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Analysis of Information Technology Governance Using Domain EDM in the SMP XYZ Jakarta

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ABSTRACT

The main goal of this study is to assess SMP XYZ Jakarta's IT governance implementation and maturity. This report provides a complete analysis, strategic recommendations, and strategies for enhancing system efficiency and functionality to improve operational outcomes. A COBIT 5 maturity value evaluation at SMP XYZ Jakarta found GAP Analysis shortcomings in many domains. In particular, EDM01 and EDM02 exhibit possible governance structure and benefit distribution concerns with discrepancies of -0.33 and -0.16, respectively. Risk optimization is substantial for EDM03, which has a positive disparity of 0.34. EDM04 emphasizes efficient resource allocation with a differential of -0.33, whereas EDM05 signals stakeholder transparency needs with 0.17. The governance structure's strengths and weaknesses are shown by the average domain disparity of -0.31. Data from questionnaires reveal proficiency in subdomains like EDM01 governance framework construction. Also noted were benefits delivery (EDM02) and risk optimization (EDM03). EDM04 and EDM05's predicted level 3 progress supports SMP XYZ Jakarta's ambitious governance framework improvement target.

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1. Introduction

The SMP XYZ Jakarta State School, which operates under the direct supervision of the Indonesian Ministry of Education, plays a vital role in facilitating communication between the Ministry and the school's administrative procedures, specifically in the documentation of student academic accomplishments. The presence of a well-structured and effective information system plays a crucial role in facilitating the evaluation and review procedures carried out by the educational personnel. An information system is a collaborative endeavor that integrates human activities and technological resources to optimize an organization's administrative and operational processes[1], [2]. Within the given framework, the term "information systems" refers to the interrelated elements comprising human engagement, data, information, technology, and artificial intelligence.

The efficient management of information technology (IT) plays a crucial role in the provision of high-quality services related to information systems[3]–[6]. Furthermore, auxiliary support services are of utmost importance in promptly resolving any operational obstacles that may emerge. The implementation of an information technology governance model is crucial to effectively address the information requirements of teaching staff, given the increasing dependence on information technology for the management of school grades.

At SMP XYZ Jakarta, educators employ a student grade entry system, which can be accessed at http://36.95.101.71:xxxx/login, to effectively administer and document academic performance, thereby substituting the previously laborious manual method. Therefore, it is imperative to analyze not just the effectiveness and functioning of the information system, but also the competence of the staff engaged. The COBIT

5 approach functions as a comprehensive framework for evaluating the performance of a system and its operational context[7], [8].

The present study heavily focuses on the utilization of the COBIT 5 framework, which has been selected due to its comprehensive set of practices in the realm of IT governance and management. The implementation of IT governance is essential for ensuring that the integration of information technology within an organization maximizes the advantages for the business, efficiently mitigates risks, and optimally utilizes available resources[9], [10]. The primary emphasis of this discussion pertains to the EDM (Evaluate, Direct, and Monitoring) domain within the broader framework of COBIT 5, which encompasses many domains[11], [12]. The findings of the information system governance audit conducted at SMP XYZ Jakarta unveiled many deficiencies, including the absence of automated information-saving mechanisms inside the systems. Consequently, this has resulted in teaching staff having to repeatedly enter data. The primary objective of this study is to examine the current status of IT governance implementation at SMP XYZ Jakarta and to estimate its level of maturity. The aim of this study is to offer a thorough examination, strategic suggestions, and direction for boosting the efficiency and functionality of the system to achieve improved operational outcomes.

2. Methodology

The research method applied is using the COBIT 5 domain EDM framework. This framework focuses on evaluation, direction, and monitoring to assess a company's governance in achieving its business goals.

