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Analysis of Information Technology Proficiency Levels For Academic Services Using The Cobit 2019 Framework: Case Study of SMP Negeri 102 Jakarta

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KEYWORDS
information technology; academic services; COBIT 2019; IT capability; IT governance

ABSTRACT
This research intends to analyze the level of capability of information technology (IT) in academic services at SMP Negeri 102 Jakarta using the COBIT 2019 framework. The background of this research is the important role of information technology in increasing the efficiency and effectiveness of the learning process in educational institutions. COBIT 2019 was chosen as a framework because it is a best practice in IT governance that can help institutions achieve their strategic goals. This research focuses on the IT governance process implemented at SMP Negeri 102 Jakarta, the maturity level of existing information system governance, and recommendations for improving IT governance. The case study method is used with limitations on the domain within Align, Place and Organize (APO) 09 dan Deliver, Service and Support (DSS) 01 the COBIT 2019 framework. Research findings show that IT governance at SMP Negeri 102 Jakarta is at a certain level of capability that needs to be improved. This research provides recommendations for improving academic services through improving IT governance. It is hoped that the results of this research can become a reference in determining IT policies at SMP Negeri 102 Jakarta and contribute to the development of knowledge in the field of information technology governance.

Introduction

Information Technology (IT) is currently one of the most important needs for an institution, this is because it can help improve the efficiency and effectiveness of the learning process (Amorim et al., 2021). The same applies to the education sector. Junior High School is one of the institutions/institutions engaged in the field of education. To achieve efficiency and effectiveness, information technology in an educational institution must be managed properly and accurately (Putra et al., 2021). Through good management of existing information technology, it is hoped that organizations/institutions will succeed

in achieving their goals with the help of this information technology. According to (Sutabri, 2023) "The success of the current governance of organizations/institutions actually depends on the extent to which information technology governance is implemented".

One part of the governance of an institution/institution is information technology governance. In this case, the information technology of the institution/institution is how the top leadership of the institution/institution believes that the information system administrator and IT organization can provide benefits in the form of things related to the interests of the institution/institution (Hilmawan et al., 2015). In other words, information technology helps institutions/institutions in achieving their goals.

One of the main activities in the first secondary school is academic services. To realize these services, information technology is needed (Nugroho et al., 2024).

To improve the quality of services to its users and can provide convenience, speed, and comfort. Information technology that supports all academic activities is very valuable for an educational institution. A good school will certainly understand the benefits and use of information technology to support the school's performance (Amali et al., 2020).

Currently, the state of information technology governance at SMP Negeri 102 Jakarta has met the minimum standards according to the provisions, but it has not been maximized in its use due to several obstacles that have arisen (Khrisnawan, 2021). It is hoped that in the future information technology governance at SMP Negeri 102 Jakarta can be utilized to the maximum, so that it can facilitate the teaching and learning process and can improve student achievement.

According to Surendro, 2009, "information technology governance is an integrated part of company management that includes leadership, structure, and organizational processes that ensure that corporate information technology can be used to maintain and expand organizational strategies and goals".

State Junior High School 102 is one of the State Junior High Schools located in Pasar Rebo District, East Jakarta Administrative City with a total of 648 students. Based on the number of students, this can be said to be a large number. With this number of students, SMPN 102 Jakarta always strives to improve the quality in order to produce graduates who are expected in accordance with the vision and mission that has been set.

To achieve alignment between IT plans and strategies with organizational goals, IT governance is required. COBIT (Control Objective for Information and Related Technology) is one of the measures to support IT governance. COBIT is a best practice for IT management in various industries, including the education industry. COBIT has the ability to help management and users bridge the gap between business risk, control needs, and technical issues.

The novelty of this research lies in the application of the COBIT framework for evaluating and improving IT governance in the educational sector, specifically at SMP Negeri 102 Jakarta. While COBIT has been widely used in various industries, its use in assessing and enhancing IT governance in secondary schools remains underexplored. This study uniquely applies COBIT to a public junior high school setting, aiming to bridge the gap between IT governance practices and educational performance outcomes.

The objective of this research is to analyze the current state of IT governance at SMP Negeri 102 Jakarta, identify the gaps between the existing IT practices and optimal COBIT standards, and provide actionable recommendations for improving the efficiency and effectiveness of IT in supporting the school’s academic services. The study seeks to demonstrate how enhanced IT governance can contribute to better alignment between IT

systems and the school's strategic goals, ultimately leading to improved student performance and institutional success.

