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EMERGING GLOBAL TECHNOLOGIES AND TRENDS**

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Contents

Preface

Contributors

1. Information Discovery Based on the Emerging Technology to Analyse Digital Images
Paul Nieuwenhuysen 1
2. S&T Development Strategies to Meet the Challenges of Emerging Technologies
Vladimir P. Zavarukhin 15
3. Memory of Dr. Eugene Garfield
Hildrun Kretschmer and Theo Kretschmer 31
4. Digitisation of Cultural Heritage Information Resources at Nehru Memorial Museum and Library, New Delhi, India : A Case Study
Ajit Kumar 42
5. The Implementation of Information Technology Infrastructure in Archival Management System at Municipal Archives of Palembang, Indonesia : Analysis Based on Read Giin Life Circle
Rusmiatiningsih 53
6. Big Data Watch : Introducing 'National Income Statistics' to the Librarians
P. R. Goswami and P. K. Jain 64
7. Effectiveness of Library Promotion Through Instagram at the Library of UIN Sunan Kalijaga, Yogyakarta, Indonesia
Sri Andayani 77

8.	Planning for Change Management in Special Libraries: Case Studies of Combining Two Libraries in Iran Mohsen Haji Zeinolabedini, Leila (Roya) Maktabifard and Abdoulrasoul Khosravi	91
9.	Digitisation Sharing in the Canton of Jura, Switzerland Jean-Marc Comment	112
10.	International Cooperation Among Libraries : The Role of Knowledge Centres H. K. Kaul	118
11.	Information Services and Resources in the Libraries of Engineering Colleges of Rajasthan, India: A Study Pradeep Kumar	135
12.	Education in Library and Information Science (LIS) : Results of Case Studies in the Special Field of Informetrics Bernd Markscheffel, Yuan Sun and Masaki Nishizawa	141
13.	Meeting LIS Competencies to Serve Inclusive Community Through Curriculum: Case Study of LIS Study Programme, UIN Sunan Kalijaga, Yogyakarta, Indonesia Marwiyah	158
14.	The Pattern of Utilisation of Digital Collection and its Level of Usability in Electronic Repository at University Library of UII (Universitas Islam Indonesia) Nurdin Laugu and Arina Faila Saufa	174

15. Service Quality in Academic Libraries: Case Studies 194
 from Delhi
 **K. Madhavan, Sangeeta Narang, Neha Chandel
 and Jyoti Sharma**

16. Users' Study and Expectations in an Engineering 213
 College Library in Batanagar, a Town Situated in
 Extended Kolkata, India : A Case Study
 Lopita Mukherjee

17. Revitalisation of Alternative Library, Yogyakarta, 224
 Indonesia
 **Okky Rizkyantha, Hadira Latiar and
 Fuad Wahyu Prabowo**



The Pattern of Utilisation of Digital Collection and its Level of Usability in Electronic Repository at University Library of UII (Universitas Islam Indonesia)

Nurdin Laugu* and Arina Faila Saufa**

Nowadays the development of digital-based libraries has attracted much attention and become a leading programme of library services. Digital library services in the form of institutional repository are actually a special challenge for libraries, because the libraries need to know about the utilisation of their services to users. The purpose of this study is to determine the utilisation of electronic repository services and the level of usability at the university library of UII Yogyakarta. The method used in this research is descriptive quantitative using a sampling technique of the slovin formula with the margin of error by 10%. There are 98 respondents used as sample from 6,000 members of the research population. Based on the results of analysis, it can be concluded that the level of usability of UII library E-repository reaches good categories in most indicators, including usefulness, relevance, efficiency, reliability, and accuracy in which those that are in the value percentage, between 65-<85. Meanwhile, the effectiveness, learnability, and satisfaction indicators only get scores between 45-<65 meaning in the level of satisfactory. The same happens in the utilisation rate of digital collections by which the three indicators, i.e. the intensity, frequency, and diversity uses also get the level of satisfactory as can be seen in the results of the percentage between 45-<65. This level can be concluded that the utilisation of the digital collection through the UII Library E-repository is still low.

