

## Adopted COBIT-5 Framework for System Design of Indonesia Navy IS/IT : An Evaluation

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### Abstract

Globalization has been seen particularly at the beginning of 1980s, and there have occurred many changes in information and other function of technology. Information is the key factor of any kinds of research and development. Global environment change with their information gives effect to maritime security, included in Indonesia sea. Today's, Indonesia Navy (TNI AL) arranges the system of information and technology to supporting Archipelagic Sea Defense System. The capability of navy IS/IT must be attempting to increase their level to be more efficient and effective. The aim of this paper is to find the level value of navy IS/IT design using COBIT-5 Framework attributes. Based on COBIT-5 framework, The result of Navy IS/IT organization assessment showed Navy IS/IT organization has accomplished it, but processing of Navy IT ability is not maximal. Based on maturity level (ability) of Navy IS/IT with table upon shows 2,63 for APO (align, plan and organize) as level 3; 2,53 for EDM (Evaluate, Direct, Monitor) as level 3; 2,55 for BAI (Build, Acquire, Implement) as level 3; 2,48 for DSS (Deliver, Service, Support) as level 2. Highest ability level for Navy IS/IT is APO level with value 2,63 and the lowest ability level is DSS level with value 2,48.

**Keywords:** COBIT-5 Framework, IS/IT Capability, Navy IS/IT.

### INTRODUCTION

Globalization has been seen particularly at the beginning of 1980s (1), and there have occurred many changes in information and other function of technology. Information is the key factor of any kinds of research and development (2). Information is one of the present organization main assets (3).

Information technology (IT) has become a vital and integral part of every segments (4). IT plays a significant strategic

role in the management of organizations (5). IT Government reduces agency conflict in aspects such as a informational asymmetry and help to reach fundamental principles related to disclosure, compliance, fairness, accountability and transparency (6). A number of IT governance frameworks, such as ITIL, COBIT are developed to provide guidance and tools for better IT governance (7).

Global environment change with their information gives effect to maritime security, included in Indonesia sea. Today's, Indonesia Navy (TNI AL) arranges the system of information and technology to supporting Archipelagic Sea Defense System. The capability of navy IS/IT must be attempting to increase their level to be more efficient and effective. The aim of this paper is to find the level value of navy IS/IT design using COBIT 5 Attributes. COBIT (*Control Objective for Information and Related Technology*) is a open standard that is being used increasingly by a diverse range of organizations throughout the world (8). COBIT is an IT governance framework and supporting toolset that allows managers to bridge the gap between control requirements, technical issues and business risks (9) (10). COBIT is a framework created by ISACA for information technology management and IT governance itself (11). COBIT provides a comprehensive framework that assists enterprises to achieve their objectives for the governance and management of enterprise IT (12).

The main focus of COBIT is the development of clear policies and good practices for security and control in IT for worldwide endorsement by commercial, governmental and professional organization (13). COBIT distinguish itself as a well recognized framework for IT governance and auditing accounting IT systems (14). COBIT focuses strongly more on control and less on execution, and is contextualized in Information Technology Governance (ITG) (6). COBIT contains 34 IT processes, each with high-level control objective (COs) and a set of detailed control objectives (DCOs) (15).

