Information Technology Services Audit Lembaga Perkreditan Desa Using COBIT 5 Framework

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Abstract *Lembaga Perkreditan Desa* or LPD is an institution that is present to assist and collect community finances in a village and is managed independently by *desa pakraman* in Bali Province. One LPD in Bali, LPD *Desa Pakraman* Gelgel has a very vital role in Gelgel Village and its surroundings because of its business activities that effectively help rural communities in capital assistance, deposit and credit services, and other financial services. In its development, the LPD of *Desa Pakraman* Gelgel has been growing rapidly and utilizing information technology services as a support for business management. The critical point of finding in IT service audits related is a problem that needs to be evaluated. Using COBIT 5 framework, the level of importance analyzed was obtained by three process domains BAI09, MEA03, and EDM03. The results showed that the level of capability of MEA03 and EDM03 reached level 4 which had met LPD expectations, but BAI09 reached level 2 which required recommendations to reach the target value of the gap. Recommendations are given to assist stakeholders or managerial in improving the achievement of the gap from the BAI09 domain regarding the management of IT service assets.

***Index Terms*—Lembaga Perkreditan Desa, COBIT 5, Audit, Information Technology Service**

I. INTRODUCTION

Information technology is a service that helps and facilitates activities in various aspects of human life, both individuals and society. In a group, organization, or institution that exists in a community environment, information technology becomes something that is mandatory to be utilized and applied. Various fields almost fully utilize technology services, such as education, health, social, legal, and economic. In the economic field, especially concerning financial institutions or organizations engaged in the field, many have used information technology services as a solution to facilitate business process needs. Information technology services in a financial institution can facilitate business management, such as savings, savings and loan services, financial administration, and others.

One of the financial institutions in the village, especially the Province of Bali, is known as the Lembaga Perkreditan Desa or LPD. LPD is a financial institution owned and managed by desa pakraman in a village area. This institution has a function to increase the economic activities of the people in the village that are collected, both through savings, savings and loan services, and providing capital that aims to improve the welfare of customers who are members of the community in the village.

LPD Desa Pakraman Gelgel is one of the LPDs that runs by utilizing information technology services to fulfill its business processes. The information technology service that is used is a desktop-based application that serves to carry out various recording and accounting transactions carried out between the institution and the customer. In the course of its business process, LPD Desa Pakraman Gelgel certainly has various obstacles related to transaction services for information technology services. The difference in the amount of the value of savings that exists in the system with those recorded in the customer's passbook is an obstacle that tends to occur. Another problem is the presence of features that are not needed in the application system used so that the frequent occurrence of human error in searching for data. In terms of business risk management, LPDs often experience obstacles in determining the granting of nominal loans to customers that are not proportional to the value of collateral obtained so that there are imbalances and losses experienced by the LPD. Another thing is the return of loans by customers that is not smooth due to certain factors, for example, customers move to the domicile of residence so it is difficult to carry out the loan collection process directly. Various obstacles that occur as a collection of critical points as an indicator of the audit process of information technology services and risk management through a framework perspective, namely the COBIT 5 Framework.

Various studies that have become references in this audit are very diverse. Based on [1] in the study conducted improvements in internal control in a number of savings and loan cooperatives. The results provided are in the form of improvements by reference to appropriate SOP services to

create good cooperative business processes and functionality. In [2] give a result of capability level to several process domains in information system development audit. Providing recommendations to several domains that are still below the level of expectations is expected to improve services towards a better one. The research conducted [3] provides service recommendations to improve the role of information technology in the form of information system development which can later be used to support the academic process. The research also combines COBIT 5 with the ISO 20000 Framework as a framework relating to information technology management services. The discussion in [4] examines the performance management capabilities of information technology in financial companies. Through the support of the decision-making process based on critical success factors, key goal indicators and key performance indicators can provide an overview of the standardized process of information technology processes to managerial parties.

COBIT 5 is a framework that focuses on auditing and information technology governance with a collection of best practices as a guide in improving the quality of information technology services in an organization. COBIT 5 Framework is a reference in mapping critical points into business objectives, information technology goals, and information technology processes in the domains described. Mapping of the problems that occur in the LPD will produce the value of capability achieved, the determination of the expected value of capability, and provide recommendations for improvements to minimize the value of the resulting gap. Through the interview process, giving an interest level questionnaire, and capability level questionnaire will determine at what level the LPD organization is located.

