INFORMATION TECHNOLOGY SERVICES MANAGEMENT AUDIT USING THE COBIT AND ITIL FRAMEWORK

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Abstract: Utilization of IT can provide services to the community, encourage convenience in public services at a more affordable cost and performance efficiency. IT governance that includes leadership, organizational structure, and processes in its management ensures that IT is utilized as optimally as possible to meet current and future needs of the organization. The Population and Civil Registration Office of Kubu Raya Regency utilizes IT in carrying out public service activities using the SIPEMUDA Application. An information system audit is needed to improve system performance. In this study, using the Control Objective for Information and Related Technology (COBIT 2019) to determine whether the organization's needs have been supported by management and the Information Technology Infrastructure Library (ITIL 4) domain service management to determine suggestions for improvement. Capability level assessment in this study using COBIT Performance Management. The results of the capability assessment are that there are 6 processes reaching level 1, 33 processes reaching level 2, 28 processes reaching level 3, 18 processes reaching level 4, 7 processes reaching level 5 while the level that does not meet the capabilities is 19 processes. Furthermore, the results of process recommendations that do not meet the capabilities are prioritized using the Action Priority Matrix.

Keywords: action priority matrix, cobit 2019, cobit performance management, itil 4, public service

Abstrak: Pemanfaatan TI dapat memberikan pelayanan kepada masyarakat, mendorong kemudahan dalam pelayanan publik dengan biaya yang lebih terjangkau dan efisiensi kinerja. Tata kelola TI yang mencakup kepemimpinan, struktur organisasi, dan proses, dalam pengelolaannya untuk memastikan bahwa TI dimanfaatkan seoptimal mungkin memenuhi kebutuhan organisasi saat ini dan yang akan datang. Dinas Kependudukan dan Pencatatan Sipil Kabupaten Kubu Raya memanfaatkan TI dalam melaksanakan kegiatan pelayanan publik menggunakan Aplikasi SIPEMUDA. Audit sistem informasi diperlukan untuk meningkatkan kinerja sistem. Dalam penelitian ini, menggunakan *Control Objective for Information and Related Technology* (COBIT 2019) menentukan apakah kebutuhan organisasi sudah didukung oleh pengelolaan serta *Information Technology Infrastructure Library* (ITIL 4) domain *service management* untuk menentukan saran perbaikan. Penilaian level kapabilitas pada penelitian ini menggunakan *COBIT Performance Management*. Hasil penilaian kapabilitas yaitu terdapat 6 proses mencapai level 1, 33 proses mencapai level 2, 28 proses mencapai level 3, 18 proses mencapai level 4, 7 proses mencapai level 5 sedangkan level yang tidak memenuhi kapabilitas yaitu 19 proses untuk diberikan rekomendasi. Selanjutnya hasil rekomendasi proses tersebut diprioritaskan menggunakan *Action Priority Matrix*.

Kata kunci: action priority matrix, cobit 2019, cobit performance management, itil 4, pelayanan publik.

INTRODUCTION

Information Technology (IT) is a service to facilitate the work of organizations or institutions. IT orientation and performance are directly proportional [1], so that with optimal IT capabilities it will produce appropriate performance, get the expected value, improve performance and productivity [2].

One of the inhibiting factors is the low level of IT service management [3]. Therefore as an organization it has its own need to maintain the system properly.

One of the institutions conducting IT governance is the Population and Civil Registration Office (DISDUKCAPIL) of Kubu Raya Regency which is engaged in population administration. One of the services is the SIPEMUDA Application (Easy to Get Aminduk Service System) to facilitate the community in carrying out population administration. IT service management audit is needed to ascertain the extent of the functional level of IT services and provide recommendations for improving IT service management [4].

This study uses the 2019 COBIT (Control Objective for Information Technologies) framework and ITIL (Information Technology Infrastructure Library) 4. This study uses COBIT 2019, the CPM (Cobit Performance Management) method, a model that contains a basic framework in providing guidelines for assessing and measuring capability level relating to IT governance and management processes [5].

This study measures the gap to what extent the level of capability of the management role of information technology service management and the implementation of objectives in order to obtain recommendations to improve the quality of information technology service governance in these applications. Optimizing the implementation of IT governance can be achieved by using a framework, namely ITIL which describes best practices in managing IT services [6], providing the guidelines needed by organizations to handle service management for the use of modern technology [7].

By implementing the SIPEMUDA DISDUKCAPIL Application Service in Kubu Raya Regency which facilitates population administration so that it is necessary to improve the management of service quality, this research uses ITIL 4 domain service management containing 17 practices, each practice has a service value chain, namely an operating model that emphasizes activities that needed to respond to needs and facilitate value creation through products and services.

METHOD

In this study, the ITIL 4 domain service management service value chain components were used providing the guidelines needed by organizations to handle service management for the use of modern technology. There are 17 domain service management [6].

The service value chain includes six value chain activities that lead to the creation of products and services that provide value. The components in these 6 activities will be mapped with the 2019 COBIT core model.

Mapping predefined ITIL 4 domain components to COBIT 2019 objective process for selection of activities to be measured. There are 68 COBIT 2019

processes that have been mapped to each of the ITIL 4 domain service management service value chains, selecting activities from the relevant COBIT 2019 processes. The mapping results can be seen in tables 1 to 17:

Table 1. Availability Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	APO09.01
	BAI04.02
	APO09.03
Design and Transition	BAI04.02
Engage	BAI04.01
Deliver and Support	BAI04.04
Improve	BAI03.11

Table 2. Business Analysis Mapping

ITIL 4 Processes	COBIT 2019
Obtain	DSS04.01
Deliver and Support	BAI03.11
Improve	EDM02.02
	BAI02.02
Engage	APO04.05
Design and Transition	BAI02.02
	APO04.04

Table 3. Capacity and Performance Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	BAI04.03
Improve	BAI04.01
	APO09.04
Engage	EDM02.04
	EDM04.01
Design and Transition	BAI04.04
Obtain	EDM02.02
Deliver and Support	BAI07.08

Tabel 4. Change Control Management

ITIL 4 Processes	COBIT 2019
Plan	BAI06.01
	DSS04.05
Improve	APO09.01
	BAI06.01
	BAI03.09
Engage	APO08.04
Design and Transition	DSS03.05
Obtain	APO05.03
Deliver and Support	BAI05.01
	APO11.02

Table 5. Incident Management Mapping

ITIL 4 Processes	COBIT 2019
Improve	DSS02.02
Engage	DSS03.01
	DSS03.04
	DSS02.06
Design and Transition	DSS03.02
Obtain	DSS02.05
Deliver and Support	DSS02.04

Table 6. IT Asset Management Mapping

ITIL 4 Processes	COBIT 2019
Design and Transition	BAI09.04
	BAI09.02
	BAI09.01
Deliver and Support	BAI09.03
Obtain	BAI09.01
Improve	EDM02.02
	BAI09.01
	BAI09.04

Table 7. Monitoring and Event Management Mapping

ITIL 4 Processes	COBIT 2019
Improve	MEA01.01
	APO09.01
Engage	MEA01.01
Design and Transition	DSS01.03
	DSS03.01
Obtain	DSS02.01
Deliver and Support	DSS03.01

Table 8. Problem Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	DSS02.02
Improve	DSS03.02
	DSS02.07
Engage	DSS03.04
	DSS02.01
Design and Transition	DSS03.01
	DSS03.02
Obtain	DSS03.05
Build	DSS03.03
	DSS02.05
	DSS02.04
Deliver and Support	DSS03.04
	DSS02.04
	DSS03.05

Table 9. Release Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	BAI07.01
Improve	BAI07.06 BAI07.01
Engage	BAI07.01
Design and Transition	BAI07.06 BAI07.07
Obtain	BAI01.06
Deliver and Support	BAI07.06

Table 10. Service Catalogue Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	APO05.03
Improve	APO05.03
Engage	APO09.03
Design and Transition	APO9.03
Obtain	APO09.02
Deliver and Support	APO05.05 APO08.01

Table 11. Service Configuration Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	BAI10.01 BAI03.03 BAI03.05
Improve	BAI10.02 BAI10.04
Engage	BAI10.05 BAI10.03
Design and Transition	BAI09.01 BAI10.01
Obtain	BAI10.03
Deliver and Support	DSS04.07

Table 12. Service Continuity Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	DSS04.08 DSS04.05
Improve	DSS04.05 DSS04.08
Engage	DSS04.03
Design and Transition	DSS04.01 BAI03.11
Obtain	DSS04.02 DSS04.03
Deliver and Support	DSS04.04

Table 13 Service Design Mapping

ITIL 4 Processes	COBIT 2019
Plan	BAI11.08
Improve	BAI03.11
Engage	BAI03.01
Design and Transition	BAI03.01
Obtain	APO09.01
Deliver and Support	APO08.05 APO09.04

Table 14 Service Desk Mapping

ITIL 4 Processes	COBIT 2019
Improve	APO08.05
Engage	DSS03.04
Design and Transition	BAI02.04
Deliver and Support	DSS03.01

Table 15. Service Level Management Mapping

ITIL 4 Processes	COBIT 2019
Plan	APO02.03 APO09.04
Build	APO11.02
Improve	APO08.05
Engage	BAI02.01
Design and Transition	BAI03.11
Deliver and Support	APO08.01

Table 16. Service Request Management Mapping

ITIL 4 Processes	COBIT 2019
Improve	DSS02.07
Engage	DSS02.07
Obtain	DSS02.03
Deliver and Support	DSS02.06

Table 17. Service Validation and Testing Mapping

ITIL 4 Processes	COBIT 2019
Improve	BAI07.01
Engage	BAI07.01 BAI07.03
Design and Transition	BAI07.03
Obtain	BAI07.01
Deliver and Support	BAI07.05 DSS03.04

Conduct functional mapping of the organizational structure of DISDUKCAPIL for Kubu Raya Regency to the functional RACI Chart COBIT 2019, namely accountable [8]. The results of the organizational structure functional mapping can be seen in table 19:

Research Informants	Head of Population Administration Information Management and Data Utilization
COBIT 2019 Processes	
EDM02.02, EDM02.04, EDM04.01, BAI05.01, DSS04.05, DSS04.08, MEA01.01.	
Research Informants	ADB Population (SIAK)
COBIT 2019 Processes	
APO02.03, APO04.04, APO04.05, APO05.03, APO05.05, APO08.01, APO08.04, APO08.05, APO09.01, APO09.02, APO09.03, APO09.04, APO11.02, BAI01.06, BAI02.01, BAI02.02, BAI02.04, BAI03.01, BAI03.03, BAI03.05, BAI03.09, BAI03.11, BAI04.01, BAI04.02, BAI04.03, BAI04.04, BAI05.01, BAI06.01, BAI07.01, BAI07.03, BAI07.05, BAI07.06, BAI07.07, BAI07.08, BAI09.01, BAI09.02, BAI09.03, BAI09.04, BAI10.01, BAI10.02, BAI10.03, BAI10.04, BAI10.05, BAI11.08, DSS01.03, DSS02.01, DSS02.02, DSS02.03, DSS02.04, DSS02.05, DSS02.06, DSS02.07, DSS03.01, DSS03.02, DSS03.03, DSS03.04, DSS03.05, DSS04.01, DSS04.02, DSS04.03, DSS04.04, DSS04.05, DSS04.07, DSS04.08, MEA01.01	

Data collection in this study was in the form of a questionnaire using the Guttman scale as a measure of the variable with the answer options "Yes" or "No". The process capability level stage finds the level of ability that is in accordance with the IT governance system. Based on the characteristics of the defined capability level. Calculate the capability assessment based on the measurement scale in table 19:

Table 19. Rating Process Activity

Scale	Called	%
N	Not Achieved	0-14
P	Partially Achieved	15 - 49
L	Largely Achieved	50 - 84
F	Fully Achieved	85-100

The method of data analysis using COBIT Performance Management is that each process in the organization lists regardless of its governance goal score and management's desired rating (N, P, L or F) should be assigned to each activity at that level. Furthermore, the organization should proceed as follows if all the activities of that level in each exercise have been rated L or F, this process must at least meet the requirements of that level. If there is an activity of that level in all process practices that is rated N or P, then one can evaluate whether to achieve the goals specified for this process is necessary, or how to achieve its goals, if required then the previous capability level should be the target of the process or if not, the process must be ruled out [9]. After analyzing the data, it can produce a gap analysis between the results of the assessment of the activity process and the capability level that has been determined by COBIT 2019.

Provide recommendations for improvements that can be made using the action priority matrix from the results of an impact and effort assessment ranging from 1 to 10.

Image 1. *Action Priority Matrix Diagram*

In Image 1 is a quadrant diagram that can help take advantage of opportunities. Analysis to facilitate decision making and determine which activities must be completed first on two scales: first on the impact that will be caused by the activity (y axis) and second on the effort involved (x axis).[10]

RESULT AND DISCUSSION

Based on the ranking of 17 process domains, the results of measuring capacity level availability management, change control, release management, service configuration management, service design and service desk have fulfilled all capability levels.

Table 20. Business Analysis Assessment

Processes	*Level*	Q	Yes	No	Amount	Scale	GAP
Obtain	2	2	2	0	100%	Fully	0
Deliver and Support	3	1	1	0	100%	Fully	0
Improve	2	2	2	0	100%	Fully	-1
	3	1	0	1	0%	Not	
Engage	3	2	2	0	100%	Fully	0
Design and Transition	2	2	2	0	100%	Fully	0
	3	1	1	0	100%	Fully	
	4	1	1	0	100%	Fully	

The measurement results in table 20 show that the process of improving the measurement scale value is noot so that

it is only reached at level 2, the organization can carry out high-level development.

The measurement results that have not been achieved in the capacity and performance management domain are the process of improving that the organization does not identify incidents caused by performance/capacity, and the deliver and support process does not have procedures regarding information processing.

The measurement results that have not been achieved in the incident management domain are the process of improving that the organization does not have a history of incident recording.

The measurement results that have not been achieved in the IT asset management domain are the design and transition process where there is no application maintenance schedule and statistics on asset capacity usage, the deliver and support process does not record assets, the acquire process does not have asset usage procedures.

Measurement results that have not been achieved in the monitoring and event management domain, namely the improve process that does not evaluate existing service component requests (IT services, service level options) into new service packages, the engage process does not communicate organizational requirements and goals in carrying out IT monitoring , and the design and transition process does not contain rules for violating event thresholds, the obtain process does not stipulate rules and procedures for incident escalation.

The measurement results that have not been achieved in the problem management domain are the plan process that does not classify service incidents, the improve process does not contain problem pattern rules and the build

process does not document incident resolution.

The measurement results that have not been achieved in the service catalog management domain, namely the deliver and support process, show that there are no goal achievement metrics.

The measurement results that have not been achieved in the service continuity management domain, namely the plan process does not have a continuity capability plan review, the improve process does not have an improve process, there is no business continuity plan assessment list, the deliver and support process does not have continuity plan scheduling.

The measurement result that has not been achieved in the service level management domain is the obtain process where there is no documentation of the proposed service option portfolio.

The measurement results that have not been achieved in the service request management domain are the obtain process and the absence of an automatic service request process.

The measurement results that have not been achieved in domain service validation and testing are the improve process without a business risk review.

Processes that do not meet the predetermined capabilities require recommendations for improvement as shown in Image 2
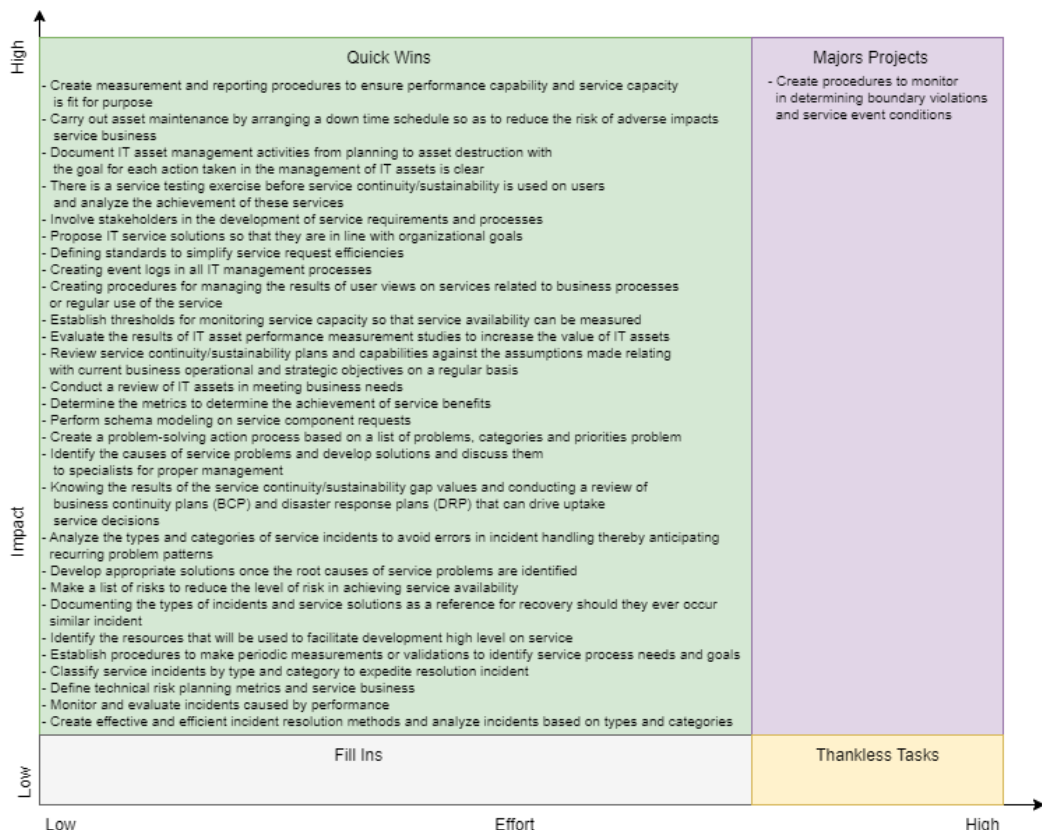

Image 2. Result Action Priority Matrix Diagram

CONCLUSION

The IT service management audit process can be carried out by mapping the service value chain components in ITIL 4 domain service management with COBIT 2019 processes so that focus areas can be produced which can be controlled to measure the level of capability. The results of measuring the capability level based on the COBIT Performance Management (CPM) measurement scale are 6 processes reaching level 1, 33 processes reaching level 2, 28 processes reaching level 3, 18 processes reaching level 5.

Governance recommendations for the SIPEMUDA DISDUKCAPIL Application in Kubu Raya Regency are obtained from a GAP analysis or the difference between the fact value and the capability value determined by COBIT 2019 for each process to be improved, there are 19 processes that do not meet the capabilities determined by COBIT 2019. Results of analysis from action priority The matrix is carried out by determining which activities can be prioritized by organisation, then put into the action priority matrix quadrant, namely quick wins 26 activities and major project 1 activity.

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