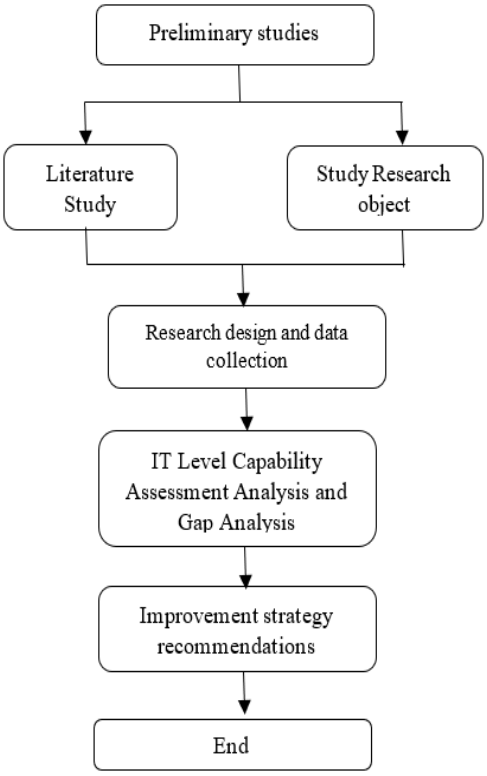

Figure 1. Stage of Research

2.1 Stage of Research

During the initial phase of the preliminary study, the focus lies on identifying and understanding the governance challenges within SMP XYZ. This step aims to establish a clear context for the primary discussion. It involves researching relevant articles to support and enrich the data on governance at the SMP XYZ. Next comes an evaluation of the potential use of information technology to streamline business processes, including discussions around its feasibility. The second stage encompasses a thorough review of existing literature and an in-depth study of the research subject. Moving to the third stage, known as research design and data collection, the investigation delves into the governance framework, particularly the use of COBIT 5.0 within the EDM domain, to assess its readiness for implementation at the SMP XYZ. This phase also involves gathering the necessary data, predominantly in statistical form, obtained from responses to various inquiries or comments. The fourth step involves analyzing the acquired data, termed the IT level capacity assessment analysis. This assessment aims to determine the extent of information technology deployed at SMP XYZ. Microsoft Excel is employed as the tool for processing and analyzing the research findings. The fifth stage revolves around providing improvement recommendations for each aspect of the EDM that falls short of user

expectations. These suggestions aim to enhance different components, ultimately contributing to a more successful utilization of information technology within SMP XYZ. In essence, the process involves understanding governance challenges, exploring IT utilization potential, studying relevant literature, evaluating the chosen governance framework, analyzing collected data, and proposing enhancements for better IT implementation. These improvements are envisioned to elevate the SMP XYZ success in utilizing information technology in the future.

2.2 Domain EDM

The EDM domain is a governance area in COBIT 5, which has the function of evaluating, directing, and monitoring overall IT management activities carried out by the company. One of them is the EDM Domain (Evaluate, Direct, and Monitor) which consists of 5 (five) processes[11], namely:

1. EDM01: Ensure the setting and maintenance of the governance framework.
2. EDM02: Ensure delivery of benefits.
3. EDM03: Ensure risk optimization.
4. EDM04: Ensures resource optimization.
5. EDM05: Ensure stakeholder transparency.

2.3 Data Collection Methods

The data collection technique used in this research is by distributing questionnaires. For the questionnaire technique, the researcher did it in a closed manner where respondents only marked answers that were deemed to agree and disagree with a minimum score of 0 which means very bad, and also a maximum score of 5 which means very good.

Table 1. Assessment Score

Score	Information
1	Strongly disagree
2	Don't agree
3	Agree
4	Quite agree
5	Strongly agree

The correspondence between the ranking value and the absolute value (maturity model) is carried out by calculating the formula:

$$\text{Attribute Maturity Index} = \frac{\sum(\text{Total Answers x Weight})}{\text{JNumber of Respondents}} \ldots\ldots(1)$$

$$\text{Maturity Index} = \frac{\sum(\text{Attribute Maturity Index})}{\sum\text{Activity}} \quad \ldots\ldots\ldots\ldots\ldots(2)$$

This maturity level determination is in accordance with the COBIT 5 standard [21], [22]. Levels can be seen in the table as follows.

