

UTILIZATION OF CSE-UCLA MODEL IN EVALUATING OF DIGITAL LIBRARY PROGRAM BASED ON EXPERT SYSTEM AT UNIVERSITAS TEKNOLOGI INDONESIA: A MODEL FOR EVALUATING OF INFORMATION TECHNOLOGY-BASED EDUCATION SERVICES

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ABSTRACT

This study was aimed at finding out the services quality of an expert system-based digital library program implementation at Universitas Teknologi Indonesia. This study was an evaluative research using CSE-UCLA model that consisted of system assessment, program planning, program implementation, program improvement and program certification. The subjects were the head of library, the development team, the lecturers, and the students. The data were collected through questionnaire, observation, interview, and documentation. The data were analyzed using descriptive quantitative technique to analyze each of the components of the CSE-UCLA model and descriptive qualitative technique to analyze the constraints met in the program implementation. The results showed that the degree of services quality of the program implementation in the components of system assessment, program planning, program implementation, program improvement and program certification were 79.80%, 69.90%, 57.40%, 74.90%, and 66.80%, respectively. With the help of T-Score data converted into Glickman quadrant it was also found out that the degrees of services quality of the program implementation in the components of system assessment, program planning, program implementation, program improvement and program certification were High-High-High-High. The evaluation results of digital library services using CSE-UCLA model provides the right recommendation to create new ideas/breakthroughs in the development of digital libraries used to support the education process.

Keywords: *Evaluation, CSE-UCLA, Digital Library, Expert System*

1. INTRODUCTION

Quality education can't be separated from the implementation of 'tri dharma' of higher education is well. Tri dharma of higher education can be run is well, if the main components of universities are: lecturers, students, facilities and infrastructures in adequate condition and in accordance with the development of information technology. Information technology is changing the way people view and act in many ways, including in education. This is in line with the statements of Divayana, Suyasa, and Sugihartini [1] which states that "The impact of advances in information and communication technology has now changed the way people view and act in spending time to work and overcome all the problems.

The fact that we know together shows that the main obligation that must be implemented by

lecturers and students in universities is to run tri dharma of higher education which includes teaching, research and community service. In implementing the 'tri dharma' higher education need to be supported with adequate facilities and infrastructure, one of which is the library. With the importance of the role of libraries in supporting the process of tri dharma of higher education, then the college managers should be able to develop the library by providing human resources, adequate infrastructure, and utilizing information and communication technology in its implementation so as to support library progress in line with the development of education and current technology.

One of the universities in Indonesia, especially in Bali which has applied information and communication technology as digital library is Universitas Teknologi Indonesia. Universitas Teknologi Indonesia provides digital library system

based on Decree of Rector of Universitas Teknologi Indonesia No. 701 / UTI / I / 2012. This Decree is issued as a form of Implementation of Law No. 43 Year 2007 regarding Library, Article 19 Paragraph 2.

The need for digital libraries at Universitas Teknologi Indonesia is based on the existence of complaints about library services that are not yet optimal. This is in line with the results of research was conducted by Divayana in 2016 [2], stating that the reason that caused the Universitas Teknologi Indonesia to provide digital library system is begins with the complaints of students and lecturers (especially those conducting the lecture at night) and students who are in the process of thesis work. Their grievances include: 1) the library does not open at night, so students and lecturers find it difficult to find the source of books/literatures related to the lecture material and student thesis; 2) the process of searching books/literatures are done manually (by looking at one by one on each book storage rack) so that the search of books/literatures becomes very long; 3) the number of books/literatures are still physically limited and can't meet the needs of students in large numbers.

Digital library system provided by Universitas Teknologi Indonesia using information and communication technology especially website technology with expert system based concept. Website technology is used to students facilitate, faculty and employees to access this system anywhere and anytime while the concept of expert system is used to facilitate the library collection tracking system, its placement in the file directory or rack, as well as the determination of library collection status (whether missing, expired, new, and so forth). Therefore, the digital library provided at Universitas Teknologi Indonesia is called the digital library based on expert system.

Digital library based on expert system is a digital library that implements the basic concept of expert system that includes knowledge base and inference engine in its service mechanism [3]. Digital library based on expert system is a digital library by applying the basic concept of expert system which includes knowledge base and inference engine in assisting the service mechanism that it provides.

The knowledge base is used for collecting data collection and manipulation of existing collections data in digital libraries, while inference engines are used for archival collection or cataloguing of digital collections, digital collection search available in digital libraries [2].

However, over time starting from the beginning of the implementation of digital library based on expert system at the Universitas Teknologi Indonesia until now, found some obstacles in the implementation such as: 1) there are still librarians who do not understand how to prepare library collection materials with digital format using ICT tools, 2) there are still found students or lecturers who have not been able to utilize ICT in searching and uploading library collections in digital libraries based on expert system, 3) facilities and infrastructure that are still inadequate for the implementation of digital libraries based on expert systems 4) The optimum steps undertaken by the developer in organizing digital libraries based on expert system that exist in the Universitas Teknologi Indonesia.

