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Assessing Information System Acquisition and Implementation Using COBIT 4.1 in Housing Developers

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Abstract: Housing development companies plan, construct, and market housing. As technology advances, information systems become crucial, especially in financial matters. However, no comprehensive analysis of financial information system implementation in this sector exists. This study employed a qualitative descriptive approach supported by quantitative assessment (mixed-method), combining observations and semi-structured interviews (qualitative) with a questionnaire-based maturity level calculation (quantitative). Data were collected from three respondents (Finance Manager, IT Staff, and Accounting Staff) directly involved in the system. The maturity level was determined using the COBIT 4.1 framework in the Acquire and Implement (AI) domain. Results show an average maturity of 3.08 Level 3 (Defined Process), meaning procedures are documented and structured. However, several subdomains remain below target AI5 gap 1.30 and AI7 gap 1.10 require improved implementation and control of financial information systems, while AI3 has the smallest gap (0.02). This study contributes to the academic community by (1) providing a detailed assessment of financial information system implementation in housing development companies, (2) identifying maturity gaps in each AI subdomain, and (3) offering practical recommendations for improving IT governance maturity. Routine maintenance, system monitoring, and infrastructure updates are still needed to ensure system stability. Overall, information systems management has not yet reached the targeted maturity level due to reliance on individuals, lack of formal training, and poor procedure communication. Continuous improvement is required to make information systems management more efficient and scalable.

Keywords: Acquire and Implement (AI); COBIT 4.1; Maturity Level; Financial Information System; Property Developer Company

INTRODUCTION

Housing developers plan, build, and market residential areas. In addition to ensuring that projects comply with regulations and meet requirements, these companies are also responsible for providing homes and supporting infrastructure (Fadli & Nugroho, 2025). The housing development industry currently relies on information technology, particularly digital financial systems that manage transactions and generate reports. However, to date, no comprehensive analysis has been conducted on the financial systems used by these development companies. Furthermore, the implementation process plays a crucial role in determining whether the system developed meets the needs of the development company (Sembiring et al., 2025). Aligning information systems with organizational goals and guaranteeing the development of business value depend heavily on effective IT governance. Strong IT governance frameworks have been linked to improved system performance and operational efficiency, according to earlier research (Lowry et al., 2024).

The COBIT 4.1 framework has been used in earlier research to study information system governance. For instance, (Saryoko et al., 2021) discovered that the Acquire and Implement (AI) domain's maturity level was often at Level 3 (Defined Process), and (Nurfadhiilah et al., 2024) also showed that most processes were documented but not yet fully optimized. Furthermore, (Imtihan et al., 2022) noted that even if IT procedures are already established, advancements are still required to reach a greater degree of maturity. Nevertheless, these studies do

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not really examine the use of financial information systems in housing development firms; instead, they mostly concentrate on general organizations.

Furthermore, prior studies have tended to focus on measuring maturity levels without offering a thorough analysis of implementation gaps in each subdomain, especially in crucial processes like system implementation and IT resource management. As a result, there is a research gap regarding the implementation and evaluation of financial information systems in home development firms.

In general, COBIT was developed by the Information Systems Audit and Control Association (ISACA) and the IT Governance Institute (ITGI) as a globally recognized framework for creating business value, managing risk, and ensuring that business objectives are achieved. The evolution of COBIT versions released by ISACA includes COBIT 1.0 (1996), COBIT 2.0 (1998), COBIT 3.0 (2000), COBIT 4.0 (2005), COBIT 4.1 (2007), COBIT 5.0 (2012), and COBIT 2019 (2018) (ISACA, 2019). The COBIT 4.1 framework was adopted because it provides a maturity level model that is more suitable for evaluating the level of process maturity compared to capability-based models.. The AI domain has the capability to systematically address deficiencies or weaknesses and build a complex audit knowledge base. With the help of the AI domain, the process of identifying audit activities and preventive measures can be carried out more quickly, consistently, and in an integrated manner, while supporting the next phase of audit information system development (Juniar Wibowo et al., 2025).

