Risk Assessment of Integrated Library System using COBIT 5 Framework

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ABSTRACT

The Integrated Library System (INLIS) at the Office of The Department of Library and Archives of Yogyakarta is an information system used for data processing of library administration. The business process can run well, so risk management is needed. The Department of Library and Archives of Yogyakarta Office requires a risk assessment of the ongoing business process. COBIT 5 is here to answer the challenges of this modern era, especially risk management. The need for a risk assessment to measure how far risk management is applied by elements in The Department of Library and Archives of Yogyakarta. The purpose of this study is to assess the Capability Level (maturity level), calculate the gap value, and provide recommendations by the APO12 (manage risk) and EDM03 (ensure risk optimization) domains.The risk management assessment in this study uses the COBIT 5 framework using the APO12 (manage risk) and EDM03 (ensure risk optimization) process domains which include the stages of data collection, risk analysis, risk profile, articulating risk, risk tolerance value, how to respond to risk, evaluate risk management, and direct risk management. The stages of research carried out in this study have three stages of analysis in research, namely determining the current capability level and the expected level, conducting gap analysis, and providing recommendations and suggestions for improvement. Based on the results of the calculations carried out in this study, the current level capability of the APO12 domain (manage risk) got a value of 2.59 which was at level 2 (managed process) meaning that IT processes in the Information system of The Department of Library and Archives of Yogyakarta has been done, achieved, and managed well. Domain APO12 (manage risk) gets a gap value of 0.31. The level of capability in the EDM03 domain (ensure risk optimization) gets a capability value of 2.70 (managed process) and the results of the calculation of the gap value get a gap value of 0.30 in the EDM03 (ensure risk optimization) domain. The recommendations generated in this study are by the expected goals.

Keywords

Information Systems, Risk Management, COBIT 5, Process Capability Level.

1. INTRODUCTION

The very rapid development of information technology (IT) provides many conveniences in aspects of activities. The role of IT in various aspects of activities can be understood because a technology that focuses on managing information systems using computers, IT can meet information needs quickly, timely, relevantly, and accurately. For now, IT has become a basic need for every company, especially in carrying out all aspects of organizational activities. The Department of Library and Archives of Yogyakarta is an agency under the Yogyakarta City government which is tasked with carrying out regional affairs based on the principles and duties of assistance in the field of archives and libraries in the City of Yogyakarta. The Department of Library and Archives of Yogyakarta has been using information technology to support agency operations and facilitate management for the agency. The Department of Library and Archives of Yogyakarta Service in achieving its organizational goals applies information technology, namely the Inlis information system. The Integrated Library System (INLIS) lite is an information system used for processing library administration data, such as managing collections/items/copies held (acquired), managing catalog data and connecting them with collection data/items/copies, managing library member data, as well as recording borrowing and returning collection transactions.

2. STUDY LITERATURE

2.1 Definition of Risk

A risk is an adverse event or in another definition risk is the possibility of an outcome that is not in line with expectations. Risk arises because there are conditions of uncertainty [9].

2.2 IT Risk Management

Risk Management is a set of procedures and methodologies used to identify, measure, monitor, and control risks arising from bank business activities. This is related to the general definition of risk, namely in every business/activity there is always the possibility of not achieving a goal or there is always uncertainty over any decisions that have been taken. In some situations, these risks can destroy the organization. Therefore, it is important to manage risk. Risk management aims to manage these risks so that we can obtain the most optimal results. The main purpose of risk management is to ensure that all risk and business policies can be implemented consistently [2].

2.3 Definition of IT Risk Management

Risk management is a comprehensive risk management system faced by the organization to improve the company [10].

2.4 COBIT 5

COBIT 5 is a framework for the latest generation of the ISACA guide that addresses IT governance and management. COBIT 5 provides a framework that helps companies achieve their goals with information technology governance and management. COBIT 5 provides a comprehensive framework that helps companies to achieve their objectives in

implementing information technology governance and management. Thus, companies can create optimal value from information technology by maintaining a balance between realizing benefits, optimizing risk levels, and using resources. COBIT 5 enables information technology to be regulated and managed holistically for the entire company and provides a clear picture of stakeholder involvement in governance [6].

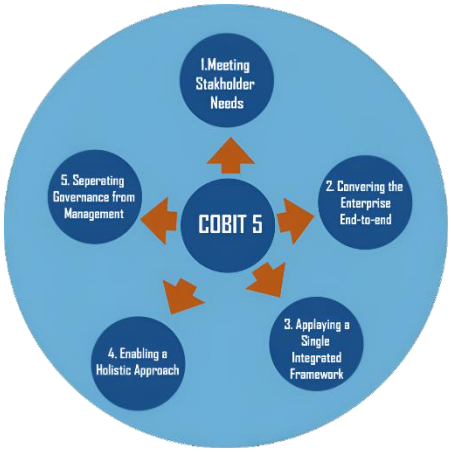


Figure 1. The Five Principles of COBIT 5

Based on Figure 1 there are 5 (five) main principles that must be carried out as follows:

1. Meeting Stakeholder Needs undertakes all stakeholder needs in maintaining a balance to realize benefits and optimize risks.
2. Covering the Enterprise End-to-end, integrating information technology corporate governance from upstream to downstream
3. Applying a Single Integrated Framework, applying a single integrated framework to guide a subset of information technology activities.
4. Enabling a Holistic Approach, enabling an efficient and effective holistic approach to corporate governance and management.
5. Separating Governance from Management, separating governance from management.

