Infrastructure Evaluation of TEPRA Information System Application for Development Administration Section of Gianyar Regency

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Abstract - The development of information technology that has developed in government is very helpful in the process of managing government infrastructure. In the Gianyar Regency Development Section which has implemented a system, namely the TEPRA. TEPRA is a system used to carry out the process of monitoring the realization of the budget given to each OPD (Organisasi Perangkat Daerah) in Gianyar Regency to find out any problems or obstacles that might occur when realizing the program of each related OPD. The frequent mistakes made by TEPRA Operators in completing data information about the program of the relevant OPDs are the reason that it is necessary to carry out an audit of the TEPRA information system. The audit process of the TEPRA information system uses a framework, namely COBIT 4.1. In the research process carried out using COBIT 4.1 and with a total of 110 respondents consisting of the Head of the Bagian Pembangunan, the Head of the Sub-Division of Pengendalian and Pembangunan , TEPRA Staff, and TEPRA Operators in each related OPD, resulting in a maturity level of 3.09 (defined). From the results obtained, generally the TEPRA system has been running or implemented properly. With this maturity level, there is a maturity gap so that improvements need to be made in order to achieve the expected maturity level.

Keywords- TEPRA, Audit, COBIT 4.1, Information System, Governmen Infrastructure, Gianyar Regency.

I. INTRODUCTION

Administration Development in Gianyar regency is a under of Assistant Economic Administration and Development in Regional Secretariat Organizational Structure. The development section has three Sub. Part namely Sub. Program Development Section, Sub. Regional Facilities Improvement Section, Sub. Control and Development Section. One of the work programs of the Control and Development Division is to carry out the process of monitoring the realization of the budget given to each OPD (Regional Apparatus Organization) in Gianyar [1]. Sub. The Control and Development Section of Gianyar Regency in the process of supervising any realization of the budget given to work programs at the relevant OPD has run an application program, namely the TEPRA system. The TEPRA system (Budget Realization Evaluation and Supervision Team) is a system designed to be able to supervise the process of budget realization that has been realized in each OPD. Sub. The Control and Development Division carries out a supervisory process for 98 OPDs in Gianyar Regency. Supervision is carried out regarding the suitability of the work program of each OPD that has been given a budget whether it has been realized or not and when the monitoring process is found an OPD does not include problems and efforts to resolve the work program where problems are found during the supervision process, it will be given notification to OPD related to complement it.

An evaluation process of the performance of the system is needed in order to find out whether the application program has been operated in accordance with the objectives of the TEPRA application program. In the process of evaluating the performance of the TEPRA system, it can be done using a variety of frameworks, one of which is the COBIT 4.1 framework. COBIT 4.1 (Control Objectives for Information and Related Technology) is a framework consisting of 4 domain parts with 34 processes for conducting an audit process that has work standards and control standards for information technology [9]. There are various studies that have chosen the COBIT 4.1 framework as a framework in the audit process carried out. The first example of research is the research conducted by Jaya who conducted an audit process on the implementation of the regional information system (SIMDA Finance) in the Klungkung Regency Government. In this study, researchers used the COBIT 4.1 framework as a framework for conducting the regional information system audit process (SIMDA Finance) with the aim of the audit being carried out, namely knowing the maturity level of application implementation. And it produces a maturity level from the

application of the application in each sub-domain PO1, PO2 and PO7 with maturity at level 3.And the second example of research is the research conducted by Laksmidewi who carried out the audit process on the Personnel Management Information System at the Bali Provincial Government using COBIT 4.1 as a framework for conducting an audit process on an information system that focuses on the Deliver and Support domain, especially DS5 (System Security) and DS9 (Configuration Management). The system evaluation is based on questionnaire data information with the determination of respondents using the RACI table. The results of the evaluation of the Personnel Information System show that the percentage index achieved by each DS5 and DS9 subdomain is above 66.66% on average, and some of them obtain a percentage index between 33.33% -66.66%. And in the third research example is the research conducted by Dewi who carried out the audit process on the Public Service Application Infrastructure of the Denpasar Regency Government. In this study, researchers used the COBIT 4.1 framework as a framework for conducting an audit process on the Denpasar City Government Public Service Application with the aim of the audit being carried out, namely to assist in the process of improving the quality of infrastructure and also to improve the quality of public services in Denpasar City. And from the results of research conducted to obtain audit results using the Maturity Model with the maturity level of the AI3 process at level 3, the objective assessment is between level 3 and level 4.

