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Maturity Measurement of Information and Communication Technology Infrastructure Governance and Management in Mojokerto Regency using Cobit 2019

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Abstract. In the current era of digital transformation, local governments are responsible for providing convenient and fast services to the public. Therefore, adequate preparation of information and communication technology (ICT) infrastructure is crucial to supporting the digital transformation initiated by the Mojokerto Regency government. The Mojokerto Regency Communications and Information Technology Office (Diskominfo) faces several challenges related to managing ICT service infrastructure. These include the uneven distribution of ICT network infrastructure across all service departments and the lack of integration of data services within Diskominfo's data center. The purpose of this study is to examine the current situation and provide recommendations regarding the stages and priorities for managing ICT network infrastructure at Diskominfo. Therefore, an appropriate method is needed to identify the condition of the ICT infrastructure and evaluate its performance achievements using the COBIT 2019 framework. The research was conducted through problem identification, stakeholder discussions, data collection, data analysis, and reporting. The results of this study are a measurement of the maturity of ICT infrastructure governance and management, based on the COBIT 2019 framework with objective domain processes BAI02 Managed Requirements Definition, BAI03 Managed Solutions Identification and Build, BAI06 Managed IT Changes, and BAI10 Managed Configuration. These recommendations and suggestions can be used to further improve ICT governance and management services in all organizations.

Keywords: digital transformation, ICT infrastructure, COBIT 2019

INTRODUCTION

Every local government in the current era of digital transformation is required to take responsibility for providing convenience and speed in services to the community (Kaganova & Telgarsky, 2018; Sussy & Vicente, 2021; Utami & Widarjo, 2022; Widodo & Kusnan, 2023). Therefore, preparations related to adequate *information and communication technology* (ICT) infrastructure are crucial to support the digital transformation program as a form of readiness to become a smart city, as launched by the Mojokerto Regency government (Abdul-Samad & Kulandaisamy, 2022; Furqan et al., 2023; Purnomo & Kusnandar, 2019; Sahamir et al., 2021; Triyono & Nuariyani, 2019).

The Ministry of Communication and Information Technology (Diskominfo) is responsible for ensuring the availability and readiness of ICT infrastructure to maintain quality connectivity services and to enable cross-sectoral information systems integration among existing agencies. The challenges faced by Diskominfo in improving ICT infrastructure services in Mojokerto Regency relate to the management of ICT service infrastructure. These challenges include uneven distribution of the ICT network infrastructure across official services and insufficient integration of data services into a centralized data center managed by the Mojokerto Regency Diskominfo (Afandi et al., 2021; Anggraini et al., 2015; Astuti & Prasetyono, 2017; Kango et al., 2019).

The concept of smart city planning, which is constantly evolving and adaptive to technological advances, can enhance government roles in service delivery and facilitate community interaction across sectors such as administration, education, trade, and investment (Arfiansyah & Han, 2020; Aziz & Achmad Djunaedi, 2022; Goldsmith & Crawford, 2014; Ng, 2022; Prabowo et al., 2023). This provides a reference for the digital transformation process

based on the readiness of sound *information and communication technology governance*, supported by appropriate and sustainable technology.

The ongoing implementation of *Information Technology* at the Mojokerto Regency Communication and Information Service can be deemed successful if its roles and efforts are aligned to support the vision, mission, and regional development objectives. Hence, measuring the extent to which Information Technology governance has been effectively executed is necessary (Eka Artha Putra et al., 2023; Juan Michael et al., 2023; Morris William Tangka et al., 2020; Safwandi et al., 2022).

To support the smart city program, a data collection strategy related to the readiness of ICT service infrastructure at the Mojokerto Regency Communication and Information Office is required. This will determine the maturity level of ICT management according to ICT governance and management principles using the *COBIT 2019* framework, which is a standard reference for ICT governance and management.

This research, using the *COBIT 2019* framework, provides a comprehensive analysis through 40 objective governance and management components. As a toolkit design factor (ISACA COBIT2019, n.d.), it aligns the needs of IT services in service management, risk management, user relationship improvement, and operational efficiency enhancement. This fosters a dynamic and evolving ICT environment that meets technological demands.

The study addresses several critical issues arising from suboptimal ICT infrastructure within the Mojokerto Regency government. First, it seeks to identify specific obstacles hindering agency performance that depends on ICT services. Second, it analyzes how current and ongoing ICT infrastructure resources are allocated and utilized. Lastly, it aims to develop actionable recommendations for enhancing ICT governance and management, forming a foundation for future evaluations and strategic planning at the Mojokerto Regency Communication and Informatics Office (Diskominfo).

Based on the problem formulation, this research aims to assess the current maturity level of ICT infrastructure regarding both capability and quantitative requirements. Furthermore, it intends to provide prioritized recommendations for ICT infrastructure development aligned with established ICT governance standards, specifically the *COBIT 2019* framework. These recommendations support Diskominfo in fulfilling its duties and realizing the regional leadership vision and mission to improve public service delivery.

To ensure focus and clarity, this study is limited to several key boundaries. Data collection on the current conditions at Mojokerto Regency Diskominfo is conducted exclusively using the *COBIT 2019* framework. Evaluation objectives are based on predetermined targets selected in collaboration with Diskominfo. Additionally, the assessment scope covers only existing ICT infrastructure within the organizational scope of Mojokerto Regency Diskominfo. The research operates under two main assumptions: first, the *COBIT 2019* ICT governance framework is applied with necessary adjustments to comply with regulations issued by the Government of Indonesia; second, the existing ICT Master Plan is utilized as a foundational document for data collection, analyzed against field conditions to identify objective gaps and guide future Master Plan improvements.

The purpose of this study is to assess the current conditions and provide recommendations regarding the stages and priority scale of completing the intranet network infrastructure and data centralization within Diskominfo. It aims to help solve various local government issues through digital solutions by utilizing technological resources that improve service quality—making services easily accessible, fast, and accurate for the community, which is the responsibility of every city government worldwide.

This study is expected to provide both theoretical and practical contributions. Theoretically, it offers a structured guide for developing in-depth ICT strategic plans at Mojokerto Regency Diskominfo and serves as a reference for other institutions mapping ICT

infrastructure governance and management using the *COBIT 2019* framework. Practically, it delivers actionable recommendations for Diskominfo to improve ICT infrastructure governance, formulated according to staged priorities. For IT organizations more broadly, these findings can function as a standardized, objective assessment tool to drive continuous improvement in ICT governance and management practices.

RESEARCH METHOD

The stages of this research method adopt 4 phases from the COBIT 2019 Implementation Roadmap. The series of research began with Phase 1 (What are the drivers), which focused on identifying problems through literature studies, regulatory reviews, and ICT process studies at the Mojokerto Regency Diskominfo. Once the problem is identified, the research continues to Phase 2 (Where are we now). At this stage, the determination of the relevant domains is carried out through discussions with the Diskominfo, the determination of objective domains, and the collection of initial data, including the implementation of questionnaires.

Furthermore, the research entered Phase 3 (Where do we want to be), where data obtained from questionnaires and stakeholder interviews were analyzed. This analysis includes capability level determination and gap analysis to measure the gap between the current operational conditions of ICT and the expected conditions of the organization. The last stage is Phase 4 (What needs to be done), where the results of the gap analysis are used as a reference to prepare concrete recommendations and suggestions for improvement to improve ICT governance at the Mojokerto Regency Diskominfo.

In this stage, research was conducted related to the collection of data and information on existing problems and obtained several problems in the field at the Diskominfo, as follows:

1. Uneven availability of IT infrastructure:
   The availability of IT infrastructure in each office is still uneven. This can cause difficulties for staff and the public to experience obstacles to access IT services.
2. Lack of awareness of the importance of Information Technology (IT) governance:
   IT governance is an important aspect in IT management, however, awareness of the importance of IT governance is still lacking in the Mojokerto Regency Communication and Informatics. This can lead to risks and losses for the organization.
3. Lack of resources:

There is a need for adequate resources, both in terms of humans, technology, and budget. However, the resources owned by the Mojokerto Regency Kominfo are still limited.