Based on the above facts, it is necessary to evaluate the implementation of digital library program based on expert system located at Universitas Teknologi Indonesia, so that it can see the results of the implementation of the program whether it is in accordance with expectations in the objectives set previously, more accurately and comprehensively. This makes evaluation very important because it includes structured measurements (both quantitatively and qualitatively) and the measurement is more comprehensive to a program. This is consistent with the opinion of Isnaeni and Kumaidi [4] which states that: "Evaluation contains two meanings, namely qualitative descriptions of behaviour's learners and quantitative description of measurement results (e.g. scores of test). Thus, the evaluation includes measurement and is more comprehensive".

Evaluation is the process of achieving the objectives and disclosure of program/activity performance issues to provide feedback for improving the quality of program/activity performance. Roswati states in general terms of evaluation can be defined a process of giving consideration about the value and meaning of something to be considered [5]. Evaluation is an activity for collecting, analyzing, and explaining comprehensively information about a particular object/program/policy being studied and the results of an evaluation can be used for the consideration in making a decision to continue or to stop the object/program/policy [6].

Evaluation is the process of assessing something based on defined criteria or objectives, followed by decision making on the object being evaluated [7]. Evaluation is an activity to collect, analyze, and present information about an object to be evaluated,

where the results of these evaluations are used for consideration in making a decision that is precise, accurate, and reliable [8]. Evaluation is an activity to collect, analyze, and present information about a particular object under study based on predetermined criteria or objectives and the results can be used for consideration in making a decision [2]. Evaluation is an activity for collecting, analyzing, and presenting, information about a particular object to be used for a consideration in making an appropriate and accurate decision[9]. Evaluation is an activity conducted by the evaluator to collect, analyze, and present complete and accurate information about a particular object/program/service/policy being studied, thus the results could be used as a recommendation in making a decision [10]. Evaluation is an activity undertaken by the evaluators to collect, analyze, and present the analyzed data into a useful information as the basis for taking a decision to continue or stop a program / object[11]. Evaluation is an activity of data collection, data processing, data analysis, presentation of data into information that used as a recommendation in taking a right decision [12]. Evaluation is an activity for data collecting, data analyzing and data presenting into information about a particular object under study so that the results can be used to take a decision [13].

Based on several definitions, then evaluation is an activity that collects, analyzes, and presents data into useful information in making decisions based on recommendations obtained from these activities.

The reason why the researcher chose to evaluate of digital library based on expert system at Universitas Teknologi Indonesia because of the problems that have been described above, but also because of the following things: 1) in the university there is no party who research and evaluate about digital library based on expert system, 2) the digital library is still active, 3) the college is one of the universities in the area of Bali which uses expert digital library service based on expert system, 4) the need to develop knowledge about digital library based on expert system at Universitas Teknologi Indonesia.

The program evaluation model used in evaluating of digital library based on expert system at Universitas Teknologi Indonesia is the CSE-UCLA (Center for the Study of Evaluation-University of California in Los Angeles) evaluation model.

The CSE-UCLA evaluation model is the first model developed by Marvin C. Alkin that has five

evaluation stages to be followed: the assessment system, program planning, program implementation, program improvement, and program certification [14]. The CSE-UCLA evaluation model developed by Alkin has five evaluation phases: the assessment system, program planning, program implementation, program improvement, and program certification [15]. Similarly, Suryanto, Gafur and Sudarsono [16] suggest that CSE-UCLA evaluation developed by Alkin evaluates the program in five evaluation phases: assessment system, program planning, program implementation, program improvement, and program certification.

CSE-UCLA model is an evaluation model that has five evaluation dimensions, which include system assessment, program planning, program implementation, program improvement, and program certification that is suitable to be used to evaluate service programs that help human life [17].

The CSE-UCLA model is an evaluation model that has five dimensions of evaluation (*system assessment, program planning, program implementation, program improvement, program certification*) and is suitable to evaluate service programs that help human life, such as library program, bank, cooperative, *e-government, e-learning* and others [18]. Furthermore Divayana and Sugiharni [19] stated that: “CSE-UCLA model is an evaluation model that has five evaluation dimensions, such as: *system assessment*, which provides information on the state of the system, *program planning* that helps the selection of certain programs to meet the needs of the program, the *program implementation* that provides information to introduce the program, *program improvement* that provides information about the function/performance of the program, and the *program certification* that provides information about the benefits or use of the program”.

The reason for choosing the CSE-UCLA model used to evaluate of digital library based on expert system at Universitas Teknologi Indonesia because this model is very suitable for evaluating service programs. The statement is also in line with the results of research was conducted by Divayana in 2016 [2], which states that the CSE-UCLA model is suitable for evaluating service programs.

To find out the evaluation result of digital library program based on expert system at Universitas Teknologi Indonesia, it is necessary to conduct research by using CSE-UCLA evaluation model to

organize digital library system based on expert system at Universitas Teknologi Indonesia.