The benefits of this research include providing SMP Negeri 102 with a structured approach to IT governance that can enhance decision-making processes, ensure the efficient use of IT resources, and improve service delivery in academic and administrative activities. Additionally, it offers a model for other educational institutions to follow in optimizing their IT governance using the COBIT framework.

Research Methods

In this study, COBIT 2019 was chosen because it is one of the most relevant guidelines and structures for research, this is because of its focus on problem analysis, namely capability level and gap. In addition, the governance listed in COBIT 2019 is very relevant. This is in line with the need for institutions to conduct assessments of existing business processes to improve and find weaknesses that can be fixed through IT governance processes. The APO 09 and DSS 01 domains are used to achieve the goal of integrating IT risk management with overall enterprise risk management (ERM) and balancing recycling costs. The goal of the APO09 domain is to ensure that the IT services provided by the organization meet the business needs and agreed requirements, and maximize the value generated from those services. As for the DSS01 domain, the purpose of this domain is to ensure that IT operations are managed effectively and efficiently to support the organization's business objectives. This aims to provide transparency of performance and conformity and encourage the achievement of goals.

Results and Discussions

There are two ways that can be used to determine the COBIT *2019* domain, namely by understanding the problems faced by an organization or by working with the organization to conduct research on areas that require system capabilities (Sweety et al., 2023). The object of research in this study is the Academic Information System of SMP Negeri 102 Jakarta

Here are the steps to follow to determine a domain:

Understanding Stakeholder Needs

Stakeholders are people who have an interest or concern in a particular problem. Stakeholders are defined as relationships based on certain interests. This is influenced by both the authorities and the organization. It can be seen from the point of view of social relations, especially responsibility. The school and stakeholders have reached an agreement to conduct research on the Academic Information System section of SMP Negeri 102 Jakarta.

Identification Stages

The identification carried out in this study includes the review, implementation, and measurement of IT governance performance related to Academic Information Systems at SMP Negeri 102 Jakarta. At this stage, Cascade Goals will be determined, *namely Enterprise Goals, Aligment Goals, and Governance Management Objectives*. After the *Cascade Goal* is obtained through *Stakeholder Drivers and Needs*, namely the vision and mission related to the management of the academic information system of SMP Negeri 102 Jakarta, the next analysis is to determine the objectives of the process that is in the interest of the company through *the Design Factor* (Rooswati & Legowo, 2018).

The following are the results of interviews conducted with IT staff to find out the extent of the information system infrastructure at SMP Negeri 102 Jakarta in accordance with the conditions in the field as shown in table 1 below

Table 1
Results of Infrastructure Interview at SMP Negeri 102 Jakarta

Internet Service Provider (ISP) SMP Negeri 102 Jakarta				
It	Brand	Speed	Sum	Ket
1	Indihome	100 Mbps	3	Good
Network Switch SMP Negeri 102 Jakarta				
It	Brand	Sum	Information	
1	D-Link	5	Good	
Network Access Points SMP Negeri 102 Jakarta				
It	Brand	Speed	Sum	Ket
1	TP-Link	100 Mbps	5	Good
CCTV SMP Negeri 102 Jakarta				
	Sum	Placement	Information	
	1	Sekoa Headroom	Good	
	1	Administrative Room	Good	
	1	Library Room	Good	
	1	Lobby	Good	
	1	Teacher's Room	Good	
	1	Science Lab	Good	
	1	Computer Lab	Good	
	15	Classroom	Good	
Database SMP Negeri 102 Jakarta				
Contains a website-based digital master book, website-based school library, website-based school profile, website-based Personnel Data, website-based E-Letter.				
Web Server SMP Negeri 102 Jakarta				
Contains complete data of students for 3 years running each school year (consisting of grades per class, student biodata, alumni diploma series, alumni diploma grades of the student order list per batch), digital letters (consisting of incoming letters / exit letters / assignment letters / disposition letters / lecture internship letters / diploma loss letters / letter numbering / SPTJM letters / student and teacher letter / road letters), School Profile (Consists of: Home / School Homepage, Alumni Testimonials, Staffing List (Staff / Educators), Announcements, Articles, School News, Contact Questions & Answers), School Online GPS Location, School Facilities Gallery), Library (Consists of: List of Books Available at the School, Library Digital Membership Card, Book Borrowing and Return Activities, Library Staff Info, Library Moto's Vision and Mission), E-Staffing (Consists of: Travel History While Registered in the School Depot)				

