Research Article

Implementation Evaluation of Information Technology in the New Normal Era Using Cobit 2019 Method

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Abstract.

This research is a continuation of the previous research on Information Technology Governance Analysis of STMIK Palcomtech in the New Normal Era Using Cobit 2019 where the measurements carried out are the stages of 11 factors design Tool Kit Cobit 2019. The results of the study included 13 important processes in the domain that must be considered in STMIK Palcomtech including EDM03, APO08, DSS05 EDM02, APO04, APO09, APO12, APO13, BAI01, BAI02, BAI03, BAI06, MEA03. This research aims to evaluate the application of information technology used by STMIK Palcomtech focusing on the application of information technology applied based on the needs of the company and the strategy of the impact of COVID 19, which uses the Goal cascade framework Cobit 2019. Use qualitative method by spreading questionnaires in accordance with the domain that has been determined to students then continued with the measurement of maturity level so that current conditions are obtained and then continued gap analysis. The results of this study showed the average maturity level is at level 3 and the result of the gap level then the lowest value is a priority to prioritize new development then to the next domain to achieve the expected value in the domain Level.

Keywords: information technology, COBIT, governance analysis

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1. Introduction

The pandemic conditions experienced by the world today inevitably force us to practice social distance so that gatherings involving large numbers of people must be avoided first. In Indonesia itself, this pandemic has resulted in major changes, especially in the field of education where the use of information technology and learning media in education is the key to the implementation of the teaching and learning process. In universities, especially in the city of Palembang, the use of information technology and learning media is mandatory due to the decision of the minister of education which requires universities to carry out online learning activities.

The use of information technology in learning media itself has its own advantages and disadvantages so that further analysis needs to be done whether the use of information technology in learning media is in accordance with the initial goals of education at the university. The method that can be used is to apply the Cobit Framework 2019 where with this method the current maturity level can be known in the application of information technology.

Previous research that discussed the use of the 2019 Cobit Framework, including the research conducted by Hendy Maulana, Amalia Ika, et al entitled Adjusting the Governance System at the Kalimantan Institute of Technology Using Cobit 2019 in this study resulted in a governance system design from the core model of Cobit 2019 as many as 18 core models that the Kalimantan Institute of Technology must run [1]. Another study conducted by Keszya Wabang, Yusiana Rahma, et al entitled Governance of Information Technology Using Cobit 2019 At PSI Muria Kudus University was carried out in 11 process domains and the domain maturity result was 3.37 then the gap analysis obtained results of 1.63 so that improvements are needed in the central governance of the Muria Kudus University information system [2].

2. Methods

The research method in this study uses a descriptive-quantitative method by describing the indicators used as the basis for measurement taken by the 2019 literature framework using measurements in the form of numbers [3]. As for the stages of the research itself can be seen in Figure 1.

3. Literature review

The literature review at this stage is carried out:

1. have business documents from STMIK Palcomtech such as vision and mission documents, learning SOPs, and other documents related to online learning at STMIK Palcomtech, then identify and formulate problems to determine research objectives and benefits.

2. Besides that, a literature study on the 2019 Cobit Framework was also carried out as a starting material in determining the domain to be used in research.
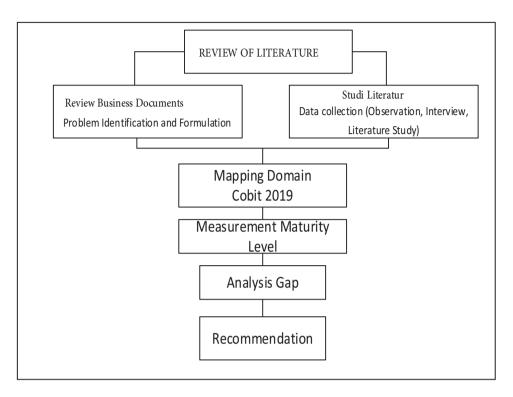
Figure 1: Research Stages.

3. In collecting data, this research uses an interview approach, literature study

3.1. Cobit 2019 Domain Mapping

Cobit framework 2019 domain mapping at this stage is analyzed using the Goal cascade framework cobit 2019 with stages as shown in Figure 2 [4].

3.2. Meturity Level Measurement

Meturity measurement from the results of the questionnaire that has been distributed in accordance with the 2019 COBIT domain with answer choices using a value range of 0-5. then the researcher manages to get the maturity level value [5][6][7].

