

# Village Information System Risk Mitigation in Subdistricts using COBIT 5 Framework

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## ABSTRACT

The village information system is an IT-based application created to support the community's role in managing local resources and potential in the village environment to improve services to the community. The village information system as a means of service for the community, allows risks such as invalid population data and failure to input data when updating, which can hamper the service process. This research aims to mitigate risks at the Ambarketawang District SID by calculating capability levels. This research uses the COBIT 5 framework with the APO12 domain to carry out risk analysis and mitigation for the Ambarketawang District SID which focuses on calculating capability level values. To obtain the capability level value, three stages need to be carried out, namely current capability, expected capability, and gap analysis as well as providing appropriate recommendations for future risks. The capability level value is obtained by collecting data through observation, interviews, questionnaires, and self-assessment assessments to determine the current level and future levels. Is at level 2, while the capability level is in the expected condition with a value of 3.43, which is at level 3 and the gap value is known to be 1. This research produces recommendations by the APO12 process which can be considered as a reference in making improvements so that it can improve the performance of the Ambarketawang District SID.

## Keywords

Village Information System, Mitigation Risk, COBIT 5, Capabilities Levels

## 1. INTRODUCTION

Rapid advances in the world of information technology have resulted in a significant transformation in the way organizations and businesses view the role of this technology. Previously, information technology was considered as a support, but now this technology has become the core that drives increased competitiveness of organizations and businesses. Therefore, companies and organizations must pay attention to and manage information technology well so that their business operations continue to run [1]. To ensure that significant investments in information technology contribute positively and are in line with desired business objectives [2]. Information systems and information technology play an integral role in business because information systems can support decision-making, improve service quality to customers, and develop market coverage and product marketing strategies [3]. The strategy is prepared in line with the company's vision and mission, so that the existence of IT can support the achievement of company goals directly or through support for operational activities [4].

The Village Information System is a tool created to support the community's role in managing local resources and potential in the village environment. The SID component consists of various elements, including social elements and information

technology, which are managed in the context of community life at the village level. Data and information, as core elements in the SID framework, are the main content managed in the system. The SID Ambarketawang Village aims to improve services to village communities, provide easy access to information, as well as promote village community business results, village potential, population, and various information about villages such as administrative area data, employment data, marital status data, and so on. When using information systems and information technology, there is the potential for threats and risks to emerge that could disrupt smooth operations both in terms of service and in terms of users. When using the Ambarketawang District SID, sometimes encounter several errors when accessing, such as the server being down and there being several bugs, so this can hamper ongoing business processes. In the use of information systems and information technology, risks and business disruption may arise.

In the use of information systems and information technology, risks will arise. Risk is a state of uncertainty that has the potential to create a detrimental event. With these risks, risk management is needed. Risk management is a process of identifying, and measuring risks, and forming strategies to manage them using available resources. Strategies that can be used include transferring risks to other parties, avoiding risks, reducing the bad effects of risks, and accepting some or all of the consequences of certain risks [5].

This research uses the COBIT 5 framework because COBIT is an internal control framework related to information technology. COBIT was created to conduct research and development on a set of information technology controls, which are internationally acceptable for the benefit of auditors and business managers of an organization. Apart from that, COBIT 5 has a capability model that aims to achieve the overall goal of the assessment and improvement support process, namely to provide a means for measuring the performance of IT management which is then applied to a process capability assessment [6].

## 2. LITERATURE STUDY

### 2.1 Evaluation

Assessment is a process of collecting data and processing information to determine the level of development achievement and decision-making. Assessment can also be interpreted as a program or activity to decide the value of something and provide answers to questions [7]. Assessment is a systematic and systemic effort carried out by collecting data or information that is authentic (valid) and reliable, and then the data is processed as an effort to make decisions for making decisions about an educational program. Learning assessment is a series of activities to obtain, analyze, and interpret data about student learning processes and outcomes which are carried out systematically and continuously [8].

## 2.2 Risk management

Risk management is the process of carrying out management activities to be able to overcome emerging risks faced by the company. So in this case it can be concluded that the management functions carried out to overcome risks include the process of risk management, measurement, and assessment [9]. One of the goals of risk management is to improve the performance of an organization/company [10]. Risk Management refers to efforts made by a company or entrepreneur to reduce risk by analyzing, identifying, and handling risks that may occur in various company activities [11].