The problems studied as follows: 1) how the quality of the implementation of digital library program based on expert system viewed from the component of system assessment, namely: vision, mission, objectives, human resource competency needs, community participation support, legal basis or policy supporting the program? 2) how is the quality of the implementation of digital library program based on expert system in terms of program planning component, namely: organizational structure, readiness of lecturer ability, readiness of student ability, preparedness of development team ability, finance, facilities and infrastructure ?, 3) how is the implementation quality of digital library program based on expert system in terms of the program implementation components, namely: the introduction of programs and tools required in running the program ?, 4) how the quality of the implementation of digital library program based on expert system in terms of the components of the program improvement, namely: collection management process, process of learning making access rights and digital documents, the process of learning the use of the program, the process of financial management ?, 5) how the quality of the implementation of digital library program based on expert system in term of the components of the program certification, namely: visitor satisfaction on the quality of services provided by the program in terms of several dimensions, such as: tangibles, reliability, responsiveness, assurance, and empathy ?, 6) what are the constraints faced in the implementation of digital library program based on expert system at Universitas Teknologi Indonesia and how the alternative/solution its solving?

In general, evaluation aims to assess whether a program is running in accordance with the goals set previously. This is in line with the statement expressed by Aman [20] which states that: "Evaluation is conducted to assess whether a program is implemented in accordance with the planning and achieve the expected results or not".

Based on the problems that have been described previously and the existence of a very strong impulse to know the quality of the implementation of digital library program based on expert system in terms of *system assessment* component, *program planning*, *program implementation*, *program improvement*, and *program certification* then in particular, this study aims to obtain information about the quality of the implementation of digital

library program based on expert system at Universitas Teknologi Indonesia in terms of the five components of CSE-UCLA model evaluation as well as the constraints faced in the implementation of the program and its solutions are expected to be able to provide recommendations for program refinement.

In general, the benefits of a program evaluation are to improve program identification methods, ensure program success, determine of program affordability, measure achievement of program objectives, measure program impacts. This is consistent with the opinion of Susilaningih [21] which states that: "The benefits of a program evaluation are: (1) Improving the methods used to identify a program to always be consistent with the intended purpose, (2) Ensure the possible success rate of the program, and help choose the most suitable strategy in order to achieve the stated goals, (3) Determine whether the program's implementation can reach the program beneficiaries, (4) Measure whether the implementation of the program is capable of achieving the stated objectives, and (5) Measuring the program's impact on development (education, economy and defence) on a large scale".

Specifically, the benefits of this research are the stakeholders can obtain information about the quality of the implementation of digital library program based on expert system at Universitas Teknologi Indonesia thoroughly reviewed from the components of the system assessment, program planning, program implementation, program improvement, and program certification.

Previously the background of this research is carried out is research conducted by Divayana, *et al* [3] in 2015 that is about Digital Library of Expert System-Based at Indonesia Technology University. The results of research in 2015 conducted by Divayana, *et al* is a digital library application program that implements artificial intelligence based on expert systems that include knowledge base and inference motor. Meanwhile, the weakness found in the research is not able to show the effectiveness level of the implementation of digital library services based on expert systems at Universitas Teknologi Indonesia.

Several researches related to this research include: research conducted by Ariawan, Sanjaya, and divayana [22] in 2016 about an evaluation of the implementation of practice teaching program for prospective teachers at Ganesha University of Education based on CIPP-Forward Chaining, have

similarities with this research in the use of forward chaining method in searching information, While the difference lies in the presence/absence of evaluation activities in determining the quality/effectiveness of the program. Another research is a study conducted in 2017 by Divayana [23] on evaluation of blended learning implementation in SMK TI Udayana using CSE-UCLA model, has similarities with this research that is in terms of utilization of CSE-UCLA evaluation model in evaluating the program. The difference lies in the object under study, where this study examines the services of digital libraries, while research conducted by Divayana in 2017 is researching about blended learning.

2. RESEARCH METHODOLOGY

This research is an evaluative research using CSE-UCLA model developed by Marvin C. Alkin. Respondents involved in this research consist of: head of library, lecturer, student, and program development team. Methods of data collection were conducted by observation, questionnaires distribution, interviews, and documentation. Data

analysis on the evaluation of digital library program based on expert system at Universitas Teknologi Indonesia viewed from component of system assessment, program planning, program implementation, program improvement, and program certification using quantitative descriptive analysis technique by comparing the evaluation result with predetermined evaluation criteria. This is in line with the analysis of research data conducted by Waluyati [24] that is data analysis is done by quantitative descriptive analysis, by comparing the results of research with predetermined criteria. While data analysis about the constraints found in the implementation of digital library program based on expert system at Universitas Teknologi Indonesia using descriptive qualitative analysis techniques.

3. RESULTS AND DISCUSSION

The view of digital library program based on expert system at Universitas Teknologi Indonesia can be seen in Figure 1 below.

