ATLANTIS
PRESS

E-Readiness Analysis in Development of Information Technology Library:
Case Study of Library of Universitas Negeri Padang

Habiburrahman
Information, Library, and Archival Study Program
Universitas Negeri Padang
Padang, Indonesia
habiburrahman@fbs.unp.ac.id

Gustina Erlianti
Library and Information Science Study Program
Universitas Negeri Padang
Padang, Indonesia
gustinaerlianti@fbs.unp.ac.id

Abstract—**This study aims to identify the level of e-readiness of the Library of Universitas Negeri Padang in the development of information technology-based libraries using the e-readiness tool developed by Mutula and Brakel (2006). Data in this study were obtained from questionnaires, interviews, observations, and documentation. The data were analyzed using the mixed-method concurrent triangulation model. The sample in this study was determined by saturated sampling techniques to obtain quantitative data and purposive sampling to obtain qualitative data. Quantitative analysis shows that the readiness segment of the institution obtained a score of 3.12 which means that in the ready category, the human resource readiness segment obtained a score of 3.31 which is categorized as very ready, and the information readiness segment obtained a score of 2.89 which is categorized as ready. Meanwhile, the score of the infrastructure readiness segment was 3.09 categorized as ready while the external environment readiness segment had a score of 3.10 in the ready category. From the qualitative analysis, the findings showed that the Library Universitas Negeri Padang has applied information technology in almost all library activities and has been running quite effectively. However, it is still constrained related to the freedom of the library in managing the library software system that is still connected and integrated under the management of the computer center of the Universitas Negeri Padang.**

Keywords: E Readiness, information technology, library

I. INTRODUCTION

Along with the development of the times, the application of information technology in the library becomes something that must be done. Public libraries to universities are competing to implement information systems in their institutions. When it is viewed from one perspective, this has a positive impact because libraries can keep abreast of the times and changes in the behavior of modern society who want everything practically, but on the other hand sometimes the attention of readiness of the library manager is not always be considered. This can be seen from the library manager who still cannot operate the computer. If they are forced to adapt to things that they do not understand, it is feared that new problems will arise such as decreased morale and technostress which will ultimately impact on the lack of maximum service in the library itself

To carry out good information services, all components in the library must have good preparation, both from employees who have professional competence and quality to carry out their work, as well as supporting infrastructure in order to facilitate the fulfillment of information needs of library service users.

The readiness to apply information technology is called E-Readiness, this term defined as the ability of a department, organization or workgroup to successfully adopt, use and benefit from information and communication technology (Ardoni, 2005; Asari, 2014). To find out the readiness, it is necessary to evaluate the readiness in the implementation of information technology (E-Readiness) in the library, the results of which can determine how much the readiness of a library in implementing information technology. In addition, the measurement of E-Readiness can provide instructions that can guide policy-makers in making decisions related to the development of information technology that needs to be done. Furthermore, the measurement of E-Readiness is also useful as an introspection of the library's ability to integrate information technology to run effectively and efficiently.

Library of Universitas Negeri Padang is a university library that applies information technology in library activities. Automation activities at the Library of Universitas Negeri Padang including member administration activities, data input, provision of online catalogs (OPAC) and circulation services. Based on preliminary studies conducted by researchers on the implementation of information technology in the Library of Universitas Negeri Padang, many experienced problems, including the dependence of the system on the University Communication Center (PUSKOM), to the development funds which were considered to be lacking, for this reason, the authors were interested in seeing the extent of the readiness of the

Library of Universitas Negeri Padang in implementation of information technology (E Readiness) (Bowles, 2011).