## 2.3 Information Technology

Information technology is all forms of technology used to create, store, change, and use information in all its forms. Information Technology (IT) is the most important asset that every organization must have because it can help increase the effectiveness and efficiency of the organization's performance. Every organization needs to implement, utilize, and develop its IT resources to support performance in achieving organizational goals [6].

## 2.4 Information Systems

Information systems are a technological development that helps the activities of an organization. This important role supports management decision-making activities, business operations, and competitive strategic functions in an organization [12]. Information systems also mean a set of organizational procedures that, when implemented, will provide information for decision-makers and/or to control the organization [13].

## 2.5 Village Information System

A Village Information System is a computer and internet-based process and application or media, that manages village information, supporting the functions and tasks of village government, which includes population administration, planning, reporting, asset management, budget management, public services, top-down information transmission or on the contrary, cross-sectoral communication, village government and community communication [14].

## 2.6 Method COBIT 5

COBIT (Control Objectives for Information and Related Technology) is the practice best For management technology information developed by ISACA (Information Systems Audit and Control Association). COBIT 5 is a comprehensive framework that can help companies achieve their goals for corporate information technology governance and management. COBIT 5 enables information technology to carry out holistic governance and management for the entire enterprise, managing the business from end to end, and being responsible for all areas of the information technology function. COBIT 5 is global and useful for all enterprises of

various sizes, both commercial, non-profit, and public sector [15].

### 2.6.1 Principle COBIT 5

COBIT 5 own principle and ability are general which is useful for companies and organizations, good commercial non-profit or sector public [15]. Following principle COBIT 5 which is seen in Figure 1.



Figure 1. COBIT Principles 5

Principle COBIT 5 which is seen in Figure 1 is principles COBIT 5 for system management and risk management IT.

1. Principle 1: Fulfil Need Stakeholder Interest Company.
2. Principle 2: Covers Company from End to End.
3. Principle 3: Implementing the Framework Single Work Which Integrated.
4. Principle 4: Activate Approach Holistic.
5. Principle 5: Separate System management from Management.

### 2.6.2 COBIT 5 Process Reference Model

COBIT 5 defines set supporter for supports the implementation of a governance and management system For an IT company. Enablers in a way wide defined as everything that can help reach an objective company. Framework Work COBIT 5 defines seven supporting categories for system implementation comprehensive governance and management such as that seen in Figure 2 [4].

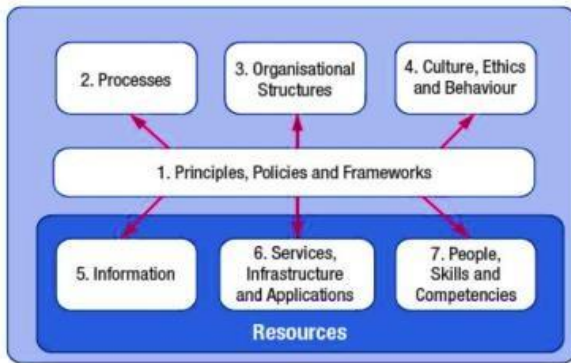


Figure 2. COBIT Governance Area 5

1. Principle, Policy, And Framework Work works to formulate behavior and needs stakeholders to become guides in activity operational I.T company.
2. Process, used to give details regarding the series of activities carried out to reach the objective company.
3. Structure organization becomes the key main in decision-making in the company.
4. Values and objective company can achieved with habit company Which Good.
5. Information is something matter which important for making movements within the company such as overcoming problems and making decisions.
6. Application and infrastructure, technology, and applications that provide services are objects that internally drive COBIT 5.
7. Skill and competence relate to a person operating all activities in company.

The process in COBIT 5 consists of two processes, namely the governance process and the management process.