1. Background

The development of an increasingly advanced world of information technology has changed the face of libraries to be more modern, attractive, and competitive. One of the forms of creative digital service innovation is the birth

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of a digital library. The Digital Library Federation explained that "the digital library is an organisation that provides a variety of resources, including the specialised staff, to select, structure, offer intellectual access, distribute, and preserve the integrity, so they are readily and economically available for users by defined community or set of communities."¹ The definition explains that digital libraries are a provider of digital-based information sources that can be distributed to users more easily, quickly and inexpensively.

As a modern library collection service, digital libraries are designed as user-oriented. The design is planned with a mature consideration because their budget needed is not small. According to McCray, et. al. there are at least ten principles of digital library design, namely (1) Expect Change, (2) Know your content, (3) Involve the right people, (4) Design usable systems, (5) Ensure open access, (6) Be aware of data rights, (7) Automate whenever possible, (8) Adopt and adhere to standards, (9) Ensure quality, (10) Be concerned about persistence. One of the digital library forms that are widely applied in various libraries is the electronic repository service (E-repository).²

The existence of digital libraries, such as E-repository, allows users to search information. Blandford discloses that the motivation to build a digital library is to reduce the problem of storing collections, preserving valuable collections, and fulfilling the perception that digitisation will be able to develop access.³ However, from some of these motivations, none of them explain how digital libraries should be well designed to be really useful.

Therefore, the existence of E-repository in a library is interested to conduct assessment whether or not it is able to meet the needs of information and provide satisfaction to the users. One of the electronic repository assessment activities that can be done is to look at the level of usability. Theng et al. explained that a slight work that must be done by digital libraries is to understand the purpose and usefulness of digital libraries.⁴ While Borgman, et al. says that there are relatively few libraries that evaluate the usefulness of digital libraries in any context.⁵

The UII Yogyakarta library is one of the university libraries that developed digital library through E-repository. This digital library provides various digital collections at the repository that can be accessed through <http://library.uii.ac.id/> or <http://rac.uii.ac.id/uii-repository>. Digital collections that are served include E-journals, Proceedings, Archives, theses/dissertations, and other research reports. To check on the performance of UII Yogyakarta E-repository we need to find out how the pattern of E-repository utilisation by users is evaluated to their satisfaction.

2. Literature Review

2.1. Pattern of Collection Use

Badudu explained that utilisation comes from the word 'benefit' which means useful, or avail, while utilising means to load something useful.⁶ Thus, utilisation is a way to benefit from something. The use of libraries can be viewed from two sides, i.e. from the way in which library users use information, and the effects of using information.⁷

Actually, the use of the collection is closely related to the term collection evaluation, because through evaluating the utilisation of the collection can be known how many such collections can meet the needs of users. King et al. explained that there are three factors that can affect the level of use of a library collection, namely (1) ease of access and cost of services, (2) satisfaction towards library collection or services, such as library opening hours and convenience while in the library, and (3) awareness about services provided by the library in meeting the needs of the users, such as providing credible journal collection to users.⁸

Thompson provided measurements on the concept of utilising a library. He explained that there are at least three indicators that can be used as a measurement of the utilisation level of library services. These indicators can also be used as a model or pattern of utilisation of collections at libraries. These indicators include:⁹

1. Intensity of use is that an indicator shows the extent to which the reliability of collections that are owned by the library. The intensity of use can be seen from the visits made by the users every day.
2. Frequency of use, which aims to show how often users use the collection to meet their needs of information. Utilisation is not only from the use of collections but also from the utilization of existing facilities in the library.
3. The amount used (diversity of use), which shows how far is the dependence of users on the existing collection in the library. In the use of collections, users not only come to borrow or access but also use the collection that is accessed.

2.2 Institutional Repository

Institutional repository (IR) comprises digital collections that are the works of intellectuals.¹⁰ While Shreeves argued that "a repository is a digital assets management system of some kind of network of systems that allows for the deposit and subsequent distribution of digital files over the Internet." Further, she explained that "the type of content contained in the repositories can be extensive: published articles, conference papers and book chapters, as well as

unpublished papers, technical reports, working papers, presentations, data sets, scholarly websites, dissertations and theses, digitised materials from library holdings, audio, video, and other materials."¹¹ Based on these explanations it can be concluded that the repository is a digital content-based management system comprising of articles, conference papers, research reports and other scientific publications.