Goal Cascade

that is, determining the needs of the stackholder is then reduced to the goals of the company, after the goals of the company are met, then it is reduced to alignment between the company's goals and IT goals. So in COBIT 2019, IT goals and company goals must

be aligned first, after being aligned, it can be lowered back to governance and management objectives. The following are the stages of Goal Cascade in this study, namely:

Enterprise Goals

The initial identification stage carried out is to identify the business goals and goals of SMP Negeri 102 Jakarta which will be aligned with *the Enterprise Goals* according to the *COBIT 2019 standardization* in the first and second modules according to the company's vision, mission, and goals (Rizal et al., 2020). The following is a detailed mapping *of Enterprise Goals* obtained based on the vision and mission of SMP Negeri 102 Jakarta and linked to 4 perspectives or Balance Score Cade (BSD) according to COBIT 2019.

Table 2 Detailed Mapping Enterprise Goals SMP N 102

It	Vision and Mission	*Reference*	*Enterprise Goal*	*Balanced Scorecard (BSC) Dimension*
1	Excelling in achievements, worship, morals, and the character of the Pancasila profile	EG 13	Product and business innovation	Growth
2	Carry out learning and guidance effectively, so that each student innovates optimally according to their potential	EG 12	Managed digital transformation programs	Learning
3	Carry out habituation in accordance with the noble values of the nation derived from the religious teachings adhered to and socio-cultural values	EG 05	Customer-oriented service culture	Customer
4	Creating a clean, green, beautiful, cool and comfortable school environment	EG 01	Competitive portfolio of products and services	Financial
5	Implementing projects to develop the profile of Pancasila students	EG 01	Competitive portfolio of products and services	Financial
6	Organizing technology and information-based learning	EG 10	Staff skills, motivation and productivity	Internal

From the results of the identification of Enterprise Goals based on the company's vision and mission, the company has included the four perspectives / BSC in *COBIT 2019*. The following are the results of the Enterprise Goals mapping of SMP Negeri 102 Jakarta.

Table 3 Results of Mapping Enterprise Goals SMPN 102

Reference	*Enterprise Goal*
EG 01	Competitive portfolio of products and services
EG 05	Customer-oriented service culture
EG 10	Staff skills, motivation and productivity
EG 12	Managed digital transformation programs
EG 13	Product and business innovation

Alignment Goal

The second identification stage carried out after identifying Enterprise Goals is to identify the Alignment Goals from the previously mapped Enterprise Goals. The way to determine Alignment Goals is through the mapping table of Enterprise Goals which is obtained with a value of "P", namely the Primary listed in COBIT 2019. From the identification mapping of Enterprise Goals, it can be seen what Alignment Goals can later be aligned with the company's business. Here is the mapping:

		EG01	EG02	EG03	EG04	EG05	EG06	EG07	EG08	EG09	EG10	EG11	EG12	EG13
BSC Dimension Alignment Goals		Financial				Customer			Internal				Learning and Growth	
AG01	I&T compliance & support for business compliance with external laws and regulations		S	P								S		
AG02	Managed I&T-Related Risk		P				S							
AG03	Realized benefits from I&T-enabled investments and services portfolio	S				S			S	S			P	
AG04	Quality of technology related financial information				P			P		P				
AG05	Delivery of I&T services in line with business requirements	P				S	S		S				S	
AG06	Agility to turn business requirements into operational solutions	P				S			S				S	S
AG07	Security of information, processing infrastructure and applications, and privacy		P				P							
AG08	Enablement and support of business processes by integrating applications and technology	P				P	S		S		S		P	S
AG09	Delivering programs on time, on budget and meeting requirements and quality standards	P				S	P		S	P			P	S
AG10	Quality of I&T management information				P			P		S				
AG11	I&T compliance with internal policies		S	P								P		
AG12	Competent and motivated staff with mutual understanding of technology and business					S			S		P			
AG13	Knowledge, expertise and initiatives for business innovation	P		S					P	P			S	P

Figure 1

Mapping Enterprise Goals To Alignment Goals SMPN 102 Jakarta

To clarify the results of the Enterprise Goals to Alignment Goals mapping, you can see the details of the mapping alignment goals as shown in the table below:

Table 4
***Detail Mapping Alignment Goals* SMPN 102 Jakarta**

BSC	*Reference*	*Enterprise Goal*	*Alignment Goals*				
Financial	EG 01	Competitive portfolio of products and services	AG05	AG06	AG08	AG09	AG13
Customer	EG 05	Customer-oriented service culture	AG08				
Internal	EG 10	Staff skills, motivation and productivity	AG12				
Learning and Growth	EG 12	Managed digital transformation programs	AG03	AG08	AG09		
	EG 13	Product and business innovation	AG13				

