

# Establishing IT Governance Using CMMi – A Case Study of Malaysian Private University

Aliza Abdul Latif and Nor Izzati Hanifi

**Abstract**—A study was performed on an IT function of a private university in Malaysia and this paper aims to assess the initiatives to adopt and implement ICT governance using Capability-Maturity Model Integration (CMMI) Framework. The goal of the initiative was to perform gap analysis and improve the organization's service delivery process in order to be able to reach Level 2 on the CMMI framework. Key people from chosen department were interviewed and assessment using specific framework was conducted. From the result of the research, it suggests that CMMi Framework can be adopted in a university setting in order to achieve higher levels of control and performance while delivering operational excellence.

**Index Terms**—IT Governance, CMMi, service management

## I. INTRODUCTION

### A. Background of UNITEN

ICT environment is critical to every aspect of a universities and it always been characterized by its huge and costly investment. These investments come with a huge risk in ensuring good IT services are delivered to all the stakeholders, including employees and students.

Universiti Tenaga Nasional is a private university in Selangor that currently cater hundreds staffs and thousands of students. All of them are using IT services in delivering their work and assisting them in daily routine, which may includes downloading notes, finding journals or articles from the digital databases or even using all the internal information system to send complaints. As ICT has become so vital to a university, higher priority has been given in implementing IT governance.

Due to this high priority, an initiative has been started to introduce an IT governance framework in the university. There is no governance standard currently used except for the ISO 9001, which was adapted to have a better quality management system. The lack of a strong governance framework created an improper structure of governing bodies, which control the IT services delivery. This has lead to a few cases of system downtime that affects the daily operations of the university.

The aim of this research paper is to report on the development initiatives towards providing a CMM-like capability maturity framework. Such a framework can be used to guide the case university in managing their IT service delivery in an optimized and holistic fashion. An

assessment of the processes in Service Management will assist them in identifying its specific maturity status, and establishing a structure for developing a prioritized improvement plan.

The research methodology will be reviewed in the next section of this paper. This will be followed by the results of the assessment and discussion. The recommendation and conclusion will be presented in the final section of the paper.

## II. RESEARCH BACKGROUND AND METHODOLOGY

The study was conducted within a period of six (months), starting from March 2011 until September 2011. Two methods were used in collecting data for the study, which are interviews and documentation analysis. Interviews were conducted to gather information relevant to the study, and the respondents were all the departments' manager. The interview approaches were divided into two, which were normal interview to assess the company structure and interview using CMMI questionnaire to assess the Service Management Maturity level. Secondly, data was also collected through documentation analysis (written documents). The data was obtained from the company intranet or provided by the selected departments.

This interview involved all the manager of all the units in Information Technology and Multimedia Services (ITMS). The respective units involved are Administration which is the main unit in ITMS, Network & Server unit that handle all the network, security and server related matters, Multimedia & Printing unit that handle all the matters related to graphics, multimedia, printing as well as photography for event in UNITEN.

The other unit is Application Development unit that handle the problem related to system and application including web development and as an IT support team, Database Administration unit which a new unit in ITMS that cater all the things that related to database and system. The core services of ITMS is the helpdesk operation unit that handle the all the IT problem, or the medium and central point for IT user and all the units in ITMS to communicate to one another about any IT problem.

All seven representatives from each of the units were required to answer the interview questions about their unit and ITMS department as a whole. The results from the questionnaires are listed as below.

### A. Types of Interviews

- Normal Interview. The interview data that was collected from the assessment team revealed several diagrams on the flow of data among processes across different departments/unit and their relationships.

- Interview for assessment of Service Management Maturity Level. The interviews were with a few managers from ITMS. A set of question booklet with detailed instructions was provided to each interviewee in order to provide better understanding on the questions asked. Interviewees were asked on their knowledge and experiences pertaining to the processes involved in the organization.

The Service Management Maturity level assessment was held in different sessions consisting of the same set of personnel attending the interview session earlier. A set of questionnaire booklet was distributed to the respondents, which was adapted from the IT Service CMM questions and tailored to the familiarity of the organization. Respondents were asked on each key process areas of Maturity Level 2 and to provide answers from the choices of Yes, always, Not always, Never, and Don't Know. All choices were assigned to points ranging from 0 (Never), 1 (Not Always), 2 (yes) and no marks given for don't know.

The software development maturity level assessment was carried out based on the renowned Software Development CMMI assessment method. The questionnaire was obtained from a trusted partnering body of the Carnegie-Melon Software Engineering Institute. The respondents were given a questions relating to the key process areas of all 5 levels in the Software Development CMMI. Respondents were asked to answers several questions for every key process areas, based on their understanding on how much those specific processes have been implemented in the organization.

Scores from both maturity level assessments were tabulated and a graphical representation was produced in order to portray the achievement of each key process areas. Thus from the scores tabulated and input provided, a decision was made pertaining to the level of maturity.

