Meeting The Information Service Needs Of Researchers: A Case Study Of The Research Center For Science And Technology Area (Puspiptek - Indonesia)

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The Asian Conference on Literature, Librarianship & Archival Science 2016
Official Conference Proceedings

Abstract
Research center for science and technology, known as Puspiptek area, is the name of the Largest Research Area in Indonesia. In this area there are three research institutions under the coordination of State Ministry of Research, Technology and Higher Education. Information services to support research activities in this region provided by Center for Scientific Documentation and Information, Indonesian Institute of Sciences (PDII-LIPI). Information services provided include journal, handbook, standard, etc. The rapid advancement of information technology has changed the expectations of the information services of the researchers. Therefore, information services need to make innovations so as to meet the needs of information of the user. The study aims to identify the needs of information (content, form of information (digital or printed), and communication channel) of researchers in the region of Puspiptek Indonesia. The method used was a survey through questionnaires with respondents are researchers in the region Puspiptek Indonesia. Results of the research is a recommendation for enhancement the quality of information services through development the appropriate information services.

Keywords: information services, PDII-LIPI, Puspiptek Indonesia, the need of information.

Introduction

Research center for science and technology, known as Puspiptek area, is the name of the largest research area in Indonesia. In this area there are three research institutions under the coordination of State Ministry of Research, Technology and Higher Education. The research center are: Agency for Assessment and Application of Technology (BPPT), National Nuclear Energy Agency of Indonesia (BATAN), and Indonesian Institute of Sciences (LIPI). Population of researcher in this area is 6.3% of the total number of researchers in Indonesia and 18.3% of the total number of researchers in Indonesian Institute of Sciences (LIPI).

Information services to support research activities in this region provided by Center for Scientific Documentation and Information, Indonesian Institute of Sciences (PDII-LIPI) since 1993. Information provided include journal, handbook, and standard. The type of services consists of physical and electronic; ordering by phone and email. The rapid advancement of information technology has changed the expectations of the information services of the user. Nicholas et al (2006) state that the users expect the information that is quick, easy, and can be accessed fulltexs. The research shows the user behavior in using journal database (Emerald and Blackwell), they just catch a glimpse of the content of the article. If the fulltexs is available they will continue, otherwise they will leave the page without trying to subscribe (Nicholas, Huntington, Jamali, & Dobrowolski, 2007). Therefore, information services need to make innovations so as to meet the needs of information of the user. Arora (2015) says to meet the appropriate of information services in the digital era expecially for researcher, there are a few things to watch in the development of library. There is information requirement of the user, how user access information, highly aware and IT savvy, and the user assumption about library. Various types of information services have been developed by PDII-LIPI to meet the information needs. One of which is the mobile library application. However, whether the development of information services is appropriate to the needs of researchers in the region? Therefore, the research is examined how the information needs of researchers in Puspiptek area.

The study aims to identify the needs of information (content, form of information (digital or printed), and communication channel) of researchers in the region of Puspiptek Indonesia. The result can be identified to compose the recommendation for development of services that appropriate with the needs of researchers in the area Puspiptek.

Theoretical Background

The trend of information services in the digital era

Information services has entered the digital era. The library's role is slowly being replaced by search engine like Google (Haglund & Olsson, 2008) (Turan & Bayram, 2013) and social media (Hajtnik, Uglešić, & Živkovič, 2015). Libraries should take a role in the shift towards the digital era and not limit themself. Therefore the development of the library should also be adjusted for changes in the digital era. Full text-based information service has been badly needed by the user. Nevertheless the need for printed collection will remain there cannot be replaced by digital collection. Digitization can be used for delivering collection (Arora, 2015) (Chinnasamy, 2015).

Information services for researcher

Researchers have certain characteristics in information retrieval. These characteristics will also affect the type of information services will be provided to researchers. According to Bishop (1999), the behavior of researchers in the field of technology to the journal article had the following stages: 1) finding the relevant documents, 2) to assess the relevance of the article before deciding to take or read the article, 3) reading the article, 4) sorting; create a new document with notes or cite 4) to compile the literature and integrating it into a new document. Karlsson et al., (2012) state that researchers behaviour in information retrieval is at the category of survivor. This category generally only searching the information on Google and Google scholar, library catalog, and databases subscribed by its agencies (Karlsson et al., 2012). The survivor has the subject matter and he or she utilizes personal knowledge. Survivors also report that they utilize the knowledge of the social networks of their friends or colleagues.