It can be seen that the Alignment Goals mapping of the Enterprise Goals obtained previously in the table above, the results of the Alignment Goals identification mapping are as follows:

Table 5
Results of Mapping Alignment Goals of SMPN 102 Jakarta

BSC	*Reference*	*Alignment Goals*
Financial	AG 03	I&T compliance and support for business compliance with external laws and regulations
Customer	AG 05	I&T service delivery in line with business needs
	AG 06	Agility to turn business requirements into operational solutions
Internal	AG 08	Enabling and supporting business processes by integrating applications and technologies
	AG 09	Deliver programs on time, within budget and meet Quality requirements and standards
Growth	AG 12	Competent and motivated staff with a shared understanding of technology and business
	AG 13	Knowledge, expertise and initiatives for business innovation

Governance and Management Objective (GMO)

In the next step, management and management objectives must be established in accordance with alignment objectives. The way to identify GMOs is to create a *mapping*

table of the Alignment Goals, which is obtained with a value of "P", which is Primary, which was found in the 2nd module of COBIT 2019 (Rooswati & Legowo, 2018).

This GMO data will be evaluated through the next questionnaire data collection. In this case study, the researcher will assess only the objectivity resulting from the design factor, which has the highest level of importance and has a great influence on the success of the company's business. Therefore, the control objectives of this study are taken from the objectives resulting from the design factors. Here is a map of management goals and management of alignment goals (Sadewo, 2020).

Based on the results of the Alignment *Goals to Governance and Management Objective mapping*, it can be seen that the identification results of the *Governance and Management Objective mapping* are as shown in the table below:

COBIT 2019 Gov & Mgmt Objectives		AG01	AG02	AG03	AG04	AG05	AG06	AG07	AG08	AG09	AG10	AG11	AG12	AG13
	Evaluate, Direct and Monitor	Financial				Customer		Internal					Learning and Growth	
EDM01	Ensured governance framework setting and maintenance	P	S	P					S			S		
EDM02	Ensured benefits delivery			P		S	S		S	P				S
EDM03	Ensured risk optimization	S	P					P				S		
EDM04	Ensured resource optimization			S		S	S		S	P			S	
EDM05	Ensured stakeholder engagement				S						P	S		
2	Align, Plan and Organise													
APO01	Managed I&T management framework	S	S	P		S		S	S	S	S	P		
APO02	Managed strategy			S		S	S		P				S	S
APO03	Managed enterprise architecture			S		S	P	S	P					
APO04	Managed innovation			S			P		S				S	P
APO05	Managed portfolio			P		P	S		S	S				
APO06	Managed budget and costs			S	P					P	S			
APO07	Managed human resources			S		S				S			P	P
APO08	Managed relationships			S		P	P		S	S			P	P
APO09	Managed service agreements					P			S					
APO10	Managed vendors					P	S			S				
APO11	Managed quality			S	S	S				P	P			
APO12	Managed risk		P					P						
APO13	Managed security	S	S					P						
APO14	Managed data	S	S		S			S			P			
3	Build, Acquire and Implement													
BAI01	Managed programs			P			S		S	P				
BAI02	Managed requirements definition			S		P	P		S	P			S	
BAI03	Managed solutions identification and build			S		P	P		S	P				
BAI04	Managed availability and capacity					P		S		S				
BAI05	Managed organizational change			P		S	S		P	P			S	
BAI06	Managed IT changes		S			S	P		S	S				
BAI07	Managed IT change acceptance and transitioning		S				P			S				
BAI08	Managed knowledge			S			S		S	S			P	P
BAI09	Managed assets				P						S			
BAI10	Managed configuration					S		P						
BAI11	Managed projects			P		S	P			P				
4	Deliver, Service and Support													
DSS01	Managed operations					P			S					
DSS02	Managed service requests and incidents		S			P		S						
DSS03	Managed problems		S			P		S						
DSS04	Managed continuity	S	S			P		P						
DSS05	Managed security services		P			S		P				S		
DSS06	Managed business process controls		S			S		S	P	P		S		
5	Monitor, Evaluate and Assess													
MEA01	Managed performance and conformance monitoring	S		S		P				S	P	S		
MEA02	Managed system of internal control	S	S		S	S		S		S	S	P		
MEA03	Managed compliance with external requirements	P										S		
MEA04	Managed assurance	S	S		S	S		S			S	P		

