CONTROLLING E-LEARNING QUALITY WITH DATABASE HEALTH MONITORING METHOD

Untung Rahardja*, Muhamad Yusup
*Raharja Enrichment Centre, STMIK Raharja
15117 Banten Indonesia
email: untung.rahardja@faculty.raharja.ac.id*, muhamad.yusup@faculty.raharja.ac.id*

ABSTRACT

In the globalization era like today, the system information that is not foreign anymore. Information system that is currently supporting all activities in organizations and companies processing data to produce information. Information system will provide many benefits if you have a database of 'healthy'. Definition of a database that 'healthy' is the database has a high accuracy of the data that high. rather less useful if the system is felt to have a database of information 'not healthy' as a result of the data anomaly. Because the data affect the process of anomaly enter, delete and modify data in relations. In addition, the database is' not healthy 'because of errors at the time because of differences input data standard that is applied. There is no indicator that can detect errors anomaly data and things that may not. To overcome this it needed a methodology called Database Health Monitoring (DHM), which combines methods of Database Self Monitoring (DSM) [1] and the Server Health Indicator (SHI). DHM system is defined as a dashboard indicator that displays system information and indicators of data storage capacity at the same time, with the DHM can anticipate all possible anomaly data using self-control techniques to improve the quality of information systems and control self-storage capacity. In this article, identified the problem that faced the company in terms of a quality information system, 4 is defined by using the typical method of DHM as a problem-solving steps, and 7 benefit from the implementation of the new concept. In addition, shown that the listing program written using Active Server Pages. Can be concluded that the methodology can be DHM a recent evaluation in improving the quality of the information, and support activities throughout the organization and companies with more stable, controlled and better monitoring.

Keywords: Database Health Monitoring, E-Learning Quality

1 INTRODUCTION

The development of information technology and computers have been rapidly provide support to the activities of large organizations and companies, information technology and computers in general are used to support the daily transactional data processing organizations or companies to produce information that can be fast, precise, accurate and relevant. System information will provide many benefits if you have a database of 'healthy'. Definition of a database that 'healthy' is the database has a high accuracy of the data is high. rather less useful if the system is felt to have a database of information 'not healthy' as a result of the data anomaly. Because the data affect the process of anomaly enter, delete and modify data in relations. Some important data may be lost if the updated database containing relations anomaly. In addition, databases that are 'not healthy' arising from errors at the time because of differences data input standard that is applied in the transactional process. Although the standard has been applied to control input with a warning, may be found error. So also with the user control do input carefully, can also be found error. Consequently, the resulting data is not consistent, for example, found fault input name, date, Punctuation in the information system will read it as a mistake. In addition, errors can also be obtained from external sources of data on the extraction process and transform loading. And information that may not have for example a student enrolled in one of the campus with the age of 4 years or an employee enrolled in one of the company with the age of 123 years. The quality of an information system will be higher when the information system that is used as support all operational activities and transactional organizations or companies are equipped with a useful control to monitor the performance of the system independently, which can anticipate the possibilities of errors when. Good control is important to avoid things that will prevent all
activities the organization or company.

To determine the quality of information systems used three angles of which are organization, management and engineering. To get a better understanding of the nature of the system determine the quality of the information in a manner different from the software quality. Quality dimensions need to be extracted and expressed more specifically in relation to the nature of the situation and changes the system used. Characteristics of the quality of this software will differ from the information systems that are part of the organization. An information system can be defined in relation to the function and structure: a person, process, data, models, technology, formalized language in the cohesive structure that serves several purposes or functions of the organization. As an information system involves people and their working practices in the context of an organization, the quality must be assessed in the same context by evaluating how well the day-to-day that meet the needs of information. How well the needs of day-to-day will be filled this reflects the quality of an information system. His view that the organization is interested in the impact of systems and technology have on the way organizations work. An organizational approach that emphasizes the use ability of the system and understand that an information system not only provides the sense of a new organization, but also affect areas outside the scope of the main goals. The effectiveness will be achieved through improving the quality of the system Utilization. Quality improvement may have been caused by the repair service that is provided with a computer-based information system. Level of quality that the above depends on the intangible elements of service and heavily influenced by user perceptions about the system and the benefits. Adoption of Information Technology will lead to changes in organization structure and control. The ability to create and manage a successful strategic change some of the less successful organizations. Although the speed and content of the change depends on the competitive environment of the organization, quality information systems play an important role in this process, which requires the understanding of the role of technology in the organization and influence in the organization.

