Systematic Training Programme and Certification for Healthcare and IT Practitioners

# eHealth Training for eHealth Executives

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