3.3. Gap Analysis

At this stage the researcher calculates the gap from the difference between the current maturity level and the expected maturity level [8][9].
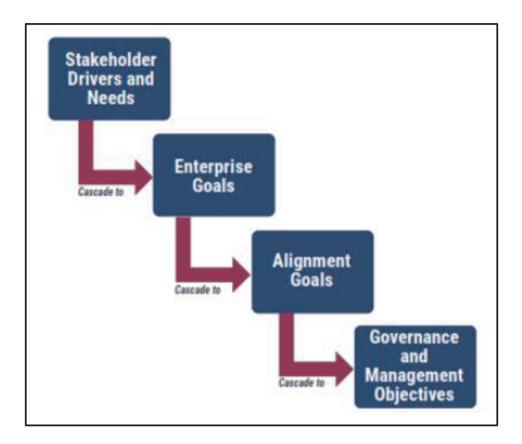
Figure 2: Cobit 2019 Domain Mapping.

3.4. Recommendation

The results of this study are formulated recommendations for improvement related to IT governance based on the gap analysis that has been obtained. Results and Discussion [10].

4. Result and Discussion

4.1. Understand the Enterprise Context and Strategy

At this stage, the researcher determines the basis of the company's goals, strategies, objectives, risks, and problems related to information and technology regarding Learning Media in the New Normal Era in the Palcomtech Online Learning Application based on the design factor criteria provided by COBIT 2019 [11][12]. The results achieved are based on STMIK Palcomtech's vision and mission. Based on the needs of the STMIK Palcomtech College stakeholders, it is mapped in table 1. COBIT 2019 has defined 13

company/organizational goals in general using a 1-dimensional balanced score card (BSC) [13][14].

TABLE 1: Mapping Enterprise Goals.

No	Tujuan	Enterprise Goals
1	Become a study program that produces graduates who have competence in the analysis, design, and implementation of business information systems, who are competitive at the national level and have an entrepreneurial spirit.	EG01 EG10
2	Conduct quality research to contribute to the development of science and information technology	EG08 EG10 EG12 EG13
3	Organizing education with competency in analysis, design, implementation of entrepreneurship-based business information systems	EG02 EG01 EG06 EG08
4	Organizing community service in the field of information technology.	EG02 EG06 EG08 EG10
5	Providing quality educators, technology, and facilities as well as a good learning environment for the implementation of academic activities	EG08 EG10 EG12
6	Building partnerships and networks nationally, regionally and globally both with the academic world, the business world and the industrial world	EG06 EG13
7	Facilitating the academic community to excel, develop themselves, and achieve a better future	EG01 EG02 EG08 EG12

From the results of the Enterprise Goals Mapping, the researcher determines the process domain according to the alignment goals that have been selected [15]. The results of the process domains identified according to the alignment goals are shown. It can be seen in table 2.

Based on the results of the Enterprise Goal then the analysis proceeds to the stage Alignment Goal with the following details

After obtaining the Enterprise Goal and Alignment Goal, the 2019 cobit domain was also determined to be used in the research [16]. which can be seen in table 4

TABLE 2: Mapping Enterprise Goals.

BSC Dimension	Ref	Enter-prise Goals
Financial	EG01	Competitive product and service portfolio
	EG02	Managed business risk
	EG03	Compliance with external laws and regulations
Customer	EG06	Sustainability and availability of business services
Internal	EG08	Optimization of internal business process functions
	EG10	Staff skills, motivation and productivity
	EG11	Compliance with internal policies
Learning & Growt	EG12	Managed digital transformation program
	EG13	Products and business

TABLE 3: Alignment Goal.

BSC Dimension	Ref	Enter-prise Goals
Financial	AG01	IT compliance and support for business compliance with external laws and regulations
	AG02	Managed IT related risks
	AG03	Realized benefits from IT-enabled investments and service portfolio
Customer	AG06	Agility (ability) to turn business requirements into operational solutions
Internal	AG08	Enabling and supporting business processes by integrating applications and technology
	AG10	IT management information quality
	AG11	IT compliance with internal policies
Learning & Growt	AG12	Competent and motivated staff with mutual understanding of technology and business
	AG13	Knowledge, expertise and initiative for the innovation business.

4.2. Maturity Level Measurement

Based on the results of the 2019 COBIT process domain determination which was carried out in the previous stage, it was continued by making a questionnaire based on the characteristics of the activity domain in question [17], while the respondents consisted of 32 lecturers and 10 staff so that the total number of respondents was 42 people. while the range of answers to the questionnaire is a value of 0 to 5.