The topic that the writer wants to address is E-Readiness is a very broad study because so many fields that apply information technology such as education, economics, business, to health, the discussion about this has been widely studied. However, research relating to the readiness of implementing information technology (E-Readiness), especially in the field of library and information science is still very little. Among those that can be found by the author include, Rahman (2015) this research uses the Integrated Information Rich E-Readiness tool model Assessment Tool developed by Mutula & Brakel (2006) with the addition of variables from the CID Harvard E-Readiness Tool namely Individual Usage, Business Usage, Government Usage, and City Government Policy. The study found that all the variables in the research model had a positive influence on the implementation of the E-Government blueprint for the city government of Balikpapan. The next research was conducted by Asari (2014) aiming to determine the readiness of DIY Province BPAD in applying information technology. Using a qualitative approach and a questionnaire developed by Mutula and Brakel (2006), the findings showed that the readiness of DIY BPAD institutions is at the level of being ready to implement information technology. A study by Gombachika and Khangamwa (2013) examines the effect of E-Readiness readiness on the acceptance of information technology in TEVT students at the University of Malawi. This quantitative study showed that technology readiness influences the acceptance of information technology, while gender aspects do not have a significant effect on technology readiness. The renewal of this study is the location of research in the University library, this study is the first time conducted using the Mutula and Brakel (2006) models in Collage Library.

Referring to the background above, the researchers wish to conduct further research on the extent of the readiness of library of Universitas Negeri Padang in the implementation of information technology, in order to measure readiness using a measuring instrument developed by Mutula and Brakel (2006). This measure comes from concepts from the Computer System Policy Project (CSPP) study, the Center for International Development (CID) at Harvard University, the Economist Intelligence Unit (EIU), and the IBM Program, the United Nations Development Program, the United Nations Conference on Trade and Development, McConnell International (MI). Mutula and Brakel (2006) studied the study and then added several indicators and new components in order to assess the readiness of the application of information technology in an institution. From the 112 assessment components then adjusted to the state of the library in University.

II. METHOD

This research is a descriptive study with a case study approach. The objects in this study were all staff of the Library of Universitas Negeri Padang. In this research, the method used is a mixed method of concurrent triangulation or a mixture of quantitative and qualitative methods in a balanced manner (Sugiyono, 2009). This research method was chosen because the writer wants to know the level of readiness for the implementation of information technology with precision tools developed by Mutula and Brakel (2006). After the data (quantitative) is obtained it will be equipped with data sourced from interviews, and observations (qualitative).

In this study, the writers used a model developed by Mutula and Brakel (2006). This assessment model was named An Integration Information Rich E-Readiness Assessment Tool and was the result of the development of several concepts of E-Readiness research models such as CSPP (Computer System Policy Project), Harvard CID (Center of International Development), EIU (Economist Intelligence Unit, and IBM Program), then Mutula and Brakel (2006) added several components of information access indicators to the model they designed.

The E-Readiness assessment model developed by Mutula and Brakel (2006) was chosen because this model was developed to assess the readiness of an institution in terms of access to information, and of the many assessment models, this model is the most appropriate to be applied in E-Readiness assessment in the library. The five components include Information Readiness, Enterprise Readiness, Human Resources Readiness, Infrastructure Readiness, and External Environment Readiness as shown in Figure 1.
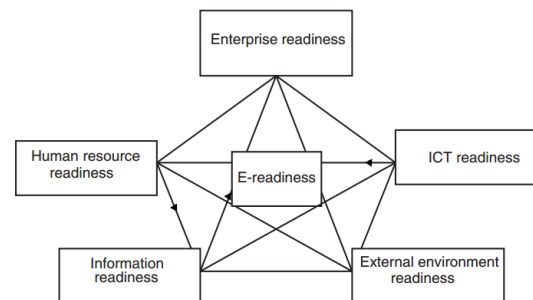

Fig. 1 points of Mutula & Brakel Readiness Segments

The research findings in the form of quantitative data sourced from questionnaires and qualitative data sourced from observations and interviews will be used together to answer the problem formulation related to the level of readiness of the Library of Universitas Negeri Padang in the implementation of information technology.

