AUDIT OF ACCOUNTING INFORMATION SYSTEM GOVERNANCE USING THE COBIT 5 FRAMEWORK (CASE STUDY: CV. XYZS)

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Abstract

CV. XYZ is a producer of handicrafts for local and international markets. This company uses a desktop-based Quickbooks Accounting System in carrying out accounting transactions, from the transaction input process to the report generation process. However, in its application at CV XYZ, there are still obstacles experienced by users or admin employees, so an in-depth study is needed regarding the management of the Quickbooks Accounting System by auditing the information system so that recommendations can be made in improving IT management. Good IT management will result in the alignment of business goals and strategies, and can improve, develop business and optimize business process costs. This research only focuses on the APO06, BAI04 and DSS01 domains. From the audit results, CV XYZ obtained the current maturity level with an average of 1.4 which is at level 1 (Performance) and the expected maturity level is level 3 (Established) so that it has an average gap (GAP) of 1.6.

Keywords: COBIT 5, APO06, BAI04, DSS01, Accounting System.

INTRODUCTION

CV. XYZ is a handcraft company for both domestic and foreign markets. This organization performs accounting transactions using a desktop-based Quickbooks Accounting System, from transaction entry to report production. Accounting procedures may be conducted more quickly, practically, and accurately with Quickbooks Accounting System, allowing businesses to optimize business process expenses. This software connects nine clients to one server over a LAN (Local Area Network) network in its application.

The Quickbooks Accounting System is an integrated accounting information system. CV. XYZ employees constantly back up their files to avoid unexpected problems or file loss. However, users and administrative workers continue encountering issues when using it. According to the findings of interviews with accounting managers and administrative staff, the Quickbooks system could be faster and even had errors when staff was entering data. There needed to be a specific budget for updating IT assets, resulting in delays in repairs for problematic technology assets. Because of these limits, the accounting process cannot be completed rapidly. There is a gap between what is expected and the actual situations in deploying accounting information systems. As a result, an in-depth investigation into the management of the Quickbooks Accounting System is necessary by auditing the information system.

Accounting information system audits are carried out using the COBIT 5 framework. This framework chose because it makes it easier for auditors to deal with technical problems and to identify company needs [1]. In addition, COBIT assists in making recommendations for corporate organizational

management, strengthens IT management, and companies can achieve their goals more quickly. Previous research about system audit research that uses the COBIT framework is the research titled " Enterprise Asset Management System Audit Using the Cobit 5 Framework," by Pistia Octaviyanti and Johanes Fernandes Andry in 2018. This research focused on the EDM02, BAI06, and BAI09 domains to obtain a level of capability in the Enterprise Asset Management information system and obtain solutions to increase value contribution, controlled change management, and asset management [2]. Another research was also conducted by Iskandar Budiman Sukmajaya and Johanes Fernandes Andry in 2017 at PT. Setia Jaya Teknologi, namely auditing Accurate applications using the COBIT 4.1 framework model with a domain focus on Delivery and Support (DS) to determine the effectiveness and efficiency of using Accurate applications, as well as examining the suitability of using applications with the vision and mission of PT. Setia Jaya Technology [3]. In addition, COBIT 5 was also used in research conducted by Ni Made Natalisa Putri I Gede Putu Krisna Juliharta in 2019 to audit information systems at hospitals with a focus on the domains EDM4, APO7, BAI4, BAI7, DSS1, DSS4, DSS6, and MEA3.

One of the conveniences provided by COBIT is that the research mechanism can be carried out with a modified COBIT 5 framework, filtering all activities from the COBIT 5 domain that have to be measured or assessed, adjusted to company conditions [1],[4]-[5]. The research problem is the domain in COBIT 5 that is slow and even errors entering the DSS01 (managing operations) and BAI04 (managing availability and capacity) domains, as well as constraints regarding the absence of a particular budget to renew IT entering the domain APO06 (managing IT investment budgets and costs). Thus, applying information systems will align goals and business strategy, develop business, and optimize process costs.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

According to Santoyo Gondodiyoto, an information system audit is an audit conducted to check the level of maturity or readiness of an organization in managing information technology (IT governance) [3]. The purpose of an information system audit is to assess adequate information system control over asset security, data integrity, effectiveness and efficiency [6]. The important things in an information system audit are as follows [6]:

1. The process of collecting and evaluating evidence

In auditing, a technique will be used in collecting and evaluating evidence, as well as determining the format and amount of data used or required.

2. Adequate confidence

Information systems audits are conducted to obtain reasonable assurance, not absolute assurance.

3. Operational objectives and control objectives

In carrying out the audit must pay attention to operational objectives and control of business and information technology.

ACCOUNTING INFORMATION SYSTEM

According to Romney and Steinbart, an *Accounting Information System* is a system that is used for data processing, which includes collecting, recording, storing, and processing data into information so that decision making can be done easily [7]. Chandra and Adriana explained that "an

accounting information system is a system that processes financial transactions and will produce accounting-related information or reports" [8]. According to Hall, there are three parts of the system in an accounting information system, namely "transaction processing systems, ledger/financial reporting systems, management reporting systems" [9]. According to Bodnard & Hopwood "an accounting information system is a collection of resources, people and equipment, designed to transform financial and other data into information" [10]. From this explanation it can be concluded that the accounting information system is a system that is used in collecting, processing, storing data into information or reports regarding accounting and finance to support decision making.

Quickbooks is a *desktop- based accounting application* . *Quickbooks* as "one of the accounting application programs for small and medium businesses developed and marketed by Intuit Inc, United States of America" [11]. *Quickbooks* is an integrated accounting information system and is prepared to handle all parts related to business, from product sales, product purchasing, warehouse, production, to the accounting process. *Quickbooks* has a report menu that lists report categories to make it easier to create and access accounting reports. Various menus and *tools* contained in *Quickbooks* will help create accounting reports for management purposes, such as on the report menu there is a choice of report categories that are used to make it easier to create and access the desired accounting reports.

COBIT 5

end-to-end business breakdown of corporate IT governance so that the IT governance and management that companies desire can be realized. COBIT 5 is structured to incorporate new ideas about enterprise IT techniques and governance [1]. COBIT 5 is a framework *that* is structured to make it easier for companies to achieve their goals [12]. The preparation of COBIT 5 was carried out by experts to develop COBIT 4.1 by unifying IT values *and* IT risks *from* ISACA, ITIL, and relevant standards from ISO, so that COBIT 5 can provide effectiveness in assessing or evaluate information systems [1].

A. COBIT 5 REFERENCE MODEL

The COBIT 5 process reference model is divided into two main process areas namely governance and management processes. The following is an explanation regarding the two COBIT 5 main process areas:

1. Governance process area, this domain consists of evaluation, supervision, which are direct in the area of organizational governance related to organizational structure. This domain contains five governance process *control practices* that are used to determine methods or implementation in each *evaluate, direct, and monitor* (EDM) process. The five process *control practices* in the EDM domain in COBIT 5 are as follows:

Table 2. 1 Evaluate, direct, and monitor (EDM) process

Process Code	practice
EDM1	Ensuring the setting and maintenance of the governance framework.
EDM2	Ensuring benefits are received.
EDM3	Ensuring risk optimization.
EDM4	Ensure resource optimization.
EDM5	Ensuring transparency of stakeholders or *stakeholders* .

(Source: ISACA, 2012)

2. The management process area has four domains that are equivalent to the scope of responsibility from *plan, build, run, and monitor* (PBRM), and provides the entire scope of IT on an *end-to-end basis* . The domains that are contained in the management process area are developments from the domain and process structure contained in COBIT 4.1, namely:

a) *Align, plan, and organize* (APO) is a domain that has 13 *control practices* . This domain is used to align, plan, and manage IT in order to achieve business goals. The thirteen process *control practices* in APO can be seen in table 2.2 below:

Table 2. 2 Align, plan, and organize (APO) process

Process Code	practice
APO1	Manage the information technology management *framework* .
APO2	Manage strategy for IT.
APO3	Manage enterprise architecture.
APO4	Manage technology innovation.
APO5	Manage IT portfolio.
APO6	Manage IT investment budget and costs.
APO7	Manage human resources.
APO8	Manage organizational relationships and cooperation.
APO9	Manage service agreements.
APO10	Manage suppliers.
APO11	Manage quality.
APO12	Manage IT risk.
APO13	Manage security.

(Source: ISACA, 2012)

b) *Build, Acquire, and Implement* (BAI) is a domain that consists of 10 *control practices.* This domain is used to create or establish, procure, and implement business process support systems. The ten process *control practices* can be seen in table 2.3 below:

Table 2. 3 The build, acquire, and implement (BAI) process

Process Code	practice
BAI1	Manage organizational programs and projects.
BAI2	Set needs.
BAI3	Manage the identification and creation of solutions.
BAI4	Manage availability and capacity
BAI5	Manage the empowerment of organizational change.
BAI6	Manage change.
BAI7	Managing new technology transitions.
BAI8	Manage knowledge.
BAI9	Manage *assets* .