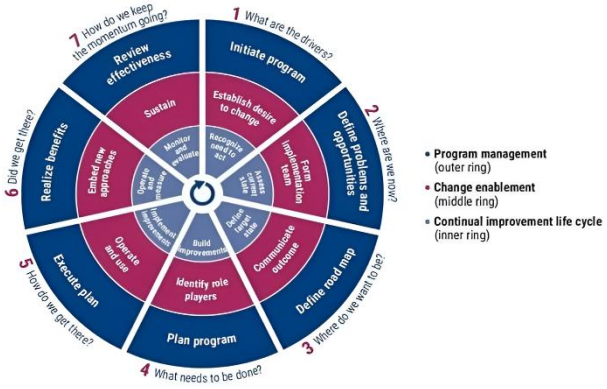


Figure 2. Implementation of COBIT 5

Based on Figure 2, the implementation of COBIT 5 has 7 (seven) stages that need to be carried out as follows**[6]:**

1. What are the drivers (InitiateProgram), identifying who will be the controller to support change and create a desire to achieve goals in the executive label which is then made into a form of a new process, controllers can be sourced from internal and external parties and the existence of issues makes it possible to be a support driver ofchange?
2. Where are we now (Define Problems andOpportunities), ensure that IT goals with strategy and change risks are commensurate and prioritize enterprise goals, IT goals, and key IT processes.
3. Where do we want to be (Define RoadMap), set targets to create improvements, which is then followed by gap analysis (difference)?
4. What needs to be done (PlanProgram), planning the right solution for immediate execution, monitoring, and ensuring continuous business risk.
5. How do we get there (ExecutePlan), calculate and monitor the system to ensure the business does not change the direction of the goal which is then carried out with activities every day.
6. Did we get there (RelatedBenefits), focusing on revolutionizing the continuous shift from improved management and management practices to business and monitoring the achievement of improvements using work schemes?
7. How do we keep the momentum going (ReviewEffectiveness), evaluate the achievement of objectives to identify governance needs, and improve needs on an ongoing basis?

2.5 Process Capability Level

In the COBIT 5 framework, there are 6 (six) levels of process capability [7].

1. Level 0 (Incomplete Process), the process is not implemented or fails to achieve the goal of the process.
2. Level 1 (Performed Process), the implementation of the process achieves its objectives.
   a. PA 1.1 Process Performance, the implemented process achieves its process objectives.
3. Level 2 (Managed Process), the process at level 1 is implemented into a process arrangement (planned, monitored, and evaluated) and the work products of the process are defined, controlled, and maintained appropriately.
   a. PA 2.1 Performance Management, measures the extent to which process performance is managed.
   b. PA 2.2 Work Product Management, measures the extent to which the work products produced by the process are managed appropriately.
4. Level 3 (Established Process), the process is defined and implemented according to existing standards
   a. PA 3.1 Process Definition, measures the extent to which a process is maintained to improve the deployment of a defined process.
   b. PA 3.2 Process Deployment, measures the extent to which the process is still implemented as a defined process to achieve the results of the process.
5. Level 4 (Predictable Process), the process operates according to the specified limit to achieve the process results.
   a. PA 4.1 Process Measurement, measures the extent to which the measurement results can

ensure that the performance of the relevant process performance goals is achieved in support of the specified business objectives.

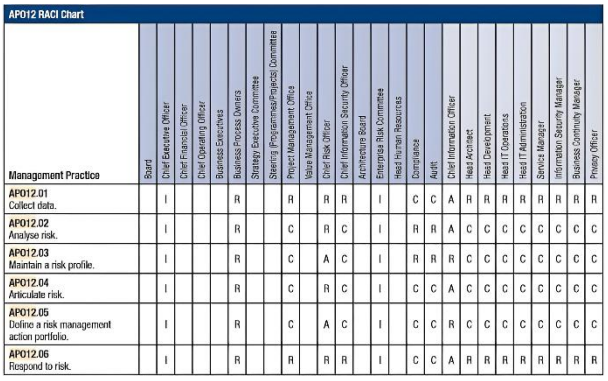
b. PA 4.2 Process Control, measures the extent to which processes are managed quantitatively to produce stable, capable, and predictable processes within specified limits.