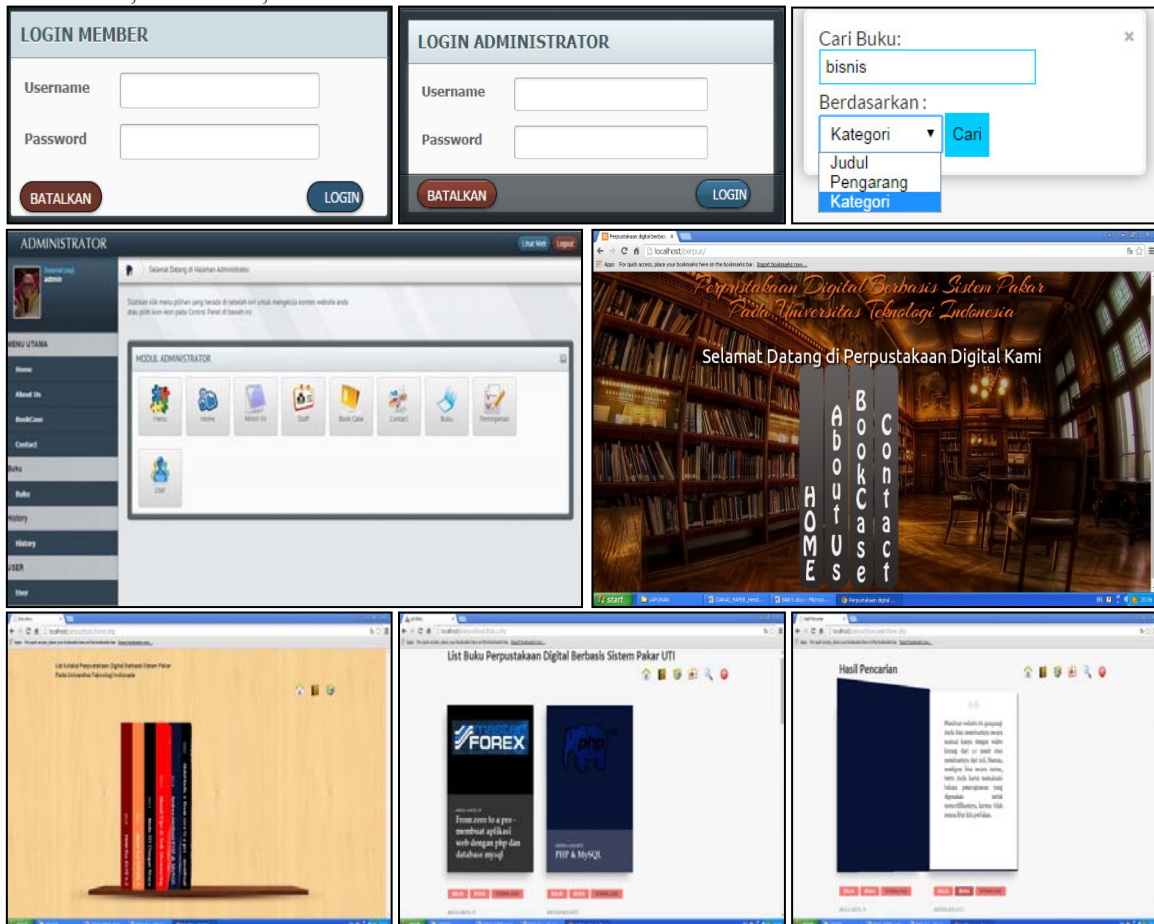


Figure 1: Display of Digital Library Program Based on Expert System at Universitas Teknologi Indonesia

Here is the inference method of expert system using forward chaining method in digital library program at Universitas Teknologi Indonesia.

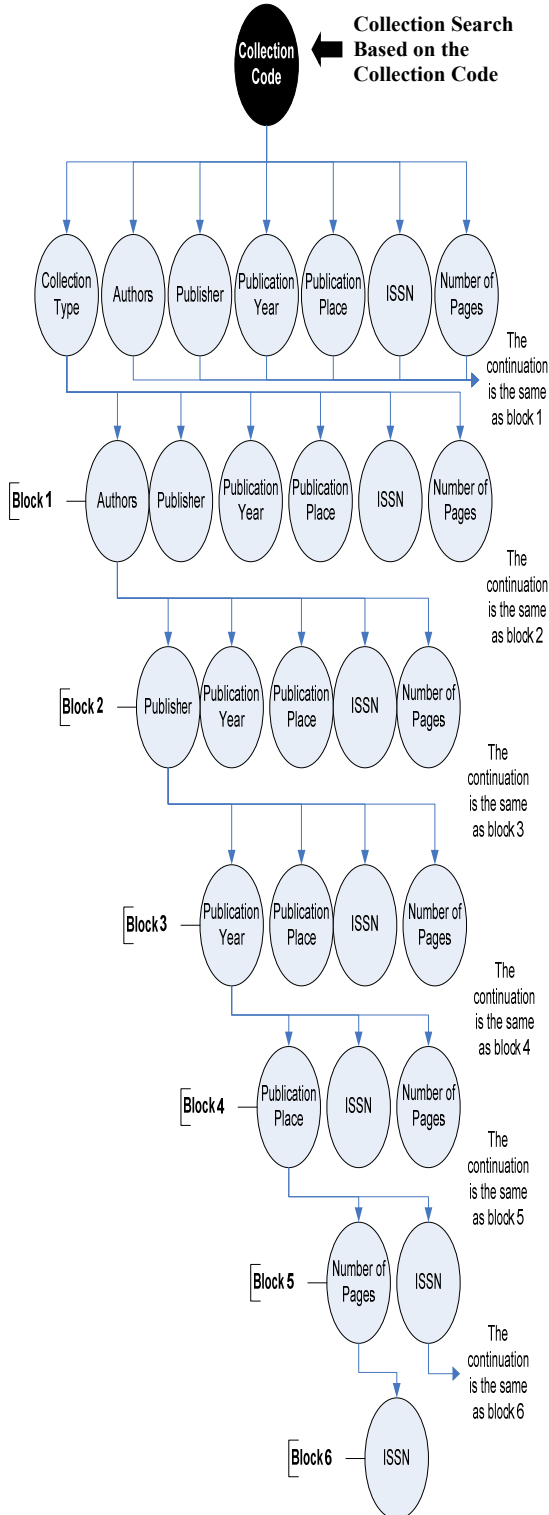


Figure 2: Display of Forward Chaining Method in Digital Library Program at Universitas Teknologi Indonesia

Here is the inference method of expert system using backward chaining method in digital library program at Universitas Teknologi Indonesia.

