Conference Paper

Prototype Development of Interactive Multimedia Manual and Electronic Recordkeeping Simulator for E-Archive Learning

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Abstract

The research aims to develop web-based interactive multimedia Manual and Electronic Recordkeeping Simulator (M.E.R.S.) that proper to be applied as a medium of electronic archives learning for office administration program in vocational schools. The kind of this study is research and development (R&D). The design of the research is involves identification of the potential and problems, data collection, making of design, design validation, prototype design revision, and products trials. M.E.R.S. was developed by using web technology that have many advantages so it can be more accessible. The results of this study shows that M.E.R.S. considered very feasible with a mean percentage of 90%. Material expert is scoring 38 out of 40 with a percentage of 95% (criterion very decent) while the media experts provides an assessment score of 34 out of 40 with a percentage of 85% (criterion very decent). M.E.R.S. also effective in increasing students positive perception, motivation, and understanding about electronic archival learning practice. Based on the results, it can be concluded that medium successfully developed by using R&D research approach. M.E.R.S. also considered feasible by the material expert and media expert as a medium for learning which it can be applied in the electronic archive learning for office administarion program. Even so, M.E.R.S. still needs to be extensively tested through further research to get another effectiveness so that it can be improved.

Keywords: medium, multimedia, simulator, electronic record, e-archive learning

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1. Introduction

The disruption era of Science and Technology requires organizations to keep abreast of developments in order to improve competitiveness and productivity [26], thus encouraging organizations to compete to apply science and technology advancements in

order not to be left behind by their competitors [29]. Implementation of science and technology through the application of various automation technologies in the industrial world is believed to support and facilitate the completion of a job so as to increase the productivity and performance of its employees [29]. However, these implementations need to be balanced with the availability of competent human resources (HR) in using and utilizing existing technologies.

Automation has now touched various fields of work, ranging from finance, staffing, inventory, filing and other fields. One of the activities closely related to automation is administrative activities. For example document creation activities using microsoft office software, business communication activities using email services and send documents through the internet. The consequence is the creation of electronic documents and archives, which if not properly managed will lead to inefficiencies so that the human resources that manage the competence to master the management of electronic archives.

In practice, the management of electronic archives is very different from paper based or conventional archive management. Its management require a special system called Electronic Document and Record Management System (EDRMS). Therefore, in the last few decades the development of EDRMS is so rapid (PABRICA, n.d) with ISO 15489 standard and has been widely applied in various types of organizations [9]. While in Indonesia, the management of electronic archives also already have Undang-Undang No. 43 Tahun 2009 as legal basis.

Reinforced research results, the use of electronic records management system in office governance proved to contribute positively to the governance of information and archival performance [1] so as to create an organization that has efficient administrative governance and good performance [11]. The same thing was also expressed by Johnston and Bowen (2005), Saman and Haider (2012), and Demirtela and Bayram (2014). Therefore, many government and private agencies around the world have developed and implemented electronic records management system.

In line with these developments, through the implementation of the 2013^{th} curriculum in accordance with the decision of Kemendikbud No. 330/D.D5/KEP/KR/2017 on the Office Admintration (AP) skills program in Secondary Vocational School (SMK), students are expected to master two new basic competencies (KD) in archival subjects, 1) to apply electronic archives management and 2) electronic archive. Students are required to not only master the competence of paper based or conventional archival management but also the competence of electronic archival governance so that there is a link and match between needs in the world of work and curriculum.

The material management of electronic archives that are fairly new and abstract requires visualization to explain concepts and require simulations for practice. Students are less able to understand the theory and concepts in depth if the technology approach to simulation and practice in learning requires less visualization [15] considering the concept of learning in SMK requires the latest facilities for practice [5]. According to Pate (2015) teachers must understand how to teach with relevant learning media that can trigger interest, critical thinking ability, and ability to create learners.