The main challenge is to convince management and users must be involved in the development of information systems. In many organizations showed reluctance to participate in requirements definition, development and implementation of information systems. As a result, operations are left in the hands of a professional IT priorities quite different from those involved in the organization as a whole. Management must overcome this psychological barrier if you want to use the functions of control over information systems. One of the ways in controlling a system with information is an indicator to show the possibilities that can cause things that are not desired, the indicator can be used as a dashboard [2]. In this case, controlling the use dashboard can be a choice, because the system can perform self-control and can prevent the occurrence of a system error. In other words the system can anticipate the possibilities that will happen. What kind of support will be monitored in the 'health' a system? Dashboard is the latest technology in information technology by the organization or company at this time, not only as a supporting data processing and transactional support decision making, but can also become tools for evaluation. In principle, many things that can be used as indicators to monitor the process. Depending on how we decide what we want to monitor whether in whole or only some parts of the course which is considered to be important as an indicator.

## 2 CRITICAL REVIEW

A number of critical reviews will be sought for the Database Health Monitoring or associated with it. After that the results will be considered, sought equality and difference, and to detect weaknesses and strength. Some of the critical review are as follows:

- Research conducted by Mikael Berndtsson, Jorgen Hansson, 1993, Department of Computer Science, University of Skovde, explains about the real-time database technology, which is seen as essential to support applications such as non-traditional computer integrated manufacturing (CIM), merger deal real-time database. In this research several issues and questions such as is found and the time constraints on the rule. Matters related to the research is about the detection, evaluation and selection rules in active database real-time system. A real-time method to detect the event multi-level real-time [3].

- Research conducted by Martin Sköld, 1997, from the Department of Computer and Information Science Linkoping University, Linkoping, Sweden, describes Active Database Management Systems for Monitoring and Control. This study discusses the exploration of problems in real-time database system, to introduce the characteristics of data and transactions in real-time database also
associated with the transaction processing time, source search and recovery problems in the handling of I/O overloads Real time database [4].

- Research conducted by Dushyanth Narayanan, Eno Thereska, Anastassia Ailamaki, 2005, from Microsoft Research, Cambridge, and Carnegie Mellon University, about Continuous resource monitoring for self-predicting DBMS, discusses how tasks increasingly dominate the administration of the total cost of ownership of database management system. Main task is very difficult to apply to the administrator. There are some deficiencies in this system where the condition of the database system is designed not only offer limited assistance to the administrator only [5].
Research done by Jason Lee, Dan Gunter, Martin Stoufer, Brian Tierney, 2002, from Lawrence Berkeley National Laboratory, about Monitoring data archives for grid environments, discusses a relational monitoring data archive that is designed to efficiently handle a high volume of flow monitoring data [6]. This study presents a method of instrumentation and archive service that can be used to collect and aggregate details of the monitoring information to the end of a distributed application. Research that can be done now also adopted a more dashboard system how to do flow monitoring data and has a relation with this article.

Research conducted by Shang-Wen Cheng, 2002, from the School of Computer Science, Carnegie Mellon University, about Using Architectural Style as a Basis for System Self-repair provide information how the system has the ability to adapt to the running time to accommodate a variety of system errors, and change the requirements, can improve the system, one of the problems that are difficult to determine if changes needed, and find out what the necessary adaptations. In this research have the benefits of how the system can run time monitoring, error detection, and improved independently, and have relevance to this article [6].

3 PROBLEM SOLVING

In the system, the most important thing is to maintain and improve the quality of the quality of an information system. One way in controlling the information system is the method of information control system.

Control procedures that apply to online or in a remote job entry, namely:
1. Control input, the process includes the receipt of data and data conversion.
2. Control process, including the receipt of the work, assembly work and the separation of work.
3. Control the output includes output processing and distribution of output.

Control input includes activities related to the receipt of raw data, inspection, and in the form of edits to that can be read by computers. Organizing control includes control accuracy. The goal of control is to direct activities towards achieving the goals set. There are many types of control (or the most appropriate match with the computer system), management control, operational control, control procedures, control performance and control data can also be used. In principle the same for all and can adapted to various situations and conditions. Control requires data impact on the people who are running a job. Need to obtain the correct level of control in the system and the need to maintain a certain balance between the risks that might occur, the needs of control and control systems. Control goal here is to maintain the required level of authority, decency and accuracy in work performed, together with the accuracy of the resulting data, to consider the need to achieve control policy, organizational control, operational control management control, control data and control data movement.