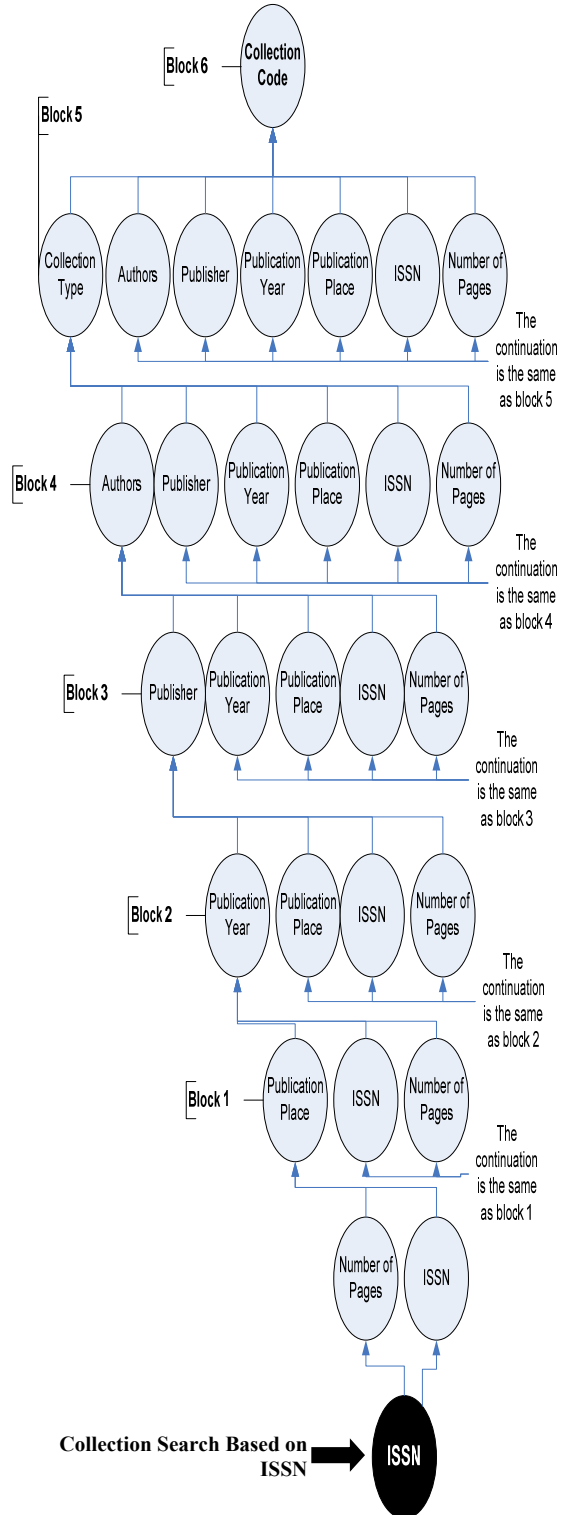


Figure 3: Display of Backward Chaining Method in Digital Library Program at Universitas Teknologi Indonesia

Evaluation result of digital library program based on expert system at Universitas Teknologi Indonesia by using component of system assessment, program planning, program implementation, program improvement, and program certification can be manually shown in table 1 and use the help of information technology shown in Figure 4 below.

Table 1: Result of Implementation of Digital Library Program Based on Expert System at Universitas Teknologi Indonesia on All Components of Evaluation

No	Components of Evaluation	Total of Average	Quality of Components (%)	Result of Evaluation	Criteria of Evaluation	Decision
1.	System Assessment	239.25	79.80	Good	Good	Maintaining its Quality
2.	Program Planning	209.70	69.90	Good	Good	Maintaining its Quality
3.	Program Implementation	172.25	57.40	Enough	Good	Optimize of Device Introduction
4.	Program Improvement	224.75	74.90	Good	Enough	Maintaining its Quality
5.	Program Certification	200.36	66.80	Good	Good	Maintaining its Quality
	The Overall Average	209.26	69.76	Good	Good	Maintaining its Quality

