Information system product implementation and support process maturity analysis

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Information system product implementation and support process maturity analysis

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Abstract: Changing business and market environment render the implementation and support of IT division obsolete and not relevant. In this paper we assess and analyze the implementation and support process using ITIL v3 - COBIT 5 Mapping. With objective to create practical guidance for measuring maturity of the process, assess capability level of the process, and make recommendation that can be applied to company’s business process. As the result of assessment, we conclude that mean capability level of implementation and support process is 0.71. This indicates that majority of the process do not achieve level 1 capability level and failed to achieve its objective or fail to deliver any process evidence. As for recommendation we propose two short term solution, fulfill uncompleted base practice and focusing in development of Information Management System.

1. INTRODUCTION

Nowadays, fast IS/IT development increase risk in developing innovation and forcing company or organization to speed up their response to dynamic business environment [1]. This dynamic business environment challenge SME to keep their company competitive advantage to stay competitive [2]. One of the important factors in creating competitive advantage is effective and efficiency level of the business process. Business process that not optimized and not suitable for new dynamic business environment can cause ineffective and inefficient product and service. In this case study, we use IT company focused on developing package human resource software solution for HR department. Packaged human resource solution means the product will be ready to implement and use without much customization. This type of company rely on its IT division especially Implementation and support process to ensure their delivery of the product. In 2015 IT division faced increasing sales trend that cause high workload of system integrator. This is one of factor that caused many implementation projects fall behind schedule and increase in cost. To adapt with this business condition, company needs IT management and control to align IS/IT with their business environment and requirement. One of the framework that can be used to assess and analyze is COBIT (control objective for information and related technology). COBIT is a framework for IT governance and management based on best practice and being used by organization to create value from IT by maximizing benefit and minimizing the risk [3]). According to [4], COBIT is a guide used by company to assess all IT function and structure of IT governance [4]. COBIT provide guidance and best practice for company to assess their IS/IT process maturity. There are 5 key principle in COBIT 5 [5], such as (1). Meet stakeholder needs, (2)
Cover the enterprise end to end, (3). Apply a single and integrated framework, (4). Enable holistic approach, and (5). Separate governance from management.

II. Literature Review

COBIT 5 provide Process Assessment Model known as PAM. PAM provided company with base in assessing IT process [6]. COBIT PAM divided into two main dimension, process and capability [5]. Process dimension is classification of company’s IT processes to COBIT Processes. Capability dimension is definition of process attribute grouped into capability level. COBIT 5 divided IT process into two activity area [5]. Capability dimension provide capability level that can be used for assessing capability level of the process. There are 6 level of process capability in COBIT PAM [5]. Process is continuously improved to meet relevant current and projected business goals. Because of company in this case study is categorized as vendor company and providing service is their main product, one of the framework to assess IT service is ITIL. ITIL (information technology infrastructure library) is a customer oriented framework use for improving standard and quality of IT service. According to [7], ITIL is standardize methodology based on best practice for IT service management and ITIL consist of recommendation that a company may choose to implement [7]. The current version of ITIL is ITIL v3 which is published in 2011. ITIL v3 provide perspective about organization IT service life cycle. ITIL v3 detailed in five service life cycle (Mourad & Hussain, 2014). Mapping ITIL v3 with COBIT 5 are analysis method for assessing the maturity of company business process. This analysis method consists of two framework perspective, ITIL v3 and COBIT 5. According to [8], ITIL v3 focused on process, procedure, design, and implementation of efficient IT service management and COBIT 5 focused on process and procedure of IT management. In ITIL v3 - COBIT 5 Mapping, COBIT 5 has references to all ITIL process. But ITIL process don’t have any references to COBIT 5 process [8]. The system architecture based on FODA concept [9] and the mechanism for software complexity measurement [10].

III. Research Method

In this study, we use COBIT 5 process assessment model (PAM) combined with ITIL process as method in assessing and analyze the maturity of IT Process. The method divided into 6 phase:

1. Business Goal and IT Goal Identification
   In this first phase, we identify company goal related with IT division. The identified goal then mapped to COBIT Enterprise Goal provided in COBIT PAM. next step is to map identified COBIT Enterprise goal to COBIT IT-Related Goal. Objective of this phase is to align company perspective with COBIT perspective.