According to Swan, IR can be used to increase visibility, prestige, and public value. IR in a university as an information processing unit is instrumental in publishing research results of the academic community whose purpose is to disseminate information and develop science.¹² In addition, through the repository information dissemination will be faster and easier to be enjoyed by library users indefinitely. Crow in Endang mentions important elements of IR including:

- a. Institutional defined
- b. Scholarly content
- c. Interoperability and open access
- d. Cumulative and perpetual¹³

From some of the above elements, the open access element becomes a very important element in an institutional repository, so its implementation must be considered. A library should pay attention to the implementation of the standard open access so that the operated repository system can run optimally.

2.3 Assessment Criteria of Digital Library Usability

In the context of digital libraries, Jeng stated that usability is a property of a digital library system in which all components must work together efficiently, effectively, and provide easy service to users.¹⁴ From this sense it can be explained that usability is a measure of the digital library system that can be seen from the effectiveness, efficiency, and satisfaction of the users.

Evaluating the digital library system is a very important activity especially from the perspective of users, because through the evaluation they will understand how well a system service meets their needs. Marchionini et al. emphasised that the information needs of users is the focus of a library. They also added that the entire design, implementation, and evaluation of digital libraries should be based on the information needs of users, characteristics, and conditions of the people who will use the service.

Arms argued that the usability consists of several aspects, including reliability, usefulness, relevance, and accuracy. Besides, Nielsen proposed usability dimensions including learnability, efficiency, memorability, accuracy, and satisfaction.¹⁵ Meanwhile, Jeng provided an illustration model of the

usability that includes effectiveness, efficiency, and satisfaction.¹⁶ Based on these perspectives, it can be concluded that to look at the level of usability of a digital library system can be seen from several aspects, such as: usefulness, relevancy, reliability, accuracy, efficiency, effectiveness, learnability, and satisfaction.

2.3.1. Usefulness

Usefulness includes contents and services offered by a system and how close they meet user requests.¹⁷ This aspect is more concerned with the contents provided by an information service that can provide benefits to its users. The value of the benefits provided here are closely related to how much information can meet the information seeker's needs.

2.3.2. Relevancy

Relevancy is one of the most important fundamental aspects of information retrieval activities. When the relevancy is related to contents, it can be considered as objectivity, and subjectivity which is related to the experience and needs of users.¹⁸ In the context of usefulness, the relevancy is linked to how well the system displays excellence on user demands and how well the system displays the information the user wants.

2.3.3. Reliability

According to Yang et al., reliability is accuracy, consistency of information, and credibility.¹⁹ Credibility will determine whether the source of information is acceptable and usable by users. A library that provides electronic repository with reliable sources of information will be much in demand by users. Conversely, E-repository with sources which are not credible will be automatically neglected by its users.

2.3.4. Accuracy

Pipino et al. stated that accuracy is when the information is quite up-to-date for use which is suitable for the users' requests. Up-to-date means that the information provided is not old information, whereas the latest similar information is circulating everywhere.²⁰

2.3.5. Efficiency

Efficiency is closely related to the completion of the user productivity. In this case, Petrelli added that efficiency is related to the time needed for completing a task which is measured by a valid measurement.²¹ However, other opinions say that time is not suitable to be a measuring tool of a system because it can be influenced by external factors, such as connection speed and

network traffic that can affect the time needed by the system to display user demands.

2.3.6. Effectiveness

Effectiveness is related to the completion of users' requests relating to the success of user goals. The thing to become a dimension is the lack of error experienced by users and it is accompanied with the completeness of information. The more complete and accurate the source of information provided, the higher the value of quality.

2.3.7. Learnability

Learnability is the ability of a system to satisfy users till they feel that the system provided is easy to learn.²² Then Nielsen added that learnability is often associated with fundamental aspect of usability, and the learning of a system is the users' first experience.