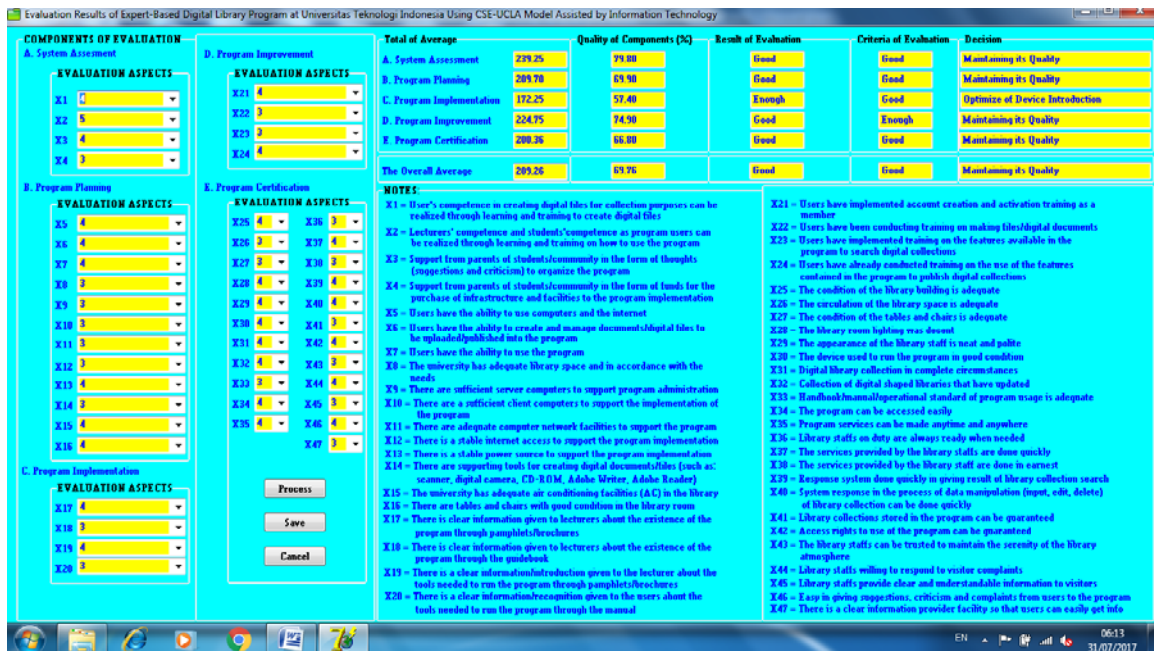


Figure 4: Evaluation Results of Expert-Based Digital Library Program at Universitas Teknologi Indonesia Using CSE-UCLA Model Assisted by Information Technology

Based on Table 1 above can be explained that the total average score of component system assessment is equal to 239.25 with the level of quality of the system assessment system of 79.80% belonging to the good category, so maintain its quality. Total average score of program planning component is 209.70 with component quality of program planning is 69.90 % which is included in good category, so maintain its quality. The total

average score of the program implementation component is 172.25 with the quality of program implementation component of 57.40% which is included in the category is enough, so the introduction of the device must be optimized its socialization. Total score average component of program improvement is equal to 224.75 with quality level of program improvement component equal to 74.90% which included in good category,

so maintain its quality. Total of average score of program certification component is equal to 200.36 with quality level of program certification component equal to 66.80% which is included in good category, so maintain its quality. The overall average of all components is 209.26 with a quality level of 69.76% which is included in either category, so maintain its quality. The overall

exposure of the implementation of digital library program based on expert system at Universitas Teknologi Indonesia on all the components of the above evaluation can be illustrated through the histogram of percentage recapitulation of quality level of each of the following evaluation components.

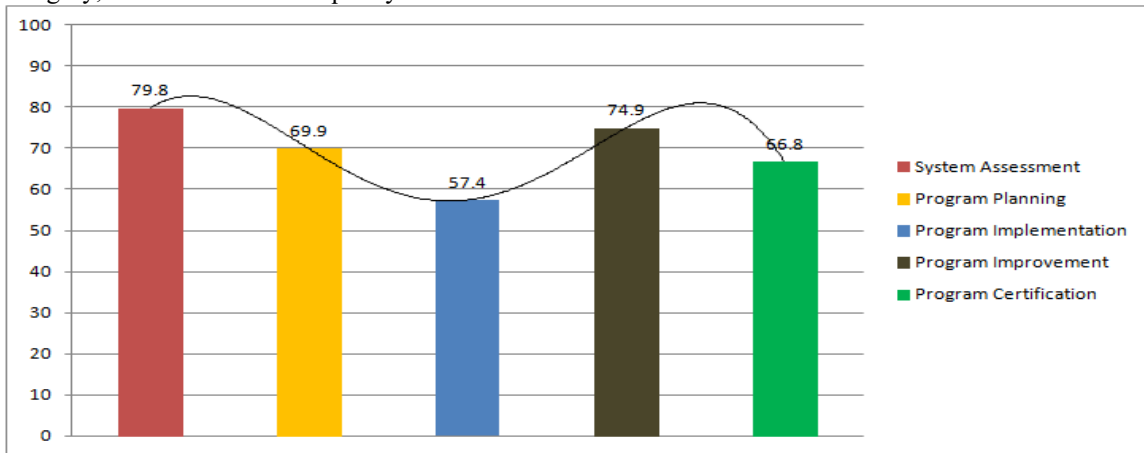


Figure 5: Histogram of Percentage Recapitulation of Quality Level of Each Evaluation Component

If observed, it appears that the component of program implementation has the lowest percentage of 57.40%, while the component of system assessment has the highest percentage of 79.80%. This means that the component of the assessment system contributes the most to the evaluation of digital library program based on expert system at Universitas Teknologi Indonesia.