An assessment of the readiness level of each indicator is carried out by calculating the mean (average) of the scores obtained in the questionnaire. The values obtained will then be categorized by calculating the range score as Table I:

TABLE I. TABLE CATEGORY OF E READINESS

Score	Category	Level
1.00 – 1.75	Level 1	Very Unprepared
1.76 – 2.50	Level 2	Not Ready
2.51 – 3.25	Level 3	Ready
3.26 – 4.00	Level 4	Very Ready

III. FINDINGS AND DISCUSSION

The following is a description of the results obtained by writers related to the readiness of the Library of Universitas Negeri Padang in implementing information technology. Based on the assessment of the readiness of implementing information technology (e readiness) using the Mutula & Brakel tool at the Library of Universitas Negeri Padang it was found that the readiness of the HR (Human Resources Readiness Segment) was at the highest stage. This indicates that in terms of Human Resources, Library of Universitas Negeri Padang is at the ready level. Whereas in terms of infrastructure readiness (ICT Readiness Segment) is in the lowest position (Vaat, 2009). The explanation is in the following Figure 2.
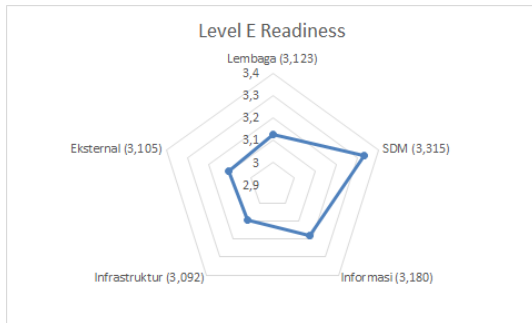

Fig. 2. Chart of E Readiness Level

Based on the diagram above, if seen as a whole readiness, the Library of Universitas Negeri Padang is already at the ready level in the implementation of information technology with an average score of 3,166. Human reassource readiness is at the highest level of 3,315 and Infrastructure readiness is at the lowest level with a value of 3,092. However, the readiness value is still in a high level because none of the readiness variables have a score below 3.00. The following is a description of each readiness variable.

1. Enterprise Readiness Segment

Enterprise Readiness Segment or institution readiness is a segment that is used to assess the readiness of Library of Universitas Negeri Padang in the implementation of information technology. This section will describe the overall readiness of the Library of Universitas Negeri Padang by assessing the availability of strategy, infrastructure, human resources, and budget sufficiency. Based on the questionnaire given to library staff, the following scores were obtained (see Table II and Figure 3).

TABLE II. ENTERPRISE READINESS SEGMENT

No	Readiness Points	Mean	Category	Level
1	E-readiness strategy	3.06	Ready	
2	Compliance with quality ICT international standards	2.75	Ready	
3	Presence of information management post as part of organization structure	3.56	Very Ready	
4	Level of information management post	3.13	Ready	
5	Responsibilities and functions of senior information management post	3.19	Ready	
6	ICT and information strategy/policy	3.5	Very Ready	
7	Information security plans	3.31	Very Ready	
8	Information disaster recovery plans	3.13	Ready	
9	Policy on information centralization or decentralization	3.13	Ready	**3.12**
10	Capacity building strategies incorporating information management	3.13	Ready	
11	Life long education and training programmes	2.63	Ready	
12	Adequacy of budgets for ICT and information management functions	2.44	Not Ready	
13	Management initiatives to promote ICT use	3.13	Ready	
14	Chief executive ICT educational qualifications and prior ICT experience	3.13	Ready	
15	Enterprise status of e-readiness to participate in global internet age	3.38	Very Ready	
16	Mechanism for information systems analysis and implementation	3.13	Ready	
17	Mechanism for information systems, design and implementation	3.13	Ready	

Fig. 3. Enterprise Readiness Segmen Chart

In this segment assessment, there are 17 readiness points that are used to measure the readiness of library institutions in implementing information technology. In this readiness variable, the Library of Universitas Negeri Padang scores 3.12, which means that in terms of institutional readiness, the Library is ready to implement information technology, this is marked from the library that has an information management section

that has an active role and an information technology implementation strategy that is supported by the main institution which is Universitas Negeri Padang, especially the Rector and head of the library who strongly support the implementation of information technology in all campus activities by adding hotspot points to provide wifi.id access for all academic communities including in the library, as well as giving initiations to employees to get accustomed to using information technology.