Referring to the facts, teachers are still having difficulty in designing and implementing electronic records management. The difficulties can be seen from the MGMP of AP and training activities of E Arsip implementation in archival learning. Periodically held MGMP in Central Java (2013), MGMP in Kendal district (2014), MGMP throughout Kudus District (2015), MGMP in Semarang City (2015), MGMP in Purwakarta District (2015), training for students of SMK Sunan Giri Demak (2016), training for students of SMK Negeri 1 Bantul (2016), training for students of SMK Negeri 1 Kudus (2017), MGMP in Magetan District (2017), and MGMP in Cilacap District (2018). The involvement of researchers in these activities is very helpful for researchers in understanding the root causes and needs of teachers. In general, the main difficulties faced by teachers due to limited learning resources (books and learning media). As a result not a few teachers who choose not to carry out electronic records management learning because teachers feel not ready and master the teaching materials.

The Archive Model E referred to in the above activities is an electronic archival learning model developed by Agung and Ashari in 2013. This model is an electronic archival management system application based on microsoft access with its module of use. The development background of Archive E is to provide relevant models as the initial solution to the problems experienced by teachers. E Archives have been piloted in community service research and used in training activities for both teachers and students. However, E Archive model still has various limitations because the development process is not through research and development (R & D).

The weaknesses and limitations of the Archive E model are identified based on the input of the MGMP activity participants and the training mentioned above. The main disadvantages are: 1) requires microsoft access at least 2010 version; 2) non-centralized data between students with one another, making it difficult in the evaluation process; 3) does not cover all archive administration activities from recording to archive retention and archiving. Therefore, there needs to be an E archive model development that suits the needs of teachers and students as a solution to the scarcity of

learning media management of electronic archive in the form of interactive multimedia M.E.R.S. Web-based.

The selection of interactive mulmedia types is based on dual coding grand theory [23] which states that the information received by a person is processed through one of two channels, verbal channels such as text and sound, and visual channels (nonverbal images) such as diagrams, images, and animations. The results of this study indicate that the right combination of visual and audio media with interactivity can improve activity [7], interest [19], motivation [16], critical thinking ability [27] and student learning outcomes [21]. Therefore according to Kamat (2009) multimedia is widely used in subjects such as science, mathematics, geography, history and others.

Multimedia generally combines different types of media. The combination of texts, sounds and diagrams is considered effective for presenting learning materials (Beacham, et al., 2009) that require visualization so as to enhance conceptual understanding [8] and improve learning outcomes [4]. Interactive multimedia contains elements of interactivity to allow for two-way communication. Interactivity elements in interactive multimedia assessed can have a positive impact on learning outcomes when compared with multimedia only. Liu (2009) argues that multimedia, which consists of text, audio, and video content with the elements of intearktifitas more able to motivate learners in learning.

This interactive multimedia application can be used in various scenarios, such as visuals in simulations. The results of Nkhoma, Calbeto, Sriratanaviriyakul, Muang, Tran, & Cao (2014) found that learning with game simulations had a positive impact on cognitive learning outcomes. Trieb (2016) also points out that web-based applications can build student interest and can strongly enrich interactive student communication skills. Through a combination of visual and audio as well as a good element of interactivity, learning becomes more interesting and learners are more motivated to learn so that learners' understanding is also better.

The advantage of utilizing web technology as the basis for developing interactive multimedia is support for various types of media formats and elements of interactivity. Web technology also supports the utilization of Relational Database Management System (RDBMS), enabling it to integrate various data centrally and facilitate monitoring and evaluation. Furthermore, web technology has a universal reach that can be easily accessed through links by utilizing the internet. On the basis of the ability of the web and ease of access, the web technology used as a technology base in the development of M.E.R.S.

On the other hand, the characteristic of electronic records management is procedural, where there are three main activities: 1) recording and storage; 2) borrowing and returning archives; and 3) archive retention and depreciation. Teaching materials with the expected procedural knowledge can be practiced, and students can understand the flow through simulation using interactive multimedia. Through the use of interactive multimedia as a medium for procedural procedural simulation, students will more easily understand the taught material and support skills acquisition in accordance with the expected competencies [10]. Therefore web-based interactive multimeda is judged precisely as output in this research and development.

In line with the above thinking, web-based interactive multimedia is recognized as having the potential to create a quality learning environment as well as improve the learning skills of learners [20]. Multimedia in learning can serve as a means of delivering information that supports the conceptualization and contextualization of newly presented material that can actively engage learners in learning (Cairncross & Mannion, 2014). Web-based multimedia-assisted learning will make students more independent in building complex knowledge by linking scientific ideas and making it easier for teachers to monitor each student's learning activities [25].