1. Governance: contains five governance processes; each process is evaluated, directed, and monitored (EDM).
2. Management: contains four domains, aligned with the areas of responsibility for planning, building, running, and monitoring (PBRM), and provides end-to-end information technology coverage. This domain is an evolution of the COBIT 4.1 domain and process structure. Here are the domain names:
  - 1) Align, Plan, Organize (APO)
  - 2) Build, Acquire, and Implement (BAI)
  - 3) Deliver, Service, and Support (DSS)
  - 4) Monitor, Evaluate, and Assess (MEA)

According to ISACA (2012;15), COBIT 5 is an ISACA guide that discusses information technology governance and management. COBIT 5 was created based on best practices and users from the information technology, risk, insurance, and security communities [16].

### 2.6.3 COBIT 5 Capability Process Model

There are 6 levels of capability where the process can be achieved, namely: Incomplete process, performed process (one attribute), managed process (two attributes), established process

(two attributes), predictable process (two attributes), optimizing process (two attributes) [17].

### 2.6.4 COBIT 5 Goals Cascade

Goals cascade is a mechanism in the COBIT 5 framework for translating total organizational goals into IT goals. For COBIT 5, stakeholders must be transformed into actionable strategies that enable management to bridge the gap between control requirements, technical issues, and business risks, and help understand and manage IT risks and benefits. In the goals cascade process, it is necessary to map the organization's goals and the need to determine the COBIT 5 area that is suitable for carrying out the research process as seen in Figure 3 [18].

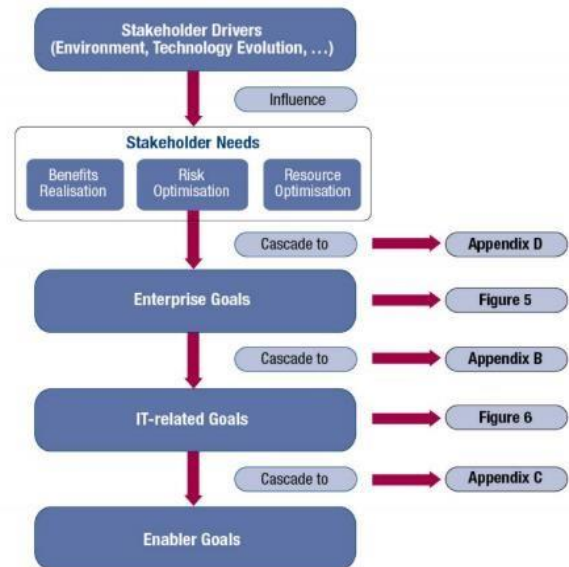


Figure 3. Goals Cascade COBIT 5

In the Goals Cascade process this will help map organizational goals and needs so that they can be determined domain COBIT 5 Which in accordance for do process research [18].

### 2.6.5 Enterprise Goals

Enterprise goals are company goals consisting of 17 points that will connect stakeholder needs to enterprise goals. Enterprise goals have metric parameters to find out which enterprise goals meet your needs, as in Table 1 [19].

Table 1. Enterprise Goals COBIT 5

Bsc Dimension	Enterprise Goal	Relation to Governance Objectives		
		Benefits Realisation	Risk Optimisation	Resource Optimisation
Financial	Stakeholder value of business investments	P		S
	Portofolio of competitive products and services	P	P	S
	Managed business risk(safeguarding of assets)		P	S
	Compliance with external laws and regulations		P	
	Financial transparency	P	S	S
Customer	Customer-oriented service culture	P		S
	Business service continuity and availability		P	
	Agile responses to a changing business environment	P		S
	Information-based strategic decision making	P	P	P
Internal	Optimisation of service delivery costs	P		P
	Optimisation of business process functionality	P		P
	Optimisation of business process costs	P		P
	Managed business change programmes	P	P	S
	Operational and staff productivity	P		P
Learning and Growth	Compliance with internal policies		P	
	Skilled and motivated people	S	P	P
	Product and business innovation culture	P		

The letter "P" stands for primary relationship, which means the relationship between the three governance objectives and EG is very strong. The letter "S" stands for a secondary relationship, which means there is a less strong relationship between the three governance objectives and EG.

### 2.6.6 IT-Related Goals

IT-Related Goals (ITG) is a mapping that aligns the relationship between EG and ITG. ITG maps the organization's key business objectives into specific IT objectives and identifies the COBIT 5 enablers required to achieve those IT objectives. If the relationship between EG and ITG is very strong then it is marked with the letter "P", however, if the relationship between the two is not strong then it is marked with the letter "S". The results of aligning EG with ITG are as shown in Table 2 [20].