COBIT 4.1 is a framework designed to govern and manage information technology, it serves as a benchmark and guideline to ensure that an organization's IT management meets established business objectives. Its primary purpose is to align organizational needs with IT, while ensuring that IT can achieve the organization's objectives in an optimal, secure, and reliable manner (Trinanda et al., 2024). COBIT 4.1 comprises four domains for managing information technology: Plan and Organize (PO), Acquire and Implement (AI), Deliver and Support (DS), and Monitor and Evaluate (ME). These four domains cover the entire IT governance lifecycle, encompassing planning, implementation, and monitoring. To measure the maturity level of IT process implementation within each domain, COBIT 4.1 provides a maturity model consisting of six levels: Level 0 (None), Level 1 (Unstructured), Level 2 (Repeatable), Level 3 (Defined), Level 4 (Managed), and Level 5 (optimized) (Purnama Adji et al., 2022).

Information system audits at software development companies are necessary to ensure that they are implementing effective IT management. These audits help companies identify various shortcomings or weaknesses in their systems, such as deficiencies in internal controls, poor risk management, or a lack of human resources. Audits also serve to uncover weaknesses in information systems and provide appropriate recommendations for improvement. Ultimately, the primary objective of an audit is to ensure that the information systems in use genuinely support the achievement of organizational goals and guarantee overall efficiency and service quality (Belelang & Nurlela, 2022).

This study supports the implementation of COBIT 4.1 for housing development companies, a sector that has received little attention in similar journals. Few studies have examined the implementation of financial systems in housing development companies. Consequently, this study was conducted to perform a technology-based audit of the financial systems of housing development companies using the COBIT 4.1 framework. This study makes three contributions: (1) it provides a detailed assessment of the implementation of financial information systems in housing development companies, (2) it identifies maturity gaps in each AI subfield and (3) it offers useful recommendations for improving IT governance maturity.

LITERATURE REVIEW

The COBIT framework has been extensively used in earlier research to assess the maturity of IT governance across a range of industries. In several previous studies, COBIT 4.1 was used to assess information systems management, particularly in the Acquire and Implement (AI) domain. A study on (Saryoko et al., 2021) found that the maturity level of information system management in the AI domain was at level 3 (Defined Process), with the highest score in domain AI1 at 3.23 and the lowest score in domain AI4 at 1.47. Research by (Nurfadhiilah et al., 2024) also found that, overall, the AI domain is at Level 3 (Defined Process). However, processes such as PO10, AI03, and ME04 are still at Level 2 (Repeatable), indicating that IT management still requires improvement. Additionally, the research conducted (Imtihan et al., 2022) indicates that the average IT maturity level is at Level 3, meaning that the defined IT management processes have been well documented but still need improvement to become more optimal. (Nurbojatmiko et al., 2024) conducted a study to assess the security of information systems in data centers using COBIT 5. The results showed that the capability level (Managed Process) was at Level 2 and that, to achieve optimal security, policies, risk management, and resource support are still needed.

According to earlier research, the majority of studies show that the COBIT framework's information system governance maturity level often falls between Level 2 and Level 3. This demonstrates that although organizational processes are already established and recorded, they have not yet attained an ideal and quantifiable state. These results demonstrate that many firms continue to struggle with increasing the maturity of IT governance, particularly with regard to implementation and control procedures.

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The primary distinction between this study and earlier research is its emphasis on financial information systems in housing development firms, which have not gotten much attention in earlier studies. Additionally, this study offers a more thorough examination of the maturity gaps in each of the Acquire and Implement (AI) domain's subdomains, with a focus on IT resource management and system implementation procedures.

The Acquire and Implement (AI) domain serves as the foundation for evaluation in this study which uses the COBIT 4.1 methodology. Data collecting by observation, interviews, and questionnaires is the first step in the research process. This is followed by gap analysis, maturity level measurement, and the creation of suggestions to enhance IT governance.

METHOD

The systematic process carried out to achieve the research objectives is known as the research stages. This process includes problem identification, data collection, and analysis conducted within the Acquire and Implement (AI) domain of COBIT 4.1. The installation of financial information systems is assessed in this study using an organized methodology. Figure 1 shows the results of the research.