BAI10	Manage configuration.

<center>(Source: ISACA, 2012)</center>

c) *Delivery, Service and Support* (DSS) is a domain that has 6 *control practices* . This domain is used for delivery, service, and support for real services for business processes including data management and information protection. The six process *control practices can be seen in table 2.4 below.*

a. *Table 2. 4 Process of delivery, service and support (DSS)*

Process Code	practice
DSS1	Manage operations.
DSS2	Organize service assistance and incidents.
DSS3	Manage issues.
DSS4	Manage continuity or service continuity.
DSS5	Manage system security.
DSS6	Manage and control business processes.

<center>(Source: ISACA, 2012)</center>

d) *Monitoring, Evaluation and Assess* (MEA) is a domain that has 3 *control practices* . This domain is used for monitoring, evaluating and assessing the control of processes carried out by independent oversight agencies either from within or outside the organization and other institutions. The three process *control practices are as follows:*

<center>**Table 2. 5 Process of monitoring, evaluation and assess (MEA)**</center>

Process Code	practice
MEA1	Monitor, evaluate and assess performance and suitability.
MEA2	Monitoring, evaluating, and assessing the system's internal control.
MEA3	Monitoring, evaluating, and assessing conformity with external requirements.

<center>(Source: ISACA, 2012)</center>

Thirty-seven *control practices* of the process will identify the needs that must be known in creating effective controls on management through the domain but not too detailed.

B. COBIT 5 MAPPING

COBIT 5 mapping is carried out to determine the process to be used or to assess its maturity level. The determination of this process is based on company goals and company IT goals. The following is a mapping step to determine the IT process to be assessed:

1. Mapping Enterprise Goals against IT-related Goals COBIT 5

Mapping of enterprise goals against IT-related goals COBIT 5 is carried out to determine *which IT-related goals* will be used or appropriate to support *the Enterprise Goals* . The following Figure 2.2 is an image related to the mapping of *enterprise goals* to *IT-related goals* :

<center>250</center>

Figure 2. 1 Mapping Cobit 5 Enterprise Goals against IT-related Goals

(Source: ISACA, 2012) Note:

P = Primary (has an important relationship as the main support for achieving company goals or company IT goals).

S = Secondary (has a relationship or relationship but is less important so that it can be used as a secondary support to achieve company goals or company IT goals).

2. Mapping *IT-related Goals* to *COBIT 5 IT Processes*

After mapping *enterprise goals* to COBIT 5's *IT-related goals* , then mapping *IT-related goals* to IT processes is carried out. This mapping is done to determine the IT processes that support the company's IT goals. The following is a picture related to mapping *IT-related goals* to IT processes:

Figure 2. 2 Maping Cobit 5 IT-related Goals to the IT1 process
(Source: ISACA, 2012)

Figure 2. 3 *Maping Cobit 5 IT-related Goals* to the *IT2 process*
(Source: ISACA, 2012)

Figure 2. 4 Maping Cobit 5 IT-related Goals to the TI3 process
(Source: ISACA, 2012)

Note:
P = Primary (has an important relationship as the main support for achieving company goals or company IT goals).
S = Secondary (has a relationship or relationship but is less important so that it can be used as a secondary support to achieve company goals or company IT goals).

c. RACI Chart

RACI chart is a list of individuals involved in a process with categories:

1) *Responsible* or responsible for the task given.
2) *Accountable* or responsible for the successful implementation of tasks.
3) *Consulted* or providing advice in the implementation of tasks.
4) *Informed* or recipient of achievement information for carrying out tasks.

The RACI chart for one process and another will be different, therefore COBIT 5 has 37 RACI charts. The following is a RACI chart on the APO06, BAI04, and DSS01 domains.

Figure 2. 5 RACI Chart APO06
(Source: ISACA, 2012)

Figure 2. 6 RACI Chart BAI04
(Source: ISACA, 2012)

Figure 2. 7 RACI Chart DSS01
(Source: ISACA, 2012)

C. COBIT PROCESS ASSESSMENT MODEL (PAM)

The COBIT process assessment model is the basis used by COBIT 5 in assessing the maturity level of a company's IT processes and as a support for process improvement. The following is *the COBIT process assessment model* used.

a. ISO/IEC 15504 Capability Level Assessment

The level of capability can be identified by conducting an assessment using ISO/IEC 15504 on the evaluation results of the COBIT domain 5. *International Organization for Standardization* (ISO) and *International Electrotechnical Commission* (IEC) has developed a research method, namely ISO/IEC or what is often called *Software Process Improvement and Capability Determination* (SPICE) [6]. This ISO/IEC is designed for research methods in controlling IT processes, measuring the achievement of *capability level* in the governance process area and management process, and is used to find out what needs to be done to increase *the capability level* or performance in the process area. The following is a process assessment model at the ISO/IEC 15504 capability level:

ISO/IEC Measurement Scale
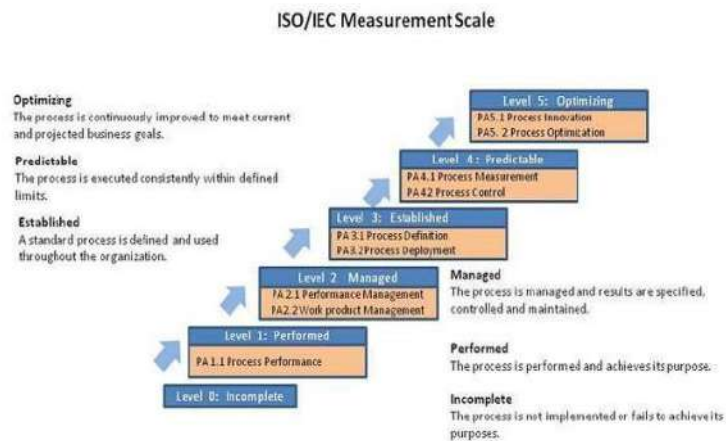
Figure 2. 8 Process assessment model at the ISO/IEC 15504 capability level
(Source: https://www.isaca.org)

levels of ISO/IEC 15504 capability level assessment for processes, namely:

Table 2. 6 Description of the ISO/IEC 15504 capability level

Level Maturity	Description
level 0 (*Incomplete*)	At this level the process is not implemented/performed or the achievement of process objectives fails, because there is little or no evidence of achievement of process objectives systematically.
Level 1 (*Performed*)	At this level it will be determined whether or not the objectives of a process have been achieved.
Level 2 (*managed*)	At this stage, the management of a process that includes planning, monitoring, and adjustment is carried out. At this level it will be determined whether the existing *work product* has been implemented, controlled, and managed properly.
Level 3 (*Established*)	Application of processes that have been made with processes that are believed to be able to achieve results from a process.

Level 4 (*Predictable*)	The process that has been made is then carried out using the provisions so that it can achieve the goals of the process.
Levels 5 (*Optimizing*)	Improve predictive processes so as to achieve current business goals and project objectives.

(Source: ISACA, 2013)

B. PROCESS CAPABILITY ASSESSMENT INDICATORS

The capability level rating indicator is the basis used to assess the achievement level of the attributes at the process capability level. The maturity level indicators are as follows [13] :

1) Level 0- *Incomplete*

This level has no indicators in the assessment because there is little or no evidence at this level.

2) Level 1-Performed

The provisions for the level 1 process attributes are as follows:

a) *Process Attribute* (PA) 1.1 *Process Performance*

At this stage it measures how much success has been achieved from the set process objectives.

Figure 2. 9 Process Attributes (PA) Process Performance

(Source: ISACA, 2013)

3) Level 2-Manage Process

The provisions for the level 2 process attributes are as follows:

a) *Process Attribute* (PA) 2.1 *Performance Management*

This stage measures how much process performance is managed. The *performance management* indicators are shown in Figure 2.10 below.