**Table 2. IT-Related Goals COBIT 5**

IT BSC Dimension	Information and Related Technology Goal	
Financial	01	Alignment of IT and business strategy
	02	IT compliance and support for business compliance with external laws and regulations
	03	Commitment of executive management for making IT-related decisions
	04	Managed IT-related business risk
	05	Realised benefits from IT-enabled investments and service portfolio
	06	Transparency of IT costs, benefits and risk
Customer	07	Delivery of IT services in line with business requirements
	08	Adequate use of applications, information and technology solutions
Internal	09	IT agility
	10	Security of information, processing infrastructure and applications
	11	Optimisation of IT assets, resources and capabilities
	12	Enablement and support of business processes by intergrating applications and technology into business processes
	13	Delivery of programmes delivering benefits, on time, on budget, and meeting requirements and quality standards
	14	Availability of reliable and useful information for decision making
	15	IT compliance with internal policies
Learning and Growth	16	Competent and motivated business and IT personnel
	17	Knowledge, expertise and initiatives for business innovation

### 2.7 Processing Data

Data calculations were carried out based on the questionnaire that had been distributed and then the following data processing was carried out formula calculation processing dataon study this [21].

1. Count results whole questionnaire

$$C = \frac{H}{JR} \times 100\%$$

Information :

C : Results recapitulation answer questionnaire levelscapability (percentage).

H : Amount answer questionnaire on eachlevels capability.

J.R : Number of respondents.

2. Count mark And levels capability

$$NK = \frac{(LPxNk)0 + (LPxNk)1 + (LPxNk)2 + (LPxNk)3 + (LPxNk)4}{100}$$

Information :

NK : Mark capability on process IT.

L.P : Levels percentage ( level percentage on each distribution app answer questionnaire).

### 3. METHODOLOGY

The subject of this research will discuss risk assessment analysis of the Village Information System in Ambarketawang District using COBIT 5. The results of this research will later be used to determine the results of measuring capability level values and provide recommendations regarding risk management actions that may arise and may be detrimental and

disruptive. business processes and organizational goals. Study this have a number of stages in its implementation for gather data which required for process analysis. Stages the is as following:

1. The first stage is conducting a literature study. The literature study stage was carried out to gain a deep understanding of the organization as well and the COBIT 5 framework supports this research.
2. The second stage is mapping COBIT 5. This stage is mapping Enterprise Goals, IT-related goals and IT processes which produces the priority domain in this research, namely APO12.
3. The third stage is collecting data. The data collection process was carried out to carry out risk analysis in information technology through observation, interviews, and questionnaires. At the questionnaire stage it is determined using RACI, the function of the RACI Chart is to be able to determine which parties can help in the research process [22].
4. The fourth stage is data processing and analysis. At this stage, processing and analysis of the data that has been collected is carried out to assess the *capability level*. It is hoped that this *capability level* can be used as input or reference regarding improvements or improvements to the technology they use [23].
5. The final stage is reporting the results of the analysis and making recommendations. At this stage, a report is presented containing the results of the *capability level* analysis along with recommendations from the results of the gap analysis that has been carried out. The gap is used to determine the difference between user satisfaction and application performance [24].

### 4. RESULTS AND DISCUSSION

In this study, respondents involved in filling out this questionnaire referred to RACI mapping *Charts* APO12. Results from mapping respondents questionnaire as shown in Table 3 [25].

**Table 3. Results Mapping Respondent Questionnaire**

No.	Name	Work Unit	Code
1	Erna Heni Surya, SE	Administrator	R1 = Respondenst 1
2	Gentur Panji Nugroho	Operator	R2 = Respondenst 2
3	Ardiana Seto Nugroho	Journalist	R3 = Respondenst 3
4	Aditya Bagus Darmawan	Staff	R4 = Respondenst 4
5	Ahmad Fauzi	Staff	R5 = Respondenst 5

#### 4.1 Process APO12

This section is a presentation of various findings and information related to SID Ambarketawang based on a questionnaire on the process APO12. Following several findings information on SID Ambarketawang :

1. APO12.01 (Gather Data)  
SID Ambarketawang Village carries out maintenance to collect data related to IT risks for managing current service data. An institution's risk profile serves as the foundation.
2. APO12.02 (Analyze Risk)  
SID Ambarketawang Village carries out risk analysis involving consideration of the factors that cause risk and regularly includes risk scenarios in the risk profile report.
3. APO12.03 (Look after Profile Risk)  
SID Ambarketawang Village carries out risk

management by documenting risks as an institutional profile that can be reviewed periodically.