In this study, the results obtained in the form of the level of capability achieved by the LPD and based on the level of capability expected by the LPD will result in recommendations for service improvements to meet the gap value obtained. Recommendations for improvements provided are expected to provide a decision support for managerial or stakeholders in the LPD in improving business process services with harmonized information technology services and objectives that are as expected.

II. Literature Review

A. LPD Desa Pakraman Gelgel

Lembaga Perkreditan Desa or LPDs are institutions engaged in finance to manage transactions, both savings, savings and loans, to capital services. The LPD is one of the official institutions established in the Province of Bali as an institution that can be utilized by the people of desa pakraman or those who are administratively registered villagers to facilitate the management and security of their financial assets.

The Lembaga Perkreditan Desa Pakraman Gelgel is one of the LPDs in Klungkung Regency, Bali Province. This institution was formed in 1988 and experienced several obstacles that affected the operation of the LPD business, so that in 2008 the LPD of Desa Pakraman Gelgel began to run normally again to date to fulfill the business objectives set by the LPD to gather and assist the desa pakraman community financial management.

B. Lembaga Perkreditan Desa Regulation

The Lembaga Perkreditan Desa which was ratified as a financial institution to protect and collect from the financial side of the desa pakraman community in Bali Province has been regulated in several regional regulations that have been ratified. Keputusan Daerah Tingkat I Bali number 972 of 1984 stated that LPD is a tool of village and is an operational unit and functions as a place for village wealth in the form of money or other securities. The same with the latest regulations which are the strong foundation for the presence of LPDs in helping the people of desa pakraman in [5] Peraturan Daerah Provinsi Bali No. 3 of 2017 which states that the LPD is needed to ensure the realization of indigenous peoples' welfare which is desa pakraman. Some of the rules explained to provide the right reasons for the presence of LPDs in desa pakraman communities according to clear and factual regulations.

C. COBIT 5 Framework

Control Objectives for Information and Related Technology or COBIT is a set of best practices to handle various forms of information technology governance efforts contained in one tangible entity. The IT Governance Institute (ITGI), supported by the Information Systems Audit and Control Association (ISACA), presented the first version of COBIT products in 1996 and up to COBIT 5 which was released in 2012 as the latest framework for use by auditors to manage information technology services. COBIT 5 is the latest version of the framework launched by modeling the reference area and mapping the domains as follows.

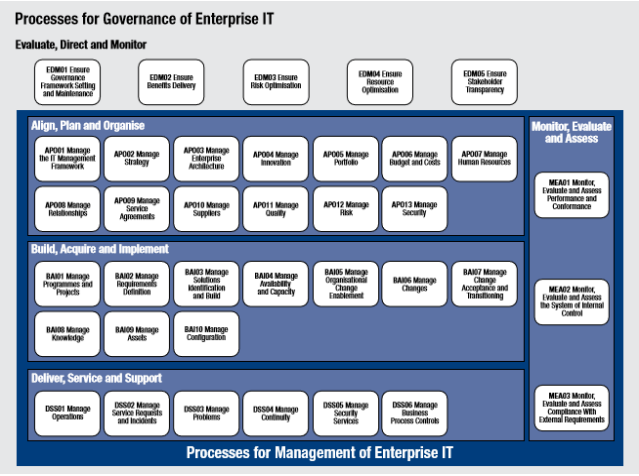

Figure 1 COBIT Reference Model Area [6]

COBIT 5 has two reference model areas that support the information technology governance process, including governance areas and management areas. The governance model reference area has the Evaluate, Direct and Monitor (EDM) process domain. The management model reference area has four process domains, including Align, Plan and

Organize (APO), Build, Acquire and Implemented (BAI), Deliver, Service and Support (DSS), and Monitor, Evaluate and Assess (MEA).

Each process domain has a subdomain of processes that are described according to the description of the process. The Evaluate, Direct and Monitor (EDM) process domain has a process subdomain as follows.

Table 1
Domain Proses EDM

Nama Domain EDM	Deskripsi Proses
EDM01	*Ensure Governance Framework Setting and Maintenance*
EDM02	*Ensure Benefits Delivery*
EMD03	*Ensure Risk Optimisation*
EDM04	*Ensure Resource Optimisation*
EDM05	*Ensure Stakeholder Transparency*

Align, Process and Oganize (APO) domains have a subdomain process with the process description as follows.