Figure 3 Mapping Alignment Goals To Governance and Management Objective SMPN 102 Jakarta

Table 6
mapping Governance and Management Objective

Aligment Goal	*Governance and Management Objective*										
AG03	EDM01	EDM02	APO01	APO05	BAA01	BAA05	BAA11				
AG05	APO05	APO08	APO09	APO10	BAI02	BAI03	BAI04	DSS01	DSS02	DSS03	DSS04	MEA01
AG06	APO03	APO04	APO08	BAI02	BAI03	BAI06	BAI07	BAI11				
AG08	APO02	APO03	BAI05	DSS06								
AG09	EDM04	APO06	APO11	BAI01	BAI02	BAI03	BAI05	BAI11				
AG12	APO07	APO08	BAI08									
AG13	APO04	APO07	APO08	BAI08								

Defining *Process Objectives with Design Factors*

In determining the objectives of the process to be evaluated, this study will use a toolkit available specifically at COBIT 2019, namely *Design Factor* designed by the ISACA team to make it easier for auditors who use the *COBIT framework* to determine and conclude the objectives of the process to be evaluated with the highest scale of importance value in driving the company's business success. In the previous discussion, namely 4.2.1.13, the company's *Governance Management Objective* has been identified, but considering the limitations of this research problem, the objectives to be evaluated are not all the objectives identified in the discussion 4.2.1.3 but the objectives that are concluded on the *design factor*, namely *IT Governance Design Result* which has the highest scale of importance for the company (Syuhada, 2021).

IT Governance Design Factor

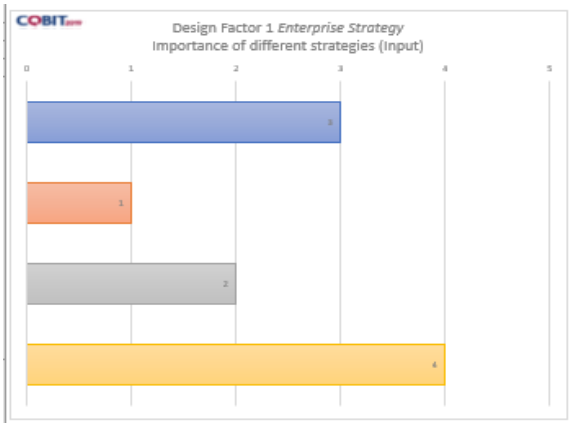
The IT Governance Design Factor has 11 stages. In determining the value of the design factor, the researcher takes the focus based on the reference of the company's annual report in 2022-2023 which is the final output report in the form of understanding the context and strategy of the company, after which determining the initial scope of the governance system (design factor 1-4) and improving the scope of the governance system (design factor 5-10) to the last is to conclude the design
governance system.

Design Factor 1 : Enterprise Strategy

The following is a graphic image of the enterprise goals obtained after analyzing the company's strategy based on the annual report of SMPN 102 Jakarta.

Table 7 DF1: *Enterprise Strategy*

Value	Importance (1-5)	Baseline
Growth/Acquisition	3	3
Innovation/Differentiation	1	3
Cost Leadership	2	3
Client Service/Stability	4	3



Graph 1 DF1: Enterprise Strategy

Conclusion:

Based on design factor 1 above, the highest value of importance for organizational strategy with point 4 is *Client Service/Stability* where the organization focuses on carrying out services to all stakeholders involved.

Growth/Acquisition with point 3, where the school also focuses on growing and developing to improve student achievement.

RACI Chart

RACI charts are used to assist organizations in decision-making. RACI charts are created based on the organizational structure to see who is responsible for their work. The RACI chart was created to find out what are the roles of each part in the organizational structure of the "Academic Information System" at SMPN 102 Jakarta. Here is the table RACI Chart for APO09 and DSS01 domains: (Lestariningsih et al., 2019)

1) *RACI Chart* APO09 - *Manage Service Agreements*

For the APO09 domains in COBIT 2019, the RACI Chart helps determine who is responsible, who has the final authority, who needs to be consulted, and who needs to be notified of activities related to managing service agreements.