4. APO12.04 (Articulate Risk)

SID Ambarketawang Village provides risk analysis results to interested parties to support institutional decisions. Report these are included in the category of corporate risk management reports or evaluation reports within the risk management framework.

5. APO12.05 (Determine Portfolio Management Risk)

SID Ambarketawang Village carries out a risk management inventory to reduce risk to an acceptable level as a portfolio.

6. APO12.06 (Responding to Risks)

Using staff knowledge regarding IT, the Ambarketawang Village SID creates and evaluates a plan detailing the appropriate actions to be taken if a risk occurs.

### 4.2 Results Answer Questionnaire

In my answer, the questionnaire contains a list of answers to the questionnaire APO12.01 until APO12.06 Which has an answer by respondents. In APO12.01 there are 7 questions, APO12.02 there is 7 question, APO12.03 there is 7 questions, APO12.04 there is 5 questions, APO12.05 there is 3 questions, And APO12.06 there are 4 questions.

Recapitulation of questionnaire answers based on questionnaire results APO12.01 until APO12.06. Recapitulation this is about the level of capability processes that exist at SID Ambarketawang both for current conditions and expected conditions displayed in percentage form (%).

Table 4. Answer Questionnaire APO12.01

	APO12.01 Questions Questionnaire	Status	Answer Distribution (%)						
			0	1	2	3	4	5	
1	SID Ambarketawang Village collects, classifies and analyzes data related to IT risks.	Current	0	0	20	80	0	0	
		Expected	0	0	0	20	60	20	
2	SID Ambarketawang Village records relevant data in IT risk management.	Current	0	20	20	60	0	0	
		Expected	0	0	0	20	80	0	
3	SID Ambarketawang Village searches and analyzes data related to IT risks and loss that is available externally.	Current	0	0	60	20	20	0	
		Expected	0	0	0	60	20	20	
4	Ambarketawang Village SID records data on IT risk incidents to be reused in IT-related investigations.	Current	0	0	80	20	0	0	
		Expected	0	0	0	60	40	0	
5	SID Ambarketawang Village organizes the collected data and looks at the factors causing IT risks	Current	0	0	20	80	0	0	
		Expected	0	0	0	20	80	0	
6	SID Ambarketawang determines detailed conditions regarding the presence or absence of IT risk events.	Current	0	0	20	80	0	0	
		Expected	0	0	0	20	80	0	
7	SID Ambarketawang Village carries out incident analysis and risk factor analysis regularly.	Current	0	0	40	60	0	0	
		Expected	0	0	0	20	80	0	
Average			Current	0	2,85	37,14	57,14	2,85	0
			Expected	0	0	0	31,42	62,85	5,71

Based on Table 4 recapitulation answer questionnaire APO12.01, is known that evaluation respondents against SID Ambarketawang in collection data for condition moment this

(current) is at level 3 with percentage 57.14 %. Meanwhile, the expected conditions are in place on level 4 with a percentage as big as 62.85 %.

Table 5. Answer Questionnaire APO12.02

	APO12.02 Questions Questionnaire	Status	Answer Distribution (%)						
			0	1	2	3	4	5	
1	SID Ambarketawang Village carries out risk analysis considerations, risk factors and criticism related to assets.	Current	0	0	60	40	0	0	
		Expected	0	0	0	60	40	0	
2	SID Ambarketawang Village carries out updates, controls and detects IT risk scenarios.	Current	0	0	60	40	0	0	
		Expected	0	0	0	60	40	0	
3	SID Ambarketawang Village estimates losses and profits related to the IT scenario.	Current	0	40	60	0	0	0	
		Expected	0	0	0	80	20	0	
4	SID Ambarketawang Village carries out residual risk and identifies IT risk and identifies IT risk actions.	Current	0	20	60	20	0	0	
		Expected	0	0	0	80	20	0	
5	SID Ambarketawang Village conducted a cost benefit analysis of risk actions.	Current	0	20	60	20	0	0	
		Expected	0	0	0	60	40	0	
6	Ambarketawang Village SID determines requirements for the IT risk mitigation controls project.	Current	0	0	80	20	0	0	
		Expected	0	0	0	80	20	0	
7	SID Ambarketawang assesses the results of risk analysis for decision making.	Current	0	0	40	60	0	0	
		Expected	0	0	0	40	60	0	
Average			Current	0	11,42	60	28,57	0	0
			Expected	0	0	0	65,71	34,28	0