Table 2
Domain Proses APO

Nama Domain APO	Deskripsi Proses
APO01	*Manage the IT Management Framework*
APO02	*Manage Strategy*
APO03	*Manage Enterprise Achitecture*
APO04	*Manage Innovation*
APO05	*Manage Portofolio*
APO06	*Manage Budget and Costs*
APO07	*Manage Human Resources*
APO08	*Manage Relationships*
APO09	*Manage Service Agreements*
APO10	*Manage Suppliers*
APO11	*Manage Quality*
APO12	*Manage Risk*
APO13	*Manage Security*

Build, Acquire and Implement (BAI) domains have a subdomain process with the process description as follows.

Table 3
Domain Proses BAI

Nama Domain BAI	Deskripsi Proses
BAI01	*Manage Programmes and Projects*
BAI02	*Manage Requirements Definition*
BAI03	*Manage Solutions Identification and Build*
BAI04	*Manage Availability and Capacity*
BAI05	*Manage Organisational Change Entertaiment*
BAI06	*Manage Changes*
BAI07	*Manage Change Acceptance and Transitioning*
BAI08	*Manage Knowledge*
BAI09	*Manage Assets*
BAI10	*Manage Configuration*

Deliver, Service and Support (DSS) domains have a subdomain process with the process description as follows.

Table 4
Domain Proses DSS

Nama Domain DSS	Deskripsi Proses
DSS01	*Manage Operations*
DSS02	*Manage Service Requests and Incidents*
DSS03	*Manage Problems*
DSS04	*Manage Continuity*
DSS05	*Manage Security Services*
DSS06	*Manage Business Process Controls*

Monitor, Evaluate and Asses (MEA) domains have a subdomain process with the process description as follows.

Table 5
Domain MEA

Nama Domain MEA	Definisi Proses
MEA01	*Monitor, Evaluate and Assess Perfomance and Conformance*
MEA02	*Monitor, Evaluate and Assess the System of Internal Control*
MEA03	*Monitor, Evaluate and Assess Compliance With External Requirements*

D. RACI Charts

RACI Charts is a mapping of the forms of tasks, responsibilities, and roles performed by various parties, especially managerial in the implementation of information technology audits. RACI Charts in COBIT 5 play a role in making it easier for auditors to map the classification of related parties that will later be used as respondents in collecting questionnaire data. RACI consists of four types of entities, namely

1) Responsible, is someone or several parties acting as executors. In this entity, responsibility related to the implementation of technical tasks to completion is the responsibility of an organization.
2) Accountable, is a person or several parties acting in the supervision and direction of other entities that carry out business activities in an organization.
3) Consulted, is someone or several parties who act as providers of solutions, ideas, and mentors to other entities in carrying out business activities in an organization.
4) Informed, is someone or several parties who act as recipients of various information in the course of business activities in an organization.

E. Capability Model

Capability model is a measure of assessment in determining the level of performance achievement of the audit process. Capability models are carried out to make it easier for auditors to identify the extent and extent to which the organization achieves its business processes. The capability of the capability model is identified in several levels as in the following table.

Table 6
Index Capability Level

Indeks Kapabilitas	**Keterangan**
0 – *Incomplete Process*	The process is not implemented or fails to meet the process objectives
1 – *Performed Process*	The process is implemented and has reached the process objectives
2 – *Managed Process*	The process achieved at the previous level is managed and the work process is determined, controlled, and maintained
3 – *Established Process*	The process achieved at the previous level is implemented using a defined process and able to achieve results
4 – *Predictable Process*	The process achieved at the previous level is implemented within the boundaries or policies that are determined to achieve results
5 – *Optimising Process*	The process achieved at the previous level continues to be improved in order to achieve the expected business expectations and with more relevant results

III. RESEARCH METHODOLOGY

This research through a series of processes needed to achieve the expected results. The methodology carried out is illustrated in the following figure.

