Examination of Higher Education Management Systems in the Digital Era

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Abstract. This article deals with application of the examination information system in higher education. The guarantee system over quality in higher education implemented by referring to customer satisfaction, National Standards on Education and demands for the development of the digital era. The solution offered is developing thesis and dissertation examination information system. Research method: Research and Development approach by applying Borg and Gall model (2006). The system manages the document from the time the document is created or received until it is set up to be saved. This system done as an effort to improve services to college students, appropriate decision making by the manager and also improved performance on procedures and better methods. Effectiveness and efficiency become the principle of performance measurement of the most important archiving and access systems. The results of the development show the product performance can be utilized for the management of thesis and dissertation exams throughout higher education.

1. Introduction

Improving the quality of higher education is continuously carried out in line with improving services to students and stakeholders. Higher education is required to provide fast and accurate services in the digital era [1]. This is a logical consequence for the management of higher education which has students spread geographically and a more independent lecture system.

The quality assurance system is implemented with the principle of Continuous Quality Improvement [2]. Educational quality assurance aims to meet or exceed national and international standards of education, it is implemented gradually, systematic and planned in a program that has a clear target and time frame [3]. Examination requires a lot of data and supporting files. All exam activities are recorded and managed properly through the management of quality administrative system documents [4].

Quality is defined as fitness for use, conforming to customer requirements, meeting customer expectations, or customer satisfaction [5]. Quality is also defined as conformance to established specifications [6], conformance to requirements without disabilities; satisfaction for, and fulfilled expectations and satisfaction of students, employees, leaders and lecturers. Quality definitions in this study are efficiency, effectiveness of document management and leadership services to stakeholders so that the realization of standardized document management, service leadership and quick and appropriate decision making. For this reason, it is necessary to develop a good test management system.

The design in this study is the development of an examination information system in higher education with a digital system and termed a system of analysis and design, namely improving
performance with improved procedures and methods. The success of document management depends on the ability to capture accurately and on time, in terms of operations, effective data management, and the use of data for analysis purposes. No less important here is the test execution referring to the merit which refers to the applicable regulations and policies.

Management of exam information is managed by the Database Management System (DBMS). DBMS requires data to be accessed by stakeholders as well as department managers. In each department, data remains in the storage media, data can be relied upon to be processed, and data can be accessed quickly when information is needed through a filing system that is created and helps in the decision-making activities needed.

2. Methods
Development model used in this study is a model of Borg and Gall [7]. The development research procedure consists of two main objectives, namely: (1) developing the product, and (2) testing the effectiveness of the product in achieving its objectives.

At the design stage, the researcher develops test document management software. At this stage it consists of the development and post-development stages. At this design stage the developer develops Postgraduate accreditation document management software. At this stage it consists of the development and post-development stages.

2.1. Development stage
At this development stage the developers will do:
- Idea, knowing the need for change
- Design, design how to solve it.
- Implementation, applying design to the system.
- Control. Checking the level of implementation is carried out according to the design.
- Evaluation. Check whether the changes that occur according to the original purpose.
- Follow-up, implementing changes in accordance with the results of existing evaluations.

2.2. Post-development stage
This trial was conducted to obtain data in the form of suggestions, responses and criticisms from experts and prospective users. Product testing in this development assessment includes: (1) trial design, (2) trial subjects, (3) data types, (4) collecting instruments and (5) data analysis techniques.

3. Result and Discussion
The usability aspect gets a very useful score [8][6]. The supporting indicators are the contribution of the exam information system needed for exam services, the contribution of the test management system to provide exam services for students, and the contribution of document management to develop document requirements for the department's quality assurance team. The feasibility aspect in the small group test gets a score of 3.6 which means that the exam information system is very easy to use and flexible for students, administrative staff, department managers and university managers, in this case the vice dean of academic and student affairs and deputy director of academics and student affairs. The accuracy aspect is represented by the accuracy of this data that is needed for each user. The user is a student, manager of the assistant department of the dean of academics and student affairs. The validity of exam scores has a very strategic role, because it relates to the graduation status of students, the value structure for students is used as a benchmark to measure the success of a student. The aspect of accuracy gets a very high score of 3.7. The performance aspects of the guidebook include indicators: attractiveness, ease of presentation and work method of getting a score of 3.6 means that it is very attractive and easy to understand to operate the test management system.

Database system architecture provides a framework for building databases. Database architecture is divided into three levels, namely: (1) Internal / Physical Level, related to how data is stored physically (physical storage). Internal level is the lowest level to represent the database. Records are stored in
storage media in byte format. Defined as an internal scheme; (2) External / View Level: related to how data is represented from the side of each user. View level is the user level, what is meant by the user is a programmer, end user or Database Administrator (DBA). In this case programmers, using programming languages and end users, the language used is the query language or using facilities available on the application program at this external level. Users are limited to the capabilities of hardware and software used by database applications that are defined as an external scheme; (3) Conceptual / Logical Level: which connects internal & external levels. Conceptual level is a representation of all the information contained in the database [9].