Based on Table 5 recapitulation answer questionnaire APO12.02, is known that evaluation respondents to SID Ambarketawang in analyze risk for condition moment this (current) is at on level 2 with percentage 60 %. Meanwhile, the expected conditions are in place on level 3 with a percentage amounting to 65.71%.

Table 6. Answer Questionnaire APO12.03

	APO12.03 Questions Questionnaire	Status	Answer Distribution (%)						
			0	1	2	3	4	5	
1	SID Ambarketawang manages business process inventory including IT services.	Current	0	20	20	60	0	0	
		Expected	0	0	0	40	60	0	
2	SID Ambarketawang Village makes efforts to maintain the running of business processes.	Current	0	0	20	80	0	0	
		Expected	0	0	0	20	80	0	
3	SID Ambarketawang Village collects risk scenarios based on business fields and functional areas.	Current	0	0	80	20	0	0	
		Expected	0	0	0	80	20	0	
4	The Ambarketawang Village SID records all information on the collection of IT risks that occur.	Current	0	0	40	60	0	0	
		Expected	0	0	0	40	60	0	
5	SID Ambarketawang defines risk indicators quickly and precisely.	Current	0	20	40	40	0	0	
		Expected	0	0	0	60	40	0	
6	Ambarketawang Village SID captures information on IT risk events for inclusion in the company's IT risk profile.	Current	0	0	60	40	0	0	
		Expected	0	0	0	60	40	0	
7	SID Ambarketawang Village records risk plan information to be documented.	Current	0	20	20	60	0	0	
		Expected	0	0	0	40	60	0	
Average			Current	0	8,57	40	51,42	0	0
			Expected	0	0	0	48,57	51,42	0

Based on Table 6 recapitulation answer questionnaire APO12.03, is known for condition level current capability is at level 3 with a mark percentage as big as 51.42 %. Whereas for condition the expected level of capability (expected), namely is at level 4 with a mark percentage as big as 51.42 %.



**Table 7. Answer Questionnaire APO12.04**

	APO12.04 Questions Questionnaire	Status	Answer Distribution (%)					
			0	1	2	3	4	5
1	SID Ambarketawang Village reports the results of the risk analysis to all stakeholders in the company.	Current	0	0	60	40	0	0
		Expected	0	0	0	40	60	0
2	SID Ambarketawang Village understand the process scenarios regarding the worst possible IT risks.	Current	0	0	80	20	0	0
		Expected	0	0	0	80	20	0
3	SID Ambarketawang Village reports the current risk profile to all stakeholders.	Current	0	0	60	40	0	0
		Expected	0	0	0	60	40	0
4	SID Ambarketawang Village looks at the results of third party assessments, internal audits, and maps to risk profiles.	Current	0	0	60	40	0	0
		Expected	0	0	0	60	40	0
5	SID Ambarketawang Village identified IT opportunities that could pose greater risks.	Current	0	20	40	40	0	0
		Expected	0	0	0	40	60	0
Average		Current	0	4	60	36	0	0
		Expected	0	0	0	60	40	0

Based on Table 7 recapitulation answer questionnaire APO12.04, is known that evaluation respondents towards SID Ambarketawang in articulating risks for current conditions (current) is at level 2 with a percentage of 60 %. Meanwhile, the expected conditions are in place on level 3 with a percentage of 60 %.