To overcome these problems, evaluation and improvement are needed by referring to Information Technology Governance with the COBIT 2019 Framework.

In this stage, objective control identification will be carried out by mapping in accordance with the components of the governance system which include processes, organizational structure, information flows, human resource capabilities and competencies, principles and policies, ethical and behavioral culture, services, infrastructure and applications. With objective Domain mapping methods against the Alignment Goal (AG), Enterprise Goal (EG) and RACI Chart. So that the following data was obtained.

- Mapping method for the domain Information technology service infrastructure: BAI02 against AG

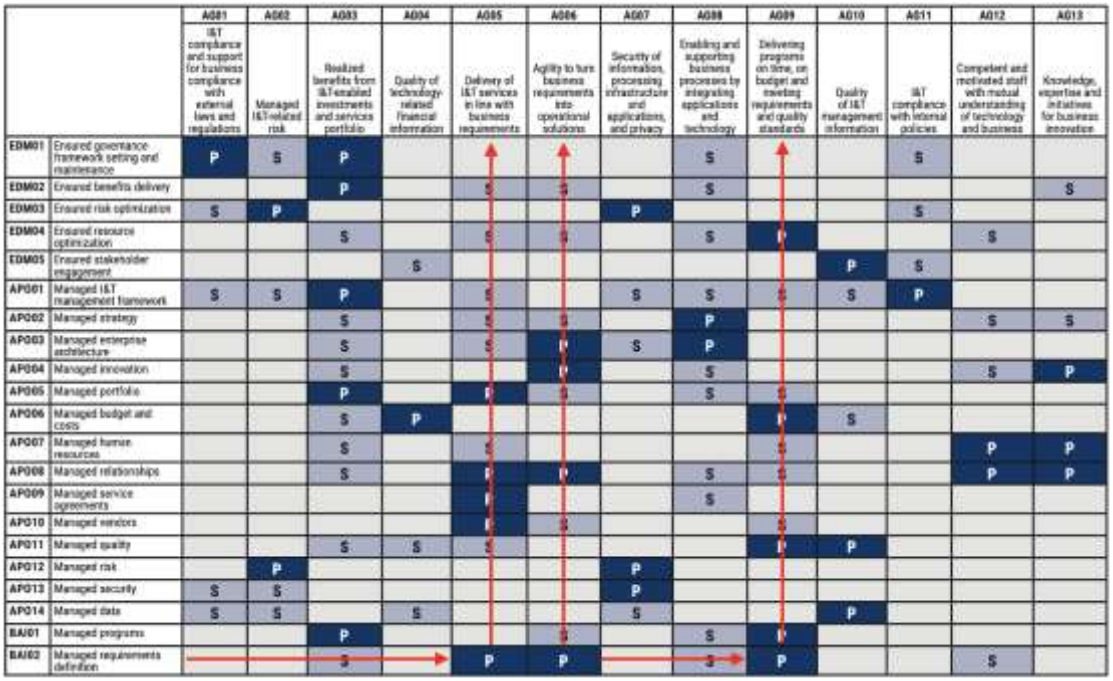


Figure 1. Mapping of BAI02 to AG
Source: Results of the researcher's analysis (2025)

- Furthermore, from the mapping of BAI02 to AG continued to EG:

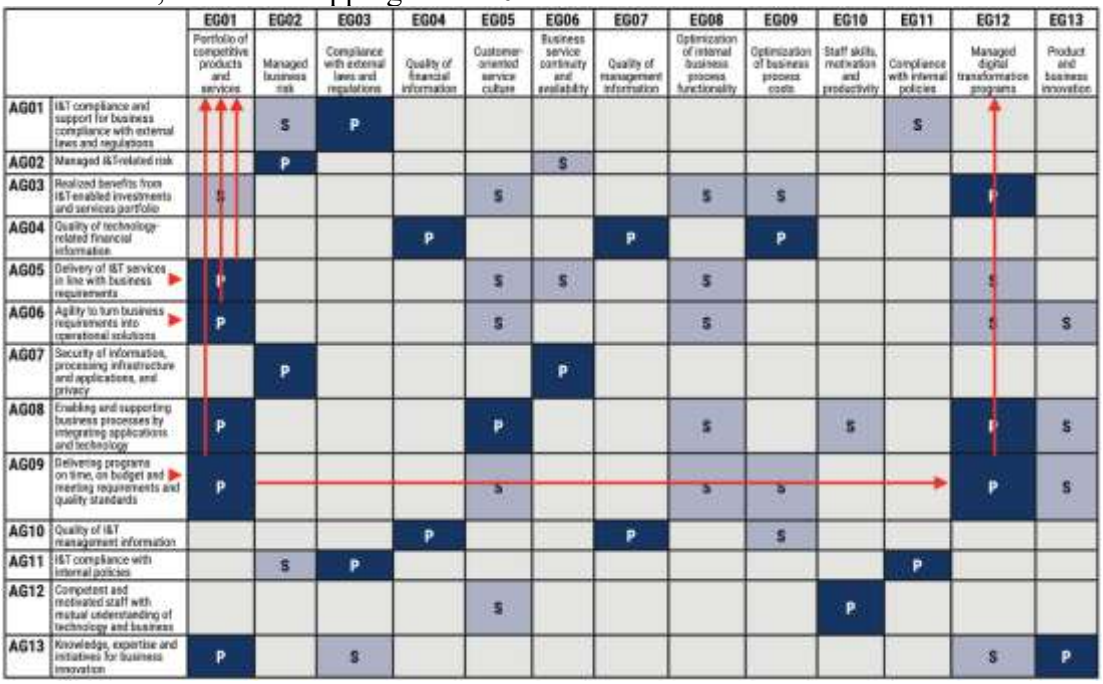


Figure 2. Mapping of BAI02 to AG and EG
Source: Results of the researcher's analysis (2025)

After obtaining the results of BAI02 mapping of AG and EG in Table 3.8, 2 AG focuses and 3 EG focuses were obtained.

Domain: Build, Acquire and Implement Management Objective: BAI02 — Managed Requirements Definition	Focus Area: COBIT Core Model
Description	
Identify solutions and analyze requirements before acquisition or creation to ensure that they align with enterprise strategic requirements covering business processes, applications, information/data, infrastructure and services. Coordinate the review of feasible options with affected stakeholders, including relative costs and benefits, risk analysis, and approval of requirements and proposed solutions.	
Purpose	
Create optimal solutions that meet enterprise needs while minimizing risk.	
The management objective supports the achievement of a set of primary enterprise and alignment goals:	
Enterprise Goals	**Alignment Goals**
• EG01 Portfolio of competitive products and services • EG08 Optimization of internal business process functionality • EG12 Managed digital transformation programs	• AG05 Delivery of I&T services in line with business requirements • AG06 Agility to turn business requirements into operational solutions • AG09 Delivering programs on time, on budget and meeting requirements and quality standards

Furthermore, a mapping of the Responsibility and Accountability of the organizational structure that supports BAI02 was carried out.

Figure 3. BAI02 mapping results

Source: Results of the researcher's analysis (2025)

Key Management Practice	Chief Risk Officer	Chief Information Officer	Business Process Owners	Steering (Programs/Projects) Committee	Program Manager	Project Manager	Project Management Office	Relationship Manager	Head Architect	Head Development	Head IT Operations	Information Security Manager	Privacy Officer
BAI02.01 Define and maintain business functional and technical requirements.			R	A	R	R	R	R	R	R		R	R
BAI02.02 Perform a feasibility study and formulate alternative solutions.			R	A	R	R	R			R			
BAI02.03 Manage requirements risk.	R	R	R	A	R	R	R			R	R	R	R
BAI02.04 Obtain approval of requirements and solutions.			R	A	R	R	R					R	R
Related Guidance (Standards, Frameworks, Compliance Requirements)	**Detailed Reference**												
No related guidance for this component													

Figure 4. RACI chart BAI02

Source: Results of the researcher's analysis (2025)

Furthermore, the mapping of the objective domain is carried out at the same stage for the objectives BAI03, BAI06, and BAI10 which are with the domain of Information Technology service infrastructure.