Test information system contributions needed for exam services, for students, and document management contributions to develop document requirements for department managers and internal quality assurance teams [10]. This contribution leads to quality assurance, which meets conformance requirements to requirements and efforts for meeting customer needs. During the process of achieving quality, it is necessary to monitor and control quality. Quality objectives that have been determined according to documented procedures are carried out by supervision, control and documentation of the process of achievement.

Archives as a source of information as well as a monitoring tool that is very much needed by universities in order to carry out various management development activities such as planning, analyzing, developing, formulating policies, evaluating and determining follow-up activities. The flow of information that runs well and smoothly can support the achievement of the objectives of higher education activities. Mulyadi [11], defining archives is managing documents according to the rules and steps set. The steps are storing, placing and finding. Good archiving must have good work systems and procedures in the field of filing. Storage and structuring of archives is the main activity that has the goal that archives, especially archives that are still often used or dynamic files can be recovered quickly and precisely when needed at any time [12].

This exam information system is very easy to use and flexible for students, administrative staff, department managers and university managers, in this case the vice dean of academics and student affairs. The ease of using this exam information system application provides leadership opportunities to make effective decisions. Effective decisions are decisions that are based on data and information analysis to eliminate the root causes of problems, so that problems related to the quality of efforts can be resolved effectively and efficiently [13], comments on situations where changes in leadership style must be shifted towards servant leadership. The flow of information that runs well and smoothly can support the achievement of the objectives of an institution's activities [14]. One effort that can be done to facilitate the flow of information is to carry out the management of dynamic records properly and correctly. Dynamic archive management with the right arrangement, good and right can help facilitate the flow of information and tasks that will be done in an institution.

Information systems are built from components, which are termed building blocks. The building block consists of blocks of input, model, output, technology, database and control. The information system that will be created requires understanding the flow of information, which flows from one place to another, planning the information system as a whole.

Database management ensures that organizational data resources reflect accurately the physical system they represent. Data resources are stored that can take sequential form or direct access. The purpose of the database system includes the provision of flexible access facilities, maintenance of data integrity, data protection from damage, and illegal use, providing facilities for shared use, data connectivity, reducing duplicate data, reducing dependence on application programs, increasing personnel productivity information systems.

Software that manages databases is called a Database Management System (DBMS). DBMS have a data description processor that is used to create a database and a database manager that provides database contents to users. There are several data models in a database system. The data model is a way to explain how users can logically view data. This data model will be the selected data model used in developing information systems. Database management is part of the management of information resources that ensures that organizational data resources accurately reflect the physical
system they represent. Data resources are stored in secondary storage media that can take sequential forms or direct access.

Factual Approach to Decision Making helps leaders make effective decisions. Effective decisions are decisions based on data and information analysis to eliminate the root causes of problems, so that quality problems can be resolved effectively and efficiently. The director, deputy director of the academic field can determine the unity of goals and direction of the organization. They must create and maintain an internal environment so that people can become fully involved in achieving organizational goals.

The main function of information is to increase knowledge or reduce information user uncertainty. In addition, it also directs decision makers to determine what must be done, reduces uncertainty to make good decisions. (1) The information that is timely, that information is up to the user before a decision is taken; (2) relevant information, namely information conveyed by superiors to their subordinates must be relevant, so that it can be said that there is a connection with the recipient; (3) valuable information, namely valuable information for making decisions, and (4) reliable information. The value of information is largely determined by benefits and costs. Measuring the value of information is related to the analysis of cost effectiveness or cost benefits.

Continuous improvement is defined as a process as a process that focuses on continuous efforts to improve the effectiveness and/or efficiency of the organization to meet the policies and objectives of the college. For this reason, progressive consolidation steps are needed, responding to the development of customer needs and expectations, and will guarantee a dynamic evolution of the quality management system.

4. Conclusions and Recommendations
The aspect of usability and the accuracy of getting a high score, the feasibility aspect gets a very high score.

- The feasibility aspect gets a very high score because the product greatly facilitates the task of the study program manager so that it is very efficient in the use of time, cost, and energy.
- The use of products can be done anywhere either by students, study program managers, postgraduate managers and administrative personnel; they do not need to have to come to graduate school to implement it.
- The performance of the tutorial book using a thesis exam and dissertation information system can be accepted by prospective users.
- Information systems for thesis examinations and dissertations can be very well received by prospective users.

5. Anknowledgements
The authors would like to Director of Postgraduate and Deputy Director of Academic Affairs Postgraduate for facilitating data collection, instrument forms to the respondent.

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