6. Level 5 (Optimizing Process), processes are developed constantly to complement current conditions that are relevant and lead to business goals.
   a. PA 5.1 Process Innovation, Process Innovation, measures the extent to which process changes are identified from the implementation of the process and the innovative approach to the implementation of the process.
   b. PA 5.2 Process Optimization, measures the extent to which changes are defined and effectively manages process execution to support the achievement of process improvement objectives

2.6 RACI Chart

RACI Chart has a function at the process level of responsibility for roles in the organizational structure of a company [8]. The RACI Chart defines the authority of a person in an IT-based company. The RACI Chart that will be used is guided by the APO12 and EDM03 processes, which will then be used to determine respondents.

The following RACI Chart is used for the APO12 domain so that researchers can map out prospective respondents who will fill out a questionnaire which will later be used as data processing material. RACI identification is taken based on people who are directly involved in business processes at The Department of Library and Archives of Yogyakarta Office, The parties in The Department of Library and Archives of Yogyakarta Office have individually been involved as actors from the RACI Chart both actors implementing tasks, Decision Making, giving directions and roles that must understand the decisions taken so that it can be concluded that the elements The Department of Library and Archives of Yogyakarta Office take part in the RACI Chart actor based on the person who carries out the task of the process. business (responsible) which is used as a reference for selecting respondents.



APO12 RACI Chart

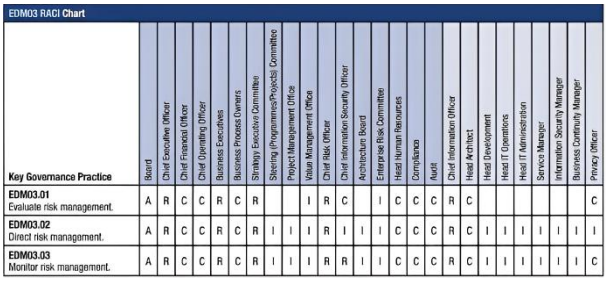
Management Practice	Board	Chief Executive Officer	Chief Financial Officer	Chief Operating Officer	Business Executives	Business Process Owners	Strategy Executive Committee	Steering (Programmes/Projects) Committee	Project Management Office	Value Management Office	Chief Risk Officer	Chief Information Security Officer	Architecture Board	Enterprise Risk Committee	Head Human Resources	Compliance	Audit	Chief Information Officer	Head Architect	Head Development	Head IT Operations	Head IT Administration	Service Manager	Information Security Manager	Business Continuity Manager	Privacy Officer
APO12.01 Collect data.		I				R			R		R	R		I		C	C	A	R	R	R	R	R	R	R	R
APO12.02 Analyse risk.		I				R			C		R	C		I		R	R	A	C	C	C	C	C	C	C	C
APO12.03 Maintain a risk profile.		I				R			C		A	C		I		R	R	R	C	C	C	C	C	C	C	C
APO12.04 Articulate risk.		I				R			C		R	C		I		C	C	A	C	C	C	C	C	C	C	C
APO12.05 Define a risk management action portfolio.		I				R			C		A	C		I		C	C	R	C	C	C	C	C	C	C	C
APO12.06 Respond to risk.		I				R			R		R	R		I		C	C	A	R	R	R	R	R	R	R	R

Figure 3. RACI Chart APO12

Based on Figure 3 there are 6 (six) key management practices of COBIT 5 as below:

1. APO12.01 (Collect Data), identify and collect data that is useful for identifying, analyzing, and reporting risks related to effective information technology
2. APO12.02 (Analyze Risk), disseminates useful information to support decision-making that is useful in business processes and risk factors that occur.
3. APO12.03 (Maintain a Risk Profile), maintain a list containing known risk and risk attributes and related resources, capabilities, and control activities
4. APO12.04 (Articulate Risk), provides information regarding explanations and opportunities regarding the latest information technology to all stakeholders needed to get the right response
5. APO12.05 (Define a Risk Management Action Portfolio), manage existing opportunities to minimize all risks to an acceptable level as a portfolio
6. APO12.06 (Respond to Risk), responding quickly in a short time with effective steps to reduce the magnitude of losses due to events related to information technology.

The RACI chart above is used for the EDM03 domain so that the questionnaire questions can be used for prospective respondents who will fill out which will later be used as data processing material. The identification of the RACI Chart is taken based on people who are directly involved in business processes at the Office of The Department of Library and Archives of Yogyakarta. The RACI Chart above is taken based on the tasks of each individual who is in the Office of The Department of Library and Archives of Yogyakarta. The parties in The Department of Library and Archives of Yogyakarta Office have been individually involved as actors from RACI Chart, both actors implementing tasks, decision making, giving directions, and roles that must understand the decisions taken, so it can be concluded that elements in the Office of The Department of Library and Archives of Yogyakarta contribute to the RACI Chart actor based on the person who carries out the task of participating in the business process (responsible) which is used as a reference for selecting respondents.