<div align="center">Table 4: COBIT 2019 Process Domain.</div>

Process	Process Title
Evaluate, Direct and Monitor (EDM) Processes	
EDM02	Ensured Benefits Delivery
EDM03	Ensured Risk Optimization
Align, Plan and Organize (APO) Processes	
APO04	Managed Innovation
APO08	Managed Relationships
APO09	Managed Service Agreements
APO12	Managed Risk
APO13	Managed Security
Build, Acquire and Implement (BAI) Processes	
BAI01	Managed Programs
BAI02	Managed Requirements Definition
BAI03	Managed Solutions Identification & Build
BAI06	Managed IT Changes
Deliver, Service and Support (DSS) Processes	
DSS05	Managed Security Services
Monitor, Evaluate and Assess (MEA) Processes	
MEA03	Managed Compliance with External Requirements

<div align="center">Table 5: Maturity Level.</div>

Indeks	Maturity Level	Level
4,50-5,00	Optimal	5
3,50-4,49	Managed	4
2,50-3,49	Defined	3
1,50-2,49	Repeatable	2
0.50-1.49	Initialization	1
0-0,49	None	0

4.3. Maturity Level Assessment of Each Process Domain

Maturity level of each domain based on the questionnaire that has been distributed to respondents

Then for the level gap analysis that occurs based on the results of the analysis between the current index and the expected results [18], it is as follows.

Given the gaps found between the level of maturity of current technology governance [19][20][21], it is necessary to improve governance. Some recommendations for improvement are.

TABLE 6: Current Maturity Level.

Domain	Current Maturity	Level
EDM02	3.59	4
EDM03	3.82	4
APO04	3.22	3
APO08	4.04	4
APO09	3.33	3
APO12	3.46	3
APO13	3.40	3
BAI01	3.39	3
BAI02	3.22	3
BAI03	3.37	3
BAI06	4.41	4
DSS05	4.37	4
MEA03	3.42	3

TABLE 7: Instrument Results.

Domain	Current Index	Expected Index	Gaps
EDM02	3.59	5	1,41
EDM03	3,82	5	1,18
APO04	3.22	5	1,78
APO08	4.04	5	0.96
APO09	3.33	5	1.67
APO12	3.46	5	1,55
APO13	3.40	5	1,60
BAI01	3.39	5	1,61
BAI02	3.22	5	1,78
BAI03	3,37	5	1,63
BAI06	4.41	5	0,59
DSS05	4.37	5	0,63
MEA03	3.42	5	1,58

1. It is necessary to determine management measures and parameters and manage communication between parties involved in determining roles and responsibilities, making plans, goals, and aligning processes with planning.

2. Increase potential IT capabilities for business purposes and implement ideas, innovations, and technologies used

3. Make a report on the results of monitoring activities on a regular basis and then identify threats in the IT process that may interfere with its performance based on predefined parameters.

4. Conducting regular meetings of the participants to discuss problems services and find solutions, as well as development priorities that need to be done to improve services.

5. Conclusions

Based on the results described previously, it was concluded that maturity level measurements were carried out at STMIK Palcomtech Palembang with a total number of 42 respondents consisting of lecturers and staff at STMIK Palcomtech resulting in a maturity level between 3.22 and 4.40 with the highest results obtained from the BAI06 measurement results.

While the average maturity level is 3.61. while the average value of the gap obtained from the difference between the current maturity level and the expected result is 1.31. so it needs to be repaired with recommendations based on the 2019 COBIT standard.

Acknowledgments

References

[1] Maulana H, et al. Penyesuaian Sistem Tata Kelola Pada Institut Teknologi Kalimantan Dengan Menggunakan Cobit 2019 Pelayanan Teknis (UPT) dan tim ad hoc. Salah satu tugas pengelola TI di perguruan tata kelola teknologi informasi adalah Control Objective for Information a. *J Sist Inf*. 2020;12(2):2060–2074.

[2] Wabang K, Rahma Y, Widodo AP, et al. "Tata Kelola Teknologi Informasi Menggunakan Cobit 2019 Pada Psi Universitas Muria Kudus." *Jurnal Teknol dan* 2021;VII(3):275–282.

[3] Sugiyono. "Metode Penelitian Bisnis (Pendekatan Kuantitatif, Kualitatif, Kombinasi dan R&D)." in *Metodelogi Penelitian*, 2017.