This questionnaire covers Maturity Level 2; Repeatable contains seven key process areas, four management process areas and three support process areas. The management processes are:

1) Service level Management

- Service commitment management: Services are *specified and realistic service levels are negotiated* with the users in order to deliver services that satisfy the user's need for IT services. The delivered services, the specified service levels and the user's service needs are reviewed with the users on a regular basis. When necessary, the service level agreement is adjusted.
- Service tracking and oversight: Service delivery is being tracked. The actual service levels are compared with the specified service levels and are reported to the users and management on a regular basis. Corrective actions are taken when actual service delivery is different from the specified service levels.
- Subcontract management: Select qualified IT subcontractors and manage them effectively.

2) Service Delivery Planning: the Service Delivery is Planned in Order to Ensure that the Specified Services Can be Delivered According to the Agreed Upon Service Levels. the Service Delivery Planning Creates Apart from the than management process, the support

process covers:

- Service request and incident management: Incidents/requests regarding the service are identified, registered, tracked, analyzed, and resolved. The status of incidents/requests are communicated with the users and reported to management.
- Service quality assurance: Management is aware and well understood of the process being used and the services being delivered.

B. Documentation Analysis

All the Process Standardization Improvement (PSI) documents obtained from the interviewee was used to analyze and identify the current standard of IT services delivered by ITMS. It was also used to compare the 'as-is' governance structure and to propose an improved service delivery process for the company.

III. RESULTS AND DISCUSSION

A. Result of Interview

Data obtained from the interview was used to identify the unit goals, timeline for each IT services delivery, the IT competencies or skills needed by the staffs, the ITMS strategic objective and the job description of each staff. All interview data from all the four units in ITMS were analyzed in comparison to the current maturity level of services in Level 2. The list of questions asked during the interview can be found in Table I below.

TABLE I: LIST OF QUESTIONS ASKED DURING INTERVIEW SESSION

No.	Questions
1.	Which best describes your current position?
2.	How long have you been working in UNITEN?: ( Please specify)
3.	Total working experience?
4.	Do you have supportive, effective and efficient management in your department?
5.	Describe the work environment or culture and its management style in which you have experienced the most success.
6.	What are the unit goal/objectives? Kindly describes.
7.	In the task given, do you have a timeline (deliverable/response time) to finish your task?
8.	What factors are important within an organization and must be present for you to work most effectively
9.	Record individuals outside of the department who formally or informally provide IT services.
10.	List your IT competencies skills-what are areas of strength, either in technical skill or in terms of hardware or software infrastructure that will contribute most to competitive advantage for your department and organization
11.	List the ITMS strategic objectives ( Example: To maintain IT support environment that is stable and reliable)
14.	List your main and ad-hoc job description

Based from the interview result, the study found out that several senior staffs that were interviewed are aware of the benefits in implementing IT governance in the organization. By following certain framework or guidelines in delivering IT services to users, the service delivery will be more reliable, manageable and efficient. However, based on the ad-hoc nature of the users' request, they do not prefer to

govern their IT services, as it will be a waste of time in following certain workflows in solving a problem or incident.

By studying the department’s documentation, there is no document that state there is a formal flow of IT activities. The normal practice for the department is to have a meeting every two weeks and all requests will be tabled at the meeting for approval. For example, a request of a new system, a staff will be assigned to develop the system and then obtain approval from the manager to start developing the system.

**B. Result of CMMi Survey**

The study only assessed the organization’s Service Management. The result concluded that ITMS as having to positively progressing towards level two for Service Management. Figure 1 shows the score obtained based on the seven key processes of the Service Management Maturity Level.

Out of the seven key process areas, the Service Commitment Management (SCM) scored the highest at 1.8 as this process involves ensuring the service commitments between ITMS, and the IT user, including staffs and students, and the actual services delivered, are based on the ICT service needs of the IT user. The IT services delivered has to be evaluated on periodic basic and incident basis.

accomplishments or results of the delivered IT services.

Subcontract management involves activities that a service provider (a department) should implement when (part of) a service, to be delivered to a customer of the division, is subcontracted to a third party (external service provider). However, in this case study, ITMS is not using any subcontractor in delivering IT services to the IT users. This is indicated with the score of zero (0) in Figure 1.

Service Delivery Planning is the process to ensure that the specified services can indeed be delivered according to the agreed upon service levels and forms the basis for delivering the services. From the survey data, this key process is progressing into Maturity Level 2, which calculated to have a score of 1.3 as shown in Figure 1. Ideally, Service Delivery Planning and Service Commitment are developed in parallel due to the interdependencies between them thus ensures the presence of a commitment process.

The Service Desk & Incident Management (SDIM) ensures the service requests and incidents on the service are identified, registered, tracked, analyzed, and resolved. Customers are informed of the service request and incident status, and reported to the management, which in this case is the department manager. This key process area involves the management of service requests and incidents that cause or might cause service delivery to deviate from the agreed upon service levels.