![Figure 3. Control system](image-url)

In this case, the control system information using Database Health Monitoring (DHM) is a new concept as an indicator in the control, which is a combination of the third point above. In addition it can be said DHM a dashboard indicator system which can anticipate the possible occurrence of a problem that is not desired, so that they can avoid obstacles that cause complaints from various parties, namely the management company or organization.

The 4 characteristics simultaneously is a method of controlling the DHM, including the following:
1. DHM can detect the possibilities of errors will occur in the information system
2. DHM can anticipate and prevent potential problems in the system.
3. DHM can be used as an indicator in the control system performance and can monitor the data storage capacity independently.
4. DHM as Dashboard Indicator System.

The advantages of DHM is DHM management before it was difficult to detect possible errors that will occur in the system, after using the DHM management easier possibilities to detect the problems that will occur in the information system since early.

7 (seven) the benefits of using the Database Health Monitoring of these:
1. Improving the Quality Information System.
2. Improve ease of management in monitoring possibilities that can occur in information systems.
3. Improve services to users, especially management information system to generate information.
4. Increasing productivity management.
5. Improve the performance of the system so that more efficient data processing
6. Information systems that are running can be more controlled with good.
7. Can control the data storage capacity so that they can anticipate the possibilities that can be possible that the performance of the system itself.

With the management method DHM akan more easily controlling the system so that information systems can be run with a stable and quality of the information generated will be increased.

4 LISTING PROGRAM

To apply the method on the DHM system information, one can use Active Server Pages (ASP) [8], as ASP is a framework that can be used to create dynamic web. ASP is used for many applications related to the database, using either Microsoft Access database to SQL Server [9] or Oracle database. Scripting the most widely used in writing are ASP VBScript. Program to display the information supporting the method DHM is Macromedia Dreamweaver [10], a web editor program that can be used to create and design web. Dreamweaver have any reliability in making and designing web without having to write HTML tags one by one, Dreamweaver also has the ability to support programming, Server Side and Client Side. Server Side is used to process the data associated with the server, database processing, eg. Client Side as a complement of other programming languages.

Here are some snippets of the view ASP script that is used on systems that implement the DHM method, as follows:

1. The script that serves as a connection to the database

```vbscript
Set conn=server.CreateObject("ADODB.Connection")
conn.open "PROVIDER=MSDASQL;DRIVER={SQLSERVER};SERVER=Raharja;DATABASE=RME;"
Set conn2=server.CreateObject("ADODB.Connection")
conn2.open "PROVIDER=MSDASQL;DRIVER={SQLSERVER};SERVER=Raharja;DATABASE=RCE;"
```

This function is used as the connection to the database to be used. Database that can be used from multiple databases.

2. The script that serves as a database selection

```vbscript
<% d=day(now)-1 m=month(now) y=year(now) Sql="select * from ao_absensi where Tanggal='"&cdate(d&"/&m&"/"&y)&"'" set rs=conn.execute(Sql)
Sql2="select * from ampuh" set rs2=conn2.execute(Sql2)
Sql3="select * from ao_kelas" set rs3=conn.execute(Sql3)
%>