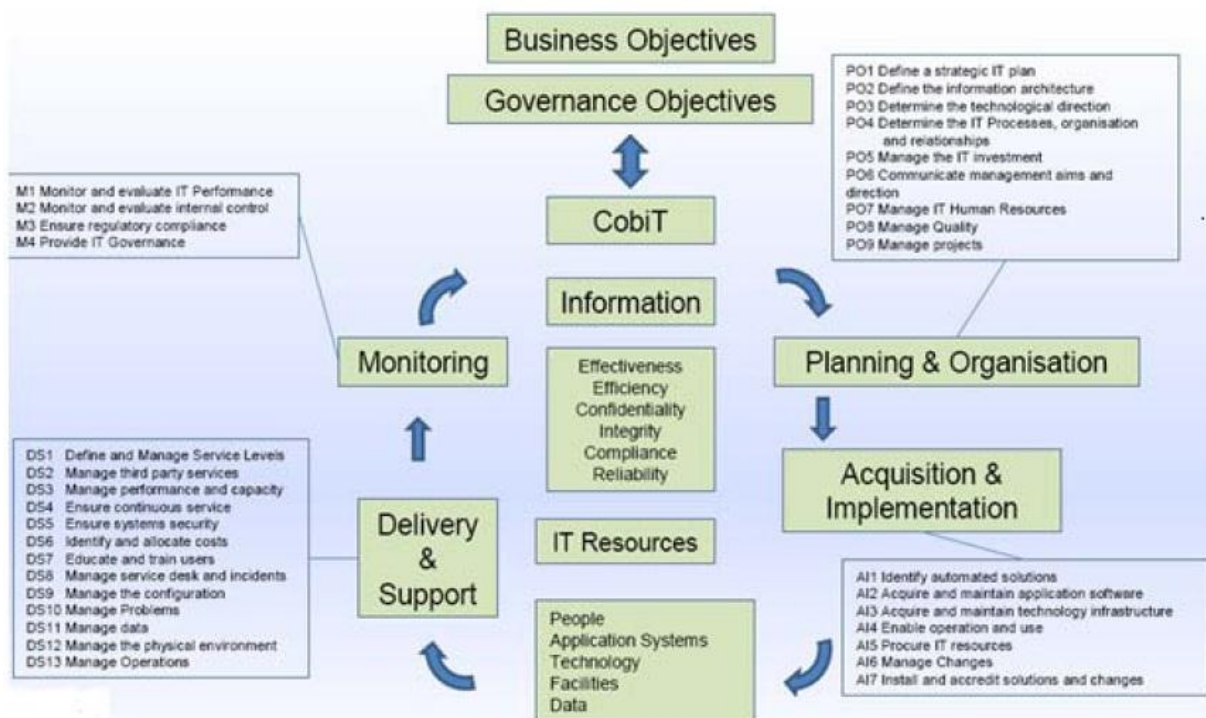


Figure 1: COBIT for IT Governance (14)

This paper has many literatures to support it, such as Design Concept of Strengthen and Ability Development at Naval Operation/Information System to Supporting Archipelagic Sea Defence Strategy (16). Conceptual Framework for Successful IT-Governance for E-Government Services (17). A Maturity Level Framework for Measurement of Information Security Performance (15). Optimising COBIT 5 for IT Governance: Examples from the Public Sector (18). Exploring COBIT Processes for ITG in Saudi Organizations: An empirical Study (19). CAT5:A Tool for Measuring the Maturity Level of Information Technology Governance Using COBIT 5 Framework (20). Incorporating the COBIT Framework for IT Governance in Accounting Education (21). Application of CobiT Maturity Model in Information Security Management and Arising Problematic Issues (22).

The inscriptive benefit from this paper is giving contribution to Indonesian Navy (TNI AL) in determine policy for IS/T system design. It gives academic contribution in development theories which concerning development of strenght and abilty of naval IS/IT. It gives contribution in formulation design and research model of State Defence Information System at sea.

This paper is organized as follows. Section 2 reviews methodology and materials this paper. Section 3 gives result and analysis of this paper. Finally, in section 4 describes paper conclusion.

## MATERIAL & METHODOLOGY

### COBIT Framework.

COBIT Framework was developed to provide a methodical basis for structuring and performing of ITG audit (23). The COBIT framework has been steadily achieving worldwide recognition as the most effective and reliable tool for the implementation and audit of IT governance, as well as for assessing IT capability (24).

The COBIT control framework responses to be successful in alignment with business, management should apply an internal control system or framework needs by (25) : Making a relationship with the business requirements; Organizing IT activites into process through a widely accepted process model; Identifying the most important IT resources to be leveraged; Defining the control objectives to be considered. COBIT framework was created with the following main characterstic (13), such as : Business-focused, Process-oriented, Control-based, Measurement-driven. COBIT's framework also identifies which of the seven information criteria (effectiveness, efficiency, confidentiality, integrity, availability, compliance and reliability) (26). COBIT categorizes IT activities in a generic process model within four domains, illustrated in Figure x, such as Plan and Organize (PO), Acquire and Implement (AI), Deliver , Service and Support (DSS), Monitor and Evaluate (ME) (27).

