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## Development Of Cooperative Web-Based E-Learning For Mastery Of Computer Applications In The Academy Jambi Health Analyst

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### Abstract

In the 21st century era of globalization, free competition and rapid change demand quality human resources (HR) with high adaptability. The quality education process is crucial, and the role of teachers is very important in implementing learning. The Jambi Provincial Health Analyst Academy, as the only Diploma III Health Analyst institution there, is under the auspices of the Jambi Provincial Health Service. Adapting to educational reform and developments in science and technology, the Jambi Province Academy of Health Analysts plays a role in developing educational science in the field of science and technology. The Health Analyst Diploma III Program at the Jambi Province Health Analyst Academy aims to produce health analysts who are able to work as technical implementers of laboratory services. This research uses the Research and Development (R&D) method with a model adapted from Borg and Gall (1989). Validation was carried out by media and material experts, with excellent final results. Material validation results reached 93%, while trials on students also received satisfactory results, reaching 93% and included in the Very Eligible category. Thus, efforts to develop education in Jambi Province have a positive impact in creating quality human resources who are ready to compete in this era of globalization.

Keywords: Development; E-learning; Learning Motivation

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## INTRODUCTION

The era of globalization in the 21st century has resulted in free competition in all areas of life and very rapid changes at any time which are often unpredictable. For this reason, quality human resources are needed, have high competitiveness and are able to adapt to every change, and are able to solve problems wisely and precisely.

The Jambi Provincial Government Health Analyst Academy is the only Diploma III Health Analyst educational institution in Jambi Province and is under the auspices of the Jambi Provincial Health Service. In line with reforms in the field of education and the rapid development of science and technology, the academic community of the Jambi Province Health Analyst Academy is taking part in developing educational knowledge in the field of science and technology. In this regard, the Jambi Province Health Analyst Diploma III Program Educational Institution provides education that produces health analysts who are able to work as technical implementers of laboratory services.

In connection with this, the Jambi Province Health Analyst Academy is an Academy whose

learning is based on the Diploma III Health Analyst curriculum for the academic year 2016/2017. One of the subjects included in the Diploma III curriculum is the health computer applications course. The health computer application course is one of the basic courses in the curriculum and is accompanied by a computer practicum which is mandatory for all Health Analyst Academy students in semesters II and V.

This health computer applications course is a course that is not easy for students to understand, because the material has to be repeated. Apart from that, conceptual understanding is also required, because this course has material that is arranged hierarchically and continuously. Therefore, the sequence of mastering the material for students is absolute, because to understand one topic of material in computers, students must master the previous material, before moving on to the next material. In other words, it can be said that students' mastery of a material topic is very dependent on their mastery of the previous material.

In lecture activities in computer laboratories, health computer application courses, based on the researchers' experience so far, there are several problems that often arise, so that they often become obstacles for students to be able to speed up the learning process in class, including:

1. The students' educational backgrounds are different, and computer application learning is not fully implemented.
2. Practical and laboratory facilities are incomplete.
3. It is difficult for students to operate computer systems
4. Lack of time to practice computers, so only the basics are taught.

As is known, graduates of the Health Analyst Academy are expected to be able to master skills, because after completing their studies, these students will work either in community health centers, state or private hospitals, and state or private laboratories, they will have direct contact with the community. Therefore, to fulfill these skills, the theories studied must be supported by practice in the form of practicums. To carry out this practicum, learning guidelines are needed that are live and easily accessible to the students themselves.

Learning is a process of interaction between students and learning resources, but in reality the learning process that takes place is still largely centered on the teacher, where a quality learning process is ideally learning that can help and facilitate students to develop their potential optimally, and be able to achieve their goals. which are determined effectively, oriented to the interests, needs and abilities of the learner. In the field of education, the learning process is identified with the process of conveying information or communication. In this case, learning media is an inseparable part of educational institutions.

The learning process is an effort to balance the activeness of students and educators. If students are active then educators are in a passive position, conversely if students are passive then educators must be active. Educator activity in this case is not to regulate every student's learning action, but rather functions to encourage students to be aroused in their awareness of learning (Wahyuningsih, 2017: 8). E-learning is distance learning that utilizes computer technology or computer networks or the internet. E-learning can allow students to learn via computer at their respective places without having to physically go to class or lecture. Electronic learning systems are a new way of teaching and learning.