The gap mastership in information technology (IT)

Some study indicates a disparity in the control of IT among the younger generation and the older generation (Hatlevik, Guðmundsdóttir, & Loi, 2015) (Lin et al., 2015) (Siddiq, Scherer, & Tondeur, 2016). Johri et. al. (2014) mention the generation who entered the lecture in 2009 as “Millenial generation”. They have an information ecology with the high use of devices, high acces of internet, and multitasking. (Johri et al., 2014). Waycott et. al. (2010) divides IT users as net generation (age less than 30 years) and the immigrant generation (the age older than 30 years). (Waycott et al., 2010) suggested that there are age-related differences in technology use and skills, creating a digital divide between generations. Net generation who have grown up with computers and the Internet have a natural affinity with technology and, seemingly, are able to effortlessly adopt and adapt to changes in the digital landscape. Competence of net generation capability is made possible due to the infrastructure (facilities) at home, language, and academic aspiration (Hatlevik & Christophersen, 2013)
That matter is very influential to the needs of information services. To meet the appropriate of information need, the library should also note in which generation are their user. The appropriate information about the user group will be used to decide the priority of the development of information services.

Method

The questionnaire was used for this study. The questionnaire has been designed based on the objective .This study attempts to find out the use of information services, information need, and how the user access the services. Among 293 (50,26% of the total researcher in Puspiptek area) questionnaires distributed to researcher in 3 instsitution (LIPI, BATAN, BPPT). Only 54 questionnaires were received and complete.

Result And Discussion

Profile of user

The user of PDII-LIPI services in Puspiptek area divided into three groups based on age. The groups are “net generation” (21-30 years old), “digital immigrant” (31-40 years old), and old generation (older than 40 years). The grouping is base on Waycott et al (2010). Most of the users are a group of "old generation" (52%). This will affect the use and the need of information services. The “old generation” ability of IT usage is assumed to be lower than the “net generation”.

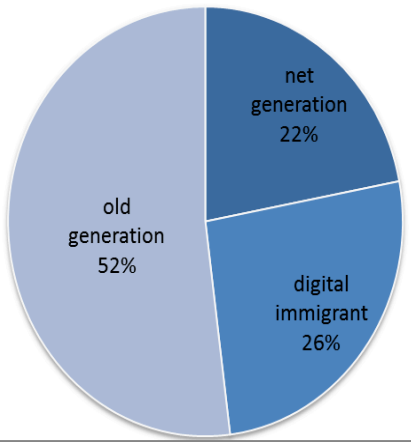

Figure 1 Age group of researcher in Puspiptek area

The use of information services

Most of user (60%) use the physical services. The user coming straight to the library to read or order the copy of collection. Only 13% responden order the services by email, and 24% use the website to acces the services. It is influenced by the amount of the group of “old generation”. This group have a habitual to use the physical services. Older people, who have encountered digital technologies later in life are thought to be more challenged by technology, showing less technological affinity and literacy than their younger counterparts. (Margaryan, Littlejohn, & Vojt, 2011) Furthermore, they believe physical services is faster underserved than order by phone or email.

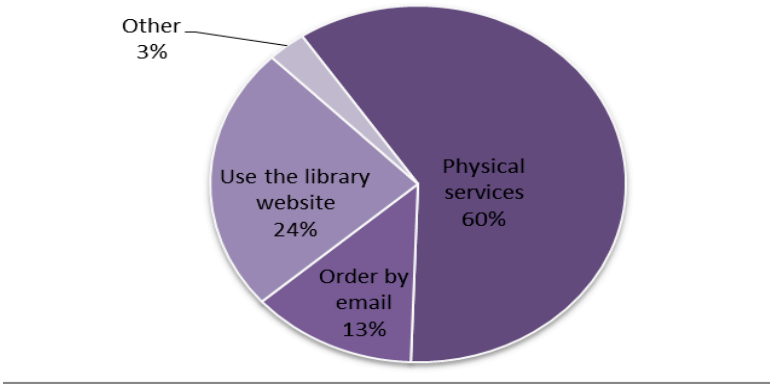

Figure 2 The use of information services

The Information need

a. Type of information

The type of information that most users need is a journal article. According to research conducted by Andy (2005) that the information that is most widely used by academic and researcher is journal article (Andy, 2005). PDII-LIPI already provides a database of journals throughout Indonesia named "Indonesian Scientific Journal Database" (ISJD). Unfortunately the article cannot be accessed in full text. In this digital era, the trend of information need is in full text. The library that not follow this trend will lose the users (Nicholas et al., 2006)(Nicholas et al., 2007). Other type of collection that have the high require is handbook and standard.