2. IT Process identification
   In this phase, we do thorough identification of important IT process in accordance with identified IT-Related Goal COBIT. Objective of this phase is to identify all COBIT 5 process related with IT Goal.

3. COBIT IT Process Identification
   In this phase, we use Mapping ITIL v3 with COBIT 5 to map every process according to our research boundary. Objective of this phase is to eliminate non corresponding IT process and narrow assessed process.

4. Base practice identification based on each corresponding IT process
In this phase, we identify all base practice correspondence with identified IT process from the last phase.

5. Capability level assessment on each identified process
   In this phase, we assess capability level of IT division’s implementation and support process using COBIT capability level model. To achieve capability level, every assessed process must achieve rating L which is 51-85% fulfillment of process parameter. To continue assessment for the next capability level, assessed process must achieve rating F which is 86-100% fulfillment of process parameter.

6. Analysis Result
   In this phase, we analyze all assessed base practice score and conclude the result. Using this result, we propose recommendation suitable with company condition.

IV. RESULT AND DISCUSSION
Using Mapping ITIL v3 with COBIT 5, we identified 7 COBIT5 processes related to ITIL v3 implementation and support scope. All identified COBIT 5 processes will be used as base for assessing capability level of IT Division’s implementation and support process.

| No | ITIL v3 Cycle     | ITIL v3 Process                  | COBIT Process |
|----|------------------|----------------------------------|---------------|
| 1  | Service Transition | Transition Planning and Support   | BAI07         |
|    |                   | Change Management                 | BAI06         |
|    |                   | Release and Deployment Management | BAI07         |
|    |                   | Service Validation and Testing    | BAI07         |
|    |                   | Change Evaluation                 | BAI07         |
|    |                   | Knowledge Management              | BAI08         |
| 2  | Service Operation | Event Management                  | DSS01         |
|    |                   | Incident Management               | DSS02         |
|    |                   | Request Fulfillment               | DSS02         |
|    |                   | Problem Management                | DSS03         |
|    |                   | Access Management                 | DSS06         |

Using 7 identified COBIT 5 process, we assess every process using corresponding process attribute parameter (base practice and work product) provided by COBIT PAM to determine capability level of each process. Based on result from assessing 7 identified processes in BAI and DSS domain. We get 3 process achieving capability level 0, 3 processes achieving capability level 1, and 1 process achieving capability level 2.
Figure 1. Capability Level Achievement

To determine overall capability level score, we calculate all assessed process capability level using mean formula.

\[
\text{Capability Level} = \frac{(0 \cdot y_n) + (1 \cdot y_1) + (2 \cdot y_2) + (3 \cdot y_3) + (4 \cdot y_4) + (5 \cdot y_5)}{Z}
\]

\[
y_n(y_1,y_5) = \text{Sum of process achieving Level } n
\]

\[
Z = \text{Sum of all assessed process}
\]

\[
\text{Capability Level} = \frac{(0 \cdot 3) + (1 \cdot 3) + (2 \cdot 1) + (3 \cdot 0) + (4 \cdot 0) + (5 \cdot 0)}{7} = 0.71
\]

Average capability level of Implementation and support process of IT division is 0.71 implying that overall capability level of implementation and support process in IT Division still on level 0. This means that majority process related with operational and knowledge management (DSS01 Manage Operation & BAI08 Manage Knowledge) fail to achieve its purpose or do not have any evidence of the process. The other process despite achieving capability level 1 and 2, the operational of the process still lack in documenting process caused by manual and random documentation procedure. This kind of behavior will promote inefficiency of the process and pose misinformation risk in business process. Based on assessment and calculation result, we conclude that capability level of IT division still far from level considered as mature. This is shown by average capability level of all assessed processes do not achieve level 1 capability level (performed process). This caused by number of base practice supporting business process is not being used or implemented. To improve business process we recommend the company to consider completing any lacking base practice and work product according to assessed process (referred as gap). This recommendation objective is to improve all related COBIT 5 process to achieve level 1 capability level.