2. Methods

This research uses the method of research and development as proposed by Borg and Gall (1989). According to Borg and Gall in the research implementation, there are ten stages to be taken. Research and development of products, equipment and models depend on a variety of qualitative techniques, including case studies, interviews, document reviews, and observations (Emzir, 2011).

This research modifies ten stages of Borg and Gall research into three stages as follows: 1) preliminary study, including literature studies, field studies and local culture analysis. 2) media development stage, covering making initial media, media trials, analyzing test results, improving media to final media. 3) Media validation stage, covering the implementation of media in learning and tested media.

This research was conducted in Office Administration Program in 2nd Semarang Secondary Vocational School. The procedure of the research and development in this research is identification of the potential and problems, data collection, making of design, design validation, prototype design revision, and products trials. Data collection techniques in this research are conducted by observing the activities of lecturers and

students, evaluation tests, questionnaires of students' and lecturer's responds, and documentation.

3. Result and Discussion

3.1. Characteristics of archival learning

Archival learning especially in electronic archive management practice requires clear and accurate visualization to explain the concepts and procedures in the archiving process. In addition, media are required to perform archiving practices, especially in the practice of operating computerized archives.

The problem, the media is not widely available so that teachers have difficulty in implementing the learning process. Based on the results of the identification, obtained an initial idea to develop the learning media M.E.R.S. web-based simulation automation system for electronic archive management system equipped with simulated archive storage using filing cabinet based on six storage systems.

3.2. Implementation of archive practice learning

In accordance with the results of interviews conducted with the speaker of the E Archive training session at SMK N 1 Kudus, that the implementation of archival learning in SMK tends to be still limited to the management of archival manually. This manual archival management learning model usually is to carry out archive storage procedures with a system of agenda books or control card systems then stored in filing cabinets.

Interview results also reveal that teachers actually want to implement computer-based archival learning. The problems are: (1) teachers have not yet understood in detail how to implement computer-based archival governance; (2) learning resources (books, modules, and other learning resources) and its very limited practice media; and (3) roller model of computerized archive learning implementation does not yet exist. So until now computer-based archival learning is still limited to the introduction of concepts and not in practice.

3.3. Development of M.E.R.S

Based on the development result, the following features are developed:

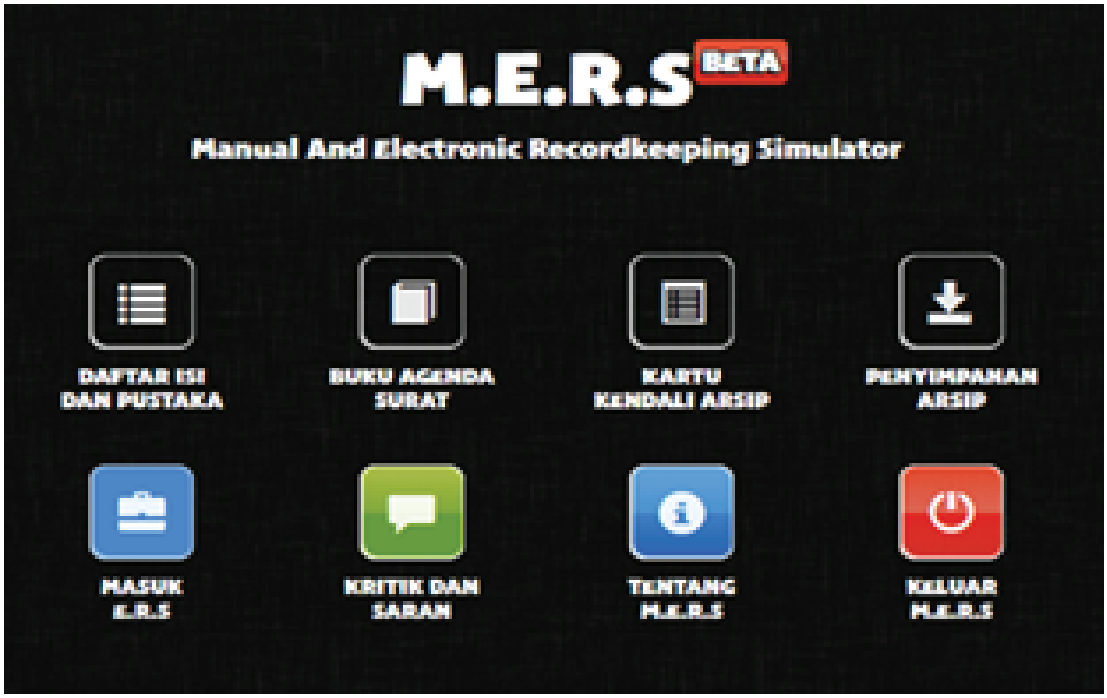

Figure 1: M.E.R.S's Main Menu

The main menu page (main menu) contains eight menu buttons to operate the media.

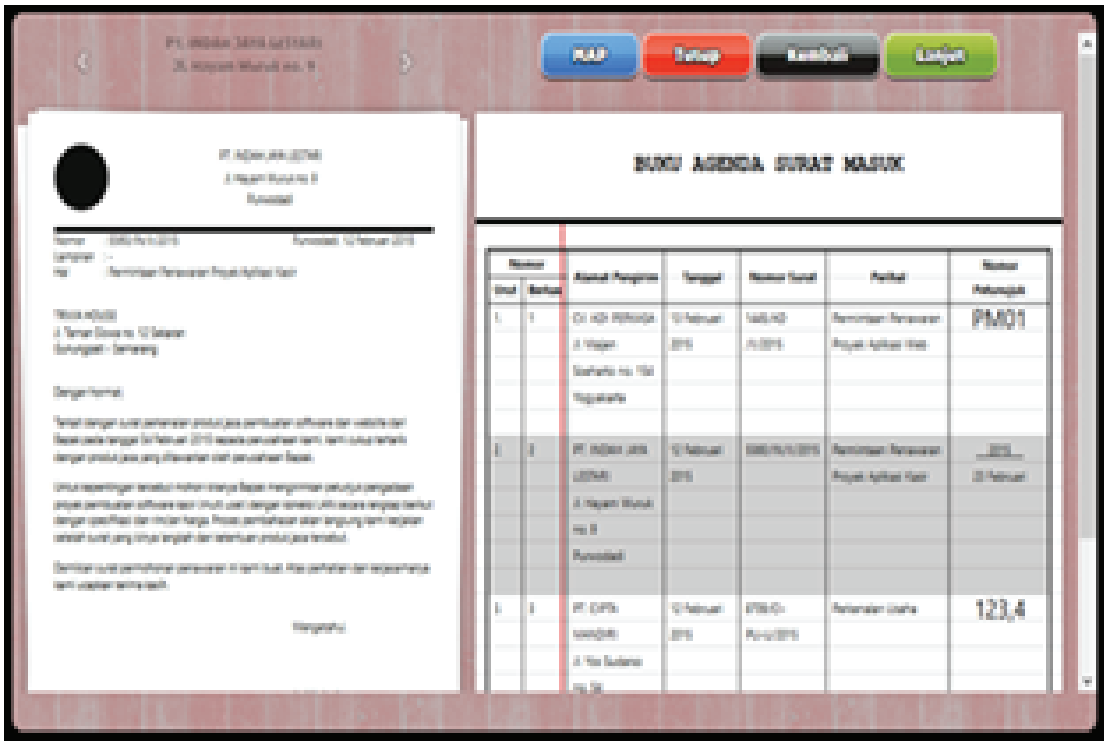

Figure 2: Agenda's Book Simulator.

In this section is displayed the format of the letter agenda book columns that are often used both in government agencies and private. As presented in this section is the format of the agenda entry book columns and the outgoing agenda book (twelve agenda books).