2.3.8. Satisfaction

User satisfaction involves user attitudes and perceptions of how they can enjoy services when using them. Jeng added that the satisfaction relates to easy-to-use areas, organised information, clear labelling, visual display, and contents measured by scale and questionnaires.²³

3. Research Method

3.1 Research Design

This study uses a quantitative research design with descriptive approach. The design is chosen by researchers because it is possible to use an assessment from the perspective of user perception. Therefore the researchers employ it to assess from the users' point of view about electronic repository at Universitas Islam Indonesia (UII) Yogyakarta.

3.2 Population and Sample

According to Arikunto, a population is the whole research subject. While a sample is a part of the population that has the characteristics or circumstances to be studied.²⁴ Samples that are too small can cause a research to be not able to describe the actual population condition. Conversely, too large samples can lead to waste of research costs (Sevilla et al., 2007). In this research, the population is the average number of users at university library of UII Yogyakarta. Whereas, the way to select samples is based on incidental sampling in which any respondent met by researchers in the field were recognised as users, then they were taken as samples. While the sample number uses the Slovin theory with the formula as follows:

$$n = \frac{N}{(1 + N(e)^2)}$$

Description:

n : Number of sample

N : Number of total population

e : Margin of error tolerance (10 %)

The population in this study is the average number of library E-repository service users of UII Yogyakarta which amounts to 6500 persons in the last six months. Thus, the use of the Slovin formula resulted in the number of samples as in the following:

$$n = \frac{N}{(1 + N(e)^2)} = \frac{6500}{(1 + 6500(0.1)^2)}$$

$$n = \frac{6500}{(1 + 6500(0,01))} = \frac{6500}{(1 + 65)}$$

$$n = \frac{6500}{66}$$

n = 98,48 becoming to 98 sample.

3.3 Data Collection Technique

According to Arikunto (2010), data collection is a conscious effort to collect data that is done systematically with standard procedures. This research uses data collection techniques in the form of questionnaires, documentation, and interviews. Questionnaires were used as secondary data containing answers of respondents filled in the questionnaires; documentation was done through collecting data about E-repository of UII Yogyakarta such as, pictures, tables, guidance, etc.; while, interviews were conducted by researchers as supporting data and proponent for data questionnaires and documentation.

3.4 Measurement Scale

A measurement scale is a set of values or scores assigned to a subject, object, and/or behaviour that can be used to measure attitudes, perceptions, values, or interests in a research.²⁵ To measure the utilisation pattern of

collection and the level of library E-repository usability UII Yogyakarta, the researchers use the technique of measuring interval data with the Likert scale. The Likert scale is a number of statements graded from positive to negative used to measure attitudes, opinions, and perceptions of a person or group of people about social phenomena.²⁶

Table 1: Likert Measurement Scale

No	Description	Positive score	Negative score
1	Strongly Agree	5	1
2	Agree	4	2
3	Neutral	3	3
4	Disagree	2	4
5	Strongly Disagree	1	5

(Source: Sugiyono, 2010)

3.5 Validity and Reliability Test

Data validity test used in this research is Pearson Product Moment with the following formula:

$$r_{xy} = \frac{n \sum X_i Y_i - (\sum X_i)(\sum Y_i)}{\sqrt{\{n \sum X_i^2 - (\sum X_i)^2\} \{n \sum Y_i^2 - (\sum Y_i)^2\}}}$$

The result of the validity test is obtained by the total sample value for 'count by 3.25, while 'table by 1.85. In the formula it is explained that if 'count (3.25) > 'table (1.85), then declared valid. Meanwhile, on the aspect of data reliability, this research uses Alpha Cronbach with the following formula.

$$r_{11} = \frac{k}{k-1} \times \left\{ 1 - \frac{\sum S_i}{S_t} \right\}$$

After tested it was found that $r_{11} = 0.913$. In the formula, it is explained that if the value r_{11} (0.913) > 0.6, then the instrument is declared as reliable.

