

MODEL KEMATANGAN DAN ADOPSI SISTEM INFORMASI ATAU REKAM KESEHATAN ELEKTRONIK

Deskripsi:

Beberapa kematangan dan adopsi sistem informasi yaitu: 1) Capability Maturity Model (CMM), 2) Enterprise Architecture (EA), 3) Australian National e-health Interoperability Maturity Model, 4) The HIMSS EMR Adoption Model.

1. Capability Maturity Model (CMM)

The Capability Maturity Model (CMM) was originally defined for software development by Carnegie Mellon University and is useful for assessing health information systems.

Five levels are defined along the model's continuum. Predictability, effectiveness, and control of an organization's software processes are believed to improve as the organization moves up these **five levels**.

1. Level 1. Initial (chaotic, ad hoc, individual heroics) – the starting point for use of a new process.
2. Level 2. Repeatable – the process is able to be used repeatedly, with roughly repeatable outcomes.
3. Level 3. Defined – the process is defined/confirmed as a standard business process
4. Level 4. Managed – the process is managed according to the metrics described in level 3, that is, data collection and analysis.
5. Level 5. Optimized – process management includes deliberate process optimization/ improvement.

2. Enterprise Architecture (EA)

An alternative method is the Enterprise Architecture (EA) approach. An early description of this methodology was described by Spewak and Hill. Which is best adopted at the highest level, 'enterprise'. Although now twenty years old, the publication is still considered a foundation text in its field. In order to implement the

Enterprise Architecture process, the organization must first establish the preliminary framework and principles, a requirements management process, and governance. After the requirements and governance are established, EA focuses on a continuous cycle of improvements.

The steps of this process are:

- 1) architecture vision,
- 2) business architecture,
- 3) information system architecture,
- 4) technology architecture,
- 5) opportunities and solutions,
- 6) migration planning,
- 7) implementation governance, and
- 8) architecture change management.

This continuous cycle is the key to successful information system improvement in this process.

3. Australian National e-health Interoperability Maturity Model

Individual health information must follow the patient as s/he receive services from various providers. This requires data interoperability which is the key to effective use of health information.

The Australian National eHealth Transition Authority has defined an Interoperability Maturity Model that identifies increasing capability for data interoperability.

1. **Initial:** There is an early awareness of eHealth interoperability requirements and characteristics and perhaps some initial eHealth interoperability solutions adopted, typically localized within certain clinical or administrative domains.
2. **Managed:** An organization will begin accomplishing some interoperability goals, such as the adoption of specific eHealth standards while gaining an early, shared understanding of data services or internal processes as well as initial governance established to ensure repetition of earlier successes.
3. **Defined:** An organization has defined a set of guidelines for the adoption of

eHealth standards for data, services and processes, according to the lessons learnt from previous maturity levels. Communication standards for interaction with internal and external partners are established, facilitating a shared understanding across technical and semantic issues

4. **Measured:** An organization has established processes for appraising and measuring eHealth interoperability.
5. **Optimized:** The organization has implemented processes to support continuous interoperability improvements, driven by feedback from monitored processes.

4. The HIMSS EMR Adoption Model

This model relates to the management of patient information and was developed by the United States based Healthcare Information and Management Systems Society (HIMSS). The HIMSS Electronic Medical Record Adoption Model describes the stages from 0 to 7 of EMR adoption within organizations.

It starts with laboratory, radiology and pharmacy and progresses to document imaging, clinical documentation and protocols, and medications. Since it is based on a hospital environment, some of the steps may not be appropriate for outpatient care models.

- Stage 0: Some clinical automation may be present, but all three of the major ancillary department systems for laboratory, pharmacy, and radiology are not implemented.
- Stage 1: All three of the major ancillary clinical systems (pharmacy, laboratory, radiology) are installed.
- Stage 2: Major ancillary clinical systems feed data to a clinical document repository (CDR) that provides physicians access to results.
- Stage 3: Clinical documentation (e.g. vital signs, flow sheets) is required
- Stage 4: This includes a CPOE along with the second level of clinical decision support capabilities related to evidence-based medicine protocols.
- Stage 5: The closed loop medication administration environment is fully implemented in at least one patient care service area.

- Stage 6: Full physician documentation/charting (using structured templates) is implemented for at least one patient care service area.
- Stage 7: The hospital has a paperless EMR environment. Clinical information can be readily shared via electronic transactions or exchange of electronic records with all entities.

The HIMSS model was developed for hospitals in the United States of America so reflects the way medicine is practiced there and assumes adoption of specific standards such as the Clinical Document Architecture (CDA) standard. Note that at the end of 2010, only 1% of hospitals (approximately 57) in the United States had reached stage 7 of the EMR adoption model.

No hospitals in Canada had attained that level of development. Although the model may be applicable to other countries it would require adaptation to country conditions and national standards.