The data needed for each domain process will be explored through planning, operational and evaluation reports at the Mojokerto Regency Communication and Information Office, with the needs as in the table below.

- Information technology service infrastructure management data:

Table 1. Information technology services infrastructure management data

Objective	Data Needs
BAI02 : Managed Requirements Definition	Technical requirements data: This data includes information about technical requirements, such as specifications, architecture, and infrastructure.
BAI03 : Managed Solutions	Solution data: This data includes information about IT solutions that were identified, developed, and built, such as specifications, costs, and schedules.

Objective	Data Needs
Identification and Build	
BAI06 : Managed IT Changes	IT change data: This data includes information about IT changes, such as goals, scope, and impact.
BAI10: Managed Configuration	IT configuration data: This data relates to information about IT assets and their changes. IT measurement data: This data includes information about the performance, availability, and security of IT assets.

Source: Processed from COBIT 2019 (ISACA, n.d.)

This data includes information about stakeholder interaction with the performance of IT human resources at the Communication and Information Service in Mojokerto Regency, such as customer satisfaction, staff satisfaction, and management satisfaction. The information data was obtained by interviews, group discussions and surveys. With the mechanism as shown in the table below.

Table 2. Methods of collecting information data

Method	Information
Interview	It is carried out with stakeholders, such as the staff of the Diskominfo office, related agencies and the community who use the service. It is done face-to-face and online.
Group discussions	Data collection involving all Diskominfo staff who discuss certain topics. Done face-to-face or online.
Survey	Data collection involving a large number of people. It is carried out voluntarily with internal and external organizations, face-to-face or online.

Source**:** Researcher (2025)

In this stage of data processing and analysis, data input and information will be carried out to be further processed as analysis material and obtain output as a follow-up for the determination of things that need to be further analyzed, to determine whether there is a gap or not. Commonly used data processing methods include:

- Data input : Data collected from a variety of sources, including management information systems, planning documents, implementation and surveys.
- Data processing : Data can be processed using a variety of methods, including statistical analysis, descriptive analysis, and qualitative analysis.
- Data output : The processed data can be presented in a variety of formats, including reports, graphs, and dashboards.

At this stage, data and information relevant to the research purpose are collected. In this study, the data needed is data that can support the fulfillment of information related to IT infrastructure. The data can be collected by creating values that describe the current conditions related to IT governance with a focus on the IT infrastructure area.

After the data and information are collected, then an assessment and analysis is carried out. This assessment and analysis is carried out using the following three stages.

1. Guttman Scale:

The Guttman scale is a measurement scale used to measure the degree of agreement or disagreement on a statement. This scale consists of two answers, namely "YES" and "NO". A "YES" answer means that the respondent agrees with the statement, while the answer "NO" means that the respondent does not agree with the statement.

The Guttman scale has several advantages, namely that the respondents' answers are firm and consistent, and this scale is easy to use and interpret. The Guttman scale also has some

drawbacks, namely the choice of answers that can be given is limited and respondents have no other options to express their opinions.
The formula of the Guttman scale is as follows:

$$CC = \frac{\sum CLa}{\sum Po} x100\%$$

Information:
CC : Value of achievement level of governance and management capability
ΣCLa : The total amount of governance and management value
ΣCPo : Total number of governance and management activities

2. Capability Level:

Analyzing Capability Level activities, or often called Core Model Evaluation, is one of the requirements to conduct objective calculations/evaluations according to the COBIT 2019 standard method for a company. This Capability Level process is carried out to assess the extent to which the company/agency has met the standards of the IT management process/stage.

The Capability Level process is also useful for improving the quality and awareness of the importance of IT management, as well as for identifying priorities in improving IT capabilities and process management. The Capability Level results that have been produced by the calculation using the COBIT 2019 method are a symbol of the quality of the IT process that takes place in the agency/company.

The Capability Level in each IT process is divided into five levels, namely:(Information Systems Audit and Control Association., n.d.)

Table 3. Capability Level Process

Level	Information
5	The process of achieving its goals is well defined, its performance is measured to always improve performance and continuous improvement is constantly being made.
4	The process to achieve its goals is well defined, and its performance is measured (quantitatively).
3	The process achieves its goals in a more organized way by using the organization's assets. The process begins to be well defined.
2	The process achieves its goals through the implementation of a series of basic but complete activities that can be characterized as performance or achievement.
1	The process of achieving its goals through the implementation of an incomplete series of activities that can be categorized as initial or intuitive activities and is not very organized.
0	Lack of basic skills, incomplete approach to achieve governance and management goals.

Source: COBIT 2019 Framework (ISACA, n.d.)

Calculation of the Average Capability Level of each domain level:

$$\bar{x}CLr = \frac{Cr1+Cr2+...+Crx}{\Sigma Rx}$$

Information:
x̄Clr : Average score Capability Level
Cr1, 2, ... x :Value Capability Level from Respondents 1, 2 and so on
ΣRx : Number of Respondents

To determine the activity, the questionnaire is carried out in stages according to the level of activity ability obtained based on the Rating Process Activities. If the calculation of the activity carried out has exceeded the level of ability that has been determined by the Rating Process Activities, then it can proceed to the next activity.

Table 4. Achievement Scale

Scale	Achievement	Achievements (%)
N	Not Achieved	0-15
P	Partially Achieved	16-50
L	Largely Achieved	51-85
F	Fully Achieved	86-100

Source: COBIT 2019 Framework (ISACA, n.d.)

3. Gap

This process aims to analyze the level of IT governance gap in an agency. This gap can be found by comparing the current condition of the Mojokerto Regency Diskominfo (As is) with the expected conditions of the Mojokerto Regency Diskominfo in the future (To Be).

If there is a gap, recommendations and suggestions will be given to overcome the gap. These recommendations and suggestions aim to achieve the level of ability desired by the Mojokerto Regency Diskominfo. A gap is the difference between current and expected conditions. These gaps need to be analyzed to determine the steps that need to be taken to improve IT governance.

The calculation of gap analysis is as follows:

$$Gap = \text{CLai} - \text{CLtb}$$

Information:

Gap : Gap Capability level
CLai : Capability level currently (As is)
CLtb : Capability level expected and in the future (To be)

RESULTS AND DISCUSSION

Data Processing and Analysis

This data and analysis explain the process of measuring the level of IT management capabilities in Mojokerto Regency. In this stage, identification and analysis of data related to objective control will be carried out by mapping in accordance with the components of the governance system for the information technology service infrastructure domain which includes:

- BAI02 : Managed Requirements Definition
- BAI03 : Managed Solutions Identification and Build
- BAI06 : Managed IT Changes
- BAI10: Managed Configuration

1. BAI02 Mapping Results

Objective Domain Mapping against BAI02 that focuses on Definition of managed requirements, against Alignment Goals (AG), Enterprise Goals (EG) and RACI Charts. So that the following data was obtained.