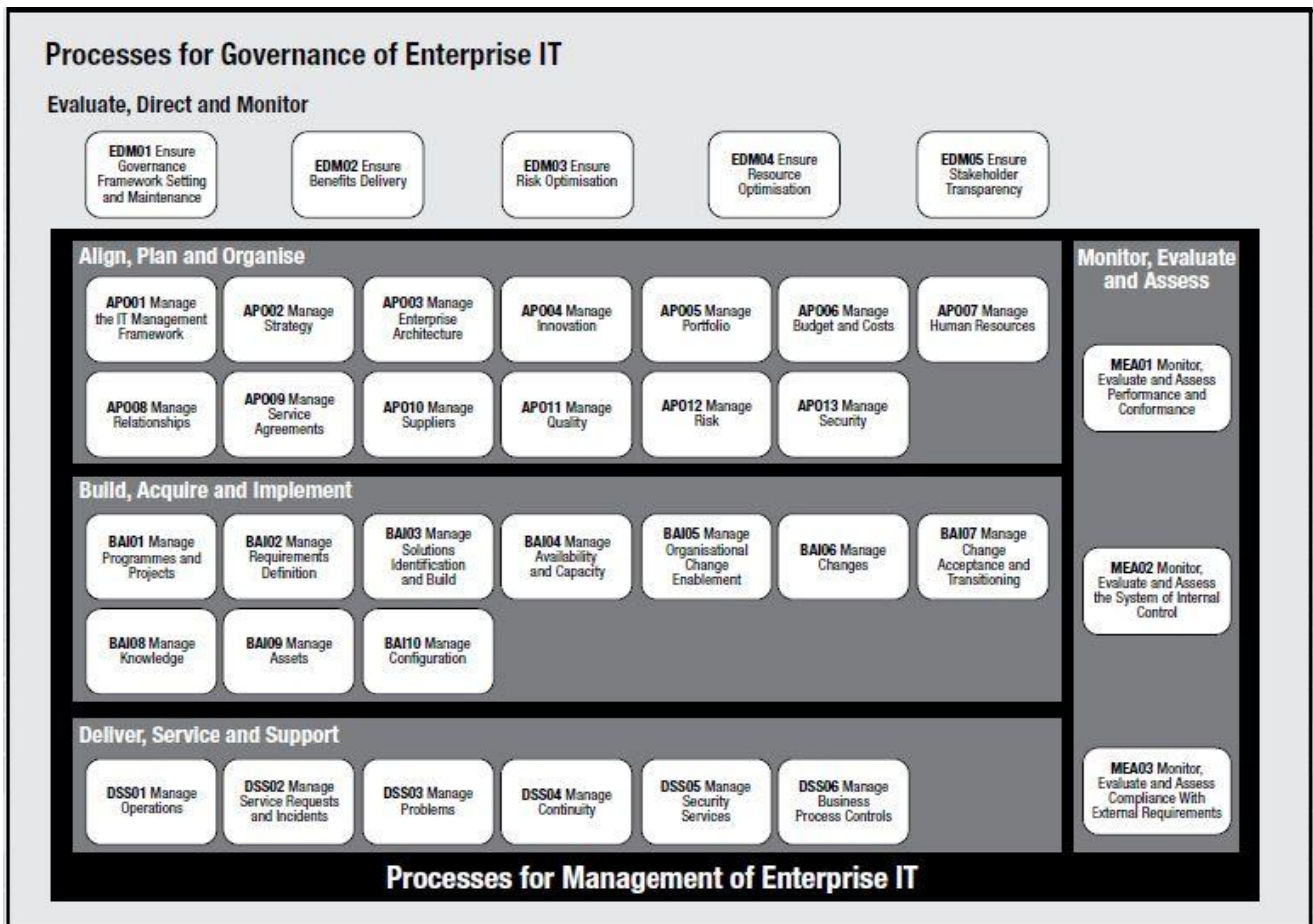


Figure 2: COBIT-5 Processes (11)

**COBIT-5.**

The new addition of the framework, COBIT-5, published in 2012, saw a shift in the framework’s orientation towards business through establishing one integrated framework that consisted of different models (18). It provides a comprehensive framework that assists enterprises in achieving their objectives for the governance and management of enterprise IT (28). According to (11), COBIT-5 is the only business framework for the governance and management of enterprise IT in which it incorporates the latest thinking in enterprise governance and management techniques, and provides globally accepted principles, practices, analytical tools, approaches and models to help increase the trust in, and value from IT.