2. *Human Resources Readiness Segment*

In this section the value of readiness of human resources of the Library of Universitas Negeri Padang as a whole is explained by assessing the availability of experts, the librarian's ability to manage information and information retrieval, and the librarian's awareness of the importance of information technology in the library. Based on the questionnaire given to library staff, the following scores were obtained in Table III and Figure 4:

TABLE III. HUMAN RESOURCES READINESS SEGMENT

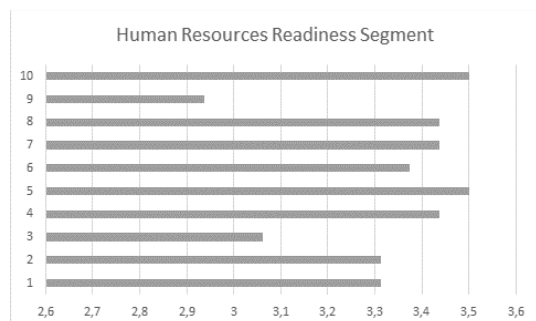| No	Readiness Points	Mean	Category	Level
1	*Ability to determine own information needs*	3.31	Very Ready	**3,33**
2	*Ability to evaluate information and its sources*	3.31	Very Ready	
3	*Ability to manage and maintain information*	3.06	Ready	
4	*Ability to analyze information*	3.44	Very Ready	
5	*Ability to use information*	3.5	Very Ready	
6	*Staff understanding of benefits of well-organized and managed information*	3.38	Very Ready	
7	*Diversity of staff ICT educational qualifications and skills*	3.44	Very Ready	
8	*ICT professionals needed most*	3.44	Very Ready	
9	*Professional skills lacking in the organization*	2.94	Ready	
10	*Usage of ICTs*	3.5	Ready	

Fig. 4. Human Resources Readiness Segment Chart

In the readiness of human resources, the Library of Universitas Negeri Padang gets very good grades, it can be seen from a number of readiness points that score in the very ready category, including the ability of library staff to manage information and the presence of IT experts in the library.

3. *Information Readiness Segment*

In this section, the overall value of information readiness of Library of Universitas Negeri Padang is explained by assessing the availability of information needed by users, the availability of access to electronic information, ease of access to information, the adequacy of information retrieval infrastructure and the availability of information sharing facilities from inside and outside the library.

The evaluation component with the category ready for the information readiness segment is the availability of regulations on access to various sources of information in the library, the availability of information technology infrastructure for library users to access information in the form of OPAC, library websites, hotline centers, and faxes. Based on the questionnaire given to library staff, the following scores were obtained in Table IV and Figure 5.

In the assessment of the information readiness variable, there are 14 components assessed. This segment shows that the average value is at stage 3.18 which means that in terms of information readiness, the Library of Universitas Negeri Padang is ready. This can be seen from the availability of access to various sources of information in the library.

To meet user information needs. Universitas Negeri Padang also provides various means for users to access information by providing computer devices to access online catalogs and search for information via the internet at several points in the library.

TABLE IV. INFORMATION READINESS SEGMENT

No	Readiness Points	Mean	Category	Level
1	*Information needs definition*	2,94	Ready	
2	*Provision for access to various sources of information*	3,25	Ready	
3	*Ease of access to information*	3,25	Ready	
4	*Mechanism to collect information*	3,13	Ready	
5	*Mechanism to store information*	3,25	Ready	**3,18**
6	*Mechanism to retrieve information*	3,25	Ready	
7	*Adequacy of information retrieval tools*	3,06	Ready	
8	*Ability to generate local content*	3,38	Very Ready	
9	*Diversity of information systems used*	2,94	Ready	
10	*Means of sharing information within and outside the enterprise*	3,13	Ready	