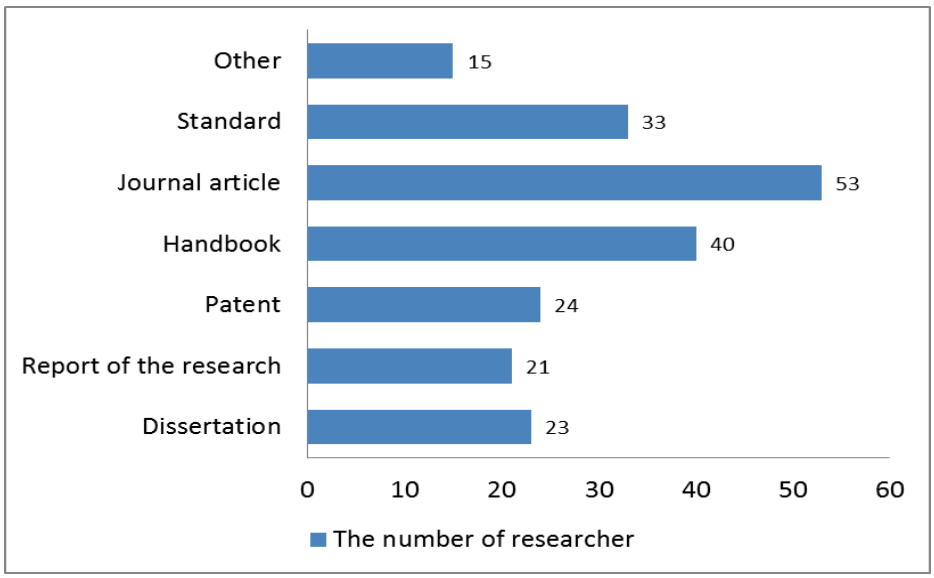

Figure 3 Type of information needed

b. Form of information

c.

Respondents who selected a printed collection more than a digital collection. Users still want printed and digital forms of collection are available in the library. It relates to amount of "old generation". According to Kang et. al. (2008) reading an E-book causes significantly higher eye fatigue than reading a printed. Reading a printed generated a higher level of reading performance than reading an E-book. (Kang, Wang, & Lin, 2008). Woody, Daniel, & Baker (2010) argue that at this time the medium itself may not be as comfortable as a textbook experience for readers and that the design of an e-book may need to differ from that of a textbook to make for a more constructive user experience.

On the other hand, the digital collection has several advantages. Morineau et. al. (2005) indicating that the time to read the electronic collection longer than the printed form. but the assimilation of the knowledge generated by reading a printed book is better than the electronic form. This is because the presentation of the printed form will further strengthen the memory sensor in the brain when compared with a form of electronic presentation on the screen. the assimilation of information is indispensable in the process of education (learning) (Morineau et al., 2005). Other studies also show that the electronic form will improve the effective learning and psychomotor learning for learners who like mobile.(Rockinson- Szapkiw, Courduff, Carter, & Bennett, 2013).

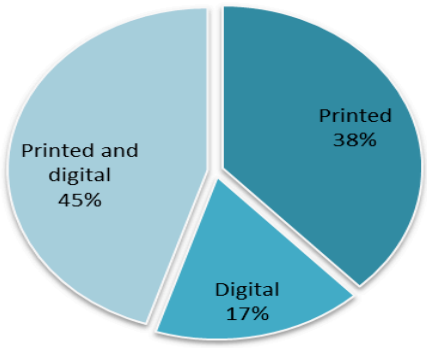

Figure 4 Form of information needed

d. Communication channel

e.

Although researchers prefer the printed collection, but to access the services they expect the information services of PDII-LIPI can access through electronic channels (email, web, phone). The low use of electronic channel is possible because they have not got a good experience when using the service information through electronic channels. Therefore, PDII-LIPI supposed to fix the system services and develop services to meet the information needs of researchers.

The issues of copying the digital collection related to the ownership of the data, which were copied and digitized collections will be easily copied again and distributed, with the same result. To overcome this can be done on the collection system of embedded digital watermarking or more famous. So the library is accountable only to copying 1 digital collection for the purpose of the service is not for commercial purposes. It

could also be applied to membership system which the member can only read digital collections, but was not able to copy or print (Maity & Kundu, 2010).

