

Predicting The Effectiveness of Online Exam Platforms With LMS to Improve Online Learning Using The Cobit 5 Method


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ABSTRACT

Distance learning today is not just about getting online content and creating interactive and collaborative learning experiences. The aim of this research is to analyze the extent to which the online test platform is effective using Cobit Method 5. The respondents in this study were 50 students in computer systems and 10 lecturers in computer systems. The research methods used are governance audits: planning, field inspection, reporting, and follow-up. With data analysis using SPSS 20. The results of the study refer to the calculation; the level of ability (performance) obtained is a figure of 4.02, which belongs to the established level, which indicates that the process has been implemented using a defined process and has the ability to achieve the desired process result (result). While the expected level of capacity obtains a number of 4.35, which is included in the predictable level, indicating that processes have been started and operated with defined limits ensures that the performance of the process helps the organization's goals and process objectives.

Keyword : Cobit 5; Efektivitas; LMS; Online Learning;

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1. INTRODUCTION

Distance learning has become an important part of education systems around the world in the rapidly growing digital age. If previously considered a limited or alternative option, it is now an important part of the learning and teaching process. Students can now access a wide range of courses and study materials from all over the world thanks to advances in information and communication technology. Online education methods such as video learning, virtual classrooms, and apps have changed the way we learn. This allows students from different backgrounds and locations to get a high-quality education.

Remote learning has become more popular due to the COVID-19 pandemic. After schools and universities closed to prevent the spread of the virus, online learning became the only way to continue education [1]. Many educational institutions soon adapted to this, although this posed a big problem. Distance learning in today's day is not just about getting content online and creating interactive and collaborative learning experiences. Students engage in discussions, group projects, and practical activities with a variety of tools and approaches [2]. Students can interact with teachers and classmates through discussion forums, live Q&A sessions, and webinars.

However, distance learning has some problems. The digital divide, where most students do not have access to technological devices or reliable internet connections, is still a major problem. In addition, the lack of in-person interaction can have an impact on student encouragement and engagement. To address this issue, many educational institutions are working to improve access to technology and create more inclusive educational programs [3].

The future of distance learning looks bright, despite some obstacles. Distance learning can be a powerful tool to provide quality education to more people due to the continuous advancement of technology and increased understanding of the best methods for teaching and learning online [4]. It also opens up opportunities for innovation in education, allowing us to explore new approaches and methods that were not previously possible in a traditional classroom environment. Distance learning is now an important part of education [5]. We can make education effective, engaging, and inclusive for all by leveraging new learning strategies and technologies.

The e-learning system has discussion forums, text delivery, and the ability of teachers to provide grades, assignments, and announcements to students [6]. There are many online platforms that you can use to perfect your education today. All these platforms are packaged in the form of a system called Learning Management System (LMS). LMS is basically software designed to help teachers communicate and organize activities with other students anywhere and anytime [7]. Examples of LMS include Moodle, Moodle stands for Modular Object Oriented Dynamic Learning Environment is a website-based e-learning software that can be used for teaching and learning purposes with the principle of social construction pedagogy. Moodle is also a learning platform intended to create a secure and integrated system for teachers, students, and administrators. Moodle, like Google Classroom, gives students a digital classroom where they can access materials or anything related to learning. According to its official website, Moodle is a classroom management system (LMS) or course management system (CMS). This LMS has the ability to help a person, group, school, institution, business, or even board of education manage courses for anyone during the teaching and learning process. It is expected that the use of various learning models and platforms will allow teachers, students, and parents to connect anytime and anywhere. For learning to be successful and for the role of parents in supervision to be fulfilled.

COBIT 5 is a set of best practices (framework) for information technology management which consists of a complete executive summary, framework, control objectives, audit guidelines, implementation tool set and management guidelines very useful for strategic information system processes. COBIT 5 is a framework or guide for governance and sharpening of information technology and all related things, starting with meeting stakeholder needs for information and technology. COBIT 5 is the latest generation of ISACA guidance on IT governance and management. COBIT 5 builds on more than 15 years of experience using COBIT by organizations and users from the fields of business, IT community, risk, insurance, and

2. RESEARCH METHOD

In this study, the stages of the governance audit research method were carried out as follows.