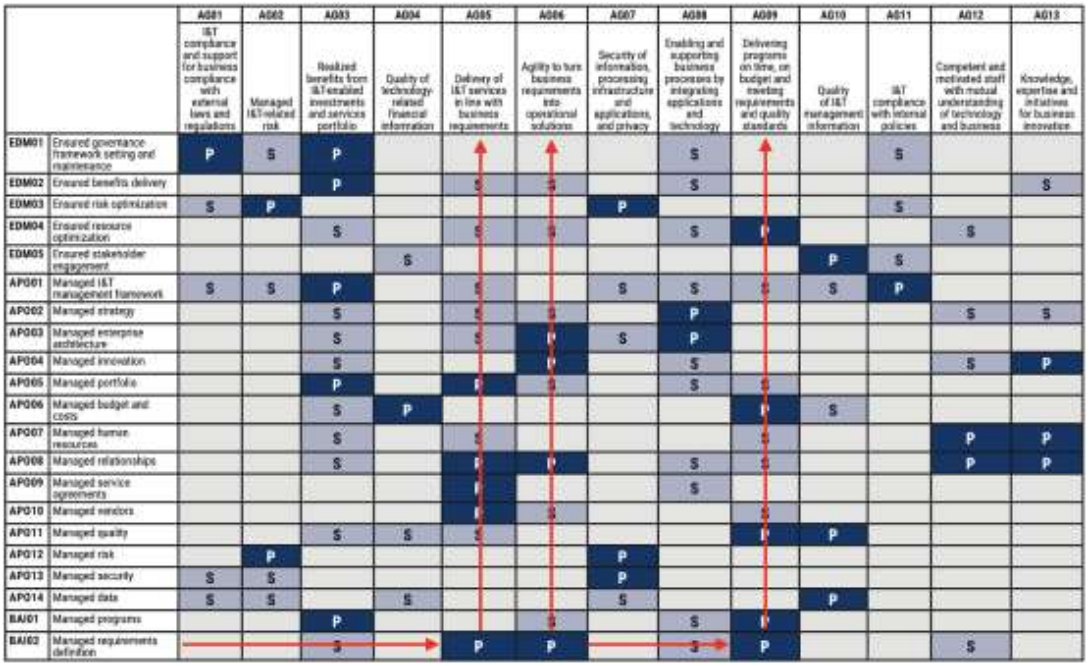


Figure 5. Mapping of BAI02 to AG
Source: Results of the researcher's analysis (2025)

2. Furthermore, from the mapping of BAI02 to AG continued to EG:

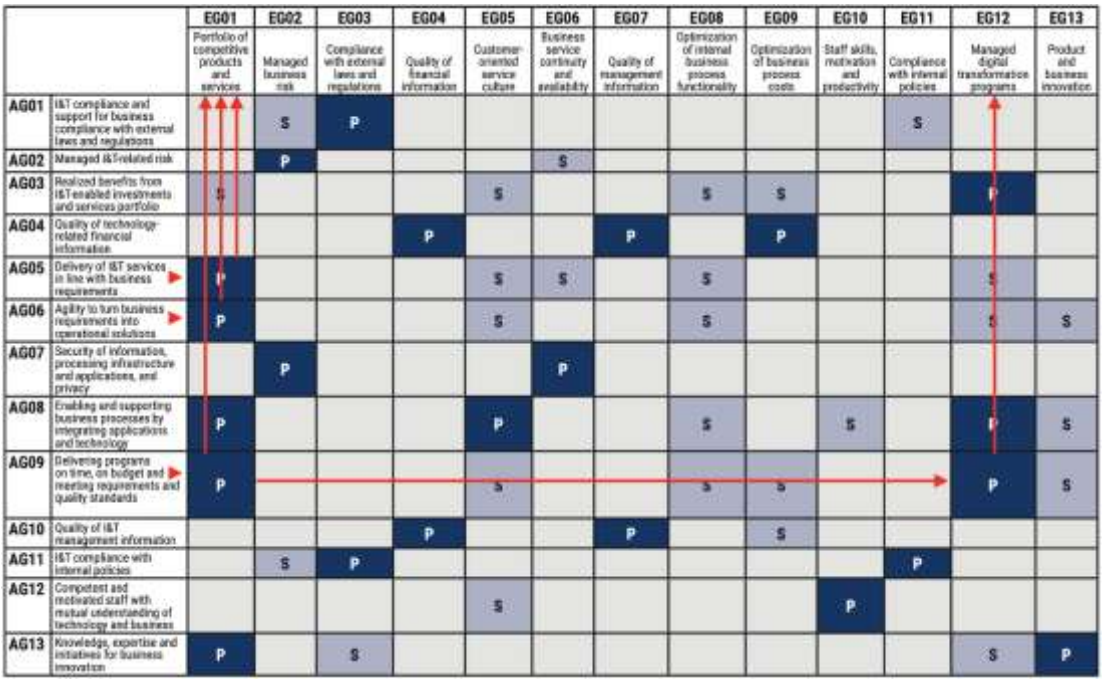


Figure 5. Mapping of BAI02 AG to EG
Source: Results of the researcher's analysis (2025)

After obtaining the results of the BAI02 mapping of AG and EG in Table 4.2, 3 AG focuses and 2 EG focuses were obtained.

Domain: Build, Acquire and Implement Management Objective: BAI02 — Managed Requirements Definition		Focus Area: COBIT Core Model
Description		
Identify solutions and analyze requirements before acquisition or creation to ensure that they align with enterprise strategic requirements covering business processes, applications, information/data, infrastructure and services. Coordinate the review of feasible options with affected stakeholders, including relative costs and benefits, risk analysis, and approval of requirements and proposed solutions.		
Purpose		
Create optimal solutions that meet enterprise needs while minimizing risk.		
The management objective supports the achievement of a set of primary enterprise and alignment goals:		
Enterprise Goals	➡	**Alignment Goals**
• EG01 Portfolio of competitive products and services • EG08 Optimization of internal business process functionality • EG12 Managed digital transformation programs		• AG05 Delivery of I&T services in line with business requirements • AG06 Agility to turn business requirements into operational solutions • AG09 Delivering programs on time, on budget and meeting requirements and quality standards

Figure 6. BAI02 mapping results

Source: Results of the researcher's analysis (2025)

Furthermore, a mapping of the Responsibility and Accountability of the organizational structure that supports BAI02 was carried out.

Key Management Practice	Chief Risk Officer	Chief Information Officer	Business Process Owners	Steering (Programs/Projects) Committee	Program Manager	Project Manager	Project Management Office	Relationship Manager	Head Architect	Head Development	Head IT Operations	Information Security Manager	Privacy Officer
BAI02.01 Define and maintain business functional and technical requirements.			R	A	R	R	R	R	R	R		R	R
BAI02.02 Perform a feasibility study and formulate alternative solutions.			R	A	R	R	R			R			
BAI02.03 Manage requirements risk.	R	R	R	A	R	R	R			R	R	R	R
BAI02.04 Obtain approval of requirements and solutions.			R	A	R	R	R					R	R

Related Guidance (Standards, Frameworks, Compliance Requirements)	Detailed Reference
No related guidance for this component	

Figure 7. RACI chart BAI02

Source: Results of the researcher's analysis (2025)

i.BAI03 Mapping Results

Objective Domain Mapping against BAI03 against the Alignment Goal (AG), Enterprise Goal (EG) and RACI Chart. So that the following data was obtained.