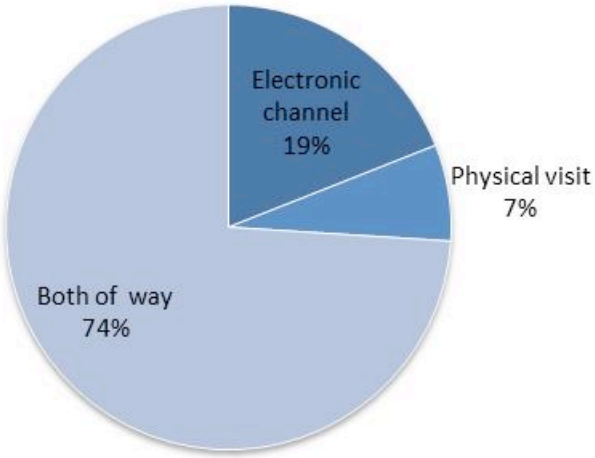

Figure 5 The need of how to access the services

Recomendation For Development Of The Information Services

The information services to meet the researcher need should be efficiently. Three approaches that can be done are simple but consistent, ease of access, and individual solutions (Haglund & Olsson, 2008). The following are some recommendations regarding the development of the information service in PDII-LIPI

a. Online Membership

These services are already being developed in PDII-LIPI. But various problems related to service policies and the development of the system causes the system was not yet used in PDII-LIPI. The results of the questionnaire showed that all respondents expressed willingness to become a member of online membership. Development of the online membership services needed by researchers, it is to support the development of a digital collection services according to user needs.

b. Mobile library application

The use of Android apps on smartphones today is very high. Therefore PDII-LIPI try to use these technologies to improve its services by creating a mobile library application based on android. Researchers in the area of Puspiptek Serpong welcomed the development of those services. Amount 89% of respondents were interested in using the mobile library application to access the library services. It should be followed up by continuing to develop the application services by paying attention to the usability of the application.

c. Library infrastructure

The use of physical services are still high by researchers in the region Puspitek causes the need for better infrastructure development. Physical infrastructure still need to be developed to meet the needs of physical services researchers, especially for old

generation. If acceptance of the printed collection is still high, so the information services in the form of printed (physical services) should be still being done and developed (Hua, Cheng, & Wang, 2011). Therefore the development of information services which is currently prioritize to the digital development should still pay attention to the development of printed collection ranging from procurement, processing, and collection management. Infrastructure should also be developed is related to the need for digital content delivery (digitizing) such as a scanner and copier. The development is not only procurement but also to consider the problem of its regular maintenance.

Conclusion

Researchers in the region Puspiptek currently on immigrant groups and the old generation. Therefore, the use of physical services remains high (60%). However, the needs of digital information asccessed by electronic chanel are still required. The type of information most needed is the collection of journals. Printed collection is more desirable than digital form. Therefore, to meet the appropriate services for researcher in Puspiptek area, PDII-LIPI should develope the information services not only foccused on digital services, but also foccussed on physical development (physical infrastructure). However, the digital services being developed by PDII-LIPI (online membership and mobile applications) enthused by researcher in Puspiptek area.

Acknowledgements

The author is indebted to advisor Ambar Yoganingrum for general guidance in theory and conceptualization. This article in particular benefitted greatly from the assistance of several team members at division of Information Dissemination, and to the helpful suppport in the implementation of the study of The head of PDII-LIPI.

Reference

Andy, B. (2005). The information-seeking habits of graduate student researchers in the humanities1. *Journal of Academic Librarianship*, *31*(4), 324–331. http://doi.org/10.1016/j.acalib.2005.04.005

Arora, J. (2015). Next generation libraries: changing roles of libraries in promoting research and innovation. In *ICLIS 2015, Challenges for Information Profesionals and LIS services in the 21st Century* (pp. 1–11).

Chinnasamy, K. (2015). A study on usage of print and electronicjournals among the students of Engineering Colleges in Madurai District K. Chinnasamy. In *ICLIS 2015, Challenges for Information Profesionals and LIS services in the 21st Century*.