Result of Full Achievement of the Attribute	Generic Practices (GPs)	Generic Work Products (GWPs)
a. Objectives for the performance of the process are identified.	GP 2.1.1 Identify the objectives for the performance of the process. The performance objectives, scoped together with assumptions and constraints, are defined and communicated.	GWP 1.0 Process documentation should outline the process scope. GWP 2.0 Process plan should provide details of the process performance objectives.
b. Performance of the process is planned and monitored.	GP 2.1.2 Plan and monitor the performance of the process to fulfil the identified objectives. Basic measures of process performance linked to business objectives are established and monitored. They include key milestones, required activities, estimates and schedules.	GWP 2.0 Process plan should provide details of the process performance objectives. GWP 9.0 Process performance records should provide details of the outcomes. Note: At this level, the record of process performance may be in the form of reports, issues registers and informal records.
c. Performance of the process is adjusted to meet plans.	GP 2.1.3 Adjust the performance of the process. Action is taken when planned performance is not achieved. Actions include identification of process performance issues and adjustment of plans and schedules as appropriate.	GWP 4.0 Quality record should provide details of action taken when performance is not achieved.
d. Responsibilities and authorities for performing the process are defined, assigned and communicated.	GP 2.1.4 Define responsibilities and authorities for performing the process. The key responsibilities and authorities for performing the key activities of the process are defined, assigned and communicated. The need for process performance experience, knowledge and skills is defined.	GWP 1.0 Process documentation should provide details of the process owner and who is responsible, accountable, consulted and/or informed (RACI). GWP 2.0 Process plan should include details of the process communication plan as well as process performance experience, skills requirement.
e. Resources and information necessary for performing the process are identified, made available, allocated and used.	GP 2.1.5 Identify and make available resources to perform the process according to plan. Resources and information necessary for performing the key activities of the process are identified, made available, allocated and used.	GWP 2.0 Process plan should provide details of the process training plan and process resourcing plan.
f. Interfaces between the involved parties are managed to ensure effective communication and clear assignment of responsibility.	GP 2.1.6 Manage the interfaces between involved parties. The individuals and groups involved with the process are identified, responsibilities are defined and effective communication mechanisms are in place.	GWP 1.0 Process documentation should provide details of the individuals and groups involved (suppliers, customers and RACI). GWP 2.0 Process plan should provide details of the process communication plan.

Figure 2. 10 Process Attributes (PA) Performance Management
(Source: ISACA, 2013)

b) *Process Attribute* (PA) 2.2 *Work Product Management*
This stage measures how much work results are obtained from managing the process.

Result of Full Achievement of the Attribute	Generic Practices (GPs)	Generic Work Products (GWPs)
a. Requirements for the work products of the process are defined.	GP 2.2.1 Define the requirements for the work products, including content structure and quality criteria.	GWP 3.0 Quality plan should provide details of quality criteria and work product content and structure.
b. Requirements for documentation and control of the work products are defined.	GP 2.2.2 Define the requirements for documentation and control of the work products. This should include identification of dependencies, approvals and traceability of requirements.	GWP 1.0 Process documentation should provide details of controls (control matrix). GWP 3.0 Quality plan should provide details of work product, quality criteria, documentation requirements and change control.
c. Work products are appropriately identified, documented and controlled.	GP 2.2.3 Identify, document and control the work products. Work products are subject to change control, versioning and configuration management as appropriate.	GWP 3.0 Quality plan should provide details of work product, quality criteria, documentation requirements and change control.
d. Work products are reviewed in accordance with planned arrangements and adjusted as necessary to meet requirements.	GP 2.2.4 Review and adjust work products to meet the defined requirements. Work products are subject to review against requirements in accordance with planned arrangements and any issues arising are resolved.	GWP 4.0 Quality records should provide an audit trail of reviews undertaken.

Figure 2. 11 Process Attributes (PA) Work Product Management
(Source: ISACA, 2013)

4) Level 3- *Established*

The provisions for the level 3 process attributes are as follows:

a) *Process Attribute* (PA) 3.1 *Process Definition*

This stage measures how much standard process management supports the implementation of defined processes.

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Result of Full Achievement of the Attribute	Generic Practices (GPs)	Generic Work Products (GWPs)
a. A standard process, including appropriate tailoring guidelines, is defined that describes the fundamental elements that must be incorporated into a defined process.	GP 3.1.1 Define the standard process that will support the deployment of the defined process. A standard process is defined that identifies the fundamental process elements and provides guidance and procedures to support implementation and guidance on how it can be tailored when needed.	GWP 5.0 Policies and standards should provide details of the organisational objectives for the process, minimum standards of performance, standard procedures, and reporting and monitoring requirements. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation.
b. The sequence and interaction of the standard process with other processes are determined.	GP 3.1.2 Determine the sequence and interaction between processes so that they work as an integrated system of processes. The standard process sequence and interaction with other processes are determined and maintained when a process is implemented in different parts of the organisation.	GWP 5.0 Policies and standards should provide a process mapping with details of standard processes and expected sequences and interaction. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation.
c. Required competencies and roles for performing a process are identified as part of the standard process.	GP 3.1.3 Identify the roles and competencies for performing the standard process.	GWP 5.0 Policies and standards should provide details of roles and competencies for performing. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation.
d. Required infrastructure and work environment for performing a process are identified as part of the standard process.	GP 3.1.4 Identify the required infrastructure and work environment for performing the standard process. The infrastructure (facilities, tools, methods, etc.) and work environment for performing the standard process are identified.	GWP 5.0 Policies and standards should identify minimum required infrastructure and work environment for performing the process. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation.
e. Suitable methods for monitoring the effectiveness and suitability of the process are determined.	GP 3.1.5 Determine suitable methods to monitor the effectiveness and suitability of the standard process, including ensuring that appropriate criteria and data needed to monitor the effectiveness and suitability of the process are defined, and establishing the need to conduct internal audit and management review.	GWP 5.0 Policies and standards should provide details of the organisational objectives for process, minimum standards of performance, standard procedures, and reporting and monitoring requirements. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation. GWP 4.0 Quality records and GWP 9.0 Process performance records should provide evidence of reviews undertaken.

Figure 2. 12 Process Attributes (PA) Process Definition
(Source: ISACA, 2013)

b) *Process Attribute* (PA) 3.2 *Process Deployment*

This stage measures how much the standard process is implemented effectively. *The process deployment* indicators are shown in Figure 2.13 below.

Result of Full Achievement of the Attribute	Generic Practices (GPs)	Generic Work Products (GWPs)
a. A defined process is deployed based on an appropriately selected and/or tailored standard process.	GP 3.2.1 Deploy a defined process that satisfies the context. When the same process is used within different areas of the organisation, it is based on a standard process, tailored as appropriate, with conformance to the requirements of the defined process verified.	GWP 5.0 Policies and standards should define the standards to be followed across all implementations of the process. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation.
b. Required roles, responsibilities and authorities for performing the defined process are assigned and communicated.	GP 3.2.2 Assign and communicate roles, responsibilities and authorities for performing the defined process. When the same process is used within different areas of the organisation, the authorities and roles for performing the activities of process are assigned and communicated.	GWP 5.0 Policies and standards should provide details, responsibilities and authorities for performing the activities of process. The evidential requirement at this level is not just that policies and standards exist, but that they are applied across the organisation.
c. Personnel performing the defined process are competent on the basis of appropriate education, training and experience.	GP 3.2.3 Ensure necessary competencies for performing the defined process. When the same process is used within different areas of the organisation, the appropriate competencies for assigned personnel are identified and suitable training is available for those deploying the defined process.	GWP 1.0 Process documentation should provide details of competencies and training requirements. GWP 2.0 Process plan should include details of the process communication plan, training plan and resourcing plan for each instance of the process.
d. Required resources and information necessary for performing the defined process are made available, allocated and used.	GP 3.2.4 Provide resources and information to support the performance of the defined process. When the same process is used within different areas of the organisation, the required human resources and information to perform the process are made available, allocated and used.	GWP 2.0 Process plan should include details of the resourcing plan for each instance of the process.
e. Required infrastructure and work environment for performing the defined process are made available, managed and maintained.	GP 3.2.5 Provide adequate process infrastructure to support the performance of the defined process. When the same process is used within different areas of the organisation, the required organisational support, infrastructure and work environment are made available, allocated and used.	GWP 2.0 Process plan should include details of the process infrastructure and work environment for each instance of the process.
f. Appropriate data are collected and analysed as a basis for understanding the behaviour of the process to demonstrate its suitability and effectiveness, and to evaluate where continuous improvement of the process can be made.	GP 3.2.6 Collect and analyse data about performance of the process to demonstrate its suitability and effectiveness. Data required to monitor the effectiveness and suitability of the process across the organisation are defined, collected and analysed as a basis for continual improvement.	GWP 4.0 Quality records and GWP 9.0 Process performance records should provide evidence of reviews undertaken tools for each instance of the process.

Figure 2. 13 Process Attributes (PA) Process Deployment

(Source: ISACA, 2013)

5) Level 4- *Predictable*

The provisions for the level 4 process attributes are as follows:

a) *Process Attribute* (PA) 4.1 *Process Measurement*

This stage measures how much the measurement results are used to ensure process performance has supported the achievement of process objectives. As for the indicators of *the process attribute process measurement* which is shown in Figure 2.14 .