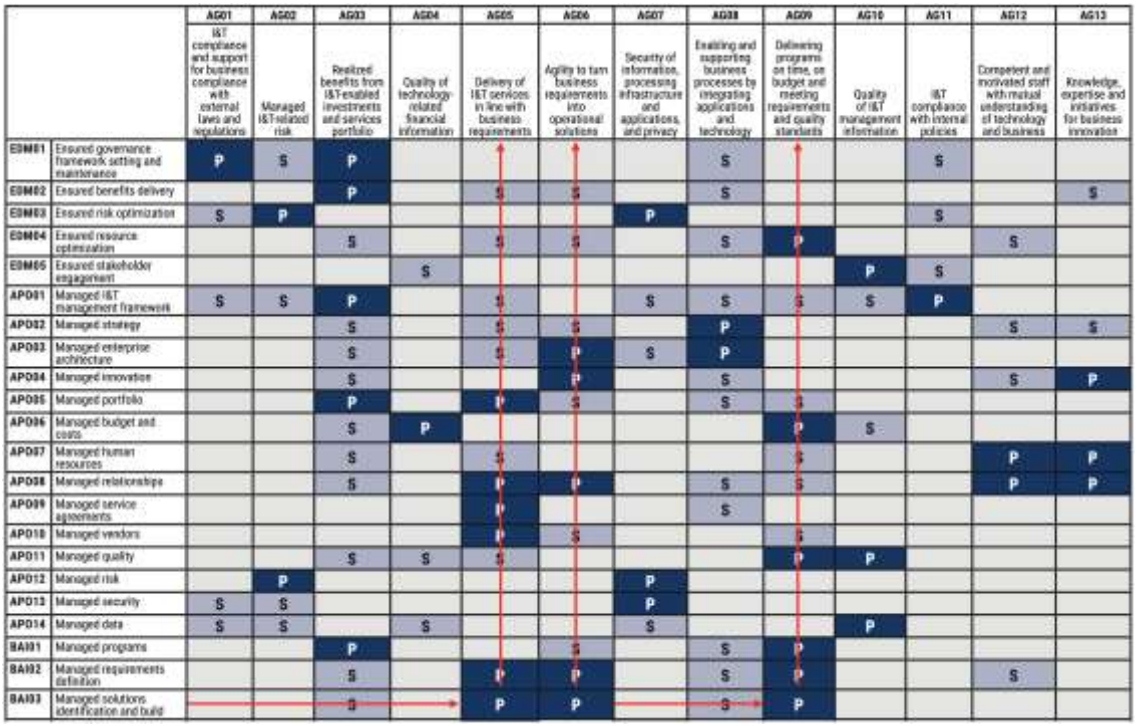


Figure 8. Mapping of BAI03 to AG
Source: Results of the researcher's analysis (2025)

- Furthermore, from the mapping of BAI03 to AG continued to EG:

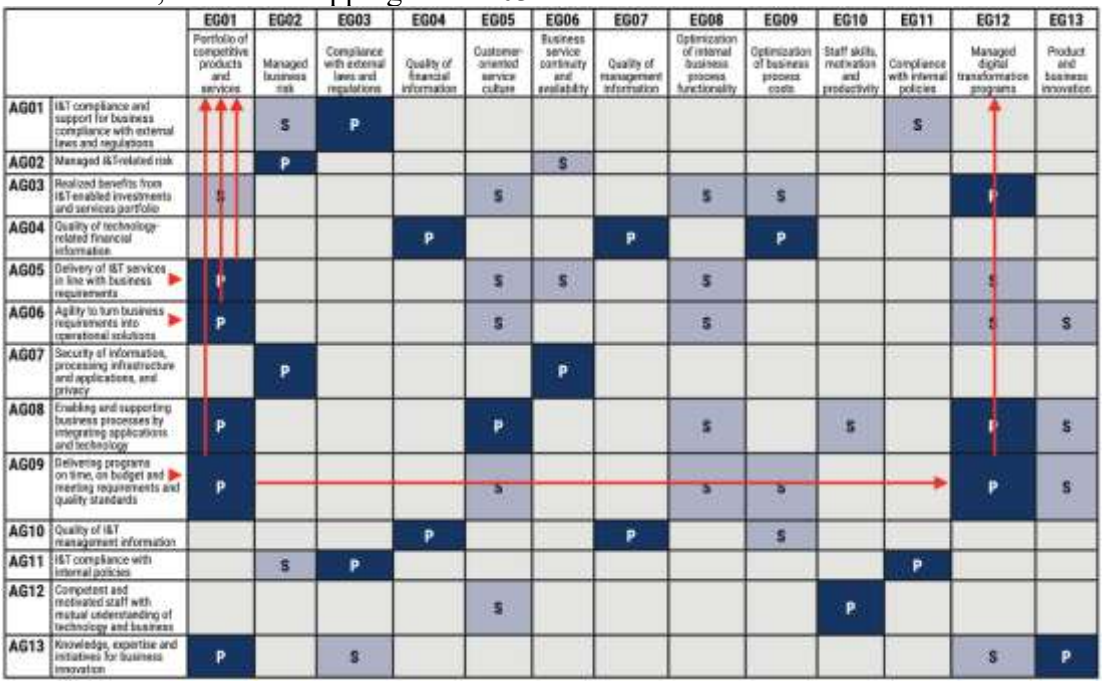


Figure 9. Mapping of BAI03 AG to EG
Source: Results of the researcher's analysis (2025)

After obtaining the results of the BAI03 mapping of AG and EG in Table 4.6, 3 AG focuses and 2 EG focuses were obtained.

Domain: Build, Acquire and Implement Management Objective: BAI03 — Managed Solutions Identification and Build	Focus Area: COBIT Core Model
Description	
Establish and maintain identified products and services (technology, business processes and workflows) in line with enterprise requirements covering design, development, procurement/sourcing and partnering with vendors. Manage configuration, test preparation, testing, requirements management and maintenance of business processes, applications, information/data, infrastructure and services.	
Purpose	
Ensure agile and scalable delivery of digital products and services. Establish timely and cost-effective solutions (technology, business processes and workflows) capable of supporting enterprise strategic and operational objectives.	
The management objective supports the achievement of a set of primary enterprise and alignment goals:	
Enterprise Goals	**Alignment Goals**
• EG01 Portfolio of competitive products and services • EG08 Optimization of internal business process functionality • EG12 Managed digital transformation programs	• AG05 Delivery of I&T services in line with business requirements • AG06 Agility to turn business requirements into operational solutions • AG09 Delivering programs on time, on budget and meeting requirements and quality standards

Figure 10. Mapping results of BAI03
Source: Results of the researcher's analysis (2025)

Furthermore, a mapping of the Responsibility and Accountability of the organizational structure that supports BAI03 was carried out.

Key Management Practice	Chief Information Officer	Chief Technology Officer	Chief Digital Officer	Business Process Owners	Portfolio Manager	Steering (Programs/Projects) Committee	Program Manager	Project Manager	Project Management Office	Relationship Manager	Head Architect	Head Development	Head IT Operations	Head IT Administration	Service Manager	Information Security Manager	Business Continuity Manager	Privacy Officer
BAI03.01 Design high-level solutions.		R		R		A	R	R	R	R		R				R		
BAI03.02 Design detailed solution components.		R		R		A	R	R	R			R						
BAI03.03 Develop solution components.		R		R		A	R	R	R			R						
BAI03.04 Procure solution components.		R		R		A						R	R	R				
BAI03.05 Build solutions.		R		R		A	R	R	R			R				R		
BAI03.06 Perform quality assurance (QA).		R		R		A	R	R	R			R						
BAI03.07 Prepare for solution testing.		R		R		A						R	R		R	R	R	R
BAI03.08 Execute solution testing.		R		R		A						R	R			R		R
BAI03.09 Manage changes to requirements.		R		R		A	R	R	R		R	R				R		R
BAI03.10 Maintain solutions.	A	R		R			R	R	R			R				R		R
BAI03.11 Define IT products and services and maintain the service portfolio.	A														R	R		R
BAI03.12 Design solutions based on the defined development methodology.	A		R		R		R	R										
Related Guidance (Standards, Frameworks, Compliance Requirements)	**Detailed Reference**																	
No related guidance for this component																		

Figure 11. RACI chart BAI03
Source: Results of the researcher's analysis (2025)

ii. BAI06 Mapping Results

Objective Domain Mapping against BAI06 against Alignment Goals (AG), Enterprise Goals (EG) and RACI Charts. So that the following data was obtained.