Table 2. Maturity Levels

Indexes	**Maturity Levels**
0 – 0,50	Non existent
0,51 – 1,50	Initial/Ad hoc
1,51 – 2,50	Repeatable but intuitive
2,51 – 3,50	Defined processes
3,51 – 4,50	Managed and measurable
4,51 – 5,00	Optimized

3. Analysis and Results

It is helpful to analyze the maturity level that SMP XYZ has attained in the EDM Domain to make use of the growth of information technology and to facilitate ongoing activities. What about the application of information technology in SMP XYZ? There are still some challenges that must be overcome to make use of the system, despite the fact that it is now operating in accordance with the plan. As a result, the current approach

to managing information technology is not judged to be optimal enough in relation to the resources that are now available. In this analysis, the Cobit framework is combined with the EDM domain, and the analysis is carried out by collecting responses from respondents in the form of questions.

3.1 Data Presentation

In presenting data in the form of filling out a questionnaire related to the EDM domain, the researcher presents the data that has been filled in by the respondent. Some of the questions asked by the researchers included:

Table 2. EDM Domain Questions

DOMAIN	Questions
EDM01	1. Are there IT usage regulations enforced within the company? 2. Is there routine maintenance on the value input system at SMP XYZ Jakarta? 3. Are the infrastructure components understandable by the people who use them?
EDM02	1. Can the current use of IT provide effectiveness and efficiency in business processes? 2. Does the current use of IT have a positive impact on the company? 3. If there are IT problems, should IT be optimized as quickly as possible?
EDM03	1. Is the stored data safe? 2. What are the security procedures for information technology services if a disaster or data theft occurs at any time? 3. Is monitoring/evaluation carried out in risk management?
EDM04	1. Are there any service support personnel in the value input system at SMP XYZ Jakarta who have the appropriate skills and sufficient IT infrastructure as expected for the future? 2. Can the IT infrastructure use help business process activities? 3. Do you review and approve the resource plan strategy and architecture?
EDM05	1. Are the data and information requirements in the value input system accessible to people who have these interests and are they transparent enough? 2. Can external parties regulate and measure IT activities? 3. Is there an evaluation of the stakeholder reporting requirements at the school?

3.2 The Results of the Questionnaire Information Collection

Obtaining data for this study is accomplished through the use of a questionnaire. The school operator section, which is a part of the administration section, and those who assist at the school are the two correspondents that are responsible for the distribution of the questionnaires that are distributed. These are the outcomes that have been calculated based on the responses that were received from the respondents who were surveyed earlier. The information that was successfully gathered in response to the questions that were presented in the table that was just presented is as follows:

Table 3. Breakdown Form

Sub Domain	Questionnaire	Discussion Score		Maturity Level
		Respondent 1	Respondent 2	
EDM01	1	4	4	3,33
	2	3	3	
	3	3	3	
EDM02	1	3	2	3,16
	2	4	4	
	3	4	2	
EDM03	1	3	3	2,66
	2	3	2	
	3	3	2	
EDM04	1	3	3	3,33
	2	4	4	
	3	3	3	
EDM05	1	4	4	2,83
	2	3	2	
	3	2	2	

The results of calculations using gfrom were obtained from 2 respondents, so the researcher can conclude that the level of IT Governance at SMP XYZ Jakarta is 3 in Performed Process (Level 2). From the calculations

that have been obtained, the researcher describes the analysis of research data that is in accordance with the data collected, resulting in a process table that predicts current maturity and expected maturity levels as follows:

Table 4. Domain Prediction

Domain	Current Maturity Level	Expected Maturity level	Maximum Maturity Level
EDM01	3,33	3	5
EDM02	3,16	3	5
EDM03	2,66	3	5
EDM04	3,33	3	5
EDM05	2,83	3	5

The results of the average respondents in managing IT at the Current Maturity level obtained will be analyzed through gap calculations using GAP Analysis of the maturity level based on existing data to produce the current maturity level and make a comparison with the expected level using Domain EDM 01, EDM Domain 02, EDM Domain 03, EDM Domain 04, and EDM Domain 05.

