Initial draft of CSE-UCLA evaluation model based on weighted product in order to optimize digital library services in computer college in Bali

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Abstract. The aim of this research was to create initial design of CSE-UCLA evaluation model modified with Weighted Product in evaluating digital library service at Computer College in Bali. The method used in this research was developmental research method and developed by Borg and Gall model design. The results obtained from the research that conducted earlier this month was a rough sketch of Weighted Product based CSE-UCLA evaluation model that the design had been able to provide a general overview of the stages of weighted product based CSE-UCLA evaluation model used in order to optimize the digital library services at the Computer Colleges in Bali.

1. Introduction

Good quality of education would not be conducted if there were no adequate supporting facilities and infrastructures. Facilities and infrastructures were used in supporting the implementation of education, especially in college, such as laboratories, libraries, study rooms, seminar rooms, tables, chairs, air conditioner, internet facilities, and others. From those several facilities and infrastructures, one of the most important facilities that must be provided in a college was the library as a place to find or obtain all the information related to books, literature, and collections that support the learning process.

Along with the development of information technology, the physical of the library has begun to change from initially requiring large rooms/buildings to accommodate a large number of collections, into digital form which does not require a large room/building. However, it only requires relatively small physical size with a large digital collection capacity storage. With the digital library, the number of documents or collections can be stored well and also can be accessed easily by visitors without any space and time limit.

In general, for the computer college, the existence of digital library becomes the most important things which must be provided because it becomes the characteristic of a Computer College engaged in the field of information technology, in which all the educational processes from the learning system and supporting learning infrastructure are expected to be developed based on technology information. Thus, it will produce a good quality of education.

In fact, it is not fully following that general view. However, in particular case, the existence of digital libraries in some college computers in Bali could not be implemented optimally. This was due
to several obstacles, such as: there were the lack of strong legality about the implementation of digital library services in the colleges, human resources who were not skilled in the field of digital library services, the lack of full support and awareness by the parties who concerned on the importance of optimizing digital library services for the advancement and education quality, incomplete supporting facilities, and so on.

From these obstacles, it was necessary to conduct an evaluation of digital library services at Computer Colleges in Bali so that there would be a recommendation for service improvements. In principle, the 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 [1]. 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 [2]. 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 [3]. Evaluation is an activity conducted by an evaluator in collecting, analyzing, and presenting information related to the program/object/policy that the results can be used to take a decision [4]. 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 [5]. 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 [6]. Evaluation is an activity that collects, analyzes, and presents data into useful information in making decisions based on recommendations obtained from these activities [7]. From these opinions, in general, evaluation can be interpreted as an activity to collect, analyze, and present related information about a particular object/program/policy/service based on measurement using appropriate evaluation model and appropriate and valid evaluation instrument so that the results could be used as a recommendation in making a decision.

The appropriate evaluation model that could be used to evaluate digital library services in computer colleges in Bali is CSE-UCLA. This is supported by Divayana’s opinion [8], which stated that “CSE-UCLA model is an evaluation model that has five dimensions of evaluation (system assessment, program planning, program implementation, program improvement, and program certification) and it is suitable for evaluating service programs that help people’s life, Such as library programs, banks, economic enterprise, e-government, e-learning, and others”.

Although the CSE-UCLA model was stated to be a suitable model for evaluating digital library services, it still had some weaknesses in terms of determining the level of optimization/effectiveness in sequence from the highest to the lowest category of the programs/services evaluated based on quantitative calculations on each evaluation component. To overcome these obstacles, it was necessary to design a new innovation name a weighted product based on CSE-UCLA evaluation model. By using this model, the evaluation aspects used were still based on the components of CSE-UCLA evaluation model, while the quantitative calculation results would use the weighted product method.

Based on several problems that had been explained, there was one question that should be sought in this research, that was: How was the initial design of Weighted Product based CSE-UCLA evaluation model used in order to optimize the digital library service at the Computer College in Bali? The main purpose of this research was to find out the initial design of CSE-UCLA evaluation model based on the weighted product used in order to optimize digital library service at Computer College in Bali.

There were several previous studies that underlie to this research, such as, a research that had been implemented by Divayana, et al [9] in 2015 which was about expert-based digital library system at the Indonesia University of Technology. The advantages obtained in this research was the formation of a digital library application program that applied the concept of an expert system which contained the knowledge-base for data storage collection/digital library and inference motor to search/browse the collections/libraries online. The weakness found in the research was not able to measure the level of quality/optimization/effectiveness of digital library services. Research conducted by Divayana [10] in
2016 about the evaluation of digital library program based expert system at Indonesia University of Technology, aimed to know the extent of service quality in digital library program based on expert system applied at University of Technology Indonesia through evaluation activity using CSE-UCLA model. The results obtained from the research as an advantage that was the quality of digital library service program viewed from the component assessment system was 79.80% so that became good category, program planning component was 69.69%, belong to good category, program implementation component was 57.40% belong to good enough category, improvement program component equal to 74.90% belong to good category, and certification program component equal to 66.80% so that belong to good category. Whereas, the weakness found in the research was the CSE-UCLA model could not show the accurate calculation result of each evaluation component in sequence from highest to lowest category in determining optimization/effectiveness level of digital library service. According to several studies that had been conducted in 2015 and 2016, then the research that began to be implemented in 2017 to 2019, it is required the findings of new models that can overcome the problems of the previous research. The new finding model was Weighted Product based CSE-UCLA evaluation model, which was a CSE-UCLA evaluation model which is modified by using the weighted product method.