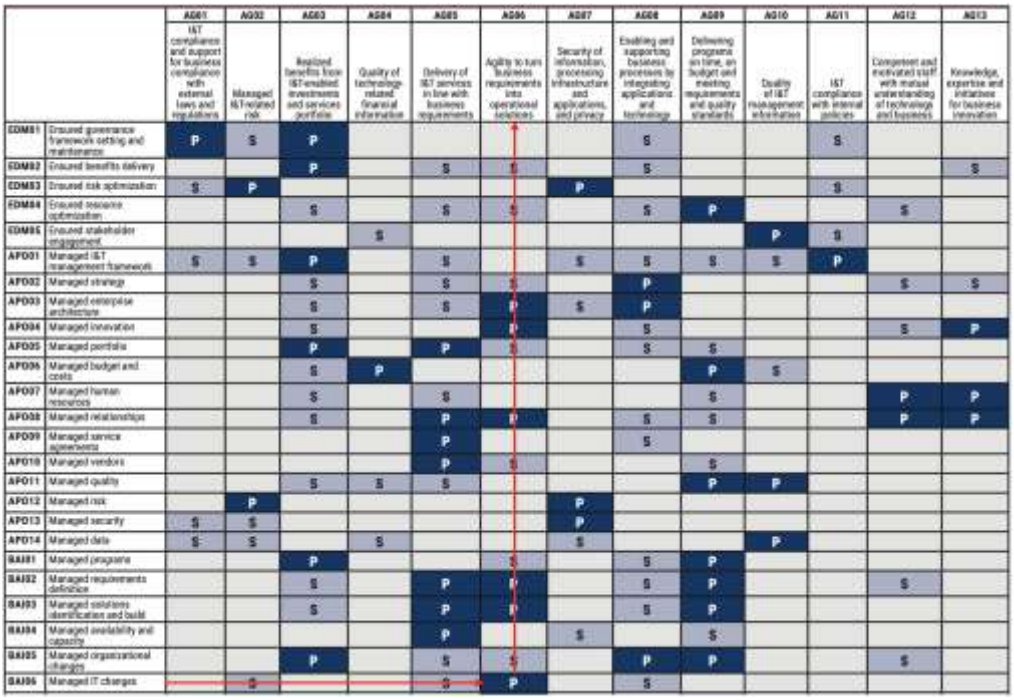


Figure 12. Mapping of BAI06 to AG
Source: Results of the researcher's analysis (2025)

- Furthermore, from the mapping of BAI06 to AG continued to EG:

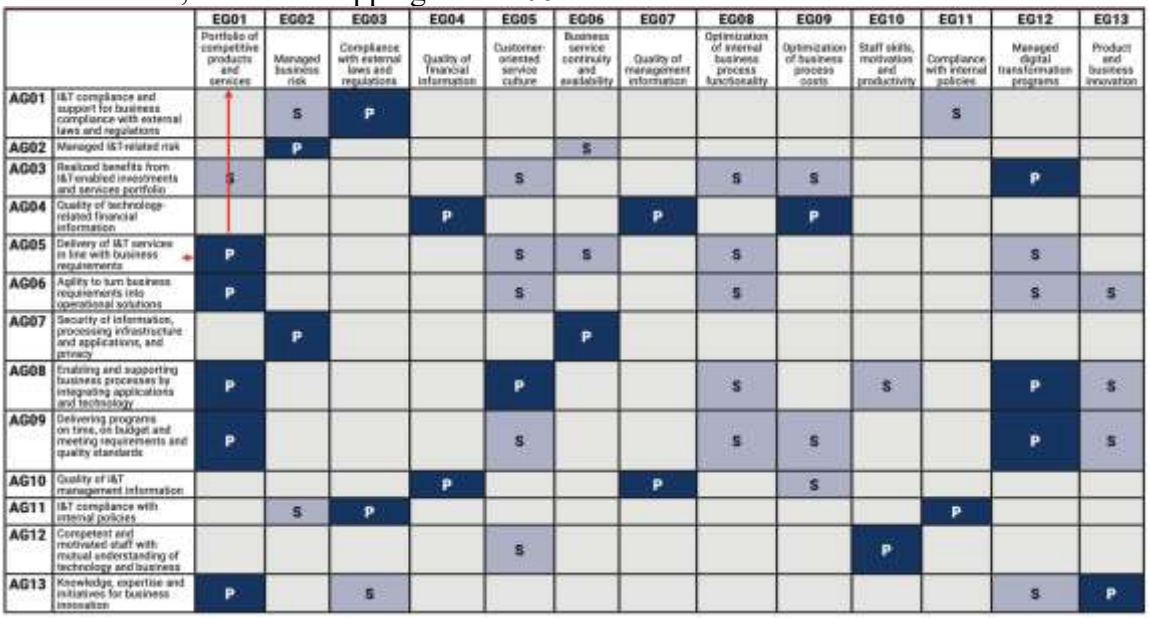


Figure 13. Mapping of BAI06 AG to EG
Source: Results of the researcher's analysis (2025)

After obtaining the results of the BAI06 mapping of AG and EG in Table 4.10, 1 AG focus and 1 EG focus were obtained.

Domain: Build, Acquire and Implement Management Objective: BAI06 – Managed IT Changes	Focus Area: COBIT Core Model
Description	
Manage all changes in a controlled manner, including standard changes and emergency maintenance relating to business processes, applications and infrastructure. This includes change standards and procedures, impact assessment, prioritization and authorization, emergency changes, tracking, reporting, closure, and documentation.	
Purpose	
Enable fast and reliable delivery of change to the business. Mitigate the risk of negatively impacting the stability or integrity of the changed environment.	
The management objective supports the achievement of a set of primary enterprise and alignment goals:	
Enterprise Goals	**Alignment Goals**
EG01 Portfolio of competitive products and services	AG06 Agility to turn business requirements into operational solutions

Figure 14. Mapping results of BAI06
Source: Results of the researcher's analysis (2025)

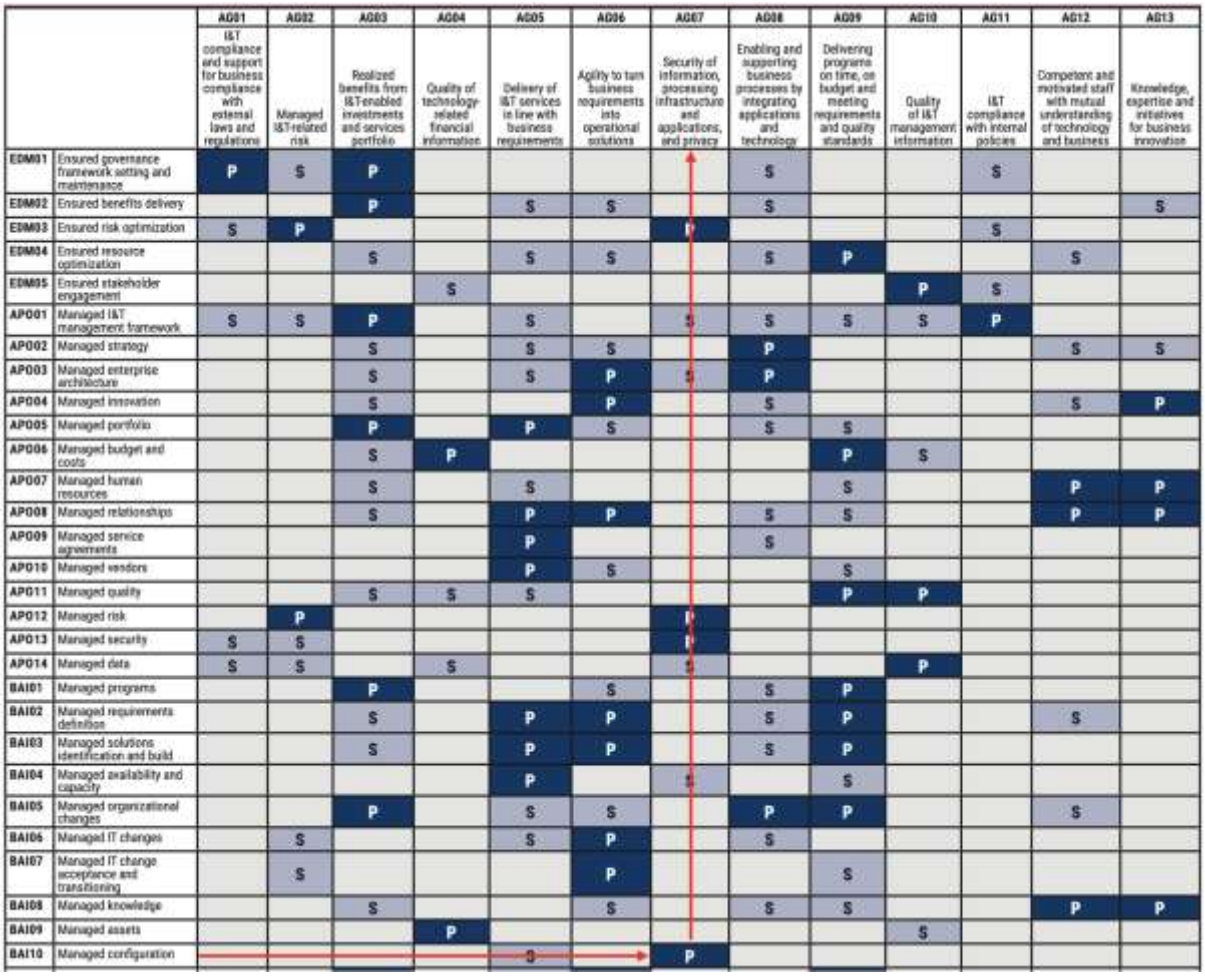
Furthermore, a mapping of the Responsibility and Accountability of the organizational structure that supports BAI06 was carried out.