E-learning or distance learning is a form of learning where students and educators are separated by distance and time. This form of learning first appeared in America and Europe more than a century ago. It is not only about distance and time that this learning is implemented as an innovation from conventional face-to-face learning, but science and technology, culture, geographical location, and the existence of learning opportunities are also the reasons this learning is implemented (Wahyuningsih, 2017: 4). The development of education towards e-learning is a necessity so that education quality standards can be improved, because e-learning is the only use of internet technology in delivering learning and has a wide reach based on three criteria, namely: (1) e-learning is a network with the ability to update, storing, distributing and sharing teaching materials or information, (2) delivery to the final user via computer using standard internet technology, (3) focusing on the broadest view of learning

behind the traditional learning paradigm, thus in the urgency of information technology being optimized for education.

From several studies that have been conducted, it can be concluded that the development of web-based e-learning has a positive influence on the learning process in the classroom. This web-based e-learning is considered very appropriate, because there are many internet facilities around campus and all of them are free wifi, and lecturers have not implemented e-learning media when conducting lessons. This is what makes researchers interested in researching and developing web-based e-learning at the Jambi Province Health Analyst Academy which can be used by students as an effective and efficient medium. So, to answer these needs, researchers aim to develop web-based e-learning as a computer learning medium at the Jambi Province Health Analyst Academy. As well as finding out students' opinions about e-learning as a means of computer learning, whether it is in accordance with current learning developments.

## **RESEARCH METHODS**

### ***Research Design***

The development model used as a reference in developing E-Learning Based Learning uses the Lee and Owens (2004) model in its design. In general, this development model consists of 5 steps, namely: (1) analysis, (2) design, (3) development, (4) implementation and (5) evaluation.

### ***Research Target/Subject***

The trial subjects consisted of several stages. First, expert validation is carried out by involving three types of experts, namely subject matter experts, learning design experts and multimedia experts. Experts in the field of study have the minimum educational background criteria of a Masters (S2), mastering health computer application material, and are practitioners in the field of nursing. Learning design experts must have a minimum educational background of a Doctorate (S3) in the field of educational technology, expertise in learning design, and work as a teacher of Technology-Based Learning courses in the Master's program. Meanwhile, multimedia experts must have a minimum doctoral (S3) background in the field of learning technology, expertise in e-learning design, and work as a teacher of Technology-Based Learning courses in the Master's program.

Then, a small group trial involved 36 level I students who were in semester 2. The sample was chosen to represent three student characteristics, namely below average, medium, and above average. Data on trial results were obtained from questionnaires filled out by students after the learning process was completed. However, field trials which are the final stage of formative evaluation were not carried out in this study due to time constraints.

### ***Research Procedure***

This research follows e-learning development procedures based on the Lee and Owens (2004) model. The first stage is Needs Analysis, which consists of needs analysis and start to finish analysis. Needs analysis includes steps such as establishing the current situation, identifying the ideal situation, determining the demands of the ideal situation, identifying the current situation, and determining the potential needs.

Next, initial and final analysis is carried out by analyzing participants, technology, tasks, critical incidents, situations, objectives, media, existing data, and costs. The next stage is Design, which includes creating a product schedule, determining the project team, determining media specifications, creating a material structure, and configuration control planning and review.

After that, the Development stage is carried out to translate product specifications into e-learning. This involves determining the product type and platform, installing components, and conducting a review by relevant experts.

The Implementation Stage is when the e-learning product is tested, either through small group trials or field trials. Trials were carried out to collect data about product quality and its role in improving the

quality of student learning outcomes. Finally, the Evaluation stage is carried out to evaluate the product and determine whether the product is suitable for use in learning. This involves product testing, trial design, and field trials.