**COBIT-5 Principles.**

COBIT-5 is founded on 5 key principles for governance and management of enterprise IT (11), such as :

- a. Meeting stakeholders needs.
- b. Covering the enterprise End-to-End.

- c. Applying a single integrated framework.
- d. Enabling a holistic approach.
- e. Separating governance form management.

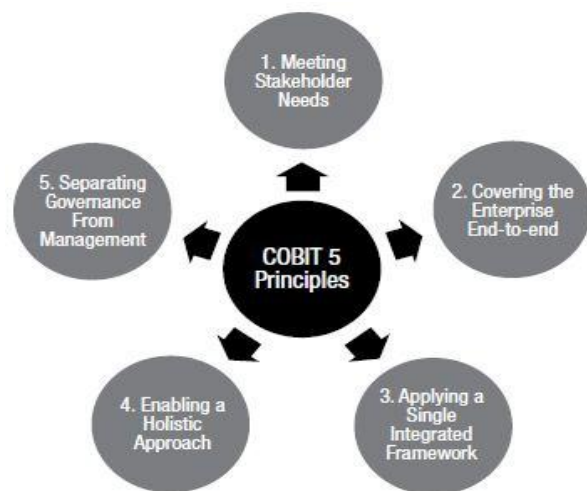


Figure 3: COBIT-5 Principle (11)

**Maturity Level.**

COBIT’s maturity model is influenced by the organization’s business goals, the operating environment and the industry practices (29). Maturity level (ML) was performed on each IT process from level 0 (non-existent) to level 5 (optimized) (30). Administration of the data to determine the maturity level is conducted by the following calculation steps (31) :

- a. Calculating the value and the compliance level of each.

The compliance level of each level (A) obtained from the division of compliance value per level (C) with a number of statements (B) per level.

$$A_i = i * D_i \quad (1)$$

- b. Normalize (D) the level of maturity.

$$D_i = \frac{A_i}{\sum_{i=0}^5 A} \quad (2)$$

- c. Calculating the value of the level of maturity.

Calculation contribution (E) of each level and maturity value (F).

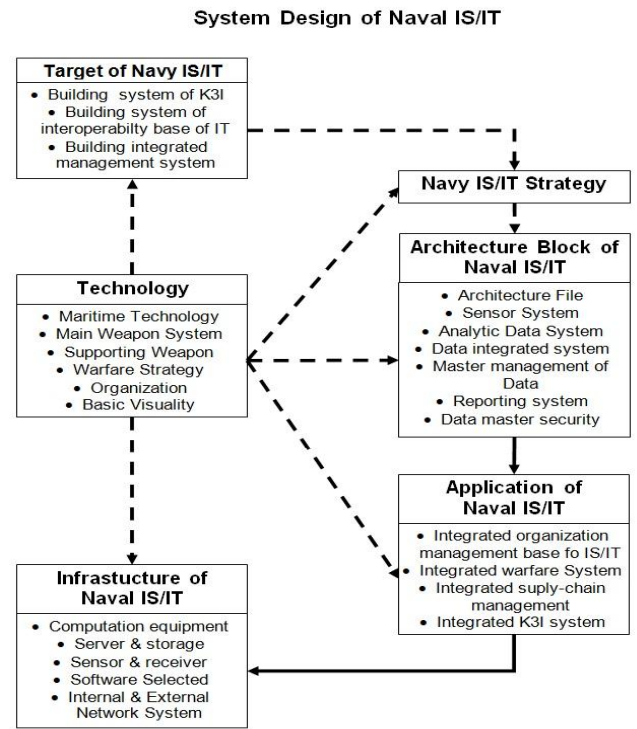
$$F = \sum_{i=0}^5 E \quad (3)$$

$$A_i = \frac{\sum C_i}{B_i} \quad (4)$$

**Table 1:** Maturity Level Assessment Criteria (31)

Maturity Index	Maturity Level
0 - 0,51	0- Non-Existent
0,51 - 1,5	1- Initial/ad hoc
1,51 - 2,5	2- Repeatable But Intuitive
2,51 - 3,5	3- Defined Process
3,51 - 4,5	4- Managed and Measurable
4,51 - 5	5- Optimized