EDM03 RACI Chart

Key Governance Practice	Board	Chief Executive Officer	Chief Financial Officer	Chief Operating Officer	Business Executives	Business Process Owners	Strategy Executive Committee	Steering (Programmes/Projects) Committee	Project Management Office	Value Management Office	Chief Risk Officer	Chief Information Security Officer	Architecture Board	Enterprise Risk Committee	Head Human Resources	Compliance	Audit	Chief Information Officer	Head Architect	Head Development	Head IT Operations	Head IT Administration	Service Manager	Information Security Manager	Business Continuity Manager	Privacy Officer
EDM03.01 Evaluate risk management.	A	R	C	C	R	C	R			I	R	C		I	C	C	C	R	C							C
EDM03.02 Direct risk management.	A	R	C	C	R	C	R	I	I	I	R	I	I	I	C	C	C	R	C	I	I	I	I	I	I	I
EDM03.03 Monitor risk management.	A	R	C	C	R	C	R	I	I	I	R	R	I	I	C	C	C	R	C	I	I	I	I	I	I	C

Figure 4. RACI Chart EDM03

Based on Figure 4 there are 2 (two) key governance practices of COBIT 5 as below:

1. EDM03.01 (Evaluate Risk Management), examine and makes an assessment of the effect of risk on the use of the latest information technology in the company. Considering the appropriate corporate risk appetite and risks to company value associated with the use of information technology are identified and managed.

2. EDM03.02 (Direct Risk Management), establish risk management measures to provide adequate assurance regarding information technology risk management by ensuring that information technology risk does not exceed the risk appetite of the board of directors.

3. METHODOLOGY

3.1 Research Stage

This section will explain the methodology for carrying out research work so that the work steps become more systematic and organized.

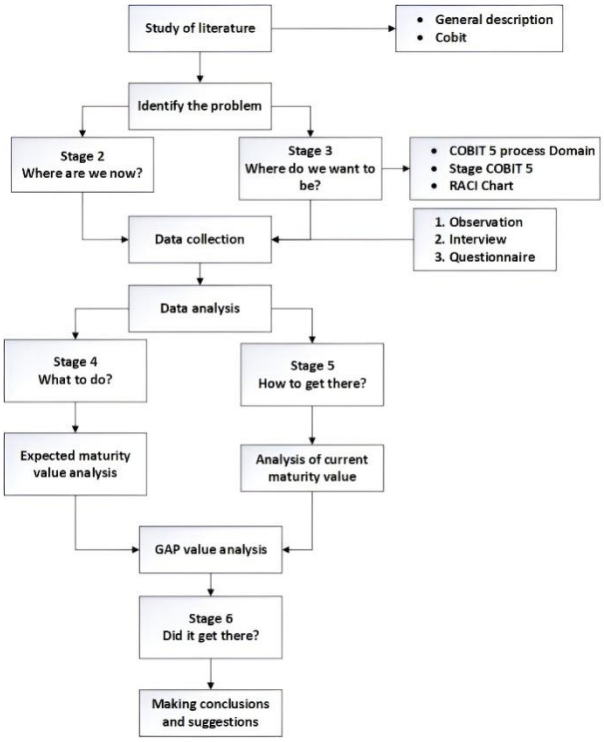


Figure 5. Stages of Research

Based on Figure 5, 11 (eleven) the stages of the research carried out are as below:

1. A literature study is conducted by collecting various information and references regarding the research topic. This is done to support knowledge to manage risk in the Inlis information system. The literature used is academic books, papers, theses, and journals related to risk management, as well as COBIT 5 standardized framework guidebooks.
2. Define the problem by determining the process domains used, namely APO12 and EDM03 to determine the RACI chart.
3. Collecting the data needed for the evaluation of information technology, by distributing questionnaires, observations, and interviews.
4. The fourth stage is analyzing the data, the role of the researcher is needed to process the data and then make its information and then the information will be used to make decisions. Researchers will find out how much maturity level is owned by an organization (The Department of Library and Archives of Yogyakarta), after knowing the maturity level that is currently in effect then the next stage will be giving authority to the executive to determine the expected maturity level then the last process is to analyze the level of maturity. the resulting gap.
5. The fifth stage is the stage of reporting research results, after knowing the results of the research in the previous stage, it will then be reported to stakeholders and at the same time provide recommendations based on research results to the organization.
6. Make conclusions from all activities carried out in research and suggestions for further research.

3.2 Data Collection

1. Observations and interviews, at the stage of observation and interviews, were conducted to obtain data relevant to the research topic.
2. The questionnaire, when using the RACI Chart method to determine research respondents, this method aims to more easily map and distinguish the main tasks that are by the responsibilities of each work unit or existing employee to help run the company's business processes.