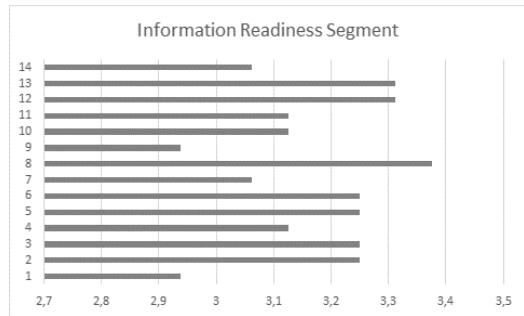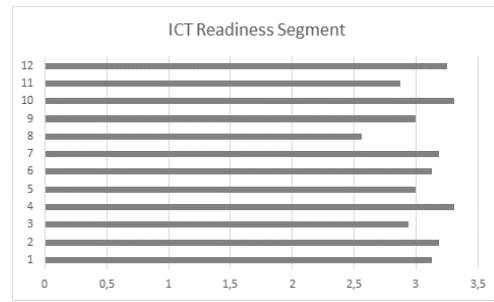| 11 | *Information storage and retrieval tools adequacy and their ease of use* | 3,13 | Ready | |
12	*Provision of documentation of system transactions*	3,31	Very Ready	
13	*Guidelines for managing e-records*	3,31	Very Ready	
14	*Compliance with information management practices e.g. backups*	3,06	Ready	

Fig. 5. Information Readiness Segment Chart

4. *ICT Readiness Segment*

In this section, the overall value of the implementation of information technology in Library of Universitas Negeri Padang in terms of infrastructure will be elaborated by assessing the spread of information technology utilization, the reliability of internet connections, the availability of supporting infrastructure and the diversity of communication channels owned. Based on the questionnaire given to library staff, the following scores were obtained in Table V and Figure 6:

TABLE V. ICT READINESS SEGMENT

No	Readiness Points	Mean	Category	Level
1	*Pervasiveness of ICTs in the enterprise*	3.12	Ready	
2	*Access to own computer or sharing*	3.18	Ready	
3	*Internet connectivity*	2,93	Ready	
4	*Access to Internet and the World Wide Web by staff*	3,31	Very Ready	
5	*High bandwidth availability for accessing the network*	3,00	Ready	
6	*Quality of connectivity to the network*	3,12	Ready	**3,09**
7	*Website availability for business promotion*	3,18	Ready	
8	*Access to radio and TV*	2,56	Ready	
9	*Availability of LAN*	3,00	Ready	
10	*Type of connectivity*	3,31	Very Ready	
11	*Diversity of communication channels available*	2,87	Ready	
12	*Level of online security.*	3,25	Ready	

Fig. 6. ICT Readiness Segment Chart

In the infrastructure readiness segment assessment, there are 12 components used to determine the readiness of library infrastructure to implement information technology. This section is the segment that gets the lowest score among other segments, namely 3.09 but still in the good category which means that in terms of infrastructure, Library of Universitas Negeri Padang is ready to implement information technology. This can be seen from the spread of information technology utilization in all work units, access to computers connected to each other.

The readiness of the Library of Universitas Negeri Padang in the implementation of information technology can also be seen from the use of information technology infrastructure in all library work units ranging from circulation services, repositories, OPAC, the use of RFID technology and the availability of online journals.

According to observations made by the writers, another assessment component that is still not ready as a whole is the quality of the information technology infrastructure that is not in accordance with international standards. Meeting the quality of information technology infrastructure with international standards can provide an overview of the quality of infrastructure in an organization. For example, an organization has received an ISO 27001: 2005 certificate on information technology security standards, meaning that the quality of information security of the organization is quite reliable. In addition, the management of information technology infrastructure at the Padang State University, especially in the software system used today is still connected under the management of the Universitas Negeri Padang computer center (PUSKOM), so the library must coordinate first when problems are found in the system, this is certainly alone takes time and limits the library to manage the system independently.