**Table 8. Answer Questionnaire APO12.05**

	APO12.05 Questions Questionnaire	Status	Answer Distribution (%)					
			0	1	2	3	4	5
1	SID Ambarketawang Village maintains investment activities related to risk management controls.	Current	0	20	80	0	0	0
		Expected	0	0	0	80	20	0
2	The Ambarketawang District SID determines the entity for each organization to monitor risk within individual and portfolio tolerance.	Current	0	40	20	40	0	0
		Expected	0	0	0	80	20	0
3	SID Ambarketawang Village in determining balanced projects to reduce risks.	Current	0	40	60	0	0	0
		Expected	0	0	0	80	20	0
Average		Current	0	33,33	53,33	13,3	0	0
		Expected	0	0	0	80	20	0

Based on Table 8 recapitulation answer questionnaire APO12.05, is known that evaluation respondents towards SID Ambarketawang in determining the risk management action portfolio for current conditions is at level 2 with a percentage of 53.33%. Meanwhile, the expected conditions (expected) are at level 3 with a percentage as big as 80 %.

**Table 9. Answer Questionnaire APO12.06**

	APO12.06 Questions Questionnaire	Status	Answer Distribution (%)					
			0	1	2	3	4	5
1	SID Ambarketawang Village prepares and tests documentation plans for steps that must be taken when an IT risk occurs.	Current	0	0	60	40	0	0
		Expected	0	0	0	60	40	0
2	SID Ambarketawang Village carried out incident categories and comparisons with IT risk tolerance thresholds.	Current	0	20	60	20	0	0
		Expected	0	0	0	60	40	0
3	SID Ambarketawang Village implemented a response plan to minimize the impact of IT risk incidents.	Current	0	0	60	40	0	0
		Expected	0	0	0	60	40	0
4	SID Ambarketawang Village examines losses from IT risk problems.	Current	0	20	40	40	0	0
		Expected	0	0	0	60	40	0
Average		Current	0	10	55	35	0	0
		Expected	0	0	0	60	40	0

Based on Table 9 recapitulation answer questionnaire APO12.06, is known that evaluation respondents against SID Ambarketawang in do response to risk for condition currently (current) is at level 2 with a percentage of 55%. Meanwhile, the expected conditions are in place on level 3 with a percentage of 60 %.

### 4.3 Process capabilities Levels

In this stage, this researcher enters calculation capability, Level determination capability, Gap, and recommendations APO12.

#### 4.3.1 Calculation Mark Capability

This section contains the calculation of the capability value from the answer questionnaire. Calculation mark capability each subdomain as following:

1. The calculation result of the APO12.01 process in the current condition (*current*) is 2.60, which means the capability level is at level 3. Meanwhile the calculation result for the expected condition (*expected*) is 3.74, which means the expected capability level is at level 4.
2. The calculation result of the APO12.02 process in the current condition (*current*) is 2.17, which means the capability level is at level 2. Meanwhile the calculation result for the expected condition (*expected*) is 3.34, which means the expected capability level is at level 3.
3. The calculation result of the APO12.03 process in the current condition (*current*) is 2.43, which means the capability level is at level 2. Meanwhile the calculation result for the expected condition (*expected*) is 3.51, which means the expected capability level is at level 4.
4. The calculation result of the APO12.04 process in the current condition (*current*) is 2.32, which means the capability level is at level 2. Meanwhile the calculation result for the expected condition (*expected*) is 3.40, which means the expected capability level is at level 3.
5. The calculation result of the APO12.05 process in the current condition (*current*) is 1.80, which means the capability level is at level 2. Meanwhile the calculation result for the expected condition (*expected*) is 3.20, which means the expected capability level is at level 3.
6. The calculation result of the APO12.06 process in the current condition (*current*) is 2.25, which means the capability level is at level 2. Meanwhile the calculation result for the expected condition (*expected*) is 3.40, which means the expected capability level is at level 3.

#### 4.3.2 Determination Levels Capability

Part This is the determination of capabilities Levels APO12 based on the calculation results of the process Capability Level APO12.01 to with APO12.06 as in Table 10.