**Indonesian Navy IS/IT**



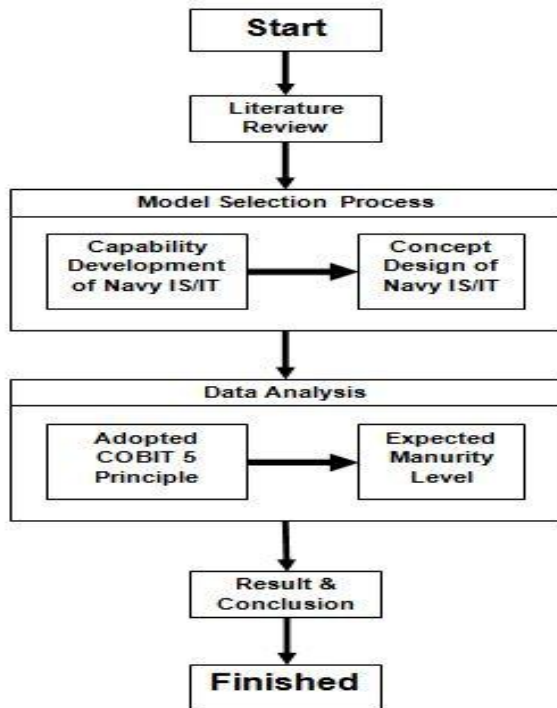
**Figure 4:** System Design of Naval IS/IT (16)

Indonesia Navy (TNI AL) as a major component of national defense in the sea, which has one of the main tasks is to maintain security in the sea area of Indonesia’s national jurisdiction (32). It is one of them component for Maritime Security and Defence in activities of warfare alert, basic training and operation at sea (33).

According to Putra (16), TNI AL as integral part of TNI which will refer to six ability of TNI in build of abilities structure of TNI AL. Structure of six abilites of TNI AL consist of maritime intelligent ability, defense and security ability, politics-social ability, territotial and supporting ability. Based of abliity of Navy Organization, system of SPLN, and system design of IS/IT, therefore at arranges design of nine core capabilites and main capability of Naval IS/IT.

System design of Naval IS/IT consist of seven groups which is architecture data, system censor and receiver, analytic data system, data integration system, reporting system, master's management, and data security. Mutually system design integrity between IS/IT, core capability and main capability from Naval IS/IT maker, it expected can building strengthen and capability of Naval IS/IT.

**Flowchart Diagram.**



**Figure 5:** Flowchart Diagram.

**Target.**

Evaluation of Design Concept of Navy IS/IT .

**RESULT AND DISCUSSION**

COBIT-5 roles as standarization of information technology (IT) can use for Indonesian Navy (TNI AL) organization . COBIT-5 helps TNI AL organization to controlling value of technology from many stakeholders. Overall, Navy IS/IT organization has accomplished COBIT-5 framework, processing of Navy IT ability is not maximal.

Based on COBIT-5 principle for Navy IS/IT, the result showed that :

- a. Meeting stakeholders needs.

The first principle of COBIT-5 for Navy IS/IT resulted that implementation of information technology not yet fully to organization purpose. Sustainability of development and implementation of IT needs controlable sustain to organization purpose.

- b. Covering the enterprise End-to-End.

System design and capability of Navy IS/IT with second principle focuses to IS/IT management, however navy IS/IT have weakness. Based from second principle, the weakness is mixed and

scattered between a governance roles and management roles.

- c. Applying a single integrated framework.

Adopted from third principle, it showed that the organize of Navy IS/IT must be rearranging on organization chart level.

- d. Enabling a holistic approach.

Based on fourth principle, it showed that the strategic vision of IS/IT development has been planned, still uncontrol. Second, management of resource have formal procedure, but still unspecific.

- e. Separating governance form management.

Based of fifth principle, it showed that the interest of development Navy IS/It still overlapping. Second, sustainability of Navy IT/IS implementation still minimum.