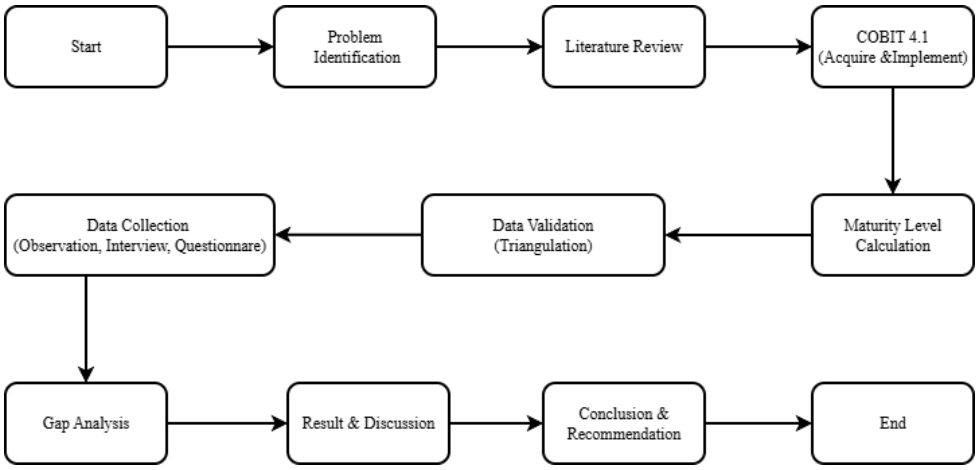

Figure 1. Research Flowchart

Based on the research flowchart shown in the figure, the process can be explained as follows:

Problem Identification

The problem identification process begins with systematically formulating the research problem, starting from a general issue and narrowing it down to a more specific and measurable one. Accordingly, observations were conducted to gather information about the status of the financial information system implementation process at a housing developer company. Next, the scope of the problem was defined to sharpen the research focus, and the researcher conducted preliminary research, including reviewing the literature, the research subjects, and the methods for evaluating and resolving the problem (Wahidah et al., 2022). This study employs a descriptive mixed-method approach, combining qualitative analysis (observations and interviews) with quantitative assessment (questionnaire-based maturity level calculations) to evaluate the acquisition and implementation processes of a financial information system at a housing development company (Roosinda et al., 2021). Descriptive research focuses on describing the current condition of a phenomenon based on existing data to provide a comprehensive explanation (Gustianto & Wanda, 2026).

Data Collection

This study involved 3 respondents, consisting of a Finance Manager, an IT Staff member, and an Accounting Staff member. These respondents were chosen to ensure that the data gathered accurately reflects the actual conditions of system usage inside the company because they are directly involved in the implementation and operation of the financial information system. Although the number of respondents is limited, the use of multiple data collection techniques ensures data validity through triangulation. Several techniques, such as speaking directly with respondents and analyzing documents related to the financial information system under study, were used to collect data to support the research objectives (Gustianto & Wanda, 2026). Before data collection, the author first visited the research site, which was a housing development company. Next, the author interviewed the respondents who were directly involved with the system and administered the questionnaire to them.

a. Observation (Direct Observation)

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A data collection method that excels at gathering firsthand information in the field. The researcher conducts direct observations at a housing development company to gain a comprehensive understanding of the existing financial information system, thereby providing in-depth insight into the implementation of the financial information system within the company (Mangunsong & Irawan, 2025).

b. Interviews

The interviews used a semi-structured approach, which allowed the researcher to explore information in greater depth with the relevant parties—namely, the finance staff who have direct access to the housing developer's financial information system (Gustianto & Wanda, 2026).

c. Questionnaire

To collect data, a questionnaire was distributed to employees working on the implementation of the financial information system. To determine the maturity level of the ongoing processes, questions were formulated based on the COBIT 4.1 Acquire and Implement (AI) domain (Siddik et al., 2024). The questionnaire items were developed based on COBIT 4.1 control objectives in the Acquire and Implement (AI) domain.

d. Literature Review

This study was conducted by compiling various theories, methods, and frameworks related to financial information systems and digital technology. At this stage, to assist in addressing the research problem, relevant information was obtained from books, websites, and journals (Muhamad & Supriadi, 2024).

To ensure data validity, triangulation techniques were applied by comparing data obtained from observations, interviews, and questionnaires. This approach improves the reliability and consistency of the findings.

COBIT 4.1

COBIT 4.1 was applied in this study as a framework for assessing the effectiveness of financial information systems at housing development companies, with a focus on the Acquire and Implement (AI) stage. The study utilized maturity levels to determine the maturity level, identify gaps, and evaluate the effectiveness of the financial information system implementation (Sinaga & Permana, 2023).