3.3 Implementation

3.3.1Preparation of the Questionnaire

Assessing risk by measuring the Capability Level in the APO12 (manage risk) and EDM03 (ensure risk optimization) domains, the researcher uses a questionnaire survey method based on the COBIT 5 Capability Model, namely by looking at the activity points in the APO12.01 to APO12.06 process domain and processing the domain EDM03.01 to EDM03.02 Specify the capability level. A questionnaire will be conducted to understand the level of capability in the Inlis information system of The Department of Library and Archives of Yogyakarta. The results of the method of making this questionnaire will be used as a guide for solving research problems and the extent of the risk level in the Inlis system of The Department of Library and Archives of Yogyakarta.

3.3.2Determination of Respondents

When using the RACI Chart method to identify potential respondents, this research is the method used to map potential respondents so that they can facilitate decision-making and help management determine the roles and responsibilities of each respondent. Research respondents are required for data collection. The respondent determination stage is carried out by identifying respondents who are believed to understand the Inlis information system at The Department of Library and Archives of Yogyakarta. Respondents were also taken according to the duties and responsibilities of each staff member.

Table 1. Results of Determination of Respondents RACI Chart APO12

No	Unit COBIT 5	ID
1	Business Process Owner	R1
2	Project Management Office	R2
3	Chief Risk Officer	R2
4	Chief Information Security Officer	R2
5	Head Architect	R2
6	Head Development	R3
7	Head IT Operations	R3
8	Head IT Administration	R4

9	Service Manager	R5
10	Information Security Manager	R3
11	Business Continuity Manager	R5
12	Privacy Officer	R4
13	Compliance	R5
14	Audit	R4
15	Chief Information Officer	R3

Based on Table 1 above, the results of mapping the RACI Chart domain APO12 (manage risk) in the Inlis information system of The Department of Library and Archives of Yogyakarta are 15 work units that have been matched with work units on the Inlis information system and produce five respondents who will fill out the research questionnaire. because there are several units of work carried out by the same person.

Table 2. Results of Determination of Respondents RACI Chart EDM03

No	Unit COBIT 5	ID
1	Chief Executive Officer	R1
2	Business Executives	R5
3	Strategy Executive Committee	R2
4	Chief Risk Officer	R2
5	Chief Information Officer	R3

Based on Table 2 above, the results of mapping the RACI Chart domain EDM03 (ensure risk optimization) on the Inlis information system of The Department of Library and Archives of Yogyakarta are 5 work units that have been matched with work units on the Inlis information system and produce five respondents who will fill out the questionnaire. research because there are several work units carried out by the same person.

3.3.3Observation and Interview

At the stage of observation and interviews were conducted to obtain relevant data related to the research topic. The interview aims to obtain valid data so that the results of the study can be maintained to completion. The following are the results of interviews conducted by researchers

1. An overview of the customer services of The Department of Library and Archives of Yogyakarta.
2. An overview of the customer services of Inlis information system.
3. A business process on Inlis information system.
4. Find solutions to the problems of the Inlis information system.
5. Duties and responsibilities of staff at The Department of Library and Archives of Yogyakarta.
6. The organizational structure of customer services at The Department of Library and Archives of Yogyakarta.
7. The Capability Level value expected by the company is 3.
8. Management risks that may occur in customer services are expected to be overcome by risk management assessment using the COBIT 5 framework using the APO12 (process domains manage risk) and EDM03 (ensure risk optimization)

3.3.4Data Analysis

3.3.4.1. Current Level Capability

At this stage, the researcher uses Guttman scale calculations to calculate the Current Level Capability value. The calculation results can be seen in Table 3.

Table 3. Current Capability APO12

Domain	Process	Current Level
APO12.01	Collecting data	2.53
APO12.02	Analyzing risk	2.47
APO12.03	Maintaining risk profile	2.77
APO12.04	Articulation of risk	2.70
APO12.05	Determining risk management portfolio	2.80
APO12.06	Responding to risk	2.26

Based on the calculation of the APO12 domain questionnaire (manage risk) in Table 3 above using the Guttman scale calculation, it gets a value of 2.59 (managed process). This value is obtained from the calculation of the average Current Level divided by the number of domain processes. The APO12 score is 2.59, which means that at this level it can be said that the implementation of business processes in the Inlis information system has carried out planning, monitoring, and adjustments and the results of its work have been determined, supervised, and cared for properly. The following is a table of calculation results using the EDM03 domain (ensure risk optimization). The table of calculation results can be seen in Table 4.

Table 4. Current Capability EDM03

Domain	Process	Current Level
EDM03.01	Evaluating risk management	2.80
EDM03.02	Directing risk management	2.60

Based on Table 4 above, the value is 2.70 in the calculation current level. At this level, it can be said that the company already has standardized IT processes within the scope of the company as a whole and has been applied throughout the company.