Haglund, L., & Olsson, P. (2008). The Impact on University Libraries of Changes in Information Behavior Among Academic Researchers: A Multiple Case Study. *The Journal of Academic Librarianship*, *34*(1), 52–59. http://doi.org/10.1016/j.acalib.2007.11.010

Hajtnik, T., Uglešić, K., & Živkovič, A. (2015). Acquisition and preservation of authentic information in a digital age. *Public Relations Review*, *41*(2), 264–271. http://doi.org/10.1016/j.pubrev.2014.12.001

Hatlevik, O. E., & Christophersen, K. A. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers and Education*, *63*, 240–247. http://doi.org/10.1016/j.compedu.2012.11.015

Hatlevik, O. E., Guðmundsdóttir, G. B., & Loi, M. (2015). Digital diversity among upper secondary students: A multilevel analysis of the relationship between cultural capital, self-efficacy, strategic use of information and digital competence. *Computers & Education*, *81*, 345–353. http://doi.org/10.1016/j.compedu.2014.10.019

Hua, G., Cheng, T. C. E., & Wang, S. (2011). Electronic books: To “E” or not to “E”? A strategic analysis of distribution channel choices of publishers. *International Journal of Production Economics*, *129*(2), 338–346. http://doi.org/10.1016/j.ijpe.2010.11.011

Johri, A., Teo, H. J., Lo, J., Dufour, M., & Schram, A. (2014). Millennial engineers: Digital media and information ecology of engineering students. *Computers in Human Behavior*, *33*, 286–301. http://doi.org/10.1016/j.chb.2013.01.048

Kang, Y.-Y., Wang, M.-J. J., & Lin, R. (2008). Usability evaluation of E-books. *Displays*, *30*(2), 49–52. http://doi.org/10.1016/j.displa.2008.12.002

Karlsson, L., Koivula, L., Ruokonen, I., Kajaani, P., Antikainen, L., & Ruismäki, H. (2012). From Novice to Expert: Information Seeking Processes of University Students and Researchers. *Procedia - Social and Behavioral Sciences*, *45*, 577–587. http://doi.org/10.1016/j.sbspro.2012.06.595

Lin, C. A., Atkin, D. J., Cappotto, C., Davis, C., Dean, J., Eisenbaum, J., … Vidican, S. (2015). Ethnicity, digital divides and uses of the Internet for health information. *Computers in Human Behavior*, *51*, 216–223. http://doi.org/10.1016/j.chb.2015.04.054

Maity, S. P., & Kundu, M. K. (2010). DHT domain digital watermarking with low loss in image informations. *AEU - International Journal of Electronics and Communications*, *64*(3), 243–257. http://doi.org/10.1016/j.aeue.2008.10.004

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, *56*(2), 429–440. http://doi.org/10.1016/j.compedu.2010.09.004

Morineau, T., Blanche, C., Tobin, L., & Guéguen, N. (2005). The emergence of the contextual role of the e-book in cognitive processes through an ecological and functional analysis. *International Journal of Human-Computer Studies*, *62*(3), 329–348. http://doi.org/10.1016/j.ijhcs.2004.10.002

Nicholas, D., Huntington, P., Jamali, H. R., & Dobrowolski, T. (2007). Characterising and evaluating information seeking behaviour in a digital environment: Spotlight on the "bouncer." *Information Processing & Management*, *43*(4), 1085–1102. http://doi.org/10.1016/j.ipm.2006.08.007

Nicholas, D., Huntington, P., Jamali, H. R., & Watkinson, A. (2006). The information seeking behaviour of the users of digital scholarly journals. *Information Processing and Management*, *42*(5), 1345–1365. http://doi.org/10.1016/j.ipm.2006.02.001

Rockinson- Szapkiw, A. J., Courduff, J., Carter, K., & Bennett, D. (2013). Electronic versus traditional print textbooks: A comparison study on the influence of university students' learning. *Computers & Education*, *63*, 259–266. http://doi.org/10.1016/j.compedu.2012.11.022

Siddiq, F., Scherer, R., & Tondeur, J. (2016). Teachers' emphasis on developing students' digital information and communication skills (TEDDICS): A new construct in 21st century education. *Computers & Education*, *92-93*, 1–14. http://doi.org/10.1016/j.compedu.2015.10.006

Turan, F., & Bayram, Ö. (2013). Information Access and Digital Library use in University Students' Education: The Case of Ankara University. *Procedia - Social and Behavioral Sciences*, *73*, 736–743. http://doi.org/10.1016/j.sbspro.2013.02.112

Waycott, J., Bennett, S., Kennedy, G., Dalgarno, B., & Gray, K. (2010). Digital divides? Student and staff perceptions of information and communication technologies. *Computers & Education*, *54*(4), 1202–1211. http://doi.org/10.1016/j.compedu.2009.11.006

Woody, W. D., Daniel, D. B., & Baker, C. A. (2010). E-books or textbooks: Students prefer textbooks. *Computers and Education*, *55*(3), 945–948. http://doi.org/10.1016/j.compedu.2010.04.005

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