### ***Instruments, and Data Collection Techniques***

In this research, data collection was carried out using several predetermined instruments and techniques. First, for the expert validation stage, an instrument is used in the form of a structured list of questions which are evaluated by subject matter experts, learning design experts and multimedia experts. Data is obtained through interviews or distributing evaluation forms to experts. Second, small group testing uses an assessment questionnaire containing structured questions about students' experiences, perceptions and impressions of the e-learning material being tested. The questionnaire was distributed to 36 level I students representing three student characteristics. Third, for field trials (which were not carried out in this study), the instruments that might be used are observation, interviews, or questionnaires to evaluate the implementation of e-learning in actual learning situations. Data obtained from appropriate instruments and collection techniques will be analyzed according to the research objectives to gain the necessary insights into the suitability, feasibility and effectiveness of the e-learning materials developed. Data analysis will provide direction for further improvements before e-learning is implemented widely.

### ***Data analysis technique***

Data analysis techniques in this research can include qualitative analysis and descriptive analysis. For expert validation, data obtained from subject matter experts, learning design experts, and multimedia experts can be analyzed qualitatively by summarizing the views, comments, and suggestions provided by each expert to improve the e-learning being developed. Furthermore, for data obtained from small group trials, questionnaires filled out by 36 students can be analyzed descriptively. Descriptive analysis can include simple statistical calculations such as frequency, mean, and distribution to analyze student responses to the quality, usability, and readability of e-learning that has been tested. However, because field trials were not carried out in this study, data analysis did not include this stage. Instead, the results of formative evaluations conducted after small group trials can be used as a basis for improving e-learning before implementation.

## **RESULTS AND DISCUSSION**

The planning stage in e-learning development begins with needs analysis and analysis of student characteristics. Based on observations at the Jambi Provincial Government's Health Analyst Academy, it was found that health computer application material was only available in textbook form, not yet supported by interactive multimedia, and teaching methods were still conventional, such as lectures, which did not motivate students. Analysis of student characteristics shows that this e-learning will be presented to students aged 18-20 years with various abilities, both low and high.

Furthermore, student analysis highlights the importance of providing independent learning resources and visualizing health computer application material in multimedia to facilitate student understanding. Technology analysis confirms the availability of computer facilities and internet connections at school and at home as a means of learning. Task analysis shows that all students have basic skills in using computers and the internet.

Critical incident analysis describes the expected results of media intervention, such as students' ability to understand the material, motivation to learn, achievement of learning objectives, and the role of e-learning in improving the quality of learning. Situation analysis involves understanding the environment and influential organizations, including the role of the Ministry of Research, Technology and Higher Education of the Republic of Indonesia and the parents/guardians of students. This entire analysis is the

basis for designing e-learning for health computer application courses, with clear learning objectives in accordance with course code K.409.

Table 1. Learning domain analysis

Week	Subject	Sub Topics
2	Computers in Context <ul style="list-style-type: none"> <li>Know the positive and negative sides of computer use in society</li> </ul>	Evolution of computer systems Understand the development of computer systems Computers in society in the health sector Get an overview of the use of computers in certain fields (health, business, education, government & industry)
3 - 4	Computer History <ul style="list-style-type: none"> <li>Can understand types of computers</li> </ul>	Types of applications based on users Know the types of computers and applications for specific users or general users in the health sector Form of computer device Know the forms of health hardware and software, Web and network based applications and database applications
6	Computer Applications for the health sector Understand the basic concepts of computer applications for office automation	Understanding health automation applications Types of health automation applications Scope of Work Health automation Can explain the meaning of computer applications for health automation including the environment, types and supporting facilities

. The planning stage in e-learning development begins with an analysis of needs, student characteristics and learners. Based on observations at the Jambi Provincial Government's Health Analyst Academy (AAK), it was found that health computer application material was only available in textbook form, not yet supported by interactive multimedia, and teaching methods were still conventional, such as lectures, which did not motivate students. Analysis of student characteristics shows that this e-learning will be presented to students aged 18-20 years with various abilities, both low and high.

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The design stage produces specific product designs, including creating a product manufacturing schedule, determining the project team, media specifications, and creating material structures. Creating a product schedule is carried out by considering the analysis, material collection, installation and content upload stages. Determining media specifications involves selecting appropriate frameworks, interactions, fonts, visuals, and videos. The structure of the material is prepared by paying attention to various aspects such as introduction to the material, clear verbal content, use of examples, quiz questions, and evaluation.

Next, the development stage involves creating website-based e-learning and preparing material using Microsoft Word and PowerPoint applications. Material was obtained from lecturers on health computer applications who were the subjects of the research. This stage is the realization of the previous product design.