[4] D. Steuperaert, "COBIT 2019: A significant update." *EDPACS*, https://doi.org/10.1080/07366981.2019.1578474.

[5] ISACA. COBIT 2019 Introduction and Methodology. ISACA; 2019.

[6] Kasma VS, Sutikno S, Surendro K. "Design of e-Goverment security governance system using Cobit 2019." *Int Conf ICT Smart Soc.* 2019.

[7] Fikri AM, Priastika HS, Octaraisya N, Sadriansyah S, Trinawati LH. "Rancangan Tata Kelola Teknologi Informasi Menggunakan Framework COBIT 2019 (Studi Kasus: PT XYZ)." *Inf Manag Educ Prof J Inf Manag.* https://doi.org/10.51211/imbi.v5i1.1410.

[8] Gusni RS, Kraugusteeliana K, Pradnyana IW. "Analisis Tata Kelola Keamanan Sistem Informasi Rumah Sakit XYZ Menggunakan Cobit 2019 (Studi Kasus pada Rumah Sakit XYZ)." in Konferensi Nasional Ilmu Komputer (KONIK) 2021; 2021.

[9] Riantini FI, Mulyana DI. Implementasi Tata Kelola Teknologi Informasi Menggunakan Framework Cobit 5 Pada Direktorat Jenderal Bea Dan Cukai. Cki Spot. 2019;12(1):1–14.

[10] Made IG, Dharma S, Made IG, Sasmita A, Suwija IM. "Evaluasi Dan Implementasi Tata Kelola Ti Menggunakan Cobit 2019 (Studi Kasus Pada Dinas Kependudukan Dan Pencatatan Sipil Kabupaten Tabanan)." *J Ilm Teknol dan Komput.* 2021;2(2).

[11] ISACA. *COBIT 2019 Framework Introduction and methodology.* 2019.

[12] Safitri A, Syafii I, Adi K. Measuring the performance of information system governance using framework COBIT 2019. *Int J Comput Appl.* 2021;174(31):23–30.

[13] Atrinawati LH, Ramadhani E, Fiqar TP, Wiranti YT, Abdullah AINF, Saputra HMJ, et al. Assessment of process capability level in university XYZ based on COBIT 2019. *J Phys.* Conference Series; https://doi.org/10.1088/1742-6596/1803/1/012033

[14] Gerl A, Von Der Heyde M, Groß R, Seck R, Watkowski L. "Applying COBIT 2019 to IT Governance in Higher Education Establishing IT governance for the collaboration of all universities and universities of applied sciences in Bavaria." *Informatik 2020*, 2020.

[15] Belo GI, Wiranti YT, Atrinawati LH. "Perancangan Tata Kelola Teknologi Informasi Menggunakan Cobit 2019 Pada PT Telekomunikasi Indonesia Regional VI Kalimantan." *Jusikom Prima. Jurnal Sist Inf Ilmu Komput. Prima*; 2020.

[16] Gerl A, Von Der Heyde M, Groß R, Seck R, Watkowski L. "Applying COBIT 2019 to IT Governance in Higher Education." *Inform. 2020 - Gesellschaft für Inform.*, 2021.

[17] Ishlahuddin A, Handayani PW, Hammi K, Azzahro F. "Analysing IT governance maturity level using COBIT 2019 framework: A case study of small size higher education institute (XYZ-edu)." in *2020 3rd International Conference on Computer and Informatics Engineering, IC2IE 2020*, https://doi.org/10.1109/IC2IE50715.2020.9274599.

[18] Wardani S, Puspitasari M. Audit Tata Kelola Teknologi Informasi Mengunakan Framework Cobit Dengan Model Maturity Level (Studi Kasus Fakultas Abc). *J Teknol.* 2014.

[19] Nagel RG, Pasyha G, Wagiu EB. "Analisa Tata Kelola Sistem Informasi Universitas Advent Indonesia menggunakan Framework COBIT 5 (Domain EDM)." *Semin Nas Inform.* 2020.

[20] White SK. What is COBIT? A framework for alignment and governance. CIO (Framingham Mass). 2019.

[21] Nachrowi E, Nurhadryani Y, Sukoco H. "Evaluation of governance and management of information technology services using Cobit 2019 and ITIL 4." *J RESTI (Rekayasa Sist dan Teknol Informasi)*, 2020.