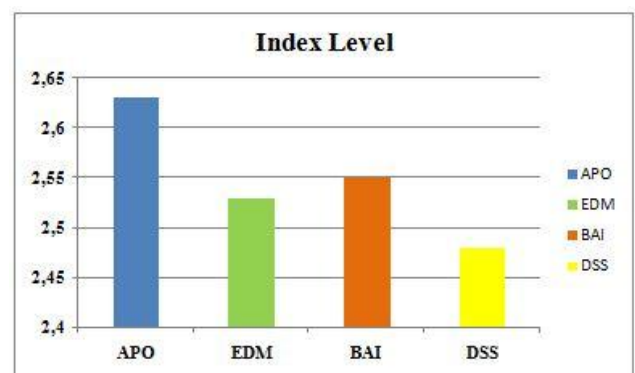
**Calculation of Maturity Level.**

Result of interview from expert choices concerning with Navy IS/IT abilities level estimation based from COBIT-5 gives many level, likely :

**Table 2:** Maturity Level assessment Criteria

No	Code	Objective Control	Ability
1	APO	Align, Plan, Organize	2,63
2	EDM	Evaluate, Direct, Monitor	2,53
3	BAI	Build, Acquire, Implement	2,55
4	DSS	Deliver, Service, Support	2,48

Based on maturity level (ability) of Navy IS/IT with table upon shows 2,63 for APO (align, plan and organize) as level 3; 2,53 for EDM (Evaluate, Direct, Monitor) as level 3; 2,55 for BAI (Build, Acquire, Implement) as level 3; 2,48 for DSS (Deliver, Service, Support) as level 2.



**Figure 6:** Value of Maturity Level

Based on graphic upon, highest ability level for Navy IS/IT is APO level with value 2,63 and the lowest ability level is DSS level with value 2,48.

The result of Navy IS/IT organization assessment showed that processing of Navy IT ability is not maximal, it indicated from many aspect, such as :

- a. Strategic planning documentation of Information Technology (IT).
- b. The function of IT and organization stakeholders.
- c. Readiness of Navy IT/IS function.
- d. Processing of IT.
- e. The technology has been used.
- f. Framework control development of IT organization.
- g. Sustainability development of stakeholders.
- h. Requirement of new application for organization.
- i. Process of implementation and update for technology infrastructure.
- j. Knowledge increase of new system availability.
- k. Readiness of IT resource.
- l. Maintenance of IS/IT application and infrastructure.
- m. Development of IS/IT new system.

Based of COBIT-5 framework, design system of Navy IS/IT needs action to realize it. This action consists of many step, such as :

- a. Management perspective control.
- b. Development system management control.
- c. File source management control.
- d. Operation management control.
- e. Security management control.
- f. Final management control.
- g. Quality management control.
- h. Output operation management.
- i. Database control.
- j. Management of application.

## CONCLUSION

- a. COBIT-5 roles as standarization of information technology (IT) can use for Indonesian Navy (TNI AL) organization . COBIT-5 helps TNI AL

organization to controlling value of technology from many stakeholders. The result of Navy IS/IT organization assessment showed Navy IS/IT organization has accomplished COBIT-5 framework, but processing of Navy IT ability is not maximal.

- b. The first principle of COBIT-5 for Navy IS/IT resulted that implementation of information technology not yet fully to organization purpose. System design and capability of Navy IS/IT with second principle focuses to IS/IT management, however navy IS/IT have weakness. Based from second principle, the weakness is mixed and scattered between a governance roles and management roles. Adopted from third principle, it showed that the organize of Navy IS/IT must be rearranging on organization chart level. Based on fourth principle, it showed that the strategic vision of IS/IT development has been planned, still uncontrol. Second, management of resource have formal procedure, but still unspecific. Based of fifth principle, it showed that the interest of development Navy IS/It still overlapping. Second, sustainability of Navy IT/IS implementation still minimum.
- c. Based on maturity level (ability) of Navy IS/IT with table upon shows 2,63 for APO (align, plan and organize) as level 3; 2,53 for EDM (Evaluate, Direct, Monitor) as level 3; 2,55 for BAI (Build, Acquire, Implement) as level 3; 2,48 for DSS (Deliver, Service, Support) as level 2. Highest ability level for Navy IS/IT is APO level with value 2,63 and the lowest ability level is DSS level with value 2,48.

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