Service delivery and incident management deals with:

- Requests for service from end users (staffs or students). For example, requests of new software installation.
- Incidents that cause or will cause service levels to be lower than agreed upon if no action is being taken. For example, a server that is down might cause the specified maximum down-time to be exceeded if it is not restarted and rectified immediately.

The SDIM key process obtained a low score at 0.7, due to the process not being implemented throughout the organization as a formally used and implemented process. Statuses of incidents are not communicated to end users and they are not documented. The IT users have to be proactive and contact ITMS to know the status of their requests. It will take sometimes for this process to be mature as the case company have not embark on any planning to develop an incident management plans. No incidents records are stored and documented. Every incident is treated on ad-hoc basis, and there are no specific processes to determine which department will handle any incoming incidents.

The last two key process areas that will be discussed are the Software Quality Assurance (SQA) and Configuration Management. The SQA key process obtains a high score due to the process has been incorporated in the ISO management system of the university. This has complied with the concept of IT Service CMM in which the entire organization needs to be aware and participate in the process. The quality assurance process for IT services is documented and all IT users are make known of the ISO documents related to the IT service delivery.

As for Configuration Management (CM), the main

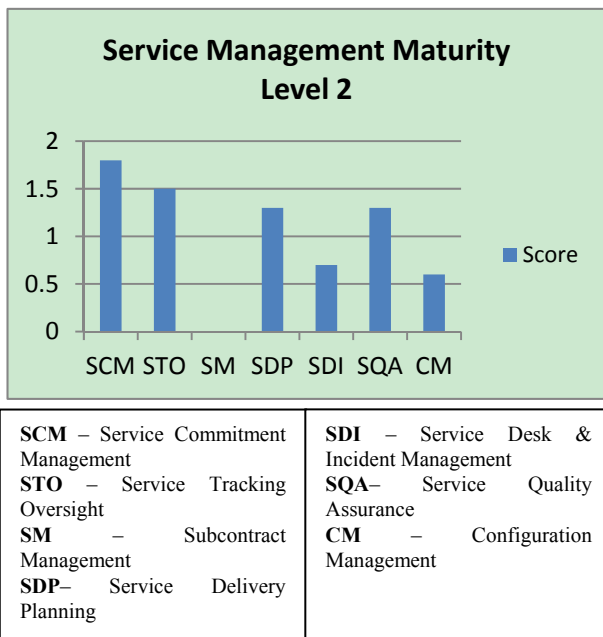


Fig. 1. Service management - maturity Level 2

This key process is partially in line with ITIL’s Service Level Management (SLM). Two of the other processes that provide similarity to ITIL’s Service Level Management would be the Service Tracking and Oversight (STO) and Subcontract Management. This process scored 1.5, the second highest as ITMS do keep track of all the IT services delivered to its customers. Service Tracking and Oversight involves reporting the actual service levels to the customer and monitoring the actual service delivery. This process recommends the service provider to take corrective actions as soon as possible. However, according to the survey, formal reviews are not conduct with the users to address the

purpose of the Configuration Management key process area is to establish control over all ICT components that are needed to properly deliver the service. The ICT components may be as simple as a single server, or as complex as the entire IT department. Overall, this key process scored lowest at 0.6, as most respondents checked “don’t know”. This indicates that they are either unaware of the processes involved in performing configuration management activities or they do not have any process of managing IT configurations.

The goal of this key process area on the services perspective is to have IT service provider identifies the ICT components that are important for the delivery of their service. These ICT components are controlled to make sure they are available. Since the identified ICT components need to be controlled to properly deliver the services, changes to these ICT components need to be controlled as well.

#### IV. RECOMMENDATION

The service delivery of ITMS needs to be changed according to CMMi Service Management Level 2. Some recommendation has been made based on the result of the study for the case university to comply with Level 2 for the key processes of the service management maturity model with respect to ITIL Service CMM.

The first recommendation is for ITMS to execute the activities prescribed in CMMi Service Management maturity Level 2 in order to obtain the desired level of the ITIL-CMM. All the changes can be successfully institutionalized if the staffs in ITMS are trained accordingly. Hence, it is proposed that ITMS will diligently subscribe to all the activities prescribed in Level 2 of CMMi

Service Management.

A knowledge management system also should be established in ITMS as it is a learning organization. It is proper for the department to set up an electronic knowledge repository and communication on best practice frameworks, manuals, training and training material.

#### V. CONCLUSION

This research project addressed the gap analysis to get the ‘as is’ situation for Service Management area using both CMMi Service Management and ITIL. The result concluded as having to positively progressing towards level 2. For the university and IT department to install a holistic governance framework, it is recommended that they implement a myriad of the best practices and standards which cover the entire spectrum of the ICT Value chain. The myriad of the best practices and standards may include COBIT, enhanced Operations Telecom Map (eTOM), ITIL and CMMI.

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