Key Management Practice	Chief Information Officer	Business Process Owners	Program Manager	Project Manager	Head Development	Head IT Operations	Service Manager	Information Security Manager	Business Continuity Manager	Privacy Officer
BAI06.01 Evaluate, prioritize and authorize change requests.	A	R			R	R	R	R	R	R
BAI06.02 Manage emergency changes.	A				R	R	R	R		R
BAI06.03 Track and report change status.	A	R	R	R	R	R	R			
BAI06.04 Close and document the changes.	A	R	R	R	R	R	R		R	
Related Guidance (Standards, Frameworks, Compliance Requirements)	**Detailed Reference**									
No related guidance for this component										

Figure 15. RACI chart BAI06
Source: Results of the researcher's analysis (2025)

iii. BAI10 Mapping Results

Objective Domain Mapping against BAI10 against the Alignment Goal (AG), Enterprise Goal (EG) and RACI Chart. So that the following data was obtained.

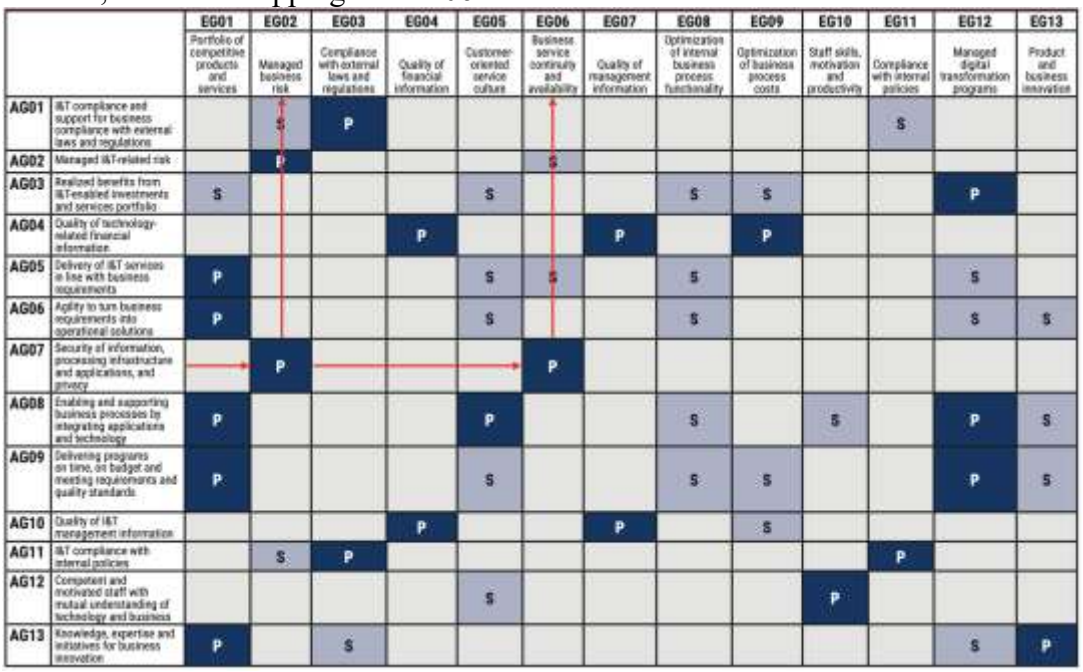


		AG01	AG02	AG03	AG04	AG05	AG06	AG07	AG08	AG09	AG10	AG11	AG12	AG13
		I&T compliance and support for business compliance with external laws and regulations	Managed I&T-related risk	Realized benefits from I&T-enabled investments and services portfolio	Quality of technology-related financial information	Delivery of I&T services in line with business requirements	Agility to turn business requirements into operational solutions	Security of information, processing infrastructure and applications, and privacy	Enabling and supporting business processes by integrating applications and technology	Delivering programs on time, on budget and meeting requirements and quality standards	Quality of I&T management information	I&T compliance with internal policies	Competent and motivated staff with mutual understanding of technology and business	Knowledge, expertise and initiatives for business innovation
EDM01	Ensured governance framework setting and maintenance	P	S	P					S			S		
EDM02	Ensured benefits delivery			P		S	S		S					S
EDM03	Ensured risk optimization	S	P					P				S		
EDM04	Ensured resource optimization			S		S	S		S	P			S	
EDM05	Ensured stakeholder engagement				S						P	S		
APO01	Managed I&T management framework	S	S	P		S		S	S	S	S	P		
APO02	Managed strategy			S		S	S		P				S	S
APO03	Managed enterprise architecture			S		S	P	S	P					
APO04	Managed innovation			S			P		S				S	P
APO05	Managed portfolio			P		P	S		S	S				
APO06	Managed budget and costs			S	P					P	S			
APO07	Managed human resources			S		S				S			P	P
APO08	Managed relationships			S		P	P		S	S			P	P
APO09	Managed service agreements					P			S					
APO10	Managed vendors					P	S			S				
APO11	Managed quality			S	S	S				P	P			
APO12	Managed risk		P					P						
APO13	Managed security	S	S					P						
APO14	Managed data	S	S		S			S			P			
BAI01	Managed programs			P			S		S	P				
BAI02	Managed requirements definition			S		P	P		S	P			S	
BAI03	Managed solutions identification and build			S		P	P		S	P				
BAI04	Managed availability and capacity					P		S		S				
BAI05	Managed organizational changes			P		S	S		P	P			S	
BAI06	Managed IT changes		S			S	P		S					
BAI07	Managed IT change acceptance and transitioning		S				P			S				
BAI08	Managed knowledge			S			S		S	S			P	P
BAI09	Managed assets				P						S			
BAI10	Managed configuration					S		P						

Figure 16. Mapping of BAI10 to AG

Source: Results of the researcher's analysis (2025)

- Furthermore, from the mapping of BAI06 to AG continued to EG:



		EG01	EG02	EG03	EG04	EG05	EG06	EG07	EG08	EG09	EG10	EG11	EG12	EG13
		Portfolio of competitive products and services	Managed business risk	Compliance with external laws and regulations	Quality of financial information	Customer oriented service culture	Business service continuity and availability	Quality of management information	Optimization of internal business process functionality	Optimization of business process costs	Staff skills, motivation and productivity	Compliance with internal policies	Managed digital transformation programs	Product and business innovation
AG01	I&T compliance and support for business compliance with external laws and regulations		S	P								S		
AG02	Managed I&T-related risk		P				S							
AG03	Realized benefits from I&T-enabled investments and services portfolio	S				S			S	S			P	
AG04	Quality of technology-related financial information				P			P		P				
AG05	Delivery of I&T services in line with business requirements	P				S	S		S				S	
AG06	Agility to turn business requirements into operational solutions	P				S			S				S	S
AG07	Security of information, processing infrastructure and applications, and privacy		P				P							
AG08	Enabling and supporting business processes by integrating applications and technology	P				P			S		S		P	S
AG09	Delivering programs on time, on budget and meeting requirements and quality standards	P				S			S	S			P	S
AG10	Quality of I&T management information				P			P		S				
AG11	I&T compliance with internal policies		S	P								P		
AG12	Competent and motivated staff with mutual understanding of technology and business					S					P			
AG13	Knowledge, expertise and initiatives for business innovation	P		S									S	P

Figure 17. Mapping of BAI06 AG to EG

Source: Results of the researcher's analysis (2025)

After obtaining the results of the BAI10 mapping of AG and EG in Table 4.15, 1 AG focus and 2 EG focuses were obtained.

