A Comparison between the EMR Adoption Model[SM] and CMMI®

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Abstract and Objective

This study analyzes similarities and differences between the EMR Adoption Model[SM] with the Capability Maturity Model Integration for Services (CMMI), which is a worldwide standard for process and quality improvement. EMR Adoption Model is a static standard for evaluating hospital's adoption of electronic medical record system. CMMI is not only is a standard, but it also a framework to guide organizations how to improve their levels within the framework.

Keywords:

EMR adoption model, CMMI.

Introduction

Hospital Information and Management Systems Society (HIMSS) developed the EMR Adoption Model (EMRAM) to characterize the implementation of EMR in a healthcare organization. Table 1 shows the definition of each stage.

Table 1-EMRAM Overview (Source: www.himss.org)

Stage 0	Not all three ancillaries – Lab, Radiology, Pharmacy – are installed.
Stage 1	The three ancillaries are installed.
Stage 2	Also installed Clinical Data Repository, Controlled Medical Vocabulary, and Clinical Data Support System; may also have Document Imaging.
Stage 3	Also installed Clinical Documentation (flow sheets), CDSS (error checking), PACS (to be available outside Radiology).
Stage 4	Also CPOE, CDSS (clinical protocols).
Stage 5	Also closed loop medication administration.
Stage 6	Also Physician Documentation (structured templates), full CDSS (variance & compliance), full R-PACS.
Stage 7	Also fully electronic medical record; HCO able to contribute CCD as byproduct of EMR; Data Warehouse in use.

The Software Engineering Institute (SEI) of Carnegie Mellon University created the Capability Maturity Model Integration (CMMI®) to guide organizations to improve their processes for software development. Over the past decade, the CMMI is widely accepted and used by organizations worldwide. The latest version of CMMI model, the CMMI for Services (CMMI-SVC), released in February 2009, is a model of best practices in service industries, and it could be applied to the healthcare business sector, as Table 2 shows.

Table 2 – CMMI-SVC Overview (Source: www.sei.cmu.edu)

Maturity Level 1	Initial: Processes are unpredictable, poorly controlled, and reactive.
Maturity Level 2	Managed: Processes are characterized for projects and are often reactive.
Maturity Level 3	Defined: Processes are characterized across the organization and are proactive.
Maturity Level 4	Quantitatively Managed: Processes are quantitatively measured and controlled.
Maturity Level 5	Optimizing: The focus is continuous process improvement.

Comparison and Result

Table 3-Comparison between EMRAM and CMMI-SVC

	EMRAM	**CMMI-SVC**
User	Healthcare organizations.	Service organizations including healthcare.
Evaluator	HIMSS	SEI authorized Lead Appraisers.
Key concepts	Various clinical information systems.	Best practices to improve processes in a service organization.
Model Structure	Static stage structure; specific IT applications at each level.	Dynamic structure; not only a standard but also guidance on what to improve.
Similarities	Both are intended to promote the adoption of best practices.	
	Both evaluate an organization's implementation and use of a technology. Therefore both give information about the capability and maturity of the adoption.	
	Both have a staged/level model structure.	

The EMRAM has several similarities as CMMI. However, the fundamental difference is that the EMR Adoption Model is a step-by-step standard for evaluating healthcare organizations in their implementation of EMR. CMMI-SVC is not only is a standard, but it also can provide detailed guidance to assist organizations to move up from lower levels to higher levels of capability and maturity. CMMI may provide EMRAM a good example for the future development.