In addition to obtaining a percentage of the quality level of each component of the evaluation with the analysis through theoretical ideal criteria calculation (*Criterion Ideal Theoretical Reference*)

described above, in this study with the help of T-Score data converted into the quadrant of Glickman also can be obtained the level of quality of program implementation on component of system assessment, program planning, program implementation, program improvement, and program certification that is High-High-High-High-High, so that included in the category very good. The level of quality of the implementation of a program on all components of CSE-UCLA by following the pattern of Glickman can be seen in Figure 6 below.

High					Very High				
System Assessment	Program Planning	Program Implementation	Program Improvement	Program Certification	System Assessment	Program Planning	Program Implementation	Program Improvement	Program Certification
H	H	H	H	L	H	H	H	H	H
H	H	H	L	H	H	H	H	H	H
H	H	L	H	H	H	H	H	H	H
H	L	H	H	H	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H
Very Low					Low				
System Assessment	Program Planning	Program Implementation	Program Improvement	Program Certification	System Assessment	Program Planning	Program Implementation	Program Improvement	Program Certification
L	L	L	L	L	H	L	L	L	L
L	L	L	L	L	L	H	L	L	L
L	L	L	L	L	L	L	H	L	L
L	L	L	L	L	L	L	L	H	L
L	L	L	L	L	L	L	L	L	H
					H	H	L	L	L
					L	H	H	H	L
					L	L	L	H	H
					L	H	L	L	H
					L	L	H	L	H
					H	L	H	L	L
					H	L	L	H	L
					L	H	L	L	H

Figure 6: Level of Quality of Implementation of a Program on All CSE-UCLA Components Following the Glickman Pattern

Notes:

H means its component value is High

L means its component value is Low

For more details about the Criterium Ideal Theoretical Reference recapitulation and the T-Score converted into the Glickman quadrant each evaluation component of the digital library program based on expert system at Universitas Teknologi Indonesia can be seen in table 2 below.

Table 2: Recapitulation of Criterium Ideal Theoretical Reference and T-Score Each Evaluation Component of Digital Library Program Based on Expert System at Universitas Teknologi Indonesia

No	Components of Evaluation	Criterium Ideal Theoretical Reference	Quality (%)	Result of Evaluation	T-Score	Category
1.	System Assessment	239.25	79.80	Good	50.0035	High
2.	Program Planning	209.70	69.90	Good	50.0012	High
3.	Program Implementation	172.25	57.40	Enough	50.0067	High
4.	Program Improvement	224.75	74.90	Good	50.0048	High
5.	Program Certification	200.36	66.80	Good	50.0008	High
	Average Score	209.26	69.76	Good	Glickman Quadrant	Very Good

Based on the data presented in Table 2 above, it can be explained that data analysis with Criterium Ideal Theoretical Reference from each evaluation component of digital library program based on expert system at Universitas Teknologi Indonesia has good category. Data analysis with T-Score from each component evaluation program of digital library based on expert system at Universitas Teknologi Indonesia also has very good category. This means that the implementation of digital library program based on expert system at Universitas Teknologi Indonesia has been running well.

Based on the results of previous research, there are matters to be discussed based on the components in the following CSE-UCLA evaluation model.

1) System Assessment

In this component the result of data analysis through Criterium Ideal Theoretical Reference calculation is in good criterion that is at score 239.25 (79.80%) and calculation of T-Score is in high category because $T > 50$ is $50.0035 > 50$. This means the quality of the system assessment component is good.

2) Planning Program

In this component the result of data analysis through Criterium Ideal Theoretical Reference is in good criterion that is at score 209.70 (69.90%) and calculation of T-score is in high category because $T > 50$ is $50.0035 > 50$. This means the quality of the program planning component is good.

3) Program Implementation

In this component, the result of data analysis through Criterium Ideal Theoretical Reference is

in enough criteria, that is the score of 172.25 (57.40%) and the calculation of T-score is in high category because the value of $T > 50$ is $50.0067 > 50$. This means the quality of the implementation program components is good.

4) Program Improvement

In this component the result of data analysis through Criterium Ideal Theoretical Reference calculation is in good criteria that is on score 224.75 (74.90%) and calculation of T-score is in high category because $T > 50$ is $50.0048 > 50$. This means that the quality of the improvement program is good.

5) Certification Program

In this component the result of data analysis through Criterium Ideal Theoretical Reference calculation is in good criterion that is on score 200.36 (66.80%) and calculation of T-score is in high category because $T > 50$ is $50.0008 > 50$. This means the quality of the certification program component is good.

In general, the advantages of this study when compared with previous research on Digital Library Based Expert System at Universitas Teknologi Indonesia was conducted by Divayana in 2015 that is in terms of ability to obtain the results of quality measurement of the implementation of digital library program based on expert system at Universitas Teknologi Indonesia in terms of five components of the CSE-UCLA evaluation model, so as to provide an overview of the feasibility of running a program. While research was conducted by Divayana in 2015 is only limited to obtain the results of application program of Digital Library Based on Expert System, but not yet evaluated in detail.