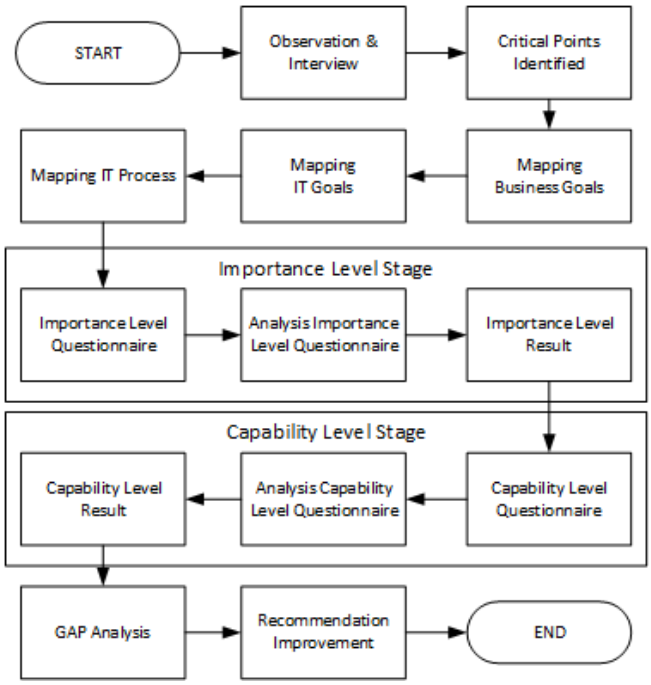

Figure 2 Research Methodology

The steps in this case study are mapped into several stages. The researcher observes the work environment in the LPD organization and conducts interviews with certain parties needed so that the researcher obtains a critical point or identifies the problems that occur in the LPD. The critical points identified will be mapped into COBIT 5 base practices, in the form of mapping business goals, IT goals, and IT Process.

At the stage of determining the level of importance, the identified IT Process is translated into a questionnaire that will be given to several respondents. The results of the questionnaire will be analyzed and the results obtained will determine which domains are the priority in identifying the level of capability in the next stage.

Achieving the capability level stage, the importance level process domain is translated into a questionnaire that will be given back to the respondents. Analysis of the results of the questionnaire will make it easier to identify the achievement of the level of LPD capability against the specified process domain.

The results of the capability level determine at what level the LPD organization reaches its business process. At this stage, LPD stakeholders or managerials provide expected achievements so that researchers can analyze gaps and provide a list of recommendations that are expected to be a consideration for LPD organizations in achieving business process expectations.

IV. RESULT AND ANALYSIS

The results of this study are reviewed in several explanations according to the design methodology described in the previous section. The researcher conducted an audit process with the Lembaga Perkreditan Desa in various

stages.

A. Identification of Critical Points

The critical point as a problem that occurs in the LPD business process is identified as follows.

1) Guarantees provided by customers are not comparable or smaller with the loan value of money given by the LPD.
2) The amount of the savings value experiences the difference between the records held by the customer in the passbook and the one recorded by the system.
3) The absence of competent staff and assigned to deal with problems in the event of a disruption to the system.
4) Redundancy of transaction data storage is entered into the system by staff.

B. Mapping Critical Points with Business Goals

The critical points identified in LPD business processes are mapped into Business Goals according to the COBIT framework 5. Business Goals that refer to COBIT 5 are based on [6] seen in the perspective of the Balanced Scorecard. The resulting mapping is described in Table 7 below.

Table 7
Mapping Critical Points with Business Goals

Critical Points	Business Goals
Guarantees provided by customers are not comparable or smaller with the loan value of money given by the LPD	5. Financial Transparency
The amount of the savings value experiences the difference between the records that the customer has in the passbook and those recorded by the system	3. Managed business risks (safeguarding of assets)
The absence of competent staff and assigned to deal with problems in the event of a disruption to the system	5. Financial Transparency
Redundancy of transaction data storage is entered into the system by staff	3. Managed business risks (safeguarding of assets)

C. Mapping Business Goals with IT Goals

Mapping based on identified business goals is continued by mapping them to IT Goals that refer to the COBIT framework in [6]. This mapping is described in Table 8 as follows.

Table 8
Mapping Business Goals with IT Goals

Business Goals	IT Goals
Managed Business Risk (safeguarding of assets)	4. Managed IT-related business risk
	10. Security of information, processing infrastructure and application
	16. Competent and motivated business and IT personel
Financial Transparancy	6. Transparency of IT costs, benefits and risk

D. Mapping IT Goals with IT Process

The next mapping is mapping the IT Goals identified against the IT Process. This process refers to [6] in the COBIT 5 framework. The mapping results will link IT Goals with process domains, be it EDM, APO, BAI, DSS, and MEA. The mapping process is described in Table 9 as follows.