Result of Full Achievement of the Attribute	Generic Practices (GPs)	Generic Work Products (GWPs)
a. Process information needs in support of relevant defined business goals are established.	GP 4.1.1 Identify process information needs, in relation with business goals. The business goals and process stakeholder information needs have been established as a basis for determining the process performance measurement objectives.	GWP 6.0 Process improvement plan should provide process improvement objectives and proposed improvement actions.
b. Process measurement objectives are derived from process information needs.	GP 4.1.2 Derive process measurement objectives from process information needs. Measurement objectives are based on the defined process measurement objectives.	GWP 7.0 Process measurement plan should provide details of proposed measurement objectives.
c. Quantitative objectives for process performance in support of relevant business goals are established.	GP 4.1.3 Establish quantitative objectives for the performance of the defined process, according to the alignment of the process with the business goals Quantitative measurement objectives are established that explicitly reflect business goals and have been verified as realistic and useful with organisational management and process owner(s).	GWP 7.0 Process measurement plan should provide details of proposed measurement measures and indicators.
d. Measures and frequency of measurement are identified and defined in line with process measurement objectives and quantitative objectives for process performance.	GP 4.1.4 Identify product and process measures that support the achievement of the quantitative objectives for process performance. Detailed measures for products and process are identified, together with the frequency of data collection and measurement as well as verification mechanisms.	GWP 7.0 Process measurement plan should provide details of proposed measures and indicators together with data collection procedures and analytical procedures.
e. Results of measurement are collected, analysed and reported in order to monitor the extent to which the quantitative objectives for process performance are met.	GP 4.1.5 Collect product and process measurement results through performing the defined process. Product and process measurement results are collected, analysed and reported according to a defined plan.	GWP 7.0 Process measurement plan should provide details of proposed analytical procedures. GWP 9.0 Process performance records should provide details of measurements collected and analysed.
f. Measurement results are used to characterise process performance.	GP 4.1.6 Use the results of the defined measurement to monitor and verify the achievement of the process performance objectives. The results of the defined measurement are analysed to verify achievement against the process performance objectives. Appropriate techniques are used to understand process performance and capability within defined control limits.	GWP 9.0 Process performance records should provide details of measurements collected and analysed.

Figure 2. 14 Process Attribute (PA) Process Measurement

(Source: ISACA, 2013)

b) Process Attribute (PA) 4.2 *Process Control*

This stage measures how much a quantitative process can provide a stable, capable and predictable process within predetermined limits. As for the indicators of *the process attribute process control* that is shown in Figure 2.15.

Result of Full Achievement of the Attribute	Generic Practices (GPs)	Generic Work Products (GWPs)
a. Analysis and control techniques are determined and applied where applicable.	GP 4.2.1 Determine analysis and control techniques appropriate to control the process performance. Methods of measuring the effectiveness of process control are defined and validated.	GWP 1.0 Process documentation should provide details of controls (control matrix). GWP 8.0 Process control plan should exist that specifies for each process the measurement approach.
b. Control limits of variation are established for normal process performance.	GP 4.2.2 Define parameters suitable to control the process performance. The standard process definition is modified to include methods for process control and control limits are established.	GWP 8.0 Process control plan should exist that specifies for each control limits for normal performance.
c. Measurement data are analysed for special causes of variation.	GP 4.2.3 Analyse process and product measurement results to identify variations in process performance. The results of process control measurements are analysed to determine issues of concern and forwarded for action.	GWP 9.0 Process performance record should provide details of measurements collected and analysed.
d. Corrective actions are taken to address special causes of variation.	GP 4.2.4 Identify and implement corrective actions to address assignable causes. Corrective action is taken to address process control concerns and results are monitored and evaluated.	GWP 9.0 Process performance record should provide details of measurements collected and analysed and corrective action taken.
e. Control limits are re-established (as necessary) following corrective action.	GP 4.2.5 Re-establish control limits following corrective action. Process control limits are appropriately modified after corrective action is taken.	GWP 8.0 Process control plan should exist that specifies control limits for normal performance.

Figure 2. 15 Process Attributes (PA) Process Control

(Source: ISACA, 2013)

6) Level 5- *Optimizing*

The provisions for the level 5 process attributes are as follows:

a) *Process Attribute* (PA) 5.1 *Process Innovation*

This stage measures related process changes that have been determined from an analysis of common causes of variation in performance and a review of innovative approaches to defining and implementing processes. As for the indicators of *the process attribute process innovation* which is shown in Figure 2.16.

Figure 2. 16 Process Attributes (PA) Process Innovation

(Source: ISACA, 2013)

b) *Process Attribute* (PA) 5.2 *Process Optimization*

This stage measures changes in definition, management and process performance so that they can have an effective impact in achieving process improvement objectives.

Figure 2. 17 Process Attributes (PA) Process Optimization

(Source: ISACA, 2013)

c. Assessment category at the capability level

According to ISACA, an assessment of *capability level* will be distinguished from one *level* to *the* next [8]. This is done to find out whether the objectives of a process have been achieved or not and these results will be used as a basis for evaluating the next *level* [8]. The results of the assessment of the levels achieved in a process will be adjusted to one of the following four categories:

Table 2.6 Assessment categories at the capability level

No	Rating Category	Range Evaluation	Description
1.	N (*Note Achieved or not achieved)*	From 0% - 15%	Have little to no evidence of achieving process attributes.
2.	P (*Partially Achieved* or partially achieved)	More than 15% - 50%	Has some evidence of approach and achievement of process attributes, and there are aspects of achieving unpredictable attributes.
3.	L (*Largely Achieved* or accomplished but not full)	More than 50% - 85%	Has evidence of a systematic approach and significant achievement of the assessed process attributes, and weaknesses are still found in the assessed process attributes.
4.	F (*Fully Achieved* or fully achieved)	More than 85%-100%	Have a complete evidence and systematic approach and full achievement and no weaknesses in the process attributes assessed.

(Source: ISACA, 2013)

To reach a level capability, then a process has been declared to be in the *Largely Achieved* (L) or *Fully category Achieved* (F). However, if you want to do an assessment of a higher level of capability, a process must have been declared to have reached the *Fully category Achieved* (F) [6].

RESEARCH METHOD

This research uses a type of case study approach. The case study approach is used for understanding, exploring, and interpreting events or events that include individuals, cultural groups, or a portrait of life. The case to be studied is the accounting information system management audit (*Quickbooks*) at CV. XYZuses the COBIT 5 framework with a focus on the APO06, BAI04, and DSS01 domains.

Sources of data used in this study are primary data and secondary data. Primary data in this study is information obtained from the results of questionnaires and the results of interviews conducted with directors, production and purchasing managers, *accounting* and HRD managers, and *staff* (admin) of CV. XYZ to obtain information regarding the maturity level of IT governance in CV. Art Echo. However, secondary data was obtained through survey methods and documentation studies to obtain reference books, scientific articles, and an overview of CV. XYZvia company profile.

The types of data used in this study are qualitative data and quantitative data. The use of qualitative data in this study is in the form of words and sentences in the form of statements, descriptions, responses, opinions or perceptions of the IT management process. In this case statements or descriptions are obtained through text or statements from informants, such as the results of interviews and results of document studies. Quantitative data in this study are in the form of a choice of numbers or *scores* for questions or statements contained in the questionnaire.

The instruments used in this study were questionnaires, interview guides and notebooks. Questionnaire that contains a list of statements relating to the domain to be examined in the CV. XYZ. In the interview guide there is *a list of* questions related to the expected level of domain maturity in the CV. XYZ. A notebook containing the researcher's notes on matters encountered in the field which will later support the results of the interviews and questionnaires.

DATA COLLECTION TECHNIQUE

Data collection techniques used are surveys, interviews and documentation studies. The survey technique used by researchers is to give questionnaires to respondents to get responses about things that are experienced related to the problems studied. The design of the questionnaire was carried out to determine the maturity level of IT governance in the application of accounting information systems (*Quickbooks*) in CV. XYZ. The target of distributing the questionnaires is to directors, production and purchasing managers, *accounting and HRD* managers , and *staff* (admin) of CV. XYZs relating to the use and management of IT.

The questionnaires distributed contained questions according to the COBIT 5 framework on the activities of the APO06, BAI04, and DSS01 sub-domains. The questions on the questionnaire will be given a rating range between 0 to 5, this rating range has been adapted to the ISO/IEC 15504 capability level model and an explanation has been given so that respondents can understand the intent of the questionnaire questions. Before the research questionnaire is distributed, it is necessary to test the validity and reliability of the questionnaire first. Researchers tested the internal validity through expert testing. Making a questionnaire must be based on the theory of the COBIT 5 framework which is discussed with experts to obtain responses or recommendations. Researchers conducted reliability testing with the *Cronbach Alpha technique* , and used a total sample for testing a questionnaire of 5 respondents. According to Jogiyanto, a research instrument that can be said to be reliable if alpha > 0.70 [1]. In this study, the calculation of the reliability of the research instrument was assisted by the SPSS *software* .

In addition, this study also uses interview techniques to obtain information regarding the expected level of governance. Interviews were conducted with the director of CV. Art of Echo by asking oral questions and the respondent giving an answer or opinion sometimes an answer requires a yes or no answer. The questions were asked randomly but still covered all the information needed and the opinions of the informants were not limited to the list so that flexible answers were obtained.

In this study, the documentation study technique aims to support or complement, confirm whether or not the requirements for documentation that must be owned by each level are fulfilled. The document study was carried out by the author by checking *the Generic Work Product* (GWP) in the selected process domain.