Based on the existing problems and purpose of this research, the researcher was interested to conduct a research on an initial design of Weighted Product based CSE-UCLA evaluation model in order to optimize digital library service at Computer College in Bali.

2. Literature Review

There were several important concepts/theories which need to be explained as the sources/references in this research, including the concepts of Digital Library, CSE-UCLA, and Weighted Product Method.

2.1. Digital Library

Digital library is all about the provision of digital collections, services, and infrastructure to support continuous learning, research, scholarly communication as well as preservation and conservation of recorded knowledge accessible anywhere and anytime [11]. Digital libraries are set of library activities and services which facilitate electronic means the processing, transmission, and display of information [12]. Based on those several definitions, it could be concluded that a digital library is a library integrated with a global computer network or the internet which is used as a facility to store large number collection of digital books and other documents and also can be accessed easily whenever and wherever the library users are located.

2.2. CSE-UCLA (Center for the Study of Evaluation-University of California in Los Angeles) Evaluation Model

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 [13]. CSE-UCLA model evaluation was accomplished in several phases, namely: system assessment, program planning, program implementation, program improvement, and program certification [14]. Based on definition above, it could be taken a general conclusion that CSE-UCLA model is an evaluation model developed by Alkin consists of five evaluation components, namely: system assessment, program planning, program implementation, program improvement, and program certification, then this evaluation model is appropriate and suitable to be used in order to evaluate programs/policy in educational and other areas related to the service programs which help human life.

2.3. Weighted Product Method

Weighted Product method is one method of decision supporting system that uses multiplication to relate the attribute rating, where the rating of each attribute must be raised first with the attribute
weight. This process is similar to the normalization process. Preferences for alternative $A_i$ are given as follows [15,16]:

$$S_i = \prod_{j=1}^{n} x_{ij}^{w_j}$$

with $i=1,2,...,m$; and $\sum w_j = 1$.

$w_j$ is a positive-valued rank for the attribute of gain and is negative-valued for the cost attribute.

3. Research Method

A research method in this research was development method design developed by Borg and Gall. The Borg and Gall model have 10 stages. Particularly in this research that was conducted in 2017, the development stage using the Borg and Gall model was limited to few stages only, including research and collecting information, research planning, design development, preliminary field testing, and preliminary product revision. The reason for limiting the stages of development, because the main purpose of research in this 2017 was only limited to know the design of weighted product based CSE-UCLA evaluation model.

The object of this research was the design of Weighted Product based CSE-UCLA evaluation model. Research subjects who were involved in the preliminary test on this evaluation model design were 2 experts of Informatics, especially those who master the decision support system and 2 experts of education, especially those who master the field of educational evaluation. Research location which was conducted in this research was in STIKOM Bali because STIKOM Bali was one of Computer College in Bali that already implemented digital library and it had complete facilities to conduct digital library research.

The main instrument that used in collecting data in this research was a questionnaire while complementing instrument that used in collecting the data were interview guide and photo/documenting picture.

The data analysis technique which was used in the accurate calculation of each evaluation component of Weighted Product based CSE-UCLA model from the highest category to the lowest category in this research was quantitative descriptive analysis technique. While data analysis about the constraints found in the design of Weighted Product based CSE-UCLA evaluation model used qualitative descriptive analysis technique.

4. Results and Discussion

The results obtained from the research and field data collecting stage during one month the beginning of this study was the rough sketch of Weighted Product based CSE-UCLA evaluation model design. These aspects were measured using (core/main/key) instruments and complementary instruments. The main instrument was a questionnaire used by respondents to evaluate each aspect of the evaluation through filling the questionnaires toward digital library services, while complementary instrument were interview guides and photographs/documentation pictures that used by researchers in conducting direct observations in the field to obtain evidence in order to reinforce the research results and derive the constraints found in digital library services.

The assessment results that were carried out by the respondents for each evaluation aspect using that main instrument, was given input weight value preferences from decision makers so that it could be calculated using the weighted product to determine the conception about optimization digital library services based on each evaluation component sequentially from highest to the lowest category. In addition, there was also an illustration about constraints found in digital library services that lead to the results sequenced calculation on each evaluation component. From the constraints illustration, it could be recommended the appropriate solutions in order to improve/repair digital libraries service, so that, digital library service at Computer College in Bali could run optimally.

The rough sketch of Weighted Product based CSE-UCLA model design could be seen in Figure 1 below.
Figure 1. The rough sketch of Weighted Product based CSE-UCLA model design

Related to the rough sceptical design of the Weighted Product-based CSE-UCLA model shown in Figure 1 showed that digital library services were evaluated using five components of CSE-UCLA model: system assessment, program planning, program implementation, program improvement, and program certification. Each evaluation component had evaluation aspects used to determine the optimum level of digital library services.

The obstacles found in this research was not able yet to find the evaluation model design which was able to input new aspects automatically if in the future it would be found new aspects that influence the optimization of digital library services.

5. Conclusions
Based on the problems stated, the results of research and discussion, it could be concluded several things, such as 1) the research which was conducted at the beginning of this month had produced a rough sketch of Weighted Product based CSE-UCLA evaluation model design shown in Figure 1. Although it was still a sketch, the design had been able to provide a general overview with the stages of weighted product based CSE-UCLA evaluation model used in order to optimize the digital library services at the Computer Colleges in Bali; 2) To overcome the obstacles found in this research, then in the future was needed to develop evaluation model design which was able to input new aspects automatically.

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