Table 9
Mapping IT Goals with IT Process

IT Goals	IT Process				
	EDM	APO	BAI	DSS	MEA
4. Managed IT-related business risk	3	10, 12, 13	1, 6	1, 2, 3, 4, 5, 6	1, 2, 3
6. Transparency of IT costs, benefits and risk	2, 3, 5	6, 12, 13	9	-	-
10. Security of information, processing infrastructure and application	3	12, 13	6	5	-
16. Competent and motivated business and IT personel	4	1, 7	-	-	-

After this process is identified, the next process is to list questionnaires aimed at managerial parties and staff to determine the level of interest. The process of mapping IT Goals with IT Process produces 22 IT Processes from various process domains.

E. RACI Charts in Data Collection

Identification carried out before giving the Level of Questionnaire is to know the organizational structure and the number of managerial parties and staff within the LPD organization. The number of parties in the organizational structure that is known will make it easier for researchers to provide questionnaires for the process of collecting data as a process of analyzing importance. The number of managers and staff in the LPD organization are identified in the

following Table 10.

Table 10
LPD Organizational Structure

Position	Quantity
Head	1
Administration	1
Cashier	1
Savings Staff	3
Credit Staff	3
Credit Administration Staff	1

The identified organizational structure will be mapped back into a structure based on the RACI Chart. RACI Chart will provide an overview of the duties and responsibilities of each entity related to business activities in LPD organizations. The RACI Chart of LPD organizational entities is identified in Table 11 below.

Tabel 11
RACI Chart

Position	RACI			
	R	A	C	I
Head	✓	✓		
Administration			✓	✓
Cashier				✓
Savings Staff			✓	✓
Credit Staff	✓	✓		✓
Credit Administration Staff	✓			✓

F. Analysis of Importance Level

Analysis of the level of importance is done on the results of giving questionnaires given and assessed by respondents. The assessment indicators of the importance level questionnaire consist of five levels, including Very Not Important (STP), Not Important (TP), Sufficiently Important (CP), Important (P), and Very Important (SP). The value of each of these levels is worth from 1 to STP to the largest value 5 for SP. The results of the assessment of the importance level questionnaire obtained the results identified in Table 11 below.

Table 11
Result of Importance Level

No	COBIT 5 Domain Process	Respons					Score
		STP	TP	CP	P	SP	
1	BAI09					10	50
2	MEA03				1	9	49
3	EDM03				1	9	49
4	DSS05				2	8	48
5	DSS03				2	8	48
6	MEA01				2	8	48
7	EDM04				2	8	48
8	EDM05				3	7	47
9	APO13				3	7	47
10	EDM02				3	7	47
11	DSS01				3	7	47
12	APO07				4	6	46
13	DSS02			1	2	7	46
14	APO06				4	6	46
15	BAI06				4	6	46
16	DSS04				5	5	45
17	DSS06				6	4	44
18	APO01			1	5	4	43
19	MEA02			2	5	3	41
20	APO12		4	1	4	1	32
21	APO10	-	-	-	-	-	0
22	BAI01	-	-	-	-	-	0

Table 11 shows the results of the questionnaire of importance level assessed by respondents according to reality in business process activities in LPD organizations. Based on the results of the table, the auditor takes three process domains with the highest value for the questionnaire process and capability level analysis. The three process domains include:

1) BAI09 Manage Assets

The process domain in managing assets related to IT, responsibilities, and can ensure its use provides value at optimal costs [7].

2) MEA03 Monitor Evaluate and Asses Compliance With External Requirements

The process domain in evaluating and ensuring the organization is compliant and in line with all applicable external requirements [7].

3) EDM03 Ensure Risk Optimisation

Process domains in ensuring that organizational risks related to IT can be identified, managed, and various potential failures can be minimized [7].

Analysis of eight process domains outside of the process domain with a high importance value on the Very Important (SP) index as a sample description of LPD business processes is as follows.

1) DSS05 Manage Security Services

The DSS05 process domain regarding the management of security services has a fairly high level of importance, wherein the LPD case all staff to managerial understand the importance of security and guarantee the integrity of information. Various policies and maintenance in managing information so that it can be guaranteed and secure is an important task carried out by all parties in the LPD.