Table 3. Best Practices and Work Products Output in Domain Area

| Domain Area          | Best Practices              | Work Products Output                  |
|----------------------|-----------------------------|---------------------------------------|
| BAI07 Manage Change  | Plan Acceptance Test        | Approved Acceptance Test Plan         |
| Acceptance and       |                             |                                       |
| Transitioning        | Perform Acceptance test     | Test Result Log                       |
| BAI08 Manage         | Identify and Classify Sources of Information | Classification of Information Sources |
| Knowledge | Organize and Contextualize Information into Knowledge | Published Knowledge Repositories |
|-----------|------------------------------------------------------|---------------------------------|
|           | Use and Share Knowledge                              | Knowledge User Database          |
|           | Evaluate and Retire Information                      | Knowledge Use Evaluation Result  |
|           |                                                      | Rules for Knowledge Retirement  |
| DSS01     | Manage Outsourced IT Services                        | Independent Assurance Plans      |
|           | Monitor IT Infrastructure                            | Asset Monitoring Rules and Event Conditions |
|           |                                                      | Event Logs                      |
|           |                                                      | Incident Tickets                |
|           | Manage the Environment                               | Environmental Policies           |
|           |                                                      | Insurance Policy Reports         |
|           | Manage Facilities                                    | Health and Safety Awareness      |
| DSS02     | Define Incident and Service Request Classification Schemes | Rules for Incident and Request Escalation |
|           |                                                      | Criteria for Problem Registration |
|           | Close Service Request and Incidents                  | User Confirmation of Satisfactory Fulfillment or Resolution |
|           | Track Status and Produce Reports                     | Incident Status and Trends Report |
|           |                                                      | Request Fulfillment Status and Trends Report |
| DSS03     | Raise Known Errors                                  | Known-Error Records              |
|           | Resolve and Close Problems                           | Proposed Solutions to Known Errors |
|           | Perform Proactive Problem Management                 | Communication of Knowledge Learned |
|           |                                                      | Identified Sustainable Solutions |
| DSS06     | Align Control Activities Embedded in Business Process with Enterprise Objective | Results of Processing Effectiveness Reviews |
|           | Manage Error and Exceptions                          | Root Cause Analyses and Recommendation |
|           | Ensure Traceability of Information events and Accountabilities | Evidence of Error Correction and Remediation |
|           | Secure Information Assets                            | Error Reports and Root Cause Analysis |
|           |                                                      | Retention Requirement            |
|           |                                                      | Reports of Violations            |

The next recommendation we propose is for company to put priority on information management system. This is based on finding that implementation and support process lack of documentation management. Majority of the existing document are maintained and stored by individual and not integrated with other department. This can increase implementation and support time and risk because of information mismatch. This Information Management System will consists of 3 main modules, implementation and migration management module, customer support management module, and knowledge repository module. Each module integrated with other module to ease information exchange between departments. The system designed to run on 2-tier architecture. Access controls for all modules are assigned by IT manager and access to information stored in system is restricted to staff from related department. All modules have their own dashboard accessible by IT manager. Function of implementation and migration management module is to help managing and controlling information related to implementation and migration process. In this module, superior can assign implementation task to system integrator. System integration can only access and store information which is their responsibility. For the migration management, the module is connected to company website portal. With this module, system integrator can create needed customer migration data list which can be accessed by customer from web portal. Customer management module is a module to help and control support in IT division. Access control in this module will be assigned by IT manager. All customer information stored in this module is only accessible by assigned support. Every incident, problem and request received by support must be grouped according to its parameter, documented and stored to the
system. Knowledge repository is module aim to store all reusable information for guidance in running business process. All information stored in this module are grouped according to its purpose, such as (a). document format, (b). user manual, (c). customer information, and (d). solution

V. Conclusion
In conclusion, IT Division implementation and support assessment result, we conclude that From 7 process assessed using COBIT 5, we found 3 process still in capability level 0, 3 process achieved capability level 1, and 1 process achieved capability level 2. Based on capability assessment from each process, average capability level for implementation and support are 0.71. This score indicate that process maturity of IT Division do not achieve level 1 and still at level 0. There are 2 recommendations to improve IT division implementation and support process: (1). Optimize implementation and support by prioritizing achievement of level 1 capability level. This can be done using COBIT 5 as guidance to complete every incomplete base practice and work product, (2). Prioritize in development of information and document management system. This system are aim to eliminate manual and scattered documentation process which can pose risk to implementation and support process.

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