The results of the e-learning website design as a learning medium in the D-III Health Analyst major in the health computer application course are presented in the following figure:

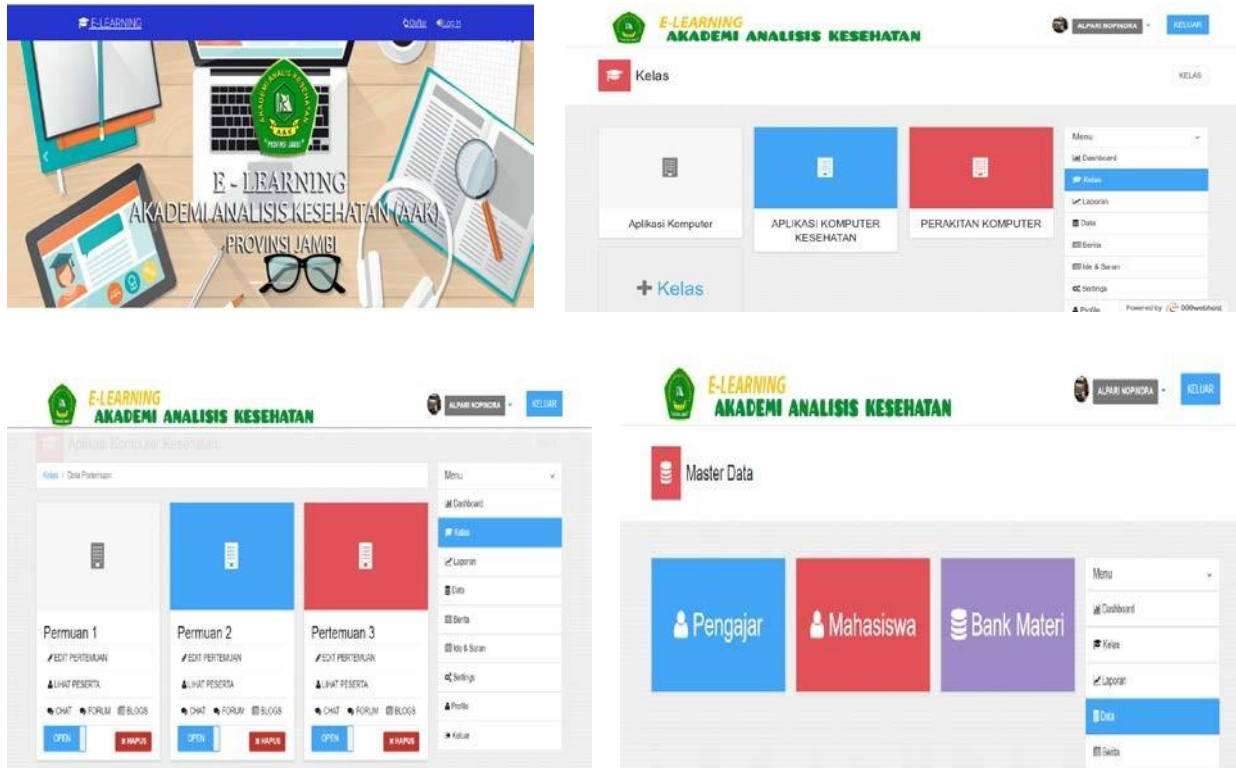


Figure 1. Results of e-learning website design

Validation The e-learning design was validated by Dr. rer. Nat. Muhaimin, S.Pd., M.Sc. with assessment aspects which include aspects of appearance, coloring, letters, images and menus. Web design validation aims to see the suitability of the web appearance in terms of suitability for ease of use, implementation and language of a web appearance.