3.3.4.2. Expected Level Capability

Value desired by customer services which are at level 3. At this level, the company already has standardized IT processes within the scope of the company as a whole. This means that they already have process standards that apply throughout the company.

3.3.4.3. Analysis of GAP Value the GAP

The value obtained in the APO12 domain (manage risk) is 0.41 While the EDMO3 domain (ensure risk optimization) is 0.30, which means that customer has reached the desired level and only needs the advice to maintain the level that has been achieved.

Table 5. Value of GAP domain APO12

Domain	Process	Current	Expected	Max	Gap
APO12.01	Collecting data	2.53	3.00	5.00	0.47
APO12.02	Analyzing data	2.47	3.00	5.00	0.53
APO12.03	Maintaining risk profile	2.77	3.00	5.00	0.23
APO12.04	Articulate risk	2.70	3.00	5.00	0.30
APO12.05	Determine risk management protofolio	2.80	3.00	5.00	0.20
APO12.06	Respond to risk	2.26	0.30	5.00	0.74
Average Current Level		2.59	3.00	5.00	0.41

Based on Table 5 above it can be concluded that the Inlis information system reaches level 2.59, which means the company in implementing the IT process has achieved its goals and has been managed properly, so there is more assessment because the implementation and achievements are carried out with good management. In the following table, the results of the Capability Level show domain EDM03 (ensure risk optimization) that has been known. The gap value table can be seen in Table 6.

Table 6. Value of GAP domain EDM03

Domain	Process	Current	Expected	Max	Gap
EDM03.01	Evaluating risk	2.80	3.00	5.00	0.20
EDM03.02	Directing risk management	2.60	3.00	5.00	0.40
Average Current Level		2.70	3.00	5.00	0.30

Based on Table 6 above, it can be concluded that the Inlis information system has reached the expected level and got a GAP value of 0.30 for all existing domains.

Table 7. Process APO12 PA 1.1 Process Performance

Work result	Description	Exist	Comment	Proof
APO12.01	Data on the operating environment, risk events, and factors that influence risk	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement, plan, identify, and improve maintenance-related methods of collecting, classifying, and analyzing data related to IT risks.	Profile risk
APO12.02	IT risk scenarios and risk analysis results	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement, plan, identify, and improve the understanding and consideration of risk analysis, IT risk factors, and asset criticism as well as the ability to detect IT risk scenarios.	Profile risk
APO12.03	The collection of risk profiles includes the status of risk management actions	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement, plan, identify, and improve business process support personnel including applications, facilities, and suppliers, as well as plan, utilize and improve IT service requirements and approvals to maintain business processes.	Profile risk
APO12.04	Risk analysis and risk profile	✓	The Department of Library	Profile risk

	reporting for stakeholders		and Archives of Yogyakarta has made efforts to implement, plan, identify, and improve reporting the results of IT risk analysis to stakeholders in a format that is useful for supporting organizational decisions.	
APO12.05	Project proposals to reduce risk	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement, plan, identify, and improve activities to maintain an inventory of risk management controls by IT risk tolerance.	Profile risk
APO12.06	Risk-related incident response plan	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement, plan, identify, and improve the implementation of appropriate response plans to minimize the impact of IT risk incidents.	Profile risk
Average Score		100%		

Based on Table 7 above, it can be seen that the completeness of data requirements at level 1 in each process domain has been fulfilled and can be interpreted with the PA scale (Process Attribute) with attribute value > 85% - 100% F (Full Achieved). To be able to reach level 2, customer services must meet the requirements at level 2. The following is the completeness of data requirements that are owned by customer services by the APO12. The complete list of data requirements can be seen in Table 8.

Table 8.Process APO12 PA 2.1 Performance Management

Work result	Exist	Comment	Proof
Objectives for process performance identified in risk management	✓	The Department of Library and Archives of Yogyakarta has made efforts to improve the achievement of goals for the implementation of IT risk tolerance which requires appropriate responses.	Employee SOP
Process performance is planned and monitored in risk management	✓	The Department of Library and Archives of Yogyakarta has made efforts to increase the rapid indicator level for the identification and monitoring of IT risks.	Profile Risk
The responsibilities and authority to carry out the process are defined, assigned, and communicated in risk management	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve its understanding of IT risk analysis, IT risk factors, and asset criticism.	Employee SOP
The resources and information needed to carry out the process are identified, available, allocated, and used in risk management	-	The Department of Library and Archives of Yogyakarta has not made efforts to improve the validation assessment of the results of the risk analysis to support the decisions to be	-

		taken.	
Interfaces between the parties involved are managed to ensure effective communication and clear assignment of responsibilities in risk management	✓	The Department of Library and Archives of Yogyakarta has made efforts to improve conditions that explain the presence or absence of IT risk events in each business process.	Monthly report
Average score		66.67%	

Based on Table 8 process attributes 2.1 Performance Management, it is known that 6 criteria must be met by the Inlis Information System at The Department of Library and Archives of Yogyakarta, which aims to measure the extent to which the performance of the risk management process is managed.

