Change management practices: Harmonizing ISO9001:2008 and CMMI in the context of a Malaysian IHL

Israa Garoot .S Eissa1
Kulliyyah of Information and Communication Technology International Islamic University Malaysia. Gombak, Malaysia

Mysa Mohammed Farhan2
Kulliyyah of Information and Communication Technology, International Islamic University Malaysia. Gombak, Malaysia

Abdul Rahman Ahmad Dahlan3
Kulliyyah of Information and Communication Technology, International Islamic University Malaysia. Gombak, Malaysia

Abstract
This paper discusses the different between ISO9001:2008 and CMMI model in the context of Malaysian IHL with the focus on new System projects implementation. Using Business Model Canvas (BMC) and Value Proposition Design (VPD) to highlight some areas in which the adoption of CMMI within an ISO certified university setting can be a value creator. By conducting a gap analysis with the aim of identifying the university’s standing within the CMMI to enable to reach level 5 of the CMMI.

Keywords: Capability Maturity Model Integration (CMMI); ISO9001:2008; Software process improvement; Institution of Higher learning.

1. Introduction
With the rising cost of Higher education noted by many researchers [1] [2] following the economic problems that were felt worldwide, and the disruptive technological trends in education means institutes of higher learning (IHLs) need to focus on implementation of new System projects. This may bring about remarkable challenges to information technology professionals and the higher education institutions impacted by these implementations. Successful implementation of software system in IHLs can be tremendously rewarding both in strengths and efficiencies. When system implementation projects fail it can weaken the institution and drain its human resources and funds. Subsequently, the reasons for the successes and failures of new software implementations can remain a puzzle for many system project managers even within ISO certified institutions. This paper will focus on integrating the Capability-Maturity Model Integration (CMMI) framework with ISO9001:2008 by performing a gap analysis of system implementations initiatives within an Institute of Higher Learning with the goal of improving the organization’s IT services delivery process in order to be able to reach a higher level on the CMMI. CMMI can also be applied to curriculum design [3] as well as designing E-learning initiatives [4].

2. Background
Research shows that “Technologically delivered content will completely replace traditional forms of teaching and learning” [5] and IIUM aims to become a leading international center of educational excellence which seeks to restore the dynamic and progressive role of the Muslims in all branches of knowledge and intellectual discourse. The summary of the university’s Mission is Integration, Islamization, Internationalization, and Comprehensive Excellence. In order to become a leading university in the future Institutions of higher learning must place high priority on IT advancement. IIUM is currently ISO 9001:2008 certified which corresponds to the CMMI level 2 with some elements of level 3. “ISO 9001 is a standard for quality management systems while CMMI is a model for process improvement. If an organization that has achieved ISO registration wishes to improve processes continuously, CMMI can be a strong candidate.
because it provides a more detailed roadmap for process improvement.” [6]

ISO9001:2008: ISO 9001:2008 specifies requirements for a quality management system where an organization:

- Needs to demonstrate its ability to consistently provide product that meets customer and applicable statutory and regulatory requirements, and
- Aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

All requirements of ISO 9001:2008 are generic and are intended to be applicable to all organizations, regardless of type, size and product provided. [7]

CMMI: The Capability Maturity Model Integration (CMMI), a model developed as a collection of best practices from software organizations, with aims of improving the success rate of projects. The focus of CMMI is process improvement to achieve business goals. The CMMI’s process areas details Training practices that produce more trained and skilled personnel. This in turn results in higher revenue due to increased organizational competency. The correct combined application of ISO and CMMI makes for enhanced quality and hence, increased business profitability.

This paper will attempt an exploration into how the HEI combine the above mentioned frameworks to provide better value.

3. Problem statement

The IIUM is currently ISO 9001:2008 certified institution, this paper will attempt an integration of the CMMI ISO 9001:2008 model for Institutes of Higher Learning which aims to assist the university in meeting its mission and vision and to provide Institutions of Higher Learning with a clear idea of how to integrate the two for a continuous quality and to be a university of the future.

4. Methodology

For this paper we will use the BMC and VPD to identify the areas in which the CMMI can help the IHL (IIUM in this context) in providing value for its customer segments that can benefit from an improved system process, and we will then conduct interview and questionnaires with the IT development division to analyze the gap areas where CMMI can provide a clear guideline for improvement.

Figure 1 Business Model Canvas for IIUM

Figure 2 Value proposition Canvas for students of IIUM

Figure 3 Capability Maturity Model Integration (CMMI) Levels
5. Literature review

The Changing global market has been a motivator for organizations to change toward continuous innovation and improvement of processes and products. As a result, quality management became of strategic importance, for internal improvement as well as a success factor for global competitiveness and in interacting with contractors, suppliers, and customers. This results in the need for improvement efforts to achieve competitive advantage with respect to customer satisfaction, business profitability, market share, product and service quality, cost reduction, and so on [9]. Both [1,10] among other researchers have concluded that the Higher Education Industry is seeing a significant change, [1] outlined 5 drivers of this change comprising: Democratization of knowledge and access, Contestability of markets and funding, Digital technologies, Global mobility and Integration with industry. Malaysia will be at the forefront in this changing environment, see figures (5). The Ministry of Education Malaysia highlighted in its Malaysian Education Blueprint 2015-2025 [10] its plans to build on five aspirations: access, quality, equity, unity, and efficiency.

Disruptive change in the education sphere and technology advancement[1,8] have introduce growing Access to Knowledge online and the emergence of innovations such MOOCs, which can be leveraged as an asset to Institutes of Higher Learning (IHL). [11] But they would need to assess and strengthen their IT implementations and infrastructure. The right application of Software solutions can reduce reliance on manual work and in turn create savings for institutions while creating more value for the customers [12] higher education cannot afford to slow down adopting information and communications technology (ICT) solution. Being the innovation forefront can enhance an institution’s image for prospective students that the university is committed to staying at the top, thus helping to bring in revenue from course fees. It can also widen the student base by reaching out to students in remote areas, where technology is conquering geography and allowing students to tap into the online learning trend from their own homes and workplaces. [12]

CMMI is a good framework to assist IHLs manage the risks brought about by the disruptive change in the education front and give them a leverage to improve software processes. From their interviews with Software Engineering Institute [13], have indicated that the CMMI is a model for risk management, it highlights an organization’s ability to manage risk. This indication is evidence for the likelihood that the organization can deliver on its promises or deliver products of high quality that are demanded in the market. The model provides a good indicator of how an organization will perform under stress. A high maturity, high capability organization will take unexpected, stressful events in its stride, react, change, and proceed forward. A low maturity and lower capability organization will tend to panic under stress, blindly follow obviated procedures, or throw out all process altogether and retrench back to chaos.

"Ultimately, parents, young people and governments will need to make difficult choices about how to allocate resources to ensure development, growth and learning that results in value creation for the individual and society.” [14]
6. References