3.6 Data Analysis Technique

Data collected through the Likert Scale score are analysed using a percentage formula by which the value scores procured from distributed questionnaires are divided by the total value scores. The value result of the

division process is then multiplied by one hundred. The formulation can be seen in the following.²⁷

$$P = \frac{n}{N} \times 100$$

Description:

P = Percentage

n = value scores procured

N = total/maximum value score

Besides, the results of analysis are interpreted using the following classification level of understanding.²⁸

20 - < 45 = Poor

45 - < 65 = Satisfactory

65 - < 85 = Good

85 - 100 = Excellent

4. Discussion

4.1 Level of Usability of E-repository at Ull Yogyakarta Library

Understanding the level of usability of E-repository is very important for any library because it can help to evaluate how effective the quality of E-repository service is. The measurement of usability level of library E-repository can be seen from several indicators, which include usefulness, relevancy, reliability, accuracy, efficiency, effectiveness, learnability, and satisfaction. Here are tables of the usability level of library E-repository of Ull Yogyakarta.

Table 2: Respondents' Answers Toward the Level of E-repository Usability

Question	Answers of Respodents				
	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Usefulness	20	51	14	8	5
Relevancy	21	53	15	5	4
Reliability	18	51	14	12	3
Accuracy	22	43	26	5	2
Efficiency	21	47	21	6	3

Effectiveness	6	19	31	29	13
Learnability	11	32	24	22	9
Satisfaction	8	23	29	32	6

Table 3: Interpretation of Scores of Respondents' Answers

Question	Value Score Procured (n)					Total Value
	Strongly Agree= number of answers Score	Agree= number of answers Score	Neutral= number of answers Score	Disagree= number of answers Score	Strongly Disagree= number of answers Score	
Usefulness	100	204	42	16	5	367
Relevancy	105	212	45	10	4	376
Reliability	90	204	42	24	3	363
Accuracy	110	172	78	10	2	372
Efficiency	105	188	63	12	3	371
Effectiveness	30	76	93	58	13	270
Learnability	55	128	72	44	9	308
Satisfaction	40	92	87	64	6	289

Table 4: Percentage and Level of E-repository Usability Classification

Questions	Percentage (P = $\frac{n}{N} \times 100$)	n	Score of Percentage	Classification Level	
		n	N		
Usefulness		367	490	74.89	Good
Relevancy		376	490	76.73	Good
Reliability		363	490	74.08	Good
Accuracy		372	490	75.91	Good

Efficiency	371	490	75.71	Good
Effectiveness	270	490	55.10	Satisfactory
Learnability	308	490	62.85	Satisfactory
Satisfaction	289	490	58.97	Satisfactory

Based on the results of the data processing from 98 respondents, it is concluded that the electronic repository of the Islamic University of Indonesia (UII) Yogyakarta on average reaches good value as demonstrated by only three indicators that get satisfactory results. This can be seen from the results of the percentage of answers on each indicator that shows good in four indicators which are located on the score classification level between 65 - < 85. On the other side, the results which are satisfactory take place on the level score between 45 - < 65. Here is a diagram for the results of the percentage of usability indicators.

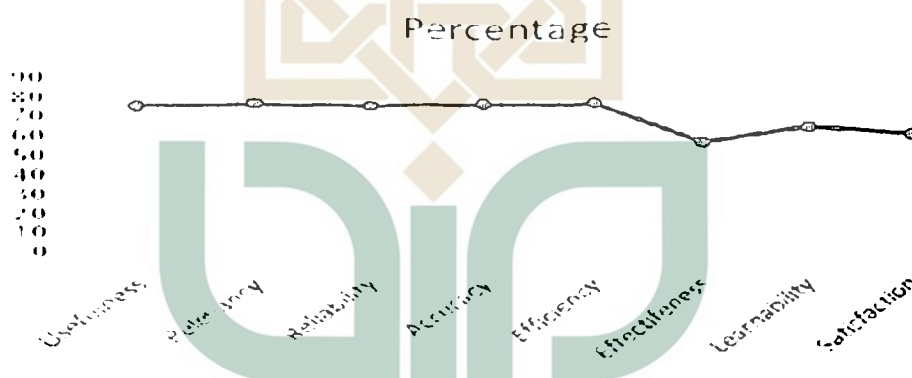


Figure 1: A diagram of percentage result of usability level

The result of percentage index calculation from the respondents' answers shows that the usability level of UII Library E-repository meets the usefulness, relevancy, reliability, accuracy, and efficiency indicators. This can be seen from the percentage of each indicator that is on the average score of 74.08-75.91 per cent. This means that these indicators fall into a category level of 'Good' as located at the interval percentage by the score 65 - < 85.