Table 7 RACI Chart Objective APO09

APO09	Principal	Head of Implementation Unit	IT Development	Operator	Teacher
APO09.01 Establish and maintain SLAs	A	R	C	C	I
APO09.2 Service performance monitoring	I	R	R	C	I
APO09.03 Service performance reporting	I	R	R	I	I
APO09.04 Handle and resolve issues	I	R	R	I	I
APO09.05 AM SLA review and remediation	A	R	C	C	I
APO09.06 User expectations management	I	R	C	A	I
APO09.07 Service recovery and continuity	I	R	R	I	I
APO09.08 Compliance with policies and procedures	A	R	C	I	I

2) *RACI Chart* DSS01 - *Manage Operations*

The RACI Chart for the DSS01 (*Manage Operations*) domain in COBIT 2019, illustrates the roles and responsibilities related to various activities in managing IT operations.

Table 8 RACI Chart Objective DSS01

DSS01	Principal	Head of Implementation Unit	IT Development	Operator	Teacher
DSS01.01 Daily operation of IT systems	I	A	R	I	I
DSS01.02 IT system performance monitoring	I	R	R	I	I
DSS01.03 IT system maintenance	I	R	R	I	I
DSS01.04 IT incident management	I	R	R	I	I
DSS01.05 IT problem management	I	R	R	I	I
DSS01.06 Capacity and performance management	I	R	R	I	I
DSS01.07 IT resource management	I	R	R	I	I
DSS01.08 Operational performance reporting	I	R	R	I	I
DSS01.09 Compliance with policies and procedures	A	R	R	I	I

Capability Level *Activity Analysis*

Determining the capability level is not only describes the measurement of the extent to which the school has met the standards of good IT management processes in assisting the management of academic information systems in each school. However, this level of ability should be used to increase awareness of the importance of improving the management of academic information systems at SMPN 102 Jakarta. The questionnaire was distributed to the school management team, namely the Principal, Head of the Implementation Unit, IT Development, Operators and teachers at SMPN 102 Jakarta (Rizaldi, 2017).

Capability Level – Objective APO09 – Managed Service Agreement

Measurement of the level of capability process in the management of academic information systems, namely the APO09 objective, is evaluated gradually or per capability level to determine the level of process capability in the school. The following are the results of the calculation of questionnaire data from each respondent per capability level:

APO09 Capability Calculation (Respondent 1)

The Capability results are obtained by the following formula:

$$CL = \frac{\sum \square CLa}{\sum \square Po} x\ 100\%$$

Information:

CL = Capability Level

ΧΛα = Number of Yes Answers

Πο = Number of Questions

The recapitulation of the results of the questionnaire data calculation by respondent 1 which was distributed to the Principal is:

a. Principal of SMPN 102 Jakarta

Table 9
Results and Data Processing of APO09 Questionnaire

Question	Yes	It	Score
1			1
2			0
3			0
4			1
5			1
6			1
7			1
8			1
Total			6
Capability level			75,00%

b. Head of Implementation Unit

Table 10
Results and Data Processing of APO09 Questionnaire

Question	Yes	It	Score
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
Total			8
Capability Level			100%

c. IT Development

Table 11
Results and Data Processing of APO09 Questionnaire

Question	Yes	It	Score
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
Total			8
Capability Level			100%

d. Operator

Table 12
Results and Data Processing of APO09 Questionnaire

Question	Yes	It	Score
1			1
2			0
3			1
4			1
5			0
6			1
7			1
8			1
Total			6
Capability Level			75,00%

e. Teacher

Table 13
Results and Data Processing of APO09 Questionnaire

Question	Yes	It	Score
1			0
2			1
3			0
4			1
5			0
6			1
7			1
8			1
Total			5
Capability Level			62,50%

There were 6 teacher respondents with the same data

Based on the results of the evaluation of questionnaire data from each respondent consisting of 10 (ten) respondents, the recapitulation and results of APO09 level 2 capability are as follows:

Capability Level Formula:

$$CLi = \frac{R1+R2+R3+R4+R5+R6+R7+R8+R9+R10}{\sum R} \%$$

Information:
CLi : Capability Value
R1 : Capability Level of Respondent 1
R2 : Capability Level of Respondent 2
R3 : Capability Level of Respondent 3
R4 : Capability Level of Respondent 4
R5 : Capability Level of Respondent 5
R6 : Capability Level of Respondent 6

R7 : Capability Level of Respondents 7
R8 : Capability Level of Respondents 8
R9 : Capability Level of Respondents 9
R10 : Capability Level of Respondents 10

$$CLi = \frac{75+100+100+75+62{,}50+62{,}50+62{,}50+62{,}50+62{,}50+62{,}50}{10}\ \%$$