```

This function is used for the selection table in the database that will be used in the method of DHM, the table-the table what is needed will be tailored to the needs of management.
3. The control script as

```vbscript
<% 
    dim persenjum
    if isnull(jum) then
        Rjum=0
    else Rjum=(jum)
    end if
    persenjum=(Rjum/100)*0.1
    persenjum=formatpercent(persenjum,0)
%>
<% 
    dim img
    if Rjum<=500 then
        img="red.gif"
    else if Rjum>700 then
        img="yel.gif"
    else if Rjum=1000 then
        img="finish.gif"
    end if
    end if
    end if
%>

This function is one of the DHM method where this script is shown in the control of the student percent number of images taken from the SIS database in the table is, where control is done by using light as an indicator.

5 IMPLEMENTATION

Raharja University move in the field of computer science that is located in Banten Province and is located only 10 (ten) minutes from the International Airport Soekarno - Hatta. Many awards that have been achieve in, one of which is winning the WSA 2009 - Indonesia E-Learning and Education category of Intranet Product Raharja Multimedia Edutainment (RME).

Raharja University has 4 pillar IT E-learning consists of the SIS (Student Information Services), RME (Raharja Multimedia Edutainment), INTEGRAM (Integrated Marketing Raharja), and GO (Green Orchestra) is the instrument to be Raharja University campus excellent fit with the vision that is superior to the universities that produce graduates who competent in the field of information systems, informatics techniques and computer systems and has a high competitiveness in the globalization era.

SIS (Student Information Services) is a software specially designed to improve the quality of service to students and works to provide information on: student lecture schedule was selected based on the semester, Card Results Studies (KHS) students, table Index Cumulative Achievement (GPA) , a list of values, and provides form creation services that can be used by student activities in lectures and so quickly and in real time [11]. Green Orchestra (GO) is a financial instrument accounting IT system at the Raharja University to provide service excellence to the Personal Raharja online form to give comfort to the cash register for staff and students in terms of speed and accuracy of data services [12].

INTEGRAM (Integrated Raharja Marketing) is a web-based information system designed specifically to serve the process of acceptance of new students at the University Raharja. With INTEGRAM, student acceptance of a new faster and controlling can be done well [13]. RME (Raharja Multimedia Edutainment) the understanding that Raharja Universities in developing the concept of the learning process based multimedia entertainment packed in so that presents the concept of Interactive Digital Multimedia Learning (IDML) that senses the strength of the cover text, image, and to provide a voice in the process of learning to all civitas academic and continuously make improvements (continuous improvement) towards perfection in the material of teaching materials, which is always evolving as the progress and development of technology. With the RME can facilitate civitas academic to obtain information about SAP, syllabus and teaching materials, faculty can easily mold into the presentation of teaching materials for RME presented to students, and academic field of control systems to make the decision easy [14].

As a form of testing and verification methods of DHM, the following is the prototype of the method DHM, DHM which is implemented in one of the Universities in the city of Tangerang. Implementation is done in the universities which have Raharja system that functions to provide services to all the prime Private Raharja. DHM method will be applied on a database system that is third RME (Raharja Multimedia Edutainment), SIS

Figure 5. 4 Pillar IT E-Learning
Behavior Detection Using the Data Mining - Untung Rahardja

(Students Information Services), and GO (Green Orchestra). Where the method than the HDM can monitor the quality of an information system can also monitor the capacity of storing data at the same time.

![Figure 6. Dashboard technology](image)

Figure 6 is a prototype implementation of the method DHM, DHM which is used as an indicator of the three databases, namely RME database, SIS, and GO and indicators to monitor the storage of data. Such as appear in the image, DHM method is described as a dashboard that is used to perform the performance indicators to monitor the system so that anticipate the possibilities of unwanted errors can occur and prevent the occurrence of prior complaints-complaints from various parties in the management of organizations and companies, the indicator on DHM images portrayed through indicators that has meaning and denotes something that can happen.

One of the following example that describes the process of DHM, DHM has the dashboard, which can be used as an indicator in the interface in order to monitor system information, where the presence of DHM then this system can perform self-control.

Figure 7 is the indicator showing the dashboard to measure the level of anomaly in the data in the RME, which signifies in the control system needs to be done as a warning to prevent the things that are not desired, for example, the needle indicator Anomaly Data on the RME are in the red region, showing the number 16% means that the database is not over 'healthy' it is necessary for further handling. With this dashboard indicator, the prevention of the things that can not be desired in anticipation.

![Figure 7. Anomaly data](image)

Figure 8 is one form of indicator lights on the dashboard for controlling the system, namely to control the data storage capacity, which is used to make a monitor to the total data capacity, capacity that has been used and the remaining storage capacity. Data storage capacity above shows a red light with the remaining capacity of 6,811,025,408 bytes. This indicates that the capacity is almost full so that steps can be anticipated to increase capacity so that data storage services to information to all Personal Raharja still running well.

![Figure 8. Indicator light on the dashboard for controlling the system](image)

6 CONCLUSION AND DISCUSSION

In controlling information on a system to maintain the quality of information on a continual basis, the conclusion can be drawn that the Health Monitoring database (DHM), work to maintain stability of the system running. The indicators in the digital dashboard monitoring system is absolutely help to facilitate detection possibilities anomaly data that may occur, which in turn can cause unwanted problems in the system. DHM method should always be planted in an Information System is needed reliability.

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