Table 9.Process APO12 PA 2.2 Work Product Management

Work result	Exist	Comment	Proof
Requirements for the work product of the defined process	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve in determining	Monthly report
Requirements for documentation and control of work products are defined	-	The Department of Library and Archives of Yogyakarta does not have a scenario that maps out where the gaps in IT-based business processes are that have the opportunity to pose a risk	-
Work products are identified, documented, and controlled appropriately for risk optimization	-	The Department of Library and Archives of Yogyakarta does not yet have records or databases reporting	-
		the latest risks that occur	
Work products are reviewed according to planned arrangements and adjusted as necessary to meet risk optimization requirements	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve the reporting of the latest risk records.	Monthly report
Average score		50%	

Based on Table 9 process attributes 2.2 Work Product Management, it is known that 4 criteria must be met by the Inlis Information System at the Yogyakarta City Regional Library and Archives Service. risks are determined and controlled.

Table 10. EDM03 PA Process 1.1 Process Performance

Work result	Exist	Comment	Proof
Possible risks are determined and communicated and key IT-related risks are identified	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve the evaluation of the risk tolerance limits used to be accepted by the company.	Monthly report and Profile Risk
Key IT-related risks are managed effectively and efficiently	✓	The Yogyakarta City Regional Library and Archives Service have made efforts to directly implement appropriate mechanisms to respond quickly to changes in risk and report immediately to the leadership supported by agreed principles.	Profile Risk
Average score		100%	

Based on Table 10 the completeness of the data to reach level 2 has all been met, in other words, Level 1 can be interpreted by the PA scale (process attribute) having an attribute value of > 85%-100% F (fully achieved). Furthermore, to be able to fulfill the requirements for meeting level 2, the Yogyakarta

City Regional Library and Archives Service should have most of the completeness of Performance Management and Work Product Management data as shown in Table 11:

Table 11. EDM03 PA Process 2.1 Performance Management

Work result	Exist	Comment	Proof
Identifying the scope and risk optimization process objectives	-	The Department of Library and Archives Service of Yogyakarta has not made any effort to evaluate and improve the company's IT risk level factors and make the right decisions.	-
Planning and monitoring risk optimization process	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve the integration direction of IT risk strategy and operations with corporate strategic decisions.	Profile risk
Adjusting risk optimization process performance	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve the IT usage determination in the assessment and relevant risks eval	Profile risk
Identifying risk optimization process responsibilities	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve the direction of risks, opportunities, problems, and concerns identified and reported by anyone at any time.	Employees' Standard Operating Procedure
Identifying and providing risk optimization process resources	-	The Department of Library and Archives of Yogyakarta has not made an effort to improve and evaluate risk management activities to ensure the company's capacity related to IT losse	-
Managing risk optimization process interface	✓	The Department of Library and Archives of Yogyakarta has made efforts to implement and improve the direction of risk communication plans development and risk action plans.	Monthly report
Average score		66.67%	

Based on Table 11 attributes process 2.1 Performance Management, it is known that six criteria must be met by the Inlis Information System in The Department of Library and Archives of Yogyakarta aimed at ensuring the risk management optimization process.

Table 12. EDM03 PA Process 2.2 Work Product Management

Work result	Exist	Comment	Proof
Quality criteria and results	✓	The Department of Library and Archives of Yogyakarta has made efforts to improve the evaluation of related IT risk assessment results.	Monthly report
Determining the needs of the results	✓	The Department of Library and Archives of Yogyakarta has made efforts to periodically implement IT opportunities that can pose	Profile risk

		greater risks.	
Documentation of the results	-	The Department of Library and Archives of Yogyakarta has not yet had records or databases reporting the latest occurring risks.	-
Evaluation of work	✓	The Department of Library and Archives of Yogyakarta has made efforts to improve the latest risk records report.	Monthly report
Average score		75%	

Based on Table 12 the process attributes of the 2.2 Process Deployment, it is known that six criteria must be fulfilled by the Inlis Information System in the Department of Library and Archives of Yogyakarta, ensuring that it can run according to the risk optimization standards.

3.3.5Recommendation APO12 and EDM03

The results of recommendations and suggestions that have been obtained from the gap values analysis results obtained and will be implemented by the content division at the Department of Library and Archives of Yogyakarta. The results of recommendations and suggestions can be seen in the following Table.