Based on the above description shows that the implementation of digital library program based on expert system at Universitas Teknologi Indonesia has been running well, but still found some constraints. The evaluation constraints in terms of CSE-UCLA evaluation model found in the implementation of the program, based on interviews, observation and documentation studies are as follows.

1) System Assessment Components

In the component of the system assessment found constraints on the aspect of vision, mission and objectives of the implementation of the program whose formulation only involving the Head of Library alone but does not involve all the organizers of digital library programs, especially in this case the system developer. In addition, the socialization of the existence of vision, mission and goals is still not optimally felt by all campus residents.

2) Program Planning Component

In the components of the program planning found constraints on the financial aspect that comes from the assistance of parents and students from the university is still minimal. Other obstacles lie in the aspects of facilities and infrastructure, namely: unstable internet access and the availability of supporting equipment to create documents/digital files (such as scanners, digital cameras, CD-ROMs, adobe writers, adobe reader) are not yet adequate.

3) Component Program Implementation

In the components of program implementation found constraints on the aspects of the introduction of the program and the introduction of the device to the user program (students and lecturers). The information given to program users about the existence of programs and tools required to run the program through the pamphlet/brochures provided in the library room is quite good but not yet optimal.

4) Program Improvement Component

In component improvement program found constraints that is on the learning aspect of digital document creation is still not optimal.

5) Component Program Certification

In component of program certification found constraint that is not optimum implementation of service quality aspect from tangibles dimension such as: condition of library building not yet well ordered, circulation of library space which still minimal, condition of table and chair not yet enough, there are still some collection of digital library has not been updated, the

program use manual is incomplete. Constraints on the aspect of service quality of the dimension of reliability is the readiness of library staff on duty is also felt not optimal. Constraints on aspects of service quality of responsiveness dimensions of the services provided by the library staff is still slow. Constraints on aspects of service quality of the empathy dimension is the provision of information by library staff is difficult to understand by program users, and not optimal use of information provider facilities in providing information.

Technical constraints in the application of expert digital library program based on expert system at Universitas Teknologi Indonesia has not been able to show automatically evaluation aspects of CSE-UCLA model.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Based on the results of research and discussion that has been described above, then obtained the following conclusions.

The utilization of CSE-UCLA model in evaluating of digital library service based on concept of expert system, able to present recommendation for novelty to library service as a new form of technology that supporting education process. This makes library services more optimally utilized by its users, so it can help the learning process towards a better direction.

The quality of the implementation of digital library services that apply the basic concept of expert systems in terms of components of CSE-UCLA evaluation model as a whole has gone well.

4.2 Recommendations

A breakthrough that can be done to overcome technical constraints in the implementation of digital library program based on expert system at Universitas Teknologi Indonesia is to create facilities on the digital library website that is able to automatically input and display evaluation aspects of CSE-UCLA model.

The recommendation given to overcome the evaluation constraints on the implementation of digital library program based on expert system at Universitas Teknologi Indonesia in terms of the five components of CSE-UCLA model evaluation are as follows:

- 1) Recommendations on system assessment components

In preparing the vision, mission and objectives of the implementation of the program, the Rector shall take a policy involving all program managers. In terms of socialization of the vision, mission, and objectives of the program should be done every opportunity on the sidelines of a meeting of leaders or on the sidelines of a grand event / meeting held by the university.

2) Recommendation on program planning component

In the financial aspect it is recommended that the Rector be able to find a breakthrough or source of funds from other parties/agencies off campus. In addition, the Rector is expected to be able to create a program budget management policy managed directly by the program manager but still supervised by the head of the university administration department, so that later there will be no problems. In infrastructure aspect, it is recommended that the Rector can also take policy to increase the bandwidth for internet access to be stable and add supporting equipment to create digital document in order to run the program optimally.

3) Recommendations on the implementation program components

In the introduction aspect of the program it is recommended that the Rector be able to instruct the program manager to be able to provide a guide book that contains information about the existence of the program. In the aspect of the introduction of the device it is recommended that the Rector instruct the program manager to be able to provide a manual which contains information about the tools required in the program.

4) Recommendations on program improvement components

In the learning aspect of making access rights and digital documents it is recommended that the Rector be able to give instruction to program managers to be able to organize routine training program usage activities to lecturers and students, so that they are smooth in using the program.

5) Recommendations on certification program components

On the aspect of visitor satisfaction with the service quality of tangibles dimension, it is recommended that the Rector give instructions to program managers to more routinely check the condition of the library building, add circulation of library space, routinely check the condition of desk and chair, digital collection to

be more updated, complete the contents of operational guideline Use of the program. On the aspect of visitor satisfaction of the dimensions of reliability is recommended that the Rector instructs the head of the library to frequently monitor the library staff on duty to always be there when needed. On the aspect of visitor satisfaction of responsiveness dimension is recommended that Rector is able to optimize the speed of service provided by library staff with the appointment of workforce determined based on expertise in the field so that it can work reliably. In the aspect of visitor satisfaction from dimension of empathy recommended for Rector able to optimize service of library staff in giving clear and easy information to understand by visitor, and optimizing utilization of facility of information provider.

ACKNOWLEDGMENT

Thank you for the all academicians of Information Technology Education Department, Dean and Vice Dean of Faculty of Technical and Vocational, Universitas Pendidikan Ganesha who has supported this research.

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