Acquire and Implement (AI)

In COBIT 4.1, the Acquire and Implement (AI) domain focuses on the processes involved in implementing an organization's information systems, from development and deployment to managing system changes. The domain's objective is to ensure that the financial information systems implemented by housing developers meet business needs. This domain consists of several processes, namely AI1 (solution identification), AI2 (application development), AI3 (technology infrastructure), AI4 (usage and operations), AI5 (IT resources), AI6 (change management), and AI7 (system implementation and testing) (Sinaga & Permana, 2023). This study uses the AI domain as a framework for evaluating the implementation process of financial information systems at housing development companies through the measurement of maturity levels.

Maturity Level

This maturity level is used to assess the maturity of IT management within a company based on survey responses, which are then averaged to determine the current state of digital infrastructure management (Nurfadhiilah et al., 2024). The formula used is:

$$\text{Maturity Level} = \Sigma \text{ Respondent's Score} / \text{Number of Respondents} \quad (1)$$

The maturity level calculation was carried out through the following steps:

a. Each questionnaire response was assigned a score (Yes = 1, No = 0)
b. The total score was calculated for each control objective by summing all respondent answers
c. The total score was divided by the number of questions to obtain the maturity index
d. The results were then mapped to the COBIT 4.1 maturity level scale

The following is an explanation of the maturity levels in COBIT 4.1, ranging from Level 0 to Level 5 (Sinaga & Permana, 2023) :

a. Level 0: None-Existent, indicating that information technology processes are not yet fully optimized.
b. Level 1: Initial/Ad Hoc, there is a problem, but the company does not have a standard operating procedure (SOP) that can be used.
c. Level 2: Repeatable But Intuitive, at this stage, implementation and development in accordance with standard operating procedures (SOP) have begun.
d. Level 3: Defined Process, at this stage, standard operating procedures have been established through documentation and training, and the standard operating procedures (SOP) are now in compliance with the standards.

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e. Level 4: Managed and Measurable, if the organization does not follow the procedures, management takes action at this stage.
f. Level 5: Optimized, If the organization does not follow the procedures, management takes action at this stage.

Gap Analysis

In this study, a gap analysis was conducted to measure the difference between the target and the current maturity level of housing developers' financial information systems. The gap was used as an evaluation tool to identify discrepancies or differences between the current maturity level and the specified target (Al Huda & Syahrudin, 2024). The gap analysis is performed by comparing the current state with the target state, as formulated below:

$$Gap = M_{to\text{-}be} - M_{as\text{-}is} \quad (2)$$

The difference between the current (as-is) and anticipated (to-be) maturity levels is represented by the gap value. Greater improvement efforts are needed to reach the targeted maturity level, as indicated by a higher gap value. Priority areas that need to be improved in IT governance are also found using this study.

RESULT

Based on the control objectives in the Acquire and Implement (AI) domain, an analysis was conducted to identify the maturity level of the financial information system implementation process at a housing developer company. The assessment results show an average maturity level of 3.08. This score falls under Level 3 (Defined Process), indicating that the process has been documented and implemented in a structured manner. To achieve the desired level of maturity, further improvements are still needed. The results yielded a maturity level index using the assessment criteria in table 1 as follows:

Table 1. Assessment Index

Maturity index	Maturity Level
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-Optimized

The results of the maturity level assessment for the financial information system implementation process in the Acquire and Implement (AI) domain will be presented in the form of tables and explanations. Next, maturity scores are calculated to identify the gap between the initial (as-is) condition and the planned (to-be) condition. The results are presented in graphical form, and this study serves as the basis for recommendations to improve the quality of financial information system implementation at housing developer companies.

Maturity Level Results

The analysis of the questionnaire data yielded maturity levels for each step in the Acquire and Implement (AI) domain. The results are presented in table 2 to illustrate the current state of financial information system management.

Table 2. Maturity Level

Control Objective	Current Maturity Index	Current Maturity Level
AI1	2.81	3-Defined Process
AI2	2.47	2-Repeatable But Intuitive
AI3	3.98	4- Managed and Measurable
AI4	3.63	4- Managed and Measurable
AI5	2.7	3-Defined Process

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AI6	3.1	3-Defined Process
AI7	2.9	3-Defined Process
Average		
3,08		3-Defined Process

Table 2 shows maturity index scores for the Acquire and Implement (AI) domain ranging from 2.47 to 3.98. In general, most sub-domains are at Level 3 (Defined Process), indicating that the implementation and control processes for information systems have documented mechanisms and are beginning to be widely applied within the organization. The average maturity level of 3.08 indicates that the management of the Acquire and Implement (AI) process is proceeding fairly well, but process control and measurement still need to be improved.