Domain: Build, Acquire and Implement **Management Objective: BAI10 – Managed Configuration**	**Focus Area: COBIT Core Model**
Description	
Define and maintain descriptions and relationships among key resources and capabilities required to deliver I&T-enabled services. Include collecting configuration information, establishing baselines, verifying and auditing configuration information, and updating the configuration repository.	
Purpose	
Provide sufficient information about service assets to enable the service to be effectively managed. Assess the impact of changes and deal with service incidents.	
The management objective supports the achievement of a set of primary enterprise and alignment goals:	
Enterprise Goals	**Alignment Goals**
• EG02 Managed business risk • EG06 Business service continuity and availability	AG07 Security of information, processing infrastructure and applications, and privacy

Figure 18. BAI10 mapping results

Source: Results of the researcher's analysis (2025)

Furthermore, a mapping of the Responsibility and Accountability of the organizational structure that supports BAI10 is carried out.

Key Management Practice	Chief Information Officer	Chief Technology Officer	Head Architect	Head Development	Head IT Operations	Head IT Administration	Service Manager	Information Security Manager
BAI10.01 Establish and maintain a configuration model.		A			R	R	R	
BAI10.02 Establish and maintain a configuration repository and baseline.		A		R	R	R	R	R
BAI10.03 Maintain and control configuration items.	A	R		R	R	R		
BAI10.04 Produce status and configuration reports.		A			R	R		
BAI10.05 Verify and review integrity of the configuration repository.		A	R	R	R		R	
Related Guidance (Standards, Frameworks, Compliance Requirements)	**Detailed Reference**							
No related guidance for this component								

Figure 19. RACI chart BAI10

Source: Results of the researcher's analysis (2025)

Obstacles in the Field Faced Related to ICT Infrastructure and Their Impact on the Performance of Related Agencies

The results of the analysis of the BAI02 to BAI10 domains show that the gap between the current level and the expected level at the Mojokerto Regency Diskominfo is closely related to several obstacles in the understanding and implementation of ICT infrastructure that is not optimal.

In the BAI02 Managed Requirements Definition, the biggest difficulty arises in the process of documenting and adjusting needs that are often unable to keep up with changes that occur in the field. Most respondents indicated that stakeholder needs have not been fully clearly documented, as seen in BAI02A.1. In this case, the process of collecting, prioritizing, and documenting technical and functional needs related to ICT infrastructure in Mojokerto is still less than optimal. This creates a gap between what should be implemented and what can actually be implemented in practice.

On the other hand, BAI03: Managed Solutions Identification and Build, shows that although some solution designs already exist, their implementation is not yet fully well-coordinated. In the results of the questionnaire, it was found that solution designs are often not well approved by stakeholders, and supervision of design implementation is still limited. This shows that there is a mismatch between design and real implementation in the field. For example, in BAI03A.14, many respondents indicated that the design change process is often not carried out in a structured manner, leading to a deterioration in quality and mismatch between the designed and implemented solutions.

Furthermore, in BAI06: Managed IT Changes, respondents indicated that despite change management procedures, changes that are emergency and without careful planning are often not well documented. Changes made without sufficient evaluation or without clear official procedures have the potential to cause disruptions to the existing ICT system, and this certainly affects the performance of related agencies which are highly dependent on the smooth operation of the ICT infrastructure. According to the ICT governance theory explained by the Ministry of Communication and Information Technology (2022), less effective change management can disrupt the smooth running of public services, which certainly has an impact on the effectiveness of local governments in providing services to the community.

Finally, in BAI10: Managed Configuration, the results of the analysis show that the system and hardware configuration at Diskominfo Mojokerto is not fully aligned with the set standards. Although there are procedures for monitoring and managing configurations, there are some significant differences between recorded configuration data and real conditions in the field. This certainly hinders the management and monitoring of changes in ICT infrastructure, which can reduce the reliability and effectiveness of existing ICT services. The lack of proper integration of configuration management systems within the organization also shows that there are gaps in ICT management that need to be corrected immediately.

Mapping of Available and Ongoing ICT Infrastructure Resources

Based on the results of the capability level achievement analysis, the mapping of ICT infrastructure resources at the Mojokerto Diskominfo shows that there is still an imbalance between needs and available capacity. Several areas show that the existing infrastructure has not fully met the required standards, especially in BAI02 and BAI06, where the policy, standard, and technology requirements needed to support ICT management at Diskominfo Mojokerto have not been met optimally.

In BAI02, many respondents indicated that they had difficulty adjusting existing needs with available resources, making the ICT infrastructure planning and development process less efficient. This gap is also reflected in BAI03, where the design of the solution built is not fully supported by a sufficiently robust infrastructure, which should be able to support the development and deployment of solutions more effectively.

In addition, in BAI10, despite the configuration management procedures implemented, the mapping of assets and devices in the field was still not in accordance with the data recorded in the system. This reflects the limitations in the management and maintenance of ICT infrastructure that require remapping and evaluation of physical conditions and actual infrastructure needs. Without clear mapping, it is very difficult to achieve optimal integration between existing systems and business strategies and objectives.

Recommendations for Improving ICT Governance and Management as a Basis for Further Evaluation and Improvement

Based on the findings of the gaps in the BAI02–BAI10 domain, several recommendations for improvement can be submitted to improve ICT governance and management at the Mojokerto Regency Diskominfo. Improving human resources is a crucial

first step, considering that the lack of relevant training for employees will hinder the understanding and implementation of optimal ICT policies. In this regard, COBIT 2019 offers a holistic approach to HR development planning through training and capacity building programs in managing ICT infrastructure better.

Furthermore, improvements in planning and documentation of needs are also very important. For BAI02, there needs to be a more systematic procedure in documenting stakeholder needs and adapting those documents to changes happening on the ground. This is in line with the recommendations of Amore et al. (2023) who emphasize the importance of building a clear structure to document and align IT needs.

For BAI03, a solution design that is more integrated with the needs of the organization needs to be implemented, where the design process must involve more experts and use the standards that have been agreed within the organization. In addition, testing and design validation procedures need to be improved so that the built solution can truly prove effective in a real environment.

In terms of change management (BAI06), there should be a more rigorous and structured procedure in dealing with IT changes in the field. This process must be accompanied by an evaluation of the impact of the change on the system and the overall performance of the organization. Better implementation of change management can also be done by using the COBIT 2019 framework which offers a more comprehensive risk assessment at each stage of change.

Finally, in BAI10, there needs to be a more thorough re-evaluation of configuration management. One of the steps that can be taken is to ensure that the configuration data recorded in the system is always in line with the conditions in the field, as well as to ensure that audit and change control procedures can be carried out regularly and more structured.

CONCLUSION

The analysis of domains BAI02, BAI03, BAI06, and BAI10 reveals that the ICT infrastructure at Mojokerto Regency Diskominfo is suboptimal in supporting agency performance, primarily due to gaps in requirements documentation, incomplete solution integration, ineffective change management, and weak configuration management. Specifically, BAI02 shows inadequate documentation and misalignment between stakeholder needs and resource capacity, which extends into BAI03 with limited supervision and discrepancies between design and implementation. BAI06 highlights risky and poorly planned emergency changes that disrupt ICT operations, while BAI10 reveals critical failures in configuration management with significant mismatches between recorded and actual system configurations, undermining the reliability of ICT services. Future research should explore strategies to enhance real-time synchronization of configuration data and develop robust change management frameworks tailored to local government contexts to improve ICT governance and overall service quality.

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