CLi = 72.50%

Capability Level – Objective DSS01 – *Managed Operation*

Capability Calculation DSS01 (Respondent 1) The Capability Result is obtained by the following formula:

$$CC = \frac{\sum CLa}{\sum Po}\ x\ 100\%$$

The recapitulation of the results of the questionnaire data calculation by respondent 1 which was distributed to the Principal is:

a. Principal

Table 14
Results and Data Processing of DSS01 Questionnaire

Question	Yes	It	Score
1			0
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
Total			8
Capability Level			88,88%

b. Head of Implementation Unit

Table 15
Results and Data Processing of DSS01 Questionnaire

Question	Yes	It	Score
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
Total			9
Capability Level			100%

c. IT Development

Table 16
Results and Data Processing of DSS01 Questionnaire

Question	Yes	It	Score
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
Total			9
Capability Level			100%

d. Operator

Table 17
Results and Data Processing of DSS01 Questionnaire

Question	Yes	It	Score
1			1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
Total			9
Capability Level			100%

e. Teachers (6 people)

Table 18
Results and Data Processing of DSS01 Questionnaire

Question	Yes	It	Score
1			1
2			1
3			0
4			0
5			1
6			0
7			0
8			1
9			1
Total			5
Capability Level			55,55%

There were 6 teacher respondents with the same answer

Based on the results of the evaluation of questionnaire data from each respondent consisting of 10 (ten) respondents, the recapitulation and results of DSS01 level 2 capability are as follows:

Capability Level Formula:

$$CLi = \frac{R1+R2+R3+R4+R5+R6+R7+R8+R9+R10}{\sum R} \%$$

$$CLi = \frac{88{,}88+100+100+100+55{,}55+55{,}55+55{,}55+55{,}55+55{,}55+55{,}55}{10} \%$$

Cli = 72.22%

Conclusion of Objective Level Capability Results APO09 and DSS01

Overall, after conducting research, *the capability levels* for the APO09 and DSS01 domains are as follows:

1. APO09 obtained a result of 72.50%, this means:
   a. Process Implementation: Shows the level of implementation of processes in the APO09 domain. If the APO09 domain is about service management, these results can show how well the service management processes have been implemented.
   b. Compliance with Standards: Indicates the extent to which practices in the APO09 domain comply with established standards or guidelines. This could be related to internal policies, industry regulations, or the best widely recognized standards.
   c. Effectiveness: Indicates the effectiveness or performance of activities in the APO09 domain. For example, if this domain is related to risk management, these results can indicate how effectively risk management is being implemented.
   d. Readiness or Maturity: Indicates the level of readiness or maturity in the APO09 domain. In the context of IT management, it can show how mature the IT processes associated with the domain are
2. DSS01 obtained a result of 72.22%, this means:
   a. Compliance Rate: 72.50% indicates a level of compliance or compliance with standards, procedures, or best practices related to the DSI01 domain. This means that most, but not all, of the aspects evaluated in this domain have been met.
   b. Process Effectiveness: This percentage can indicate how effective the process or policy is implemented in the DSI01 domain. If DSI01 relates to service operations, these results indicate that most of the processes are going well, but there is still room for improvement.
   c. Readiness or Maturity: A figure of 72.50% can indicate the level of readiness or maturity of the capabilities assessed in the DSI01 domain. This indicates that the organization has a good level of maturity, but has not yet reached its maximum potential.
   d. Areas for Improvement: There are still 27.50% of the aspects that have not met the expected standards. This indicates that there are specific areas that need attention and improvement to achieve full compliance or optimization.

As-Is and To-Be Analysis

Current Capability Level Analysis (as-is)

The analysis of current abilities is carried out with the findings of current conditions (as-is) which aims to make it easier to provide recommendations and expectations for the future (to be) according to the school's expectations target related to academic information systems. The findings of the current results (as-is) were obtained

through interviews and questionnaires distributed to respondents. The results of the assessment for the current condition (as-is) of each process objective are as follows:

Table 19
Current Capability Analysis

Objective	Objective Maturity Level Findings APO09 and DSS03
APO09 and DSS03	1. most of the processes and capabilities measured in the APO09 and DSS03 domains are in accordance with established standards, guidelines, or best practices. However, there is still room for improvement, for example in accelerating the resolution of problems that arise. 2. Capability and resource management is largely effective, but some aspects still require attention to achieve higher effectiveness, for example in improving the skills of IT staff. 3. The maturity level of this process shows a good level of maturity, but it is not fully optimal.