AI5 has a relatively low maturity level (2.7) with a gap of 1.30, indicating that IT resource management has not been effectively implemented. Unstructured IT investment planning, limited vendor management practices, and inadequate documentation of procurement processes are some of the factors that may contribute to this situation. In reality, the company may continue to rely on quick decision-making when acquiring IT resources, resulting in inefficiencies and inconsistent system support.

In addition, there are significant discrepancies in the AI7 domain, indicating that there are issues with the system's testing and implementation processes. This suggests that the system's implementation is not supported by comprehensive testing procedures or formal validation mechanisms, which could impact the system's reliability. The AI3 domain, on the other hand, has the smallest gap, suggesting that infrastructure management procedures are already well-established and nearly at the anticipated level of maturity.

The three respondents participated in semi-structured interviews and observations in addition to the questionnaire-based maturity assessment. All employees use the financial information system on a daily basis, according to observations, but there was no system performance log or official monitoring dashboard. The system runs on a single workstation and lacks a written maintenance schedule and automated backup processes.

Interviews supported a number of important conclusions. According to every response, there has never been official training for the system, and when staff members run into issues, they turn to their peers for support. There is no official documentation or communication of standard operating procedures (SOPs) for system use. The organization does not have a systematic procedure for acquiring IT resources choices are made on an as-needed basis without a written assessment of the available options. Furthermore, system modifications are carried out without formal authority or prior testing. The poor maturity scores in AI5 (IT resource management) and AI7 (system implementation and testing) are supported by these qualitative findings.

Gap Analysis Results

Next, a gap analysis was conducted to identify discrepancies at each step within the Acquire and Implement (AI) domain. This was done by comparing the current (as-is) maturity level with the expected (to-be) level. The results of this analysis are presented in table 3 below.

Table 3. Value gap

Control Objective	As-is	To-be	Gap	Description
AI1	2.81	4	1.19	Improvements are needed in system solution planning and coordination among information technology developers, as this finding indicates that the process of identifying automation solutions for the financial information systems of housing developers is not yet fully integrated with and structured around business needs.
AI2	2.47	3	0.53	This indicates that application software maintenance has been going well; however, there is a need to improve the standardization of application development processes and quality control.

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AI3	3.98	4	0.02	This situation indicates that IT infrastructure management has been successful and is nearing the expected level of maturity. Therefore, the processes included in this subdomain can be categorized as optimally managed processes.
AI4	3.63	4	0.37	These results indicate that the operational processes and use of the financial information system are functioning fairly well. However, to ensure the system is used to its full potential, improvements are still needed in the documentation of operational procedures and user training.
AI5	2.7	4	1.30	This indicates that the implementation of IT resources is not yet optimal and improvements are needed, particularly in IT needs planning and technology investment management.
AI6	3.1	4	0.90	This indicates that a change management process has been implemented during the rollout of the financial information system; however, change control, change documentation, and system testing prior to implementation are all still necessary.
AI7	2.9	4	1.10	This indicates that the installation and accreditation processes for financial information system solutions still need improvement, particularly the system testing, implementation verification, and evaluation processes prior to the system's operational deployment.

Gap Chart

To clarify the extent of the gaps in the Acquire and Implement (AI) domain, the data was further visualized based on the results of the gap analysis presented in the previous table. The graph in figure 2 shows this visualization.

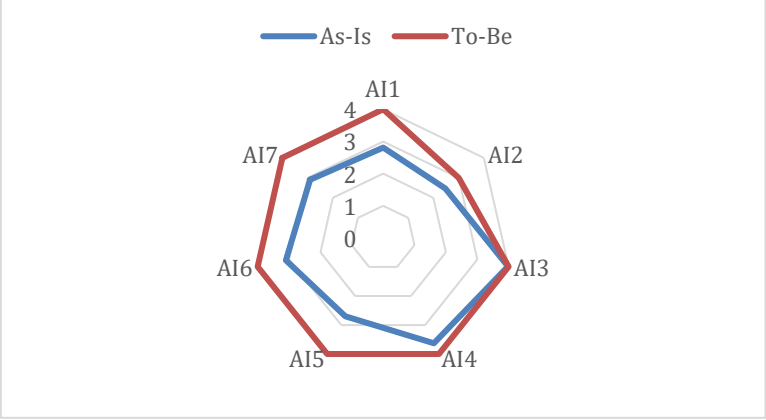

Figure 2. Gap Chart

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The gap values for every step in the Acquire and Implement (AI) domain are shown in figure 2. AI5 (1.30) has the biggest disparity, followed by AI7 (1.10), suggesting that system installation and IT resource management procedures need to be significantly improved. AI3, on the other hand, exhibits the smallest gap (0.02), indicating that infrastructure management is already nearing the anticipated level of maturity. These findings suggest that the company should give system testing, vendor management, and procurement planning top priority.