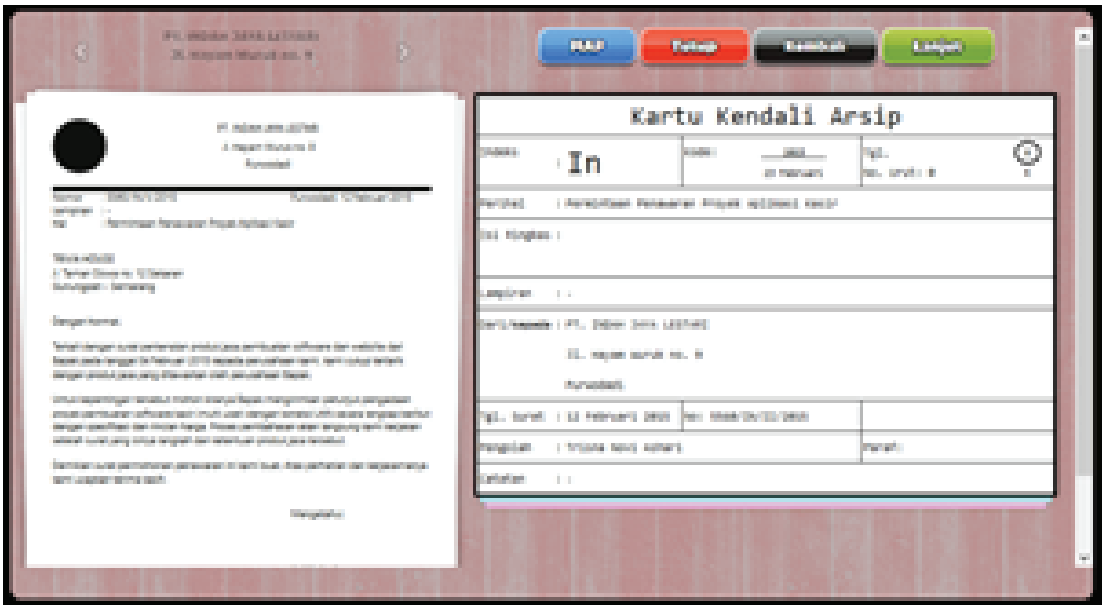

Figure 3: Control Card Simulator.

The visualizations shown in this section are two types of archive control cards including incoming mail archive control cards and outgoing mail control cards. In the illustration also mentioned the sections of columns on the archive control card and how to fill in the fields.

The illustrations presented in this section contain three dimensional visualizations (3D) from the filing cabinet, guide, and map. Especially in this section included animations that support the existing illustrations. When one of the drawers in the filing cabinet is clicked, the drawer opens and displays its contents in the form of a guide-guide and folders. Then the user can click the wrong guide available to display the folders that are behind it. Furthermore, to display the archive that is in the user folder simply click one of the folders so that later will be displayed archives in the folder.

In this section, there are two simulator that is archival management simulator and loan management simulator that used for practical simulations.

4. Discussion

Analysis of validation results by expert experts is used as a reference to revise the design of the prototype M.E.R.S. which is being developed. The material validator gives