Expected Capability Level Analysis (to-be)

The target level of ability expected for each objective is obtained from the results of the analysis contained in the conclusion *of the design factor (IT Governance Design Result*). The discovery of the expected ability level target is a relevant expectation level target because it is measured based on *stakeholder needs*, namely the school's vision and mission related to the management of academic information systems and the conclusion of 11 factors that are a tool to measure school expectations for the objective interests of the process that can support the goal of improving student achievement. The expected capability level targets are in the following table:

Table 20
Skill Level Analysis Applied

Objective	To-be	Description of expected ability level
APO09 and DSS03	4	The activities carried out have achieved their goals, are well defined, and their performance can be quantitatively measured.

Gap Analysis (GAP)

The analysis of the level of information technology governance gap aims to providing convenience for improving information technology governance, and this analysis is obtained between the difference between the current level of capability (AS-IS) and the expected level of capability (To-BE). Thus, it will be known objectively which processes have gaps and need improvement. From the comparison of the level of ability, the objective of the process will be obtained which is not in accordance with the desired level of ability. And if there is a gap, recommendations will be given based on the findings and the difference between the desire and expectation to achieve the level of capability expected by the company. The results of the analysis of the gap in the APO09 domain are 72.50% and DSS03 is 72.22%.

Scale	Description	Achievement
N	Not Achieved	0 – 14%
P	Partially Achieved	15 – 49%
L	Largely Achieved	50 – 84%
F	Fully Achieved	85 – 100%

Therefore, based on the table above, this study produces a scale of level L, while the maximum scale is level F. Thus there is a gap of one level below it.

Audit Results and Recommendations

After analyzing the data and finding findings related to the condition of the management of the academic information system and the selection of the objectives of the APO09 and DSS03 processes, it is hoped that by the stage of providing evaluation, it is hoped that it will be able to immediately make improvements to the academic information system, in order to immediately reach the expected level of ability (to-be) and leave the current level of ability (as-is). So, here is are the results and recommendations of the governance of the academic information system at SMPN 102 Jakarta as follows:

Objective	Audit Results	Recommendations
APO09 DSS03	1. Most of the processes and capabilities are measured within the APO09 domain and have conformed to established standards, guidelines, or best practices. However, there is still room for improvement, for example in accelerating the resolution of problems that arise. 2. There is no system to solve the problems that arise so that the problem is still solved manually 3. There are no dedicated servers to store data yet, making it vulnerable to loss or even hacking 4. Capability and resource management is largely effective, but some aspects still require attention to achieve higher effectiveness, for example in improving the skills of IT staff. 5. The maturity level of this process shows a good level of maturity, but it is not fully optimal.	1. In the process of accelerating problem resolution, implement automation systems to reduce problem resolution time and improve efficiency, and use proactive monitoring tools to detect problems before they become critical. 2. Strive to create an application system to solve problems that arise so that they can be controlled and resolved quickly and efficiently 3. Strive to rent a server so that data security can be controlled so that it is not detrimental to stakeholders 4. In terms of IT staff resources, regular training and mentorship programs can be carried out to improve skills and experience 5. In terms of maturity level, it can conduct internal audits and continuous improvement approaches

Conclusion

The researcher concluded that the analysis of information technology governance in the academic system at SMPN 102 Jakarta in measuring the level of performance ability with the aim of improving student achievement, obtained the following results:

Table of Research Conclusions

Governance Objectives		Capability Level (%)				Yield (As-Is)	Hope (To-Be)	GAP
		N	P	L	F			
APO 09	Managed Service Agreement	0-14	15-49	50-84	85-100	72,50	100	27,5
DSS 01	Managed Operations	0-14	15-49	50-84	85-100	72,22	100	27,8

Explaining that the researcher obtained the results of the capability level of information technology governance in academic services at SMPN 102 Jakarta as follows:

1. Obtained an objective level capability score of APO 09 with an achievement score of 72.50% (Largery Achieved)
2. Obtained an objective level capability value of DSS 01 with an achievement value of 72.22% (Largery Achieved)
3. There is a GAP in the APO 09 domain of 27.5%
4. There is a GAP in the APO 09 domain of 27.8%
5. The level of ability obtained by APO 09 and DSS 01 is the level of objective ability of the process which states that the activity has been carried out but has not been carried out well so that improvements are needed based on GAP to achieve the expected level of ability, namely level 4 where the expectation states that the activity is carried out as well as possible, consistently and structured.

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