Tabel 5 Maturity Level Domain

Average Domain	Current Maturity Level	Expected Maturity level	GAP
EDM01	3,33	3	-0,33
EDM02	3,16	3	-0,16
EDM03	2,66	3	0,34
EDM04	3,33	3	-0,33
EDM05	2,83	3	0,17
Amount	15,31		-0.31
Maturity Level Value	3,06		
Gap Level Value			

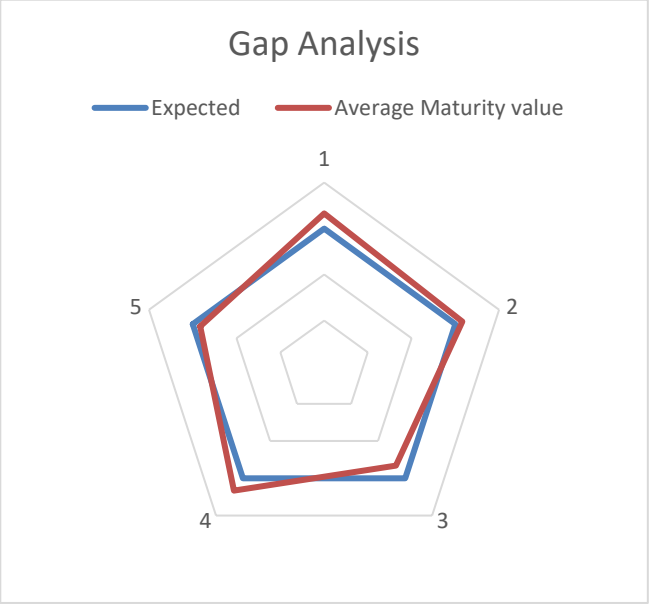

Figure 2. Gap Analysis

Dari hasil GAP Analysis dapat dilihat dari proses evaluasi dari setiap domain EDM01 memiliki selisih yaitu -0,33 , EDM02 memiliki selisih -0,16 , EDM03 memiliki yaitu 0,34, EDM04 memiliki selisih yang paling dikit yaitu -0,33 , EDM05 memiliki selisih selisih paling besar yaitu 0,17 , bedasarkan analisis tingkat kesenjangan keseluruhan yaitu memiliki kesenjangan dengan rata rata sebesar -0,31.

4. Conclusion

The evaluation carried out at SMP XYZ Jakarta, using the COBIT 5 maturity value methodology, identified discrepancies detected in the GAP Analysis across different domains. The EDM01 assessment revealed a disparity of -0.33, suggesting potential areas of concern in the establishment and upkeep of the governance structure. In contrast, EDM02 displayed a marginal discrepancy of -0.16, indicating possible shortcomings in the implementation of measures to achieve effective distribution of benefits. It is noteworthy that EDM03 exhibited a positive disparity of 0.34, indicating a comparatively advantageous stance in the optimization of risk. In contrast, EDM04 had the lowest disparity value of -0.33, indicating a notable emphasis on achieving efficient resource allocation. On the other hand, the EDM05 assessment displayed a discrepancy of 0.17, suggesting the presence of certain aspects that may necessitate further focus to ensure transparency among stakeholders. The full assessment, taking into account the average discrepancy of -0.31 across different areas, offers a thorough understanding of the diverse strengths and weaknesses within the governance structure.

Additionally, the data obtained from the questionnaire provided insights into the proficiency levels within particular subdomains. As an example, the EDM01 initiative, which centers on the construction and maintenance of a governance framework, documented a specific degree of capacity. Furthermore, EDM02 and EDM03 demonstrated distinct capabilities, with EDM02 focusing on the achievement of successful benefit delivery and EDM03 on the optimization of risks. In the context of SMP XYZ Jakarta, the projected advancement to level 3 in both EDM04, which focuses on resource optimization, and EDM05, which emphasizes stakeholder transparency, aligns with the ambitious objectives for enhancing and developing the governance framework.

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