**Table 10. Capabilities Levels APO12**

No	Subdomain	Capability Value		Capability Level	
		Current	Expected	Current	Expected
1	APO12.01	2,60	3,74	3	4
2	APO12.02	2,17	3,34	2	3
3	APO12.03	2,43	3,51	2	4
4	APO12.04	2,32	3,40	2	3
5	APO12.05	1,80	3,20	2	3
6	APO12.06	2,25	3,40	2	3
Average		2,26	3,43	2,16	3,33

After determining the APO12 Capability Level, then obtained results calculation mark capability on condition moment this (current) as big as 2,26 and condition which expected (expected) as big as 3,43, which obtained through calculation amount mark capability shared with amount subdomain APO12. Therefore, can is known that levels SID Ambarketawang's capabilities in current conditions (current) are at level 2. Whereas levels capability for condition which expected (expected) SID Ambarketawang is located on level 3. To find out more, below are the results graph calculation capabilities level APO12 can seen in Figure 4.

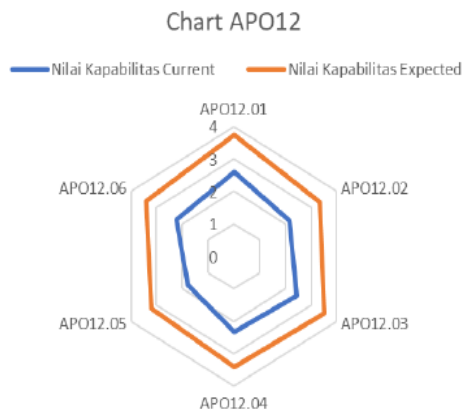


Figure 4. Graphics Process APO12

As seen in the Figure 4 APO12 process charts, is known that capabilities Levels For condition moment This (current) is at level 2 (manage process), namely level capability where there is planning, monitoring and process adjustments. Meanwhile, for Capability Level, that is expected (expected) is at level 3 (established process) which is the level capability where there is implementation from a process which there is and has capable reach results process.

#### 4.3.3 Gap And Recommendation APO12

The Ambarketawang SID Capability Level value which has been carried out in the current conditions (current) and condition which expected (expected), so can is known the gap value in SID Ambarketawang is based on calculation results in the capability level that has been stiffened can then be determined existing gaps. The gap in SID Ambarketawang can be seen as follows which is seen in Table 11 following.

Table 11. Gap APO12

No	Subdomain	Capability Level	
		Current	Expected
1	APO12.01	3	4
2	APO12.02	2	3
3	APO12.03	2	4
4	APO12.04	2	3
5	APO12.05	2	3
6	APO12.06	2	3
Average		2	3
Gap		1	

In Table 11 APO12 Gap, it can be seen that the gap is in SID Ambarketawang based on the APO12 process amounting to 1 level. Matter this is known from the condition moment this (current) is at level 2 and the expected conditions (expected) are in place at level 3. Based on the existing gap, SID Ambarketawang must take steps to repair so can reach the level or level of maturity expected. To be able to reach the expected level, it is created recommendations for improvement based on the APO12 process that has been carried out. The following recommendations can be given, as seen in Table 12.

Table 12. Recommendation

No	Recommendation
1	Carry out maintenance related to Information Technology risk management in accordance with the IT risk management framework.
2	Carrying out routine data checks with the aim of validating and ensuring the accuracy of data in the Ambarketawang Village Information System.
3	Update data regularly, including updating population data, or other relevant data. Because outdated or irrelevant data can cause validity problems.
4	Develop effective data recovery procedures, so that when facing the issue of invalid data, sub-district heads must have an in-depth understanding of the steps needed to restore data that may be lost or invalid.
5	Routinely evaluating each data risk management process and identifying areas of improvement that may be needed is an important step to ensure system effectiveness.
6	SID should consider using automation technology that can instantly validate data. The implementation of this automation system can provide immediate warnings if there are discrepancies in the input data.

Table 12 is a recommendation made as a solution to resolve existing problems. So SID Ambarketawang implemented a recommendation which made to achieve the criteria levels capability expected.

## 5. CONCLUSION

Capability level calculation, then it is known that the current level of capability (current) is at level 2 (manage process). Whereas for expected conditions, the expected level of capability (expected) is at level 3 (established process). The gap result is known to be 1 after calculations are carried out capabilities level. Based on the gaps which there are, so made a recommendation for repair for SID Ambarketawang so that it can raise the level of capability to the expected level. The recommendations that have been made can be seen in Table 12 recommendation APO12.

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