- a. Planning
 - 1) Determining the object of study
 - 2) Problem formulation
 - 3) Literature Study
- b. Field Inspection
 - 1) Field assessment questionnaire
 - 2) Questionnaire mapping based on the COBIT 5 framework of the research object.
- c. Reporting
 - 1) Results of Process State Analysis Based on COBIT Framework 5.0
 - 2) Capability Level Assessment
 - 3) Maturity level measurement and GAP Analysis
- d. Follow-up
 - 1) Results of Capability Level and GAP Assessment
 - 2) Determination of Key Performance Indicators and Critical Success Factors of IT processes Based on COBIT Framework
 - 3) Recommended process results

3. RESULTS AND DISCUSSION (10 PT)

3.1. Planning

At this point, research problems and objectives are formulated, research objects are identified (teachers and students who use e-Learning at Universitas Pembangunan Panca Budi), and literature studies are conducted (definitions, frameworks, etc.).

3.2. Field Inspection

The sample size of this study was determined using the following Slovin equation: the mapping process of the COBIT 5.0 framework and the distribution of online questionnaires on auditing e-learning services to lecturers and students.

$$n = \frac{N}{1 + N \cdot e^2}$$

Information:

n = number of sample elements/members

N = number of elements/members of the population

e = error level

Note: 1% or 0.01, 5% or 0.05, and 10% or 0.1 are usually used.

In this study, the samples used for filling out questionnaires through Google Form were students and lecturers in the Even semester of 2022/2023 as many as:

- 50 active students of Computer Systems Study Program
- 10 lecturers of Computer Systems Study Program

The design of the questionnaire made is as follows:

Table. 1: Questioner Question Indicator Design

Domain Proses	Question
APO07	The resource manager/operator has the ability to focus.
APO11	Quality management, e-learning applications have good quality
APO13	E-learning applications have a good level of security
DSS04	Has the e-learning training been properly implemented?
DSS03	Did the operator provide a solution and make sure that the hurdles didn't happen again?
DSS05	Is your internet connection good enough when using e-learning?
MEA01	Are stakeholders involved in monitoring e-learning usage?
MEA02	Is the e-learning application running in accordance with the requirements or SOP?
MEA03	Has the university ever conducted an application assessment with a user satisfaction survey?

Source: *Processed by researchers, 2024*

3.3 Reporting

Before recapitulating the capability level assessment, the validity and reliability of the data from respondents were tested.

3.3.1 Governance Audit Validity and Reliability Test

To test reliability and validity, the SPSS 20 program is used. The questionnaire data collected from respondents using this e-learning service was tested for validity with criteria comparable to APO, DSS and MEA domain testing. The validity test results for the current state (performance) can be seen in the following table:

Table. 2: Test the validity of the current state

Domain	Question	rcount	rtable	Conclusion
APO	Indk 1	0.458	0.2542	Valid
	Indk2	0.568	0.2542	Valid
	Indk3	0.721	0.2542	Valid
DSS	Indk 1	0.895	0.2542	Valid
	Indk2	0.771	0.2542	Valid
	Indk3	0.632	0.2542	Valid
Process Domain	Question	APO07	Resource managers/operators have qualified capabilities	APO11
	APO13	E-learning Application Management has a good level of security	DSS04	Has the training on the use of e-learning been carried out properly?
	Does the operator provide a solution and ensure that the problem does not occur again?	DSS05	Is your internet connection good enough when using e-learning?	MEA01

Source: *Processed by Researchers, 2024*

Based on the results of the validity test of each sub-domain in its current state (performance) in the table by displaying all question items. The result obtained is the calculated r value > the table where the calculated r value is 0.2542. Thus all question items contained in the entire domain are Valid. While the results of reliability tests in current conditions can be seen in the following table:

Table.3: Reliability Test (Performance)

Domain	Cronbach's Alpha	N of Items
APO	0.760	3
DSS	0.889	3
MEA	0.690	3

Source: *Processed by Researchers, 2024*

According to the data above, the COBIT 5 domain reliability test results are above 0.60. This indicates that the questionnaire is credible and that the respondent understands the intent and purpose of the questionnaire. The following table shows the validity and reliability test results for expected conditions:

Table.4: Test the validity of the current state

Domain	Question	rcalculate	rtabel	Conclusion
	Indk 1	0.656	0.2542	Valid
APO	Indk2	0.719	0.2542	Valid
	Indk3	0.791	0.2542	Valid
	Indk 1	0.841	0.2542	Valid
DSS	Indk2	0.891	0.2542	Valid
	Indk3	0.820	0.2542	Valid
	Indk 1	0.659	0.2542	Valid
MEA	Indk2	0.721	0.2542	Valid
	Indk3	0.803	0.2542	Valid

Source: *Processed by Researchers, 2024*

According to the results of the validity test of each sub-domain in the expected conditions, which are shown in the table above by displaying all question items, the calculated r value is greater than the table r, with a calculated r value of 0.2542. The results of the reliability test under current conditions are shown in the following table:

Table.5: Expected Reliability Test

Domain	Proses	Rata-rata	Rata-rata Proses
	Indk 1	3.37	
APO	Indk2	3.56	3.63
	Indk3	3.98	
	Indk 1	3.75	
DSS	Indk2	4.23	3.97
	Indk3	3.92	
	Indk 1	4.93	
MEA	Indk2	3.94	4.47
	Indk3	4.53	

The results show that an average (expected) capability of 4.35 falls into the predictable category, which means that the expected process can run within certain limits to achieve the desired result. This ensures that process performance supports the achievement of organizational and process objectives.

3.3.3 Gap Analysis

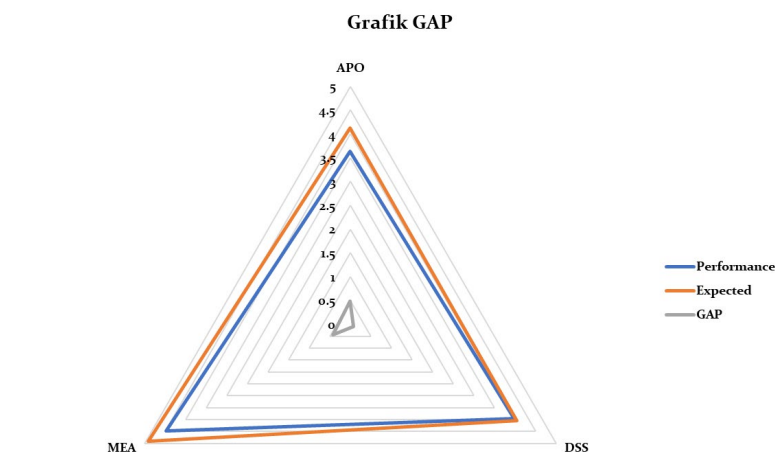
Furthermore, based on the results of the analysis above, a gap analysis (GAP) assessment was carried out. This assessment shows the difference or gap between the maturity level of the current condition and the maturity level of the expected condition from the use of e-learning at Universitas Pembangunan Panca Budi. The assessment results can be seen in the following table:

Table.8: Comparison of gap levels

Domain	Performance	Expected	GAP
APO	3.63	4.12	0.49
DSS	3.97	4.05	0.08
MEA	4.47	4.90	0.43
	Rata-rata		0.333

Source: *Processed by Researchers, 2024*

Based on the table above, the average GAP in all process domains studied is 0.333. Based on the results of the gap analysis obtained in the e-learning governance audit at Universitas Pembangunan Panca Budi, it is recommended to improve the LMS services of Universitas Pembangunan Panca Budi now in achieving the expected level of ability. The current level of capability is still at level 3, that is, existing processes have been implemented using processes that have been defined as being able to achieve the desired process results. To achieve the expected at level 4 i.e. the processes that have been implemented initially and which now operate within predetermined Constraints to achieve the results of the process. The GAP analysis can also be seen in the figure below:



Picture. 1 GAP Analysis Chart

3.4 Follow-up

In the process of determining improvement recommendations, measurements are needed using adaptations from COBIT 5.0 and the results of maturity level assessment and GAP analysis with the following details:

Predicting The Effectiveness of Online Exam Platforms With LMS to Improve Online Learning Using The Cobit 5 Method (Zulham Sitorus)

- a. Conduct regular personnel performance evaluations to ensure the company has adequate human resources.
- b. Conduct training & evaluate continuously to lecturers at Universitas Pembangunan Panca Budi about the use and obstacles experienced during the use of e-learning.
- c. Determine the right access rights for lecturers, students, and service operators to features/menus in e-learning.
- d. Manage the network well, and respond to network risks/constraints in a timely and relevant manner
- e. Improve the existing obstacles in the e-learning of Universitas Pembangunan Panca Budi and ensure IT personnel have a plan developed to prevent incidents from occurring in the future.