ANALYSIS TECHNIQUES

1. Analysis of the current maturity level
An analysis related to the assessment of the maturity level of current IT governance in activities in the APO06, BAI04, and DSS01 domains will be carried out after obtaining the results of a questionnaire survey that has been distributed to directors, accounting and HRD managers, as well as staff (admin) and documentation studies in the *form* of *checking* the related documents. Analysis can be done by calculating all the values in the activity domain, then calculating the average current level of maturity in each domain with the formula:

FORMULA 3.2 CALCULATION OF THE AVERAGE LEVEL OF MATURITY

$$\text{Maturity Average Level} = \frac{Total\ Answer}{Total\ Question}$$

Formula 3.3 Calculation of the percentage of achievement of *the Process Attribute*

$$\text{Average Score} = \frac{Number\ of\ work\ products/Generic\ work\ products\ owned}{Total\ Work\ Product/Generic\ Work\ Products}$$

2. Analysis of the expected maturity level

The auditor conducted an analysis of the expected maturity level to find out the management model of the accounting information system (*Quickbooks*) in CV. Desired XYZ. Researchers can carry out this stage if they have conducted interviews with the director of CV XYZ regarding the expected IT governance maturity level target.

The basis for formulating recommendations for efforts to improve IT management is the comparison or difference between the current maturity level and the expected maturity level. Assessment of the level of maturity in IT processes is carried out using the ISO/IEC 15504 model and the average in each COBIT 5 domain can be calculated using the formula for calculating the average level of maturity as in formula 3.2 above.

3. Gap Analysis

Gap analysis (*gap analysis*) can be done if the values of the current and expected maturity levels have been obtained first. Gap analysis is an activity of analyzing related differences or comparisons that occur in each activity of the desired IT governance maturity level with the current IT governance maturity level. This difference or comparison indicates that the level of maturity in the activities desired by the company has not been met. Therefore, the level of maturity in activities that have not been fulfilled will be improved so as to make it easier to obtain the level of maturity expected.

In improving the level of maturity in the activity domain, solutions or recommendations are made based on the results of the gap analysis that occurs. These recommendations are structured based on the COBIT 5 framework subdomains and adapted to the strategy and circumstances of CV. XYZ, so as to maximize the management of *Quickbooks* in CV. XYZ.

RESEARCH FLOW

In general, the information system audit process using the COBIT 5 *framework* is carried out in three stages, so that the results of the audit conducted by the auditor in the form of recommendations for improving an organization are right on target and can be implemented [6].

1. In the first stage the auditor team made initial observations and examined the problems that occurred, then evaluated the selection of domains in the COBIT 5 framework. The selection of the domains studied was based on the company's goals in using IT and cases encountered through interviews with accounting and HRD managers, as *well* as *staff* (admin) CV. XYZ, so that the chosen domain certainly has something to do with the existing problems in the accounting information system in CV. XYZ.
2. In the second stage the auditor team collects data. This stage is carried out after reducing the COBIT 5 domain to a questionnaire item, then the auditor conducts a survey using the questionnaire that has been made, shown to stakeholders (*stakeholders*) as respondents so that the questions or statements of the data questionnaire are answered appropriately. A documentation study was carried out to look at the documents and the current condition of the organization as supporting data for the results of the questionnaire, as well as to prove that the answers to the questionnaire and the respondents are in accordance with

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the facts that exist in the organization. Interviews were conducted with stakeholders *as* resource persons to find out the expected *capability level* .

3. The third stage is to perform data analysis. Researchers will perform data analysis on the selected domains using the ISO/IEC 15504 capability model to determine the level of information system capability. After conducting data analysis which includes an analysis of the current maturity level, an analysis of the expected maturity level and a gap analysis, recommendations are then formulated so that they can be suggested as an effort to improve the management of the accounting information system (*Quickbooks*) in CV. XYZ.

RESULTS AND DISCUSSION

DOMAIN IDENTIFICATION RESULTS AND DOMAIN IDENTIFICATION PROCESS ACTIVITIES

This stage is carried out to determine the domain process in COBIT 5 related to the problems in CV. XYZ. The determination of the domain to be studied is based on the company's goals in using *Quickbooks* , namely as a step in optimizing business process costs. *The IT-related Goals* that support *the Enterprise Goals* are: a. *Realized benefits from IT-enabled investments and service portfolio*

b. *Transparency of IT costs, benefits and risks*

c. *Optimization of IT assets, resources, and capabilities*

The three *IT-related Goals* are obtained from the results of the Cobit 5 *Enterprise Goals to IT-related Goals mapping* as shown in Figure 4.2 below.

Figure 4.1 Results of mapping Cobit 5 Enterprise Goals to IT-related Goals CV XYZ

(Source: ISACA, 2012)

Then the results of *IT-related Goals* are used as a basis for determining the IT process (domain) to be used in research. The IT processes that support the three *IT-related Goals* are as shown in Figure 4.3, Figure 4.4, and Figure 4.5 below .

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Figure 4. 2 Results of mapping Cobit 5 IT-related Goals to Process1
(Source: ISACA, 2012)

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Figure 4. 3 Results of mapping Cobit 5 IT-related Goals to Process2
(Source: ISACA, 2012)

Figure 4. 4 Results of mapping Cobit 5 IT-related Goals to Process3

(Source: ISACA, 2012)

From the three images of the mapping results above, the domain that will be used in assessing the maturity level of information system governance (*Quickbooks*) is related to the constraints that occur at CV XYZ, which can be seen in table 4.1 below.

Table 4. 1 COBIT Domains in CV. XYZ

Process Domains	Process Description
APO06	Manage IT investment budget and costs.
BAI04	Manage availability and capacity
DSS01	Manage Operations

(Source: ISACA, 2012)

IDENTIFY PROCESS ACTIVITIES

The determination of the COBIT 5 process activity is adjusted to a predetermined domain. Table 4.2 below is an IT process activity used in this study:

Table 4. 2 Activity IT processes used

Process Domains	Process Activity	Activity Description
APOS 6	APO06.01	Manage Costs and Accounting

	APO06.02	Prioritize Allocation resources
	APO06.03	create and maintain costs
	APO06.04	Model and Cost allocation
	APO06.05	Manage Fees
BAI04	BAI04.01	Assess current availability, performance and capacity and create baselines.
	BAI04.02	Assess business impact.
	BAI04.03	Plans for new or changed service requirements.
	BAI04.04	Monitor and review availability and capacity.
	BAI04.05	Investigate and address availability, performance and capacity issues.
DSS01	DSS01.01	Perform operational procedures.
	DSS01.02	Manage outsourced IT services.
	DSS01.03	Monitor IT infrastructure.
	DSS01.04	Manage the environment.
	DSS01.05	Manage facilities.

(Source: ISACA, 2012)

MATURITY LEVEL ANALYSIS

Maturity level analysis is used to evaluate each activity based on the results of distributing questionnaires to all respondents. All activity values obtained from the distribution results will be combined and averaged to obtain the current maturity level (*as-is*) in each domain. In assessing the maturity level of each process domain, it refers to the ISO/IEC 15504 model and is calculated by the formula:

$$Maturity = \frac{\sum \text{As} - \text{is condition domain}}{Total\ activity\ domain}$$

1. Calculation of maturity level

A. QUESTIONNAIRE ANALYSIS

Questionnaire analysis was carried out by finding the average process activity, then followed by an assessment of the maturity level using the maturity formula. The average process activity is calculated by the total activity score obtained from the answers to the questionnaire and then divided by the number of respondents as many as 8 people.

The details of the calculation results of the questionnaire can be seen in the attachment. The following is the average process domain activity and the results of the APO06, BAI04, and DSS01 maturity calculations.