However, based on these results, the E-repository usability level of UII libraries gets scores less on effectiveness, learnability, and satisfaction indicators. This means that users of UII Library have not felt the abilities of the E-repository to provide effectiveness, learnability, and satisfaction. From the analysis, effectiveness scores by 55.10 per cent, learnability by 62.85 per cent, and satisfaction by 58.97 per cent. These results indicate that the three indicators are at a score level between 45-<65, meaning at a satisfactory level.

4.2. Utilisation of Digital Collection at UII Library - Yogyakarta

The digital library of the Islamic University of Indonesia (UII) Yogyakarta has various collections. This digital collection service is served through electronic repository which provides various types of digital collections for students, lecturers, and all UII Yogyakarta academic community members. Among the digital collections served by UII Yogyakarta E-repository are research collections, UII Yogyakarta journals, theses and dissertations, and peer-reviewed scientific E-journals, as seen in the following collection details:

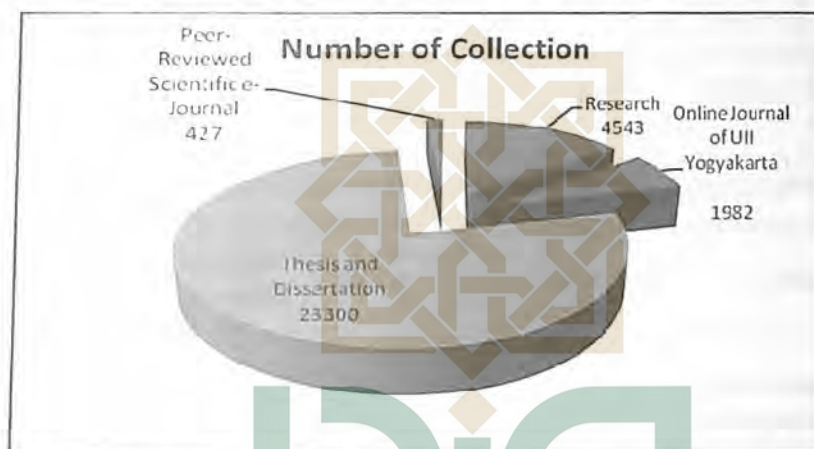


Figure 2: Type and number of UII digital E-repository collection

The collection utilisation rate becomes important for libraries, because the library is able to measure how high the user is able to take advantage of the existing collections and at the same time as an evaluation for the development of the future library collection. In measuring the utilisation level of library collections, it can be done through looking at some indicators of the library service utilisation that covers the intensity of service use, frequency, and number of collections utilised. The following diagram draws the level of utilisation of digital collections in E-repository of UII Yogyakarta.

Table 5: Respondents' Answers on the Utilization Level of Digital Collection

Question	Answers of Respodents				
	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Intensity of use	5	17	34	28	14
Frequency of use	8	19	27	34	10
Diversity of use	7	21	28	32	10

Table 6: Interpretation of Scores of Respondents' Answers

Question	Value Score Procured (n)					Total Value
	Strongly Agree= number of answers Score	Agree= number of answers Score	Neutral= number of answers Score	Disagree= number of answers Score	Strongly Diasagree= number of answers Score	
Intensity of use	25	68	102	56	14	265
Frequency of use	40	76	81	68	10	275
Diversity of use	35	84	84	64	10	277

Table 7: Level of Percentage and Classification of E-repository Usability Results