2) DSS03 Manage Problems

The domain of the DSS03 process on problem management has a high level of importance, where staff and managerial assesses that the ability carried out by the LPD to manage problems and understand a variety of causal factors is important as an effort to recommend improvements.

3) MEA01 Monitor, Evaluate and Assess Perfomance and Conformance

The domain of the MEA01 process is about monitoring, evaluating, and assessing performance and suitability that has a high level of importance, where business evaluation to achieve a level of performance compatibility is highly expected by the LPD so as to encourage the achievement of appropriate business goals.

4) EDM04 Ensure Resource Optimisation

The EDM04 process domain regarding assurance of resource optimization in LPDs has a high level of importance, where IT services and processes with employees who use them are important assessments to be evaluated so that they optimally support the LPD business process.

5) EDM05 Ensure Stakeholder Transparency

The EDM05 process domain of ensuring transparency of stakeholders has a lower level of importance than the domain previously described. The performance of IT services used is ensured and communicated transparently so that various reporting related to the performance of IT services is in line with the LPD business strategy.

6) APO13 Manage Security

The APO13 process domain describes security management, where staff and managerial assesses that management for information security from the use of IT services is considered important enough to minimize all company risks to the level of information integrity in the LPD.

7) EDM02 Ensure Benefits Delivery

The EDM03 process domain is about ensuring profit delivery related to IT service contributions to LPD business activities. The assurance that is done to assess how optimal IT services are provides the value of the benefits of delivering the LPD to the desired destination.

8) DSS01 Manage Operations

The DSS01 process domain of operations management explains the understanding of LPDs to carry out business activities by utilizing IT services that are in accordance with the mechanism or standard operating procedure so as to provide the results of IT services according to plan.

G. Analysis of Capability Level

The capability level analysis stage is the next step as the main outcome of the audit process to lead to the results in the form of recommendations. At this stage, the auditor prepares a questionnaire regarding the level of capability that refers to the COBIT 5 framework on [8]. The questionnaire assessed by the respondent can identify the achievement of the capability level in the process domain BAI09, MEA03, and EDM03 at the level described as follows.

1) The BAI09 domain process achieves a capability level of 81.85% at level 2. This level indicates that the BAI09 process domain on the LPD, IT-related assets has been identified as a service provider that has the capability and gradually maximizes reliability and availability in supporting the required business processes.

2) The EDM03 domain process achieves a capability level of 83.9% at level 4. This level indicates that the EDM03 process domain in the LPD, the applied risk management has been optimally implemented. LPD guarantees optimizing risks related to business activities that are in line with IT services that are in line with the expected results.

3) The process of MEA03 domains reaches a value of 85% capability level 4. This level indicates that the domain of the MEA03 process in the LPD, compliance with rules and external laws related to the use of information technology has been implemented. Various standards, SOPs, and business activities that utilize IT services in processing information have been complied with.

H. Recommendation Improvement

Recommendation improvements that can be given to improving the achievement of capability levels based on the gap values obtained are as follows:

1) Periodic maintenance of IT assets, monitoring performance, and analyzing various possible incidents of failures that occur so that risks can be minimized.

2) Evaluate overall IT assets used and assess the extent to which IT assets are aligned with business activities.

3) There is good communication with customers who experience the impact of using IT assets so that the failure rate of an incident can be overcome.

4) Actively coordinate the control of risk management to authorized central institutions, such as the LPD Cooperation Agency and the LPD Empowerment Institutions in both districts and provinces.

5) Evaluate policies, standards, SOPs, and LPD business activities in various service fields so that they can be ensured according to compliance with legal requirements and rules related to information processing.

V. CONCLUSION

The conclusion from the results of the analysis conducted shows that the level of capability achieved by the LPD in the process domain with the highest importance level values is EDM03, MEA03, and BAI09. The scale of the process domain based on capability level analysis shows that LPD business activities have identified various business risks and are compliant with laws and regulations related to IT policies. However, an evaluation is needed regarding how the LPD attempts to manage and use IT service assets so that they can be aligned to meet LPD business objectives.

The recommendations given are expected to be a decision support to stakeholders or managerial in the LPD to achieve the expected level of capability by making improvements to the process domain which has the largest gap value.

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