Table 4. 3 APO06 maturity calculation

Domain Activity	Statement Code	Total Score	Average Statement	As-Is Condition
APO06.01	APO06P1	6	2.00	*1.73*
	APO06P2	6	2.00	
	APO06P3	4	1.33	
	APO06P4	4	1.33	
	APO06P5	6	2.00	
APO06.02	APO06P6	7	2.33	*2.08*
	APO06P7	4	1.33	
	APO06P8	7	2.33	
	APO06P9	7	2.33	
APO06.03	APO06P10	6	2.00	*1.83*
	APO06P11	5	1.67	
	APO06P12	6	2.00	
	APO06P13	4	1.33	
	APO06P14	6	2.00	
	APO06P15	6	2.00	
APO06.04	APO06P16	6	2.00	*1.67*
	APO06P17	4	1.33	
	APO06P18	6	2.00	
	APO06P19	4	1.33	
APO06.05	APO06P20	4	1.33	*1.71*
	APO06P21	6	2.00	
	APO06P22	5	1.67	
	APO06P23	6	2.00	
	APO06P24	5	1.67	
	APO06P25	5	1.67	
	APO06P26	6	2.00	
	APO06P27	4	1.33	

Maturity APO06	1.81

Table 4. 4 BAI04 maturity calculation

Domain Activity	Statement Code	Total Score	Average Statement	As-Is Condition
BAI04.01	BAI04P1	3	1.50	1.50
	BAI04P2	3	1.50	
	BAI04P3	3	1.50	
	BAI04P4	3	1.50	
BAI04.02	BAI04P5	3	1.50	1.50
	BAI04P6	3	1.50	
	BAI04P7	3	1.50	
	BAI04P8	3	1.50	
	BAI04P9	3	1.50	
BAI04.03	BAI04P10	2	1.00	0.80
	BAI04P11	1	0.50	
	BAI04P12	1	0.50	
	BAI04P13	2	1.00	
	BAI04P14	2	1.00	
BAI04.04	BAI04P15	3	1.50	1.25
	BAI04P16	3	1.50	
	BAI04P17	3	1.50	
	BAI04P18	1	0.50	
BAI04.05	BAI04P19	1	0.50	1.20
	BAI04P20	1	0.50	
	BAI04P21	4	2.00	
	BAI04P22	2	1.00	
	BAI04P23	4	2.00	
Maturity BAI04				1.25

Table 4. 5 DSS01 maturity calculation

Domain Activity	Statement Code	Total Score	Average Statement	As-Is Condition

DSS01.01	DSS01P1	3	1.50	1.75
	DSS01P2	3	1.50	
	DSS01P3	3	1.50	
	DSS01P4	5	2.50	
DSS01.02	DSS01P5	1	0.50	0.50
	DSS01P6	1	0.50	
	DSS01P7	1	0.50	
	DSS01P8	1	0.50	
DSS01.03	DSS01P9	3	1.50	1.50
	DSS01P10	3	1.50	
	DSS01P11	3	1.50	
	DSS01P12	3	1.50	
	DSS01P13	3	1.50	
	DSS01P14	3	1.50	
DSS01.04	DSS01P15	3	1.50	1.29
	DSS01P16	1	0.50	
	DSS01P17	3	1.50	
	DSS01P18	2	1.00	
	DSS01P19	2	1.00	
	DSS01P20	1	0.50	
	DSS01P21	6	3.00	
DSS01.05	DSS01P22	3	1.50	0.91
	DSS01P23	5	2.50	
	DSS01P24	1	0.50	
	DSS01P25	1	0.50	
	DSS01P26	1	0.50	
	DSS01P27	2	1.00	
	DSS01P28	1	0.50	
	DSS01P29	1	0.50	
	DSS01P30	1	0.50	
	DSS01P31	3	1.50	
	DSS01P32	1	0.50	
Maturity DSS01				*1.19*

Determination of the current maturity level is based on the results of maturity calculations for each process domain that have been rounded up. The following table 4.10 is the result of identification of the level of maturity in accordance with the ISO/IEC 15504 assessment:

Table 4. 6 Results of questionnaire analysis

Process Domains	Process Description	Mark Maturity	Maturity Level	Condition
APO06	Manage IT investment budget and costs.	1.81	2	*managed*
BAI04	Manage availability and capacity	1.25	1	*performance*
DSS01	Manage Operations	1.19	1	*performance*

B. EVALUATION AND ANALYSIS OF CV XYZ DOCUMENTS

Document study was conducted to ensure that the results of the questionnaire were in accordance with the existing documents. Document analysis will explain that the process (domain) has correctly reached a level of maturity obtained by each domain. Therefore, this stage was carried out after distributing the questionnaire. Document analysis was carried out by looking directly at the documents related to the APO06, BAI01, and DSS01 process domains. The following is an explanation of the documents obtained during the document study:

1) Indicators of APO06 Process Capability (Managing Budget and IT Investment Costs)

Table 4. 7 Results of achieving APO06 level CV XYZ

Process Name	level 0	Level 1	Level 2		Level 3		Level 4		Level 5	
APO06		PA 1.1	PA 2.1	PA 2.2	PA 3.1	PA 3.2	PA 4.1	PA 4.2	PA 5.1	PA 5.2
Score Percentage		92.3	60	60						
Rating by Criteria		F	L	L						
Note: N (Not Achieved: 0-15%), P (Partially Achieved: 15%-50%), L (Largely Achieved: 50%-85%), F (Fully Achieved: 85%-100%)										

The following is an explanation related to Table 4.15, namely the achievement of the APO06 level:

a) Level 1 - *Performed*

1. PA 1.1 *Process Performance* APO06 (Managing Budget and Investment Costs IT)

Table 4. 8 Process Performance APO06

Base Practice	Work Products (WP)	There is (√) or No There is (-)	Proof
APO06-BP01 Manage finance and accounting.	An accounting process to manage IT related expenses, or a system in place to manage budgets and costs	√	Financial statements
	IT Cost Classification Scheme	√	Financial statements
	Financial planning practice	√	Budget report
APO06-BP02 Prioritize resource allocation.	Priority and ranking of IT *initiatives*	√	Budget report
	Budget allocation	√	Budget report
APO06-BP03 Create and maintain a budget.	IT budgets and plans	√	Budget report
	Budget communication or IT fin reporting.	√	Budget report
APO06-BP04 models and allocate costs	IT cost categories	√	Financial statements
	Cost allocation models	√	Budget report
	Cost allocation communication costor reporting allocation	√	Budget report
APO06-BP05 Manage Fees	Cost data collection methods	√	files Document
	Cost consolidation method	-	-
	Cost optimization opportunities	√	Budget report
Average Score		92.3%	

The following is an explanation of the achievements in *Process Performance* APO06 (Managing Budgets and IT Investment Costs):

1) CV XYZ has carried out an accounting process to manage IT-related expenses, namely budget management for payment of vendor services as service providers in maintaining

IT assets, and depreciation costs for computers, laptops, CPUs, and production equipment. This can be seen in the financial statements.

2) CV XYZ has carried out an IT cost classification scheme by determining the grouping of IT-related costs, such as computer maintenance costs, computer repair costs, and depreciation costs.

3) CV XYZ has carried out financial planning with budget reports. The budget report explains the budget planning that will be issued to optimize operational costs.

4) CV XYZ has prioritized the allocation of IT resources such as budget allocations for IT service providers or vendors in maintaining IT assets.

5) CV XYZ has made a budget allocation listed in the budget report, such as showing details of the budget used.

6) CV XYZ has created and maintained a budget related to IT vendor service providers and depreciation for IT equipment, such as computers, laptops and CPUs in the budget report.

7) CV XYZ has communicated and reported the financial budget for IT, as evidenced by the existence of an approved budget report.

8) CV XYZ has made IT cost categories listed in the financial statements, namely computer maintenance costs, computer repair costs, and depreciation costs.

9) CV XYZ has carried out a cost allocation model in budget reports, such as calculations regarding depreciation of IT equipment.

10) CV XYZ has communicated and reported on the allocation of costs in the budget report. As evidenced by the existence of an approved budget report.

11) CV XYZ has collected cost data by archiving all notes or receipts related to expenses incurred.

12) CV XYZ does not have documents related to cost consolidation yet.

13) CV XYZ has optimized costs by creating a budget report.

B) LEVEL 2 – *MANAGED*

1. PA 2.1 Performance Management AP006 (Managing Budgets and Costs IT investment)

Table 4. 9 Process Performance APO06

Generic Practices (GPs)	*Generic Work Products* (GWPs)	There is (√) or No There is (-)	Proof
GP 2.1.1 Identify the process goals and manage the budget cost	GWP 1.0 Process Documentation There is a description of the scope of the process (a clear statement of where the process starts and ends)	√	SOUP

	GWP 2.0 Process plan Provides details of process performance objectives (performance objectives) such as achievement targets	-	-
GP 2.1.2 Plan and monitor the performance of the process and manage the budget cost	GWP 2.0 Process plan Provides details of process performance objectives (performance goals) such as achievement targets	-	-
	GWP 9.0 Process performance log provides results details, like report, logbook problems, and informal reports	√	Budget report
GP 2.1.3 Adjusting the performance of processes managing budgets and costs	GWP 4.0 Quality Records provides details of the actions taken when performance was not achieved	√	SOUP
GP 2.1.4 Identify responsibilities and authorities in the process of managing budgets and costs	GWP 1.0 Process documentation contains details for the ownership of the process, the responsible and authorized party in each process	√	JobDesk
	GWP 2.0 The process plan includes details of the communications plan and process performance skill and experience requirements	-	-
GP 2.1.5 Identify and provide resources in the process of managing the budget and cost	The GWP 2.0 Process Plan provides a detailed training plan and planned resources required or available	√	Asset Management Document
GP 2.1.6 Manage the interface to the budget management process and cost	GWP 1.0 Process documentation provides details of the individuals or groups involved in the process	√	JobDesk
	GWP 2.0 Process plan provides details of inter-process communication plan	-	-
Average Score		**60 %**	

The following is an explanation of the achievements in *Performance Management APO06* (Managing IT Investment Budgets and Costs):

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1) CV XYZ has identified the goals of managing budgets and costs, this is evidenced by the existence of SOP documents that explain policies or rules in making budgets for optimizing operational costs.
2) CV XYZ Dalam does not yet have documents related to the detailed identification of process performance objectives or performance goals for managing budgets and costs.
3) In monitoring budget and cost management, CV XYZ does not yet have detailed performance appraisals.
4) CV XYZ has a budget report which contains details of the budget and expenses that will be incurred in a week.
5) CV XYZ has an SOP regarding detailed actions to be taken when there is a change in the budget report.
6) CV XYZ has details for responsibilities and authorities in the process of managing budgets and costs listed on *the jobdesk* .
7) CV XYZ does not yet have documents regarding the details of the communication plan as well as the skills requirements and performance experience in managing budgets and costs.
8) CV XYZ already has a training plan and resource requirement plan listed in the asset management document.
9) CV XYZ has a jobdesk document detailing the individuals or groups involved in managing the budget and costs
10) CV XYZ does not yet have documents regarding the details of individual or group communication plans involved in budget and cost management.