Based on the results of the supervision carried out by the Sub. The Control and Development Division, many of the related OPDs, still have some errors such as the absence of causes of problems and the absence of solutions to problems arising from unrealized work programs. Therefore an internal audit evaluation on the TEPRA system is needed so that the Development Department can plan for improvement and enhancement and development of the information system that has been built. The research conducted will discuss how the maturity level of governance of the TEPRA Information System in Gianyar Regency using the COBIT 4.1 framework. The audit process uses the COBIT 4.1 framework which includes all available domains in the framework that has the opportunity to obtain comprehensive analysis and evaluation results.

II. BASIC THEORY

A. TEPRA

Tim Evaluasi dan Pengawasan Realisasi Anggaran (TEPRA) was created to help carry out the supervision process of budget realization in order to improve the budget absorption process and to help narrow the target gap from budget realization. In addition, the TEPRA system is also used to optimize the process of budget realization performance and can assist in the consistency process between the realization of work programs and work program plans.

TEPRA system has several functions, namely the system must be able to provide information to assist in the development supervision process so that the budget from the government can be optimally realized, then the system must be able to provide information related to problems from the budget realization process and the efforts that each OPD has tried to solve the problem such that Sub. The Control and Development Division can provide solutions to problems that occur. In addition, for the process of the TEPRA report, the system must also be able to display information from the realization of the OPD related budget every month.

B. COBIT 4.1

Control Objectives for Information and Related Technology (COBIT) is a framework that has been developed by ISACA (Information Systems Audit and Control Association) and ITGI (IT Governance Institute). The COBIT framework is used to be a tool that can be used to assist the monitoring process and measure the performance value of information technology or information systems that have been used or have been implemented.

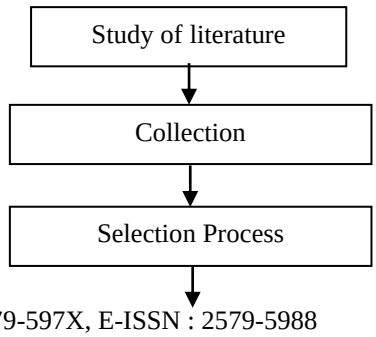
In the use of the COBIT framework, there are several assessment parameters that can assist in the process of measuring the level of management and performance of an information system or information technology that is used in the form of measurement in the maturity model. [10] Maturity model is used to measure the maturity level based on the process of using the system or related information technology so that it can be a reference source in the process of evaluation and improvement of the system or information technology used to obtain a greater maturity level [3]. In the COBIT framework there are also four domains that are used to carry out the identification process, namely the first domain is the PO (Planning and Organization) domain which focuses on identifying processes or ways to be able to make the best contribution from the system or related technology to achieve goals. The second domain is the AI (Acquisition and Implementation) domain which functions to be able to assist in the stage of realizing the strategy of an information technology or system by identifying, developing or searching, as well as carrying out the implementation process and the integration process of information technology solutions. The third domain is DS (Delivery and Support) which is related to the process of implementing services needed by information systems or technology, the process of managing the security and sustainability of systems or related information technology, supporting services for users, as well as processes for managing data and managing operational facilities. The fourth domain is ME (Monitoring and Evaluate) which consists of a process of periodic assessment and supervision of the quality and conformity to the rules and control requirements used [12].

III. METHODOLOGY AND DATA COLLECTION TECHNIQUES

This research aims to conduct an audit process of the TEPRA information system to determine the current maturity level of the information system that has been running and implemented. The results of the research process carried out are expected to obtain appropriate recommendations to close the maturity gap in order to achieve the maturity level as desired. The COBIT framework is used as a medium for conducting the audit process because the COBIT framework has management guidelines that provide information for carrying out certain control, measurement and regulatory processes [11]. The COBIT framework is also used as a reference in the process of compiling the questionnaire that will be distributed to the Sub. Control and Development Division and all TEPRA operators. The results of the questionnaire will be used as a source of data information for measuring the maturity level of the TEPRA information system in Gianyar Regency and determining the expected maturity target. The research was conducted using qualitative methods, and for the data collection process, data processing, and data analysis and the process of drawing conclusions based on the results of the audit process using the maturity level in the COBIT 4.1 area. In the data collection process using interview techniques, observing the state of technology in Gianyar Regency and distributing questionnaires for users who use the TEPRA information system. In research, an audit process of academic information system performance was carried out to provide evaluation results regarding the ability of the TEPRA information system to help provide information related to the realization of the budget for each OPD in Gianyar Regency. Based on the research conducted will use the Plan and Organization (PO) domain, namely PO2, PO3, PO4 and PO7, Acquire and Implement (AI) AI3 and AI5, Deliver and Support (DS), namely DS1, DS3, DS6, DS9, DS11 and DS13 and Monitor and Evaluate (ME) ME1 and ME4. The maturity level process in this study is obtained based on the analysis process of the fourteen processes contained in the COBIT 4.1 framework. [9] Measurement tingkat maturity didapatkan dengan mengukur indeks maturity pada setiap atribut maturity. Indeks maturity akan dianalisis berdasarkan informasi data dari hasil kuisioner yang disebarkan dengan mengacu pada diagram RACI.

A. Research Stage

The stages of the audit process of the TEPRA Information System can be seen in Figure 1.



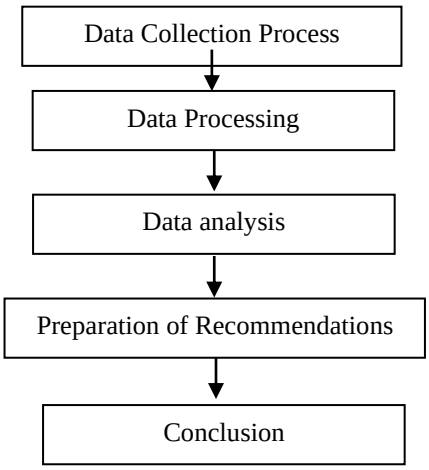


Figure 1: Research Stage

The stages of the audit process carried out are the selection of the processes used based on COBIT 4.1 and carrying out the interview stage, conducting the observation process and distributing questionnaires for users of the Tepra Information System. The results of the interview and observation process become data information in the preparation of the RACI and the results of distributing questionnaires will be processed to obtain a maturity level as a result of the evaluation of the TEPRA Information System.

B. Mapping of Respondents and Questionnaires

The results from the interview process and the observation process obtained become a reference in the process of preparing the RACI table. RACI (Reponsible, Accountable, Consulted, and Informed) consists of four parts according to the abbreviation of the word, namely Responsible, which is the user who carries out the instructions. And Accountable which is a user who decides a policy and is responsible for that policy. Consulted who is the party who communicates and provides a consideration regarding policy decisions to be made. Informed, which are users who receive reports regarding the progress of a policy that has been or will be taken. The RACI table will present the users involved in the operation of the TEPRA Information System. From the organizational structure, the results of the interview process and the observation process obtained that the relevant users are the Head of the Development Section, the Head of the Sub. Control and Development Division, TEPRA System Team Staff, and TEPRA Operators from each OPD. From the results of the recommendations for the COBIT 4.1 framework, a respondent mapping was prepared in the form of an RACI table. The RACI table on the audit process of the TEPRA Information System is shown in table 1. Contains information related to business processes, tasks and functions of the related users obtained during the interview and observation process. And users who are respondents to this research data based on the RACI table are only users who are directly involved in accordance with the recommendations of the COBIT 4.1 framework. The number of users who will be used in this study is 110 people consisting of internal parties. Table 2 will display information related to internal parties.

Table 1 : Raci's Diagram

Process		Head section of Administration Development	Head of Sub. Control and Development Section	Staff TEPRA Information System	TEPRA operator in each OPD
Plan and Organise					
PO2	Planning Information Architecture	A	R		
PO3	Planning Technology Direction		A	R	
PO4	Set Process in Each Unit	C	A	R	
PO7	Planning IT Resources	C	A	R	R
Acquire and Implement					
AI3	Maintaining IT Infrastructure		A	R	R
AI5	Procurement of IT Resources		A	R	I
Deliver and Support					
DS1	Manage Service Levels	C	A/R	R	R
DS3	Managing Performance		A/R	R	R
DS6	Identify and allocate costs		A	R	
DS9	Managing Configurations		C	A/ R	R
DS11	Managing Data	C	A	R	R
DS13	Manage Operations		C	A	R
Monitor and Evaluate					
ME1	Monitor and Evaluate IT Performance	C	A/R	R	R
ME4	Provides IT Governance	C	R	R	R

Table 1 : Internal User TEPRA

No	Respondents	Amount	Explanation
1	Head section of Administration Development	1	Executive Section Development Administration
2	Head of Sub. Control and Development Section	1	Person Responsible for monitoring TEPRA System
3	Staff TEPRA Information System	10	Supervisory officer
4	TEPRA operator in each OPD	98	Officer for data entry of budget realization for each OPD
Total Respondents		110	

IV. Results and Discussion

A. Calculation of Maturity Level

The calculation of the maturity level is carried out in stages using COBIT 4.1. In the process of Maturity Assessment Tools are used in each process that has been selected and the calculation process will be carried out at the maturity level based on the statements in the COBIT 4.1 standard. And the results of the calculation process will be sorted on the maturity index with the maturity index which can be seen in table 3. Maturity levels will describe the maturity of the TEPRA information system. The calculation on the level of maturity will be carried out by calculating the level of compliance of each level and then normalized to obtain the level of compliance and followed by calculating the value of the contribution. The PO2 calculation results that define the results of the information architecture can be seen in table 4. In the data processing that has been carried out, the current maturity level is classified as good, namely the maturity level of 3.09 (defined). Broadly speaking, this indicates that the TEPRA system has standardized, documented and communicated procedures. The Sub Division of Control and Development has provided direction so that each process must be followed, but the implementation process is given to each operator in their respective OPD, so that the possibility of a mismatch or deviation may occur. Although it already has standard procedures that have been running, it is only a formality for current development. The IT process maturity target is the expected process maturity level and will be used as a reference in the system development process.

Table 3 : Index Representation

Index Maturity	Level Maturity
0 – 0.49	0 – Non Existent
0.50 – 1.49	1 – Initial / Ad Hoc
1.50 – 2.49	2 – Repeatable but Intuitive
2.50 – 3.49	3 – Defined Process
3.50 – 4.49	4 – Managed and Measurable
4.50 – 5.00	5 – Optimised

Table 4 : Compliance Level, Contribution, and Score

Level	Compliance Level	Contribution	Score
0	0.33	0.00	0.00
1	0.83	1.00	0.83
2	0.67	1.00	0.67
3	0.83	1.00	0.83
4	0.67	1.00	0.67
5	0.57	1.00	0.57

Table 5 : Level Maturity Process

Process		Maturity	Explanation
PO2	Planning Information Architecture	3.35	Defined
PO3	Planning Technology Direction	3.07	Defined
PO4	Set Process in Each Unit	3.19	Defined
PO7	Planning IT Resources	2.81	Defined
AI3	Maintaining IT Infrastructure	3.18	Defined
AI5	Procurement of IT Resources	3.04	Defined
DS1	Manage Service Levels	2.70	Defined
DS3	Managing Performance	3.09	Defined
DS6	Identify and allocate costs	3.14	Defined
DS9	Managing Configurations	3.15	Defined
DS11	Managing Data	3.96	Defined
DS13	Manage Operations	3.14	Defined
ME1	Monitor and Evaluate IT Performance	3.32	Repeatable but Intuitive
ME4	Provides IT Governance	3.38	Repeatable but Intuitive
Maturity level average		**3.09**	**Defined**

V. CONCLUSION

Based on the research conducted, it has succeeded in conducting an audit process on the TEPRA Information system using a COBIT-based approach. By using the measurement of the performance of the TEPRA system, it can be seen that the mechanisms of IT management related to the implementation of the TEPRA Information System in Gianyar Regency have been implemented well and have resulted in a maturity level of 3.09. And in order to achieve a maturity level of 5 or an optimal level, with the maturity gap, there will be a need for an improvement that includes the stages to get the expected maturity level. Suggestions that can be given for future research are to carry out a mapping process based on research carried out using references from ITIL. So that improvements to systems that have gone through the audit stage can be improved to achieve the expected maturity level.

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