Table 13 Recommendations and Suggestions Report

Domain	Recommendation
APO12.01	a. The Department of Library and Archives of Yogyakarta must have a regular schedule, both monthly and annually, regarding this matter and create a risk group that distinguishes between IT risks and general risks. b. The Department of Library and Archives of Yogyakarta shouldadd ideal IT staff to be able to assist in carrying out tasks and distributing job descriptions, including IT risk management, and also need to coordinate with external parties related to IT to conduct joint evaluations c. The Department of Library and Archives of Yogyakarta should document any occurring risks so that they can be used as evaluation materials to avoid the same IT risk from repeating. Documentation is in physical forms, such as soft files or hard files. d. Before starting a new business process, the Department of Library and Archives of Yogyakarta needs to do careful planning including assessing occurring IT risks; while for business processes that have already run,The Department of Library and Archives of Yogyakarta must carry out a joint evaluation. e. The Head of the Department of Library and Archives of Yogyakarta should add additional staff or special fields closely related to IT risk analysis so that all types of risks can be immediately identified.
APO12.02	a. In the training materials, the Department of Library and Archives of Yogyakarta should include discussions related to the risks, both in IT and general, so the elements who received the training can understand potential actions that may cause asset losses. b. In cases related to the use of IT,the Department of Library and Archives of Yogyakarta should make improvements to the IT governance sector, includingrisk management. c. The Department of Library and Archives of Yogyakarta should have objective standards related to IT risk. It is necessary to carry out risk mapping to be used as a standard value in measuring risk impact level to assist in making decisions. d. The Department of Library and Archives of Yogyakarta must have records or databases relating to the costs of various actions taken by the company to deal with risks that may occur in the future. e. The Department of Library and Archives of Yogyakarta must include efforts that have been made to improve risk mitigation controls in the MOU document or employee recruitment. f. The Department of Library and Archives of Yogyakarta must have standards that have been agreed upon by the company so that the decisions taken can improve the company's business processes.
APO12.03	a. The Department of Library and Archives of Yogyakarta should have a concept that describes how IT risks will appear in the future so that when a risk arises, the Department of Library and Archives of Yogyakarta is certainly ready with responsible stakeholders to respond to the risks and courageous to make decisions. b. The Department of Library and Archives of Yogyakarta should have indicators of success in achieving a business process related to IT risk, including indicators of employees' success after attending the training. c. The Department of Library and Archives of Yogyakarta must utilize information obtained from various sources.
APO12.04	a. The Department of Library and Archives of Yogyakarta should have a relationshipwith KOMINFO in addition to becominga supporting actor but also an assessing actor for the Department of

	Library and Archives of Yogyakarta. Assessment includes performance and policies. b. The Department of Library and Archives of Yogyakarta should make SOPs in managing IT-related business processes, including determining when an actor is required to analyze gaps that may cause large losses. c. The Department of Library and Archives of Yogyakarta must add staff to take care of the latest risk report database and report it to the management regularly.
APO12.05	a. The Department of Library and Archives of Yogyakarta should have documents that control reasonable limits of tolerable risks so that these risks do not hinder the company's business processes.
APO12.06	a. The Department of Library and Archives of Yogyakarta should have a method to add competent people to the IT risk analysis section.
EDM03.01	a. The Department of Library and Archives of Yogyakarta must make efforts to evaluate and improve other supporting factors and make joint decisions. b. The Department of Library and Archives of Yogyakarta must make efforts to improve the evaluation that has been done previously in using company IT. c. The Department of Library and Archives of Yogyakarta must make efforts to improve the evaluation of management activities, and this evaluation is done periodically.
EDM03.02	a. The Department of Library and Archives of Yogyakarta must maintain and improve in directing strategies and hold regular deliberation or meetings to take further strategies. b. The Department of Library and Archives of Yogyakarta must maintain and improve the current carried out plans and realize them. c. The Department of Library and Archives of Yogyakarta must maintain and improve in directing arising risks to be solved properly.

Based on Table 13 the recommendations given in the table above must be implemented by The Department of Library and Archives of Yogyakarta to be able to overcome or minimize the possible risks that will occur and the impact and to increase the level to the level desired company, namely of level 3 (established level).

4. CONCLUSION

Based on the calculation of the Current Level in the APO12 (manage risk) and EDM03 (ensure risk optimization) domains, the Capability Level value is 2.59 (Managed Process) for the APO12 (manage risk) domain. For the EDM03 (ensure risk optimization) domain, the Capability Level value is 2.70 (managed process). The value of the gap (difference) in the APO12 (manage risk) and EDM03 (ensure risk optimization) domains have been known by using concrete calculations and obtaining the gap value in each domain. For the APO12 (manage risk) domain, the gap value of 0.31 level is obtained from the calculation of the Current Level in the APO12 (manage risk) domain. As for the EDM03 domain (ensure risk optimization) it produces a gap value of 0.30. The results of the recommendations given are to improve risk management in customer servicesthat have not reached the desired level requires a recommendation and mitigation steps that must be carried out, namely by having a routine schedule, making SOPs on IT risk management, backing up data to the company database, adding staff who are experts in analyzing risks so that new investigations can be carried out. That may arise can be identified and resolved properly.

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