Questions	Percentage ($P = \frac{n}{N} \times 100$)		Score of Percentage	Classification Level
	n	N		
Intensity of use	265	490	54.08	Satisfactory
Frequency of use	275	490	56.12	Satisfactory
Diversity of use	277	490	56.53	Satisfactory

Based on the results of data processing among answers from 98 respondents, it is found that the average rate of use of digital collections at the library of UII Yogyakarta locates is in the low category. The table demonstrates the results of the percentage index in each indicator which is at level 45-<65 that means satisfactory. The following is a utilisation diagram of the digital collection at UII Library Yogyakarta:

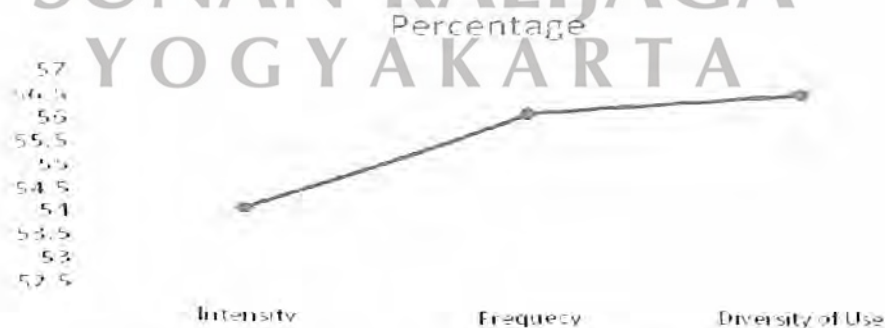


Figure 3: Diagram of digital collection utilisation level

From the results of data processing it can be explained that the utilisation level of digital collections at the library of UII Yogyakarta has not met the good category yet. That is, the use of digital collections by users is still low. This can be shown from the results of the percentage of the three indicators, namely: the indicator of the intensity of use is obtained by percentage results as much as 54.08 per cent who are at satisfactory level. It means that the average users access digital collections less than three times a week.

Furthermore, on the frequency indicator the level of use is obtained as much as 56.12 per cent who are at satisfactory level. The average user accesses digital collections for less than three hours at a time, and a few of which access for more than three hours. Therefore, the indicator of diversity of use obtains a percentage of 56.53 per cent which means the level of classification is satisfactory. This can also be interpreted that the average library users at UII Library only access the digital collection of no more than five collections in one access, so it can be concluded that the utilisation level of digital collection at the library of UII Yogyakarta is at enough category because the result of the percentage shows the value between score 45-<65.

5. Conclusion

Based on the results of data processing on the level of usability of UII Library E-repository – Yogyakarta, it can be concluded that the average library provides a good judgment. This can be seen from the provision of respondents' answers on each indicator, by which the usability that has been determined by researchers. Of the 8 (eight) indicators, the E-repository usability of UII Library gets good scores on usefulness, relevancy, reliability, efficiency, and accuracy that are in the range of 650-<85 scores that can be classified at good level. However, the E-repository usability of UII Library gets satisfactory levels in effectiveness, learnability, and satisfaction indicators. This is because the percentage of respondents' answers are in the range 45-<65 or by a satisfactory level.

Meanwhile, the results of processing respondents' answers at the level of use of digital collections can be concluded that the average utilisation of digital collections by users is in the low category. This can be seen from the percentage of respondents' answers in each indicator gets a score between 45-<65 meaning at a satisfactory level. Average users access only E-repositories less than three times a week, using E-repositories no more than three hours per access, and the number of digital collections accessed or downloaded is no more than five collections in one access, so it can be inferred that the utilisation of digital collections at UII Library through E-repository is included in the low category.

6. Recommendations

Based on the conclusions that have been made, the researchers provide recommendations to the manager of E-repository of UII Yogyakarta Library as follows:

1. UII Yogyakarta Library E-repository manager must pay more attention to the quality of the software from the repository and do regular maintenance so that the E-repository system is not often an error.
2. UII Yogyakarta Library should conduct more promotion for E-repository service so that the users know the service and want to use information through E-repository.
3. UII Yogyakarta Library must increase the number and types of digital collections so that the existing collection is more diverse and the users' needs are satisfactorily fulfilled.

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