2. PA 2.2 Work Product Management APO06 (Managing Budgets and Costs IT investment)

Table 4. 10 Work Product Management APO06

Generic Practices (GPs)	*Generic Work Products* (GWPs)	There is (√) or No There is (-)	Proof
GP 2.2.1 Determines requirements for work *products* , including process composition and quality criteria	GWP 3.0 Quality plan provides details of quality criteria and work deliverables	-	-
GP 2.2.2 of work *products*	GWP 1.0 Process documentation provides control details (control)	√	SOUP
	GWP 3.0 Quality plan provides details of requirements documentation and control	√	SOUP

GP 2.2.3 Identify, document, and control the results of the work process	GWP 3.0 Quality plan provides details of work products, documentation requirements and change of control	-	-
GP 2.2.4 Revisit and adjusting process results	GWP 4.0 Quality records provide audit signature of the review/evaluation conducted	√	Budget report
Average Score		60%	

The following is an explanation of the achievements in *Work Product Management* APO06 (Managing Budgets and IT Investment Costs):

1) CV XYZ does not yet have documents regarding detailed quality criteria or requirements for work results in managing budgets and costs

2) CV XYZ already has an SOP document which explains the policies or rules that are made in budgeting as a form of control over managing budgets and costs, such as policies in determining fee rates, provisions related to receipt of notes, and schedules for making budget reports.

3) CV XYZ has provided details of the documentation requirements for managing the budget and costs listed in the SOP document. The SOP explains the conditions for receiving notes to be archived, such as the receipt must have a logo/company name, shop/company telephone number, shop/company address, and signature of the note maker.

4) CV XYZ does not yet have documents related to changes in control over work results in the process of managing budgets and costs.

5) CV XYZ has evaluated the budget report made by the cashier every week. This evaluation is carried out by the *accounting manager* and approved by the director.

2) PROCESS CAPABILITY INDICATOR BAI04 (MANAGING AVAILABILITY AND CAPACITY)

TABLE 4. 11 RESULTS OF ACHIEVING LEVEL BAI04 CV XYZ

Process Name	level 0	Level 1	Level 2		Level 3		Level 4		Level 5	
EDM04		PA1.1	PA 2.1	PA 2.2	PA 3.1	PA 3.2	PA 4.1	PA 4.2	PA 5.1	PA 5.2
Score Percentage		80								
Rating by Criteria		L								

Note:
N (Not Achieved: 0-15%), P (Partially Achieved 15%-50%), L (Largely Achieved: 50%-85%), F (Fully Achieved : 85%-100%)

The following is an explanation regarding achieving the EDM04 level:

b) Level 1 – *Performed*

1. PA 1.1 *Process Performance* BAI04 (Managing Availability and Capacity)

Table 4. 12 Process Performance BAI04

BasePractice	*Work Products* (WP)	There is (√) or No There is (-)	Proof
BAI04-BP01 Assess current availability, performance and capacity and create baselines.	Baseline availability, performance, and capacity	√	Document asset management
	Evaluation of SLA	-	-
BAI04-BP02 Assess business impact.	availability, performance and capacity	√	Service analysis
	Availability, performance and capacity of business impact assessments	√	Service analysis
BAI04-BP03 Plans for new or changed service requirements.	Priority improvements	-	-
	Performance and capacity plans	-	-
BAI04-BP04 Monitor and review availability and capacity.	Availability, performance and capacity monitoring review reports	-	-
BAI04-BP05 Investigate and address availability, performance and capacity issues.	Performance and capacity gaps	-	-
	Corrective action	√	Document asset management
	Emergency upgrade procedure	√	SOUP
Score average		**50%**	

The following is an explanation of the achievements in *Process Performance* BAI04 (Managing Availability and Capacity):

1) CV XYZ already has an asset management document that explains the details of resource availability, performance and capacity used in the system.

2) CV XYZ does not have documents related to vendor performance evaluation or the results of vendor work assessments that are in accordance with agreements or agreements.

3) CV XYZ already has a service analysis document explaining the impact of using the system on business.

4) CV XYZ does not yet have documents related to priority improvements for new service needs or service changes.

5) CV XYZ does not yet have documents related to performance and capacity plans needed for new service needs or service changes.

6) CV XYZ does not have documents related to monitoring and capacity monitoring review reports.

7) CV XYZ does not have any documents related to investigating performance and capacity gaps

8) CV XYZ already has an asset management document that explains corrective actions that can be taken if there are problems when using the system (for example when there are problems related to performance and capacity, workload shifts, additional resources will be carried out).

9) CV XYZ already has an SOP document that explains procedures for quick decision-making if there are problems related to performance and emergency capacity or interruptions in the use of the system while working.

3) DSS01 Process Capability Indicator (Managing Operations)

Table 4. 13 Results of achieving the DSS01 level at CV XYZ

Process Name	level 0	Level 1	Level 2		Level 3		Level 4		Level 5	
DSS01		PA 1.1	PA 2.1	PA 2.2	PA 3.1	PA 3.2	PA 4.1	PA 4.2	PA 5.1	PA 5.2
Score Percentage		60								
Rating by Criteria		L								
Note:										
N (Not Achieved : 0-15%), P (Partially Achieved : 15%-50%), L (Largely Achieved : 50% 85%), F (Fully Achieved : 85%-100%)										

The following is an explanation regarding the achievement of the DSS01 level:

1. Level 1 – *Performed*

PA 1.1 *PROCESS PERFORMANCE* **DSS01 (**MANAGING OPERATIONS**)**

Table 4. 14 Process Performance DSS01

BasePractice	*Work Products* (WP)	There is (√) or No There is (-)	Proof
DSS01-BP1 Perform operational procedures.	Operational schedule	√	Code of Conduct
	Backup Logs	√	SOUP
DSS01-BP2 Manage outsourced IT services.	Independent guarantee plan	-	-
DSS01-BP3 Monitor IT infrastructure.	Asset monitoring rules and conditions that occur	√	Vendor cooperation documents
	Condition/event records	-	-
	Incident list	-	-
DSS01-BP4 Manage the environment.	Environmental policy	√	Code of Conduct
	Insurance policy report	-	-
DSS01-BP5 Manage facilities.	Facility appraisal report	√	Report asset list
	Health and safety awareness	√	SOUP
Average Score		**60%**	

The following is an explanation of the achievements in *Process Performance DSS01* (Managing Operations):
1) CV XYZ already has company rules that explain operational schedules and regulations or policies for delays and things that may not be done during working hours.
2) CV XYZ already has SOPs regarding data *backup* or documentation of important letters or documents. File *backup* activities on the computer are carried out at the end of working hours.

3) CV XYZ does not yet have documents related to an independent guarantee plan in managing IT *outsourcing services* .

4) CV XYZ already has a vendor collaboration document that explains the rules or procedures for monitoring assets and conditions that occur.

5) CV XYZ does not have documents related to recording conditions/events/obstacles in monitoring IT infrastructure.

6) CV XYZ does not have documents related to recording incidents that occur in monitoring IT infrastructure.

7) CV XYZ already has company rules that explain the rules for maintaining a clean and comfortable work environment related to the management of the work environment.

8) CV XYZ does not have documents related to insurance policy reports.

9) CV XYZ already has an asset list report which explains the list of assets available to the company. This report is the result of assessing the feasibility of the assets used.

10) CV XYZ already has an SOP that explains the steps in maintaining health and safety in carrying out the work/tasks given.

c. **Maturity level results**

The results of the maturity level obtained from the questionnaire analysis will be compared with the results of the document study analysis. This comparison was carried out to verify that the results of the questionnaire analysis and document study were in accordance with the ISO/IEC 15504 assessment category. The following results of the maturity level obtained at this time are shown in the following table.