5. *External Environment Readiness Segment*

This section will describe the readiness of the implementation of information technology owned by the Library of Universitas Negeri Padang in terms of the overall external environment. Based on the questionnaire given to library staff, the following scores were obtained as in Table VI and Figure 7.

TABLE VI. EXTERNAL ENVIRONMENT READINESS SEGMENT

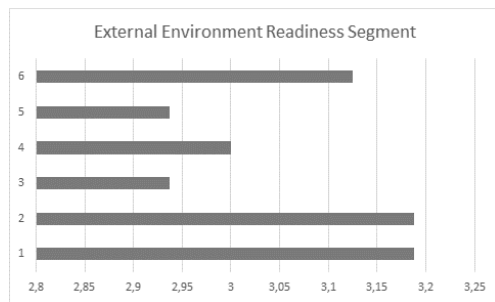| No	Readiness Points	Mean	Category	Level
1	*Quality of telecom services including adequate bandwidth*	3,18	Ready	
2	*Intellectual property rights*	3,18	Ready	
3	*Quality of nationwide ICT infrastructure*	2,93	Ready	**3,10**
4	*Adequacy and reliability of national power grid*	3,00	Ready	
5	*Government support*	2,93	Ready	
6	*Consumer protection policy*	3,12	Ready	

Fig. 7. External Environment Readiness Segment

In this readiness assessment segment, there are 6 components used to determine the readiness of the external environment supporting the library to implement information technology. This section gets an average value of 3.10 in the ready level. In this case, the library already has policies and regulations in each service and work unit, protection of intellectual property rights, in this case, the use of original software, good quality information technology infrastructure, and good support from the parent institution.

IV. CONCLUSION

This research showed the quantitative and qualitative results. The qualitative analysis showed that the readiness segment of the institution obtained a score of 3.12 which means that in the ready category, the human resource readiness segment obtained a score of 3.31 which is categorized as very ready, the information readiness segment obtained a score of 2.89 which is categorized as ready, in the infrastructure readiness segment a value of 3.09 is categorized as ready, while in the external environment readiness segment a score of 3.10 is also obtained in the ready category. While the qualitative analysis showed that the Library of Universitas Negeri Padang had applied information technology in almost all library activities, and had been running quite effectively, but it was still constrained related to the freedom of libraries in managing library software systems that were still connected and integrated under the management of the University computer center of Universitas Negeri Padang and it's also found that the library is ready for the implementation of information technology in terms of human resources but still less in terms of infrastructure because the library is under the management of the university and also the adequacy of information for users is still quite low. For that, it is still necessary to add the collection in the library and some international standard infrastructure of technology, and also the provision of continuous training to the staff and librarians by involving them in professional trainings so that the librarians and library staff will have more sufficient ability to handle the problems that occur in the implementation of information technology.

REFERENCES

Ardoni. (2005) Teknologi informasi: Kesiapan pustakawan memanfaatkannya. *PUSTAHA: Jurnal Studi Perpustakaan dan Informasi, 1*(2)*,* Universitas Sumatera Utara.

Asari, A. (2014). Kesiapan perpustakaan dalam menerapkan teknologi informasi. *Thesis S2 Kajian Media dan Budaya*, Universitas Gadjah Mada.

Bowles, D.M. (2011). *E-Readiness audit tool*. Australian Maritime College Department of Maritime and Logistic Management University of Tasmania Launceston.

Gombachika, H.S., & Khangamwa, G. (2013). ICT readiness and acceptance among TEVT students in University of Malawi. *Campus-Wide Information Systems*, *30*(1). doi: 10.1108/10650741311288805

Mutula, S.M & Brakel, P.V. (2006). An Evaluation of e-readiness assessment tools with respect to information access: Towards an integrated information rich tool. *International Journal of Information Management* 26.

Sugiyono. (2009). *Metode Penelitian Kuantitatif Kualitatif dan R&D*, Bandung: Alfabeta.

Vaati, N.V. (2009). *ICT-readiness for e-Library*. School of Computing and Informatics, University of Nairobi Kenya.