DISCUSSIONS

The maturity assessment results indicate that the Acquisition and Implementation (AI) domain is at Level 3 (Defined Process) with an average maturity score of 3.08. This indicates that processes related to the implementation of information systems have been documented and systematically implemented within the organization. However, there are still significant variations across several subdomains, particularly AI5 and AI7, indicating that some processes have not yet reached the expected maturity level.

Previous studies have shown that Level 3 organizations generally have standardized procedures, but they still face challenges in implementing effective controls, monitoring, and performance measurement. These findings are consistent with those findings. AI5 and AI7 have weaknesses in system implementation control, procurement management, and monitoring processes, which are key components that ensure effective information system governance. This result is consistent with that of (Alzeban et al., 2026), who discovered that strong IT governance and chief audit executive (CAE) IT proficiency greatly enhance cybersecurity audit quality. Our recommendation that advancements in AI5 (IT resource management) and AI7 (system implementation and testing) are essential for reaching Level 4 maturity is reinforced by their study, which was published in the Q1 journal Managerial Auditing Journal and confirms that organizations with stronger IT governance frameworks achieve better security outcomes. According to COBIT 4.1, Level 3 (Defined Processes) indicates that processes have been documented and standardized, but are not yet fully measured and managed. This explains why the company has not yet reached Level 4 (Managed and Measurable Processes), where processes are consistently monitored, evaluated, and improved based on performance metrics.

Several factors may influence the findings observed in this study, such as reliance on individual experience, a lack of formal training, and inadequate communication of procedures within the organization. These factors can lead to inconsistencies in the implementation of the system and, overall, less effective use of the information system.

Therefore, improvements are necessary to enhance the maturity level of the information system implementation process. These improvements include strengthening system monitoring and control, improving documentation and standardization of procedures, enhancing staff training, and optimizing procurement and system implementation management processes, particularly in subdomains AI5 and AI7. By implementing these improvements, the organization is expected to achieve a higher maturity level in accordance with COBIT 4.1 standards.

There are a number of limitations to this study. First, the results are not as broadly applicable as they may be because it was limited to one house building company and only three respondents. Second, response bias may have been introduced because the maturity assessment was based on self-reported questionnaire data. Third, COBIT 4.1 Plan and Organize (PO), Deliver and Support (DS), and Monitor and Evaluate (ME) domains were not reviewed only the Acquire and Implement (AI) domain was. A bigger sample size, more COBIT domains, and more recent frameworks like COBIT 2019 should all be included in future studies.

CONCLUSION

The results of the COBIT 4.1 research in the Acquire and Implement (AI) domain indicate a maturity level of 3.08, indicating that the financial information system implementation process is at Level 3 (Defined Process). At this stage, procedures have been documented and standardized but are not yet fully managed and measured effectively.

The maturity level is expected to be at level 4 (Managed and Measurable), indicating that there is still a gap between the current state (as-is) and the target state (to-be). This suggests that improvements are needed in the use of the company's information systems to achieve more efficient and measurable management.

In particular, significant gaps were found in subdomains AI5 and AI7. This indicates that the processes for implementing, controlling, monitoring, and managing the system require improvement. In general, the company has the capability to formally design and document processes. However, there are several obstacles, such as a lack of formal training, a lack of communication regarding standard procedures, and a reliance on individuals to execute processes, which can lead to errors. Therefore, improvement recommendations prioritized to optimize performance and the quality of the information system implementation are required.

By demonstrating how to apply the COBIT 4.1 framework to assess the maturity of financial information systems at housing development companies, this study contributes to the academic community. This research can help organizations improve the implementation of information systems, particularly by strengthening system controls, improving documentation, and providing comprehensive training to employees.

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It is hoped that future research will yield more comprehensive results by employing newer methodologies or frameworks and by developing evaluations that encompass other areas within COBIT.

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