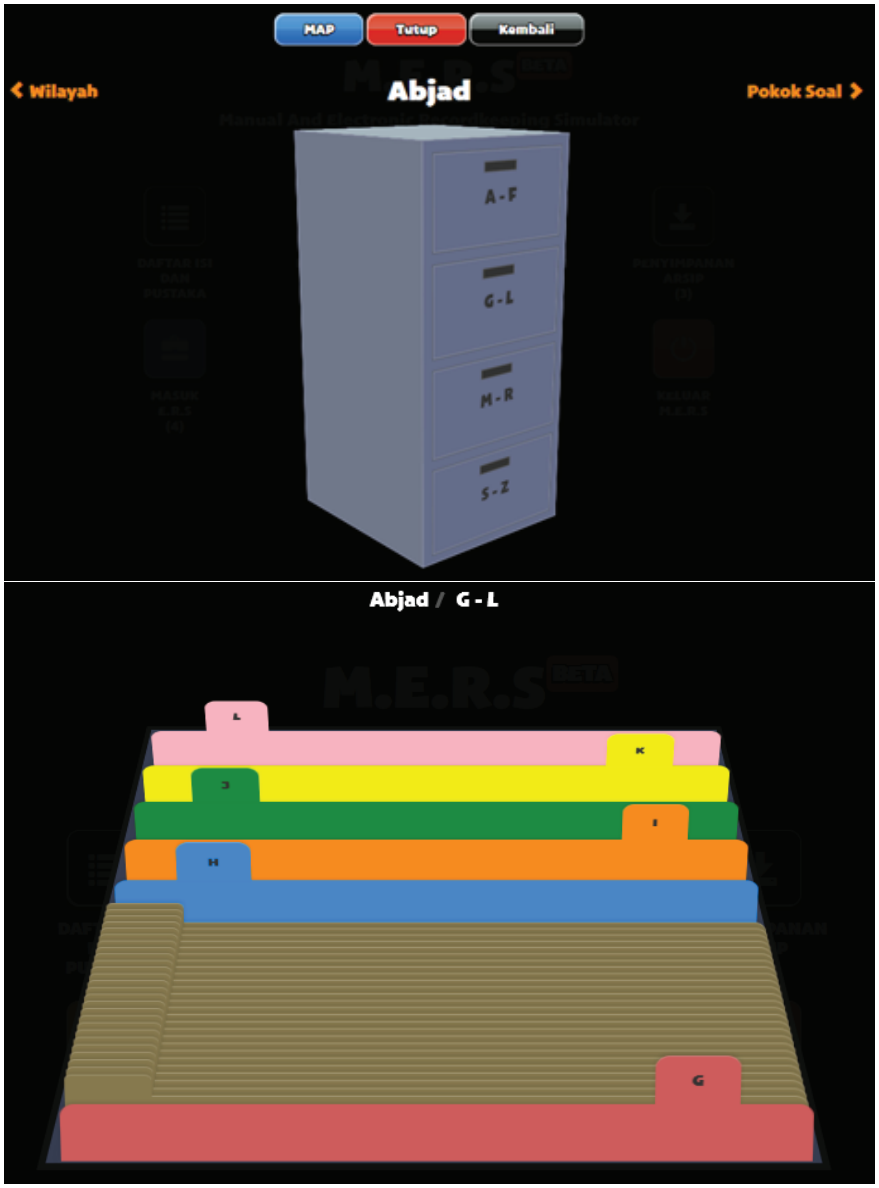

Figure 4: 3D Filing Cabinet Simulator.

a total score of 38 out of a maximum score of 40 with a percentage of 95% (very feasible). While the media validator gives a total score of 34 out of a maximum score of 40 with a percentage of 85% (very feasible).

The application of M.E.R.S. on archival learning in the learning process has a positive impact on the learning activities. Students look more enthusiastic in using the M.E.R.S. They also look creative in achieving a deep understanding of the subjects studied, and are insightful.

The results of limited product trials indicate that the media are effective in improving students' positive perceptions of archival learning. This is indicated by the increasing

Figure 5: Electronic Archive Simulator.

positive perception of: (1) the attractiveness of archival learning; (2) archival material; (3) implementation of learning; (4) confidence in mastering the material; and (5) learning outcomes. Its media increasing students positive perception, motivation, and understanding about electronic archival learning practice.

Development of interactive multimedia prototype M.E.R.S. is very appropriate to be developed in archival materials, especially for computerized archival materials so as to motivate students to learn. This is supported by the research of Cheng et al. (2012) which states that multimedia-assisted learning can improve student learning styles, improve motivation and student learning outcomes. Another study conducted by Nusir et al. (2011) found that the use of multimedia proved to improve students' understanding of learning. The same is also expressed by Sutirman (2009) and Laksana (2011).

Visual animation content with a combination of audio in the form of sound effects displayed is considered appropriate to explain the material, thus helping students in understanding the material. This is supported by the research of Kamat (2009) which states that audio-visual assisted learning can explain abstract material rather than using traditional methods.

Mayer & Anderson (1992) states that the use of visualization through animation can motivate students to learn and help students to construct words and images so they can be remembered for long periods (long-term memory). Meyer & Moreno

(2002) added that animation is the most important content in multimedia that has the potential to improve students' understanding.

5. Conclusion

The research aims to develop web-based interactive multimedia that proper to be applied as a medium of electronic archives learning for office administration program in vocational schools. The prototype of M.E.R.S was successfully developed with web based application. Student's positive perception, motivation, and understanding about electronic archival learning practice can be improved by the media. Therefore, it requires further development for the media so it can cover all procedures in archival practice.

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