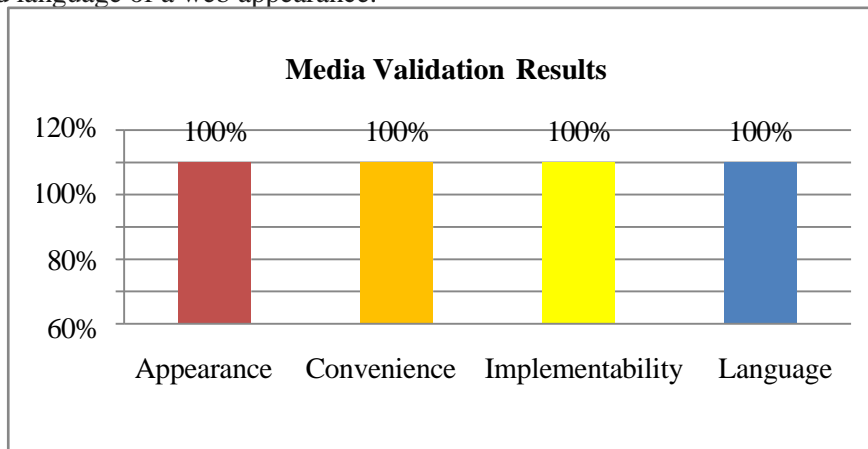


Figure 2. Media Validation Results

Material expert validation was validated by Mrs. Bunga Ayu Wulandari, S.Pd. MEIL., P.hD with an assessment that includes aspects of material relevance, material organization aspects, evaluation/practice

question aspects and language aspects. Material expert validation aims to see the content of the material in the media being developed.

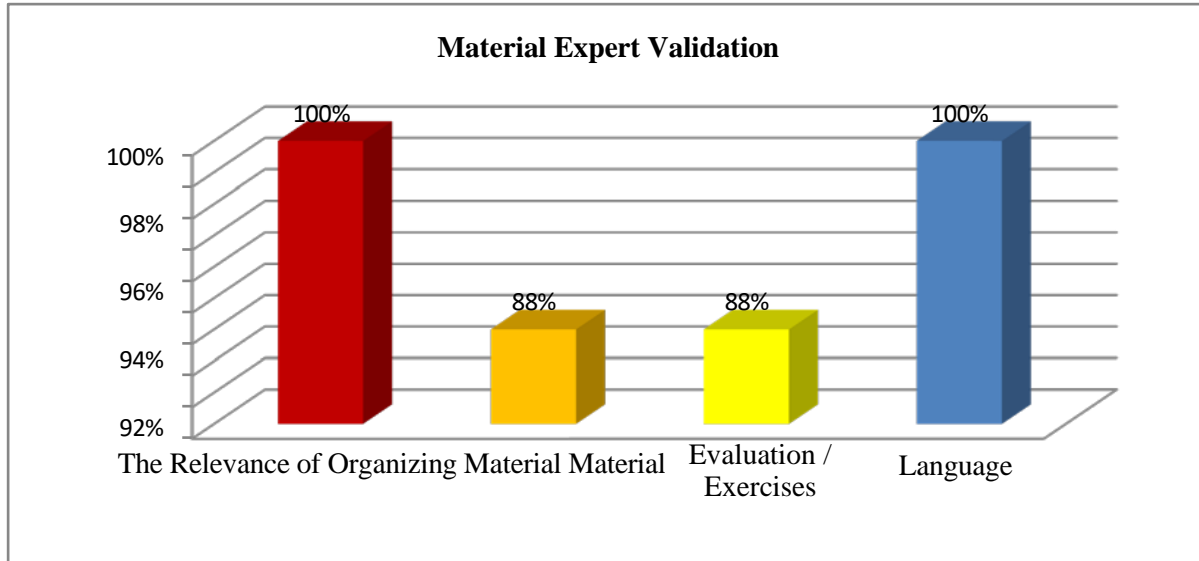


Figure 3. Material Expert Validation

Expert validation The learning design was validated by Mrs. Bunga Ayu Wulandari, S.Pd. MEIL., P.hD with 13 assessment points

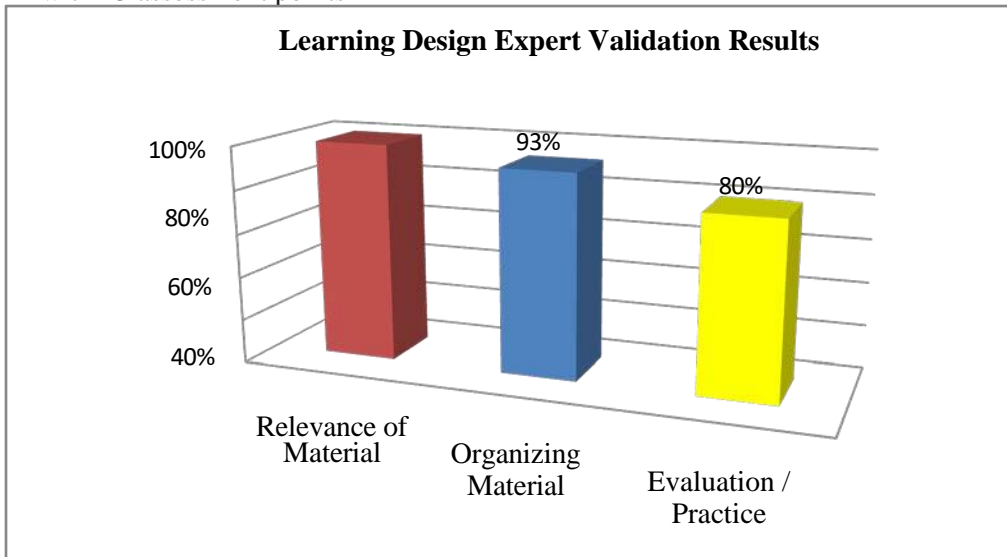


Figure 4. Learning Design Expert Validation Results

At the implementation stage, the activities carried out were product testing using small group trials. From the model developed, we can see the results of product trials carried out by researchers on Diploma III Health Analyst students at the Jambi Province Academy of Health Analysts.

The limited group trial consisted of 36 level I students who were in semester 2 with a statement instrument sheet consisting of 3 assessment aspects, namely the learning design aspect, the software engineering aspect, and the visual communication aspect. The product trial aims to determine student assessment responses to the media being developed.

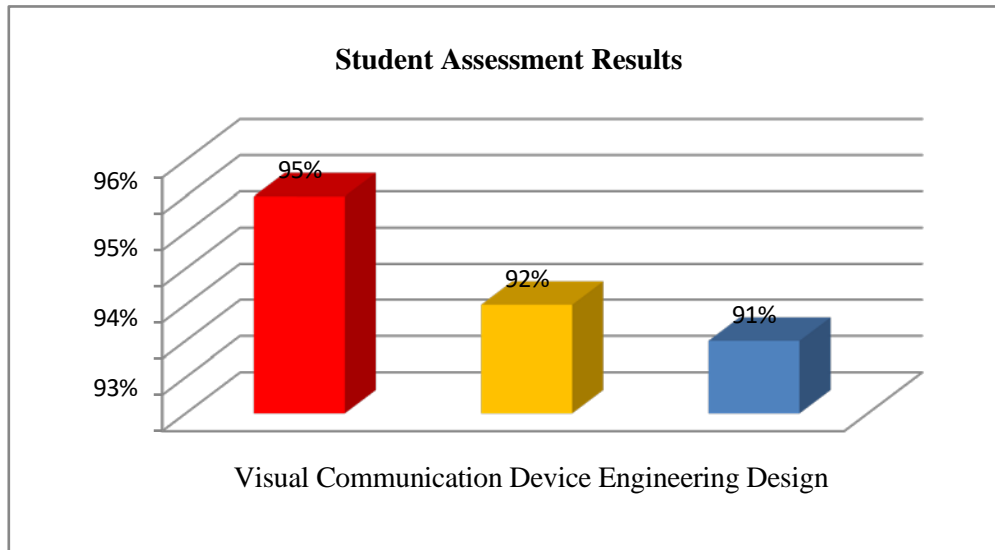


Figure 5. Student Assessment Results

The evaluation stage is carried out to evaluate the results of the product in the form of e-learning. At this stage the researcher did not carry out this evaluation activity. Researchers only carried out the small group trial stage because of limited time.

#### CONCLUSION

In this research, the process of developing e-learning based learning for health computer application material follows the Lee and Owen development model which consists of five stages: analysis, design, development, implementation and evaluation. Evaluation of the feasibility of website-based e-learning is carried out by media experts, material experts and students. The evaluation results show that this e-learning is considered very feasible by all parties involved. Media experts gave an average score of 5.0 or 100% of the total score, material experts gave an average score of 4.70 or 94%, while 36 students gave an average score of 4.65 or 93%. Thus, it can be concluded that this e-learning meets feasibility standards and is ready to be implemented in health computer application learning.

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