Table 4. 15 Results of the current maturity level

Domain	Domain Description	Results Analysis Questionnaire	Analysis Results Document Study
APO06	Manage budgets and costs	1.81	*Large achieved*
BAI04	Manage the availability and capacity of resources	1.25	*Large achieved*
DSS01	Manage operations	1.19	*Large achieved*
Average		**1.4**	

2. Gap Analysis

Based on the results of direct interviews with the Director of CV XYZ, the maturity level expected is that each process has a different level and does not have to reach level 5 (*optimizing*). The results of the interview with Mr. I Nyoman Gede Suma Artha as the Director of CV XYZ are as follows "In my opinion the maturity level in each of these domains is close to the expected maturity level. For now the maturity level is in the sufficient category. However, a company certainly needs to be developed, therefore for now the expected maturity level does not have to be perfect or does not have to be at level 5 (*optimizing*) because considering that CV XYZ is a small company and of course it still has many shortcomings. Therefore, the expected level of maturity is level 3." explanation from the Director of CV XYZ From this explanation, it

can be said that there is a gap between the current maturity level and the expected maturity level. Therefore, it is necessary to carry out a gap analysis so that it can achieve the expected level of maturity in all activities carried out at CV XYZ. This discrepancy occurs in all domains tested, namely 3 domains. Gap analysis is carried out by comparing the current maturity level with the expected maturity level so as to produce a gap (GAP). The comparison of maturity levels is shown in table 4.34 below.

Table 4. 16 Comparison of maturity levels

Process Domains	Maturity Level		
	Moment This (*as-is*)	Expected (*to-be*)	GAP (*to-be*) - (*as-is*)
APO06	1.81	3	3 - 1.81 = 1.19
BAI04	1.25	3	3– 1.25 = 1.75
DSS01	1.19	3	3 – 1.19 = 1.81
Amount			4.75
Average			1.6

Based on the average value of all domains, it shows that the level of maturity expected by CV XYZ has not been achieved. Table 4.14 shows that the average distance (GAP) in all of the domains above is 1.6, therefore it is necessary to make recommendations for improvement in each of these domains so that they can reach the expected level of maturity. Thus the conditions for comparing the maturity levels of all domains can be described in Figure 4.6 as follows:
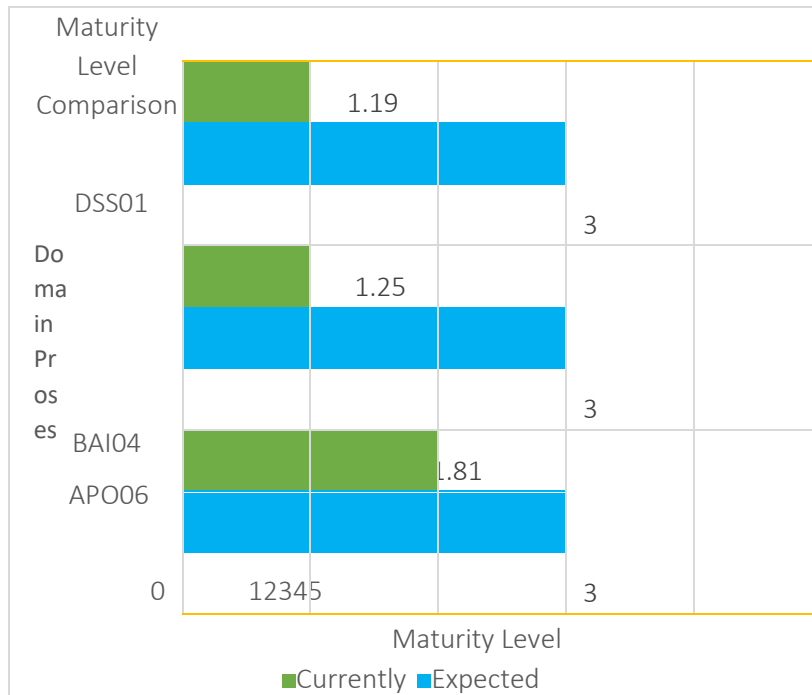
Figure 4. 5 Comparison of maturity levels of information system governance at CV XYZ

b. 3. Findings and Recommendations

The results of the gap level analysis that has been made in the 3 (three) COBIT 5 domains prove that no domain has yet reached the maturity level expected by CV XYZ. The results of these gaps indicate that improvements must be made by providing recommendations for improvements so that all domains can reach the expected level of maturity. The following are recommendations that can be implemented so that all domains can reach the expected level of maturity:

1. APO06 Process (Managing Budgets and Expenses)

The APO06 process is classified at level 2 (*managed*), this is because CV XYZ has not fully optimized resources and in the results of document validation there is only some evidence related to optimizing the resources carried out. Regarding the problem regarding the absence of a specific budget to renew IT assets, the following are findings and recommendations regarding IT governance at CV XYZ using the APO06 process domain:

1) Findings

CV   XYZ has made a budget to support production activities, however IT development or renewal has not been carried out optimally due to constraints on the resources it has. This resulted in delays in updating or repairing problematic IT devices.

2) Recommendation

CV   XYZis recommended to carry out an evaluation related to the categories of costs used so that they can optimize the costs incurred and can determine the IT budget in budget reports, at least a yearly budget related to IT renewal so that heavy or light damage to IT devices will be quickly resolved and support operational activities which is more effective.

2. Process BAI04 and DSS01

The BAI04 process (Managing Availability and Capacity) and DSS01 (Managing Operations) are classified at level 1 (*managed*), this is because CV XYZ has not fully regulated system availability and capacity, and in the results of document validation there is only some evidence related to evaluating availability and the capacity of the system carried out, this shows that the evaluation is not carried out periodically. Related to the problems that occur, namely the Quickbooks system which is slow and even *errors* when *staff* are inputting, the following are findings and recommendations related to IT governance at CV XYZ using the BAI04 and DSS01 process domains.

1) Findings

a. The RAM capacity of the *Quickbooks server system* is still 4GB with nine clients using the system simultaneously, which makes the system slow.

b. In the *Quickbooks system* there are still items of material or products that are not used so that they take up a lot of space on *the hard disk* and make the system slow.

c. CV XYZ in the management and maintenance of IT infrastructure in collaboration with external vendors and no documents related to evaluating vendor performance were found.

d. Recording related to conditions/events/incidents was not carried out by the vendor, this is evidenced by the absence of documents related to a list of events/incidents that have occurred.

2) Recommendation

a. It is recommended that CV XYZ complete the SOP documents regarding the implementation of system evaluation or auditing which can be carried out every 6 (six) months in order to minimize system *errors.*

b. It is recommended for CV XYZ to update server RAM capacity by taking into account *Quickbooks server RAM requirements* , as follows:

a) 1-5 Users: 8GB RAM

b) 10 Users: 12GB RAM

c) 15 Users: 16GB RAM

d) 20 Users: 20 + GB RAM

c. CV XYZ is recommended for evaluating (checking and deleting) old material items or products that are no longer used, so as to reduce space usage on the *hard drive* .

d. It is recommended that CV XYZ create vendor performance assessment documents related to evaluating compliance with agreements and work agreements with vendors. From the results of this evaluation, CV XYZ can analyze the vendor's performance. It is recommended that CV XYZ make reports regarding conditions/events/incidents that occur in IT infrastructure monitoring activities, so that these reports can be used as a basis for system evaluation to find out system deficiencies such as errors and problems that occur when using the system so that it can be *corrected* . In addition, with this record, the same events/incidents can be resolved immediately.

CONCLUSION

The author has conducted accounting information system management audits based on COBIT 5 at CV XYZ in the domains APO06 (managing budgets and costs), BAI04 (managing inventory and system capacity), and DSS01 (managing operations). Based on the results of the evaluation and analysis carried out, it can be concluded that:

1) The current maturity level with an average of 1.4 is at level 1 (*Performance*) and the expected maturity level is level 3 (*Established*), and has an average gap (GAP) of 1.6.

2) To increase the current maturity level (level 1) to the expected maturity level (level 3), the following recommendations are proposed:

   a. It is recommended for CV XYZ to set an IT renewal budget in a budget report a maximum of one year to support operational activities.

   b. It is recommended that CV XYZ complete the SOP documents regarding the implementation of system evaluation or auditing in order to minimize system *errors* , updating the RAM capacity of the *Quickbooks server,* and evaluating old unused material or product items, so that they can add space to *the hard drive* .

   c. It is recommended that CV XYZ make vendor performance assessment documents related to evaluating compliance with agreements and work agreements with vendors so that they can analyze vendor performance, as well as make reports related to recording conditions/events/incidents that occur in IT infrastructure monitoring activities for the basis of evaluating deficiencies from system used.

SUGGESTION

Based on the conclusions and analysis previously presented, the researcher provides suggestions and evaluations related to improving the management of IT governance at CV XYZ:

1. CV XYZ can carry out the recommendations given by researchers to increase the level of capability of the APO06, BAI04, and DSS01 process domains.

2. Future research can use a measurement scale or use a different domain, but still combine it with the COBIT 5 *framework* so that it can produce a more complete evaluation.

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