Involving stakeholders In existing constraints/problems, monitoring and evaluating improvements made so as to improve the effectiveness of LMS services of Universitas Pembangunan Panca Budi

4. CONCLUSION

- a. The validity test results of each sub-domain under performance and expectation conditions show that the calculated r value is greater than the table r , indicating that the domain-wide question item (instrument) is valid. Next, Cronbach's Alpha reliability test was carried out. Results show that the item is reliable or reliable with a Cronbach alpha coefficient between 0.60 and 0.85.
- b. Based on the results of the calculation, the level of ability (achievement) obtains the number 4.02, which is included in the predetermined level, which indicates that the process has been implemented using a predefined process and has the ability to achieve the desired process results (results). While the expected capability level gets a number of 4.35, which is included in the predictable level, which indicates that the process has been started and operated within predetermined limits ensuring that process performance helps achieve organizational goals and process objectives.
- c. The results of the GAP analysis show that the process is generally good, with the GAP difference between the current condition and the expectation condition less than one. The smaller the gap analysis (GAP) in the current state compared to the expected condition, the better the IT governance process. In this process, gap analysis (GAP) shows that previously implemented processes operate outside the specified limits to achieve process results.

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REFERENCES

- H. Kusbandono, "TATA KELOLA TEKNOLOGI INFORMASI," 2019.
- A. Fauzia, T. Hidayatulloh, T. Septiani, and N. Koeswara, "148~155 Diterima Agsutus 14, 2023; Revisi Agustus 30," *JURNAL SWABUMI*, vol. 11, no. 2, 2023.
- R. Nurlistiani, N. Purwati, and S. Yanto, "Audit E-Learning Dengan Framework Cobit 5.0 Di Masa Pandemi Covid-19," 2021.
- Sri Restu Ningsih, Seri Hartati, Liza Trisnawati, and Rosa Devitria, "Penerapan Online Learning dengan Framework Cobit 5 Untuk Mendukung Program Merdeka Belajar Kampus Merdeka," *ABDISOSHUM: Jurnal Pengabdian Masyarakat Bidang Sosial dan Humaniora*, vol. 1, no. 3, pp. 326-332, Sep. 2022, doi: 10.55123/abdisoshum.v1i3.882.
- Sri Restu Ningsih, Seri Hartati, Liza Trisnawati, and Rosa Devitria, "Penerapan Online Learning dengan Framework Cobit 5 Untuk Mendukung Program Merdeka Belajar Kampus Merdeka," *ABDISOSHUM: Jurnal Pengabdian Masyarakat Bidang Sosial dan Humaniora*, vol. 1, no. 3, pp. 326-332, Sep. 2022, doi: 10.55123/abdisoshum.v1i3.882.
- R. Boy, J. I. Sihotang, and J. Moedjahedy, "Analisa Efektivitas Pembelajaran Daring Melalui Zoom Meeting Menggunakan Framework COBIT 5 Domain Deliver, Service, and Support (DSS) Analysis of the Effectiveness

- of Online Learning Using Zoom Meetings Using COBIT 5 Framework with Deliver, Service, and Support (DSS)," *Cogito Smart Journal* /, vol. 8, no. 1, 2022.
- H. Nur, R. Achaqie, E. Sedyono, S. Yulianto, and J. Prasetyo, "Evaluasi Kinerja Pembelajaran Learning Management System Menggunakan COBIT 4.1 pada Universitas STEKOM Semarang," *Jurnal Ilmiah Elektronika Dan Komputer*, vol. 15, no. 1, pp. 97–107, 2022, [Online]. Available: <http://journal.stekom.ac.id/index.php/elkom>□page97
- R. P. Anugerah and W. A. Kusuma, "Keefektifitasan Penggunaan Platform LMS Dalam Pelaksanaan Pembelajaran Jarak Jauh," *Jurnal Komputer dan Informatika*, vol. 9, no. 2, pp. 127–132, Sep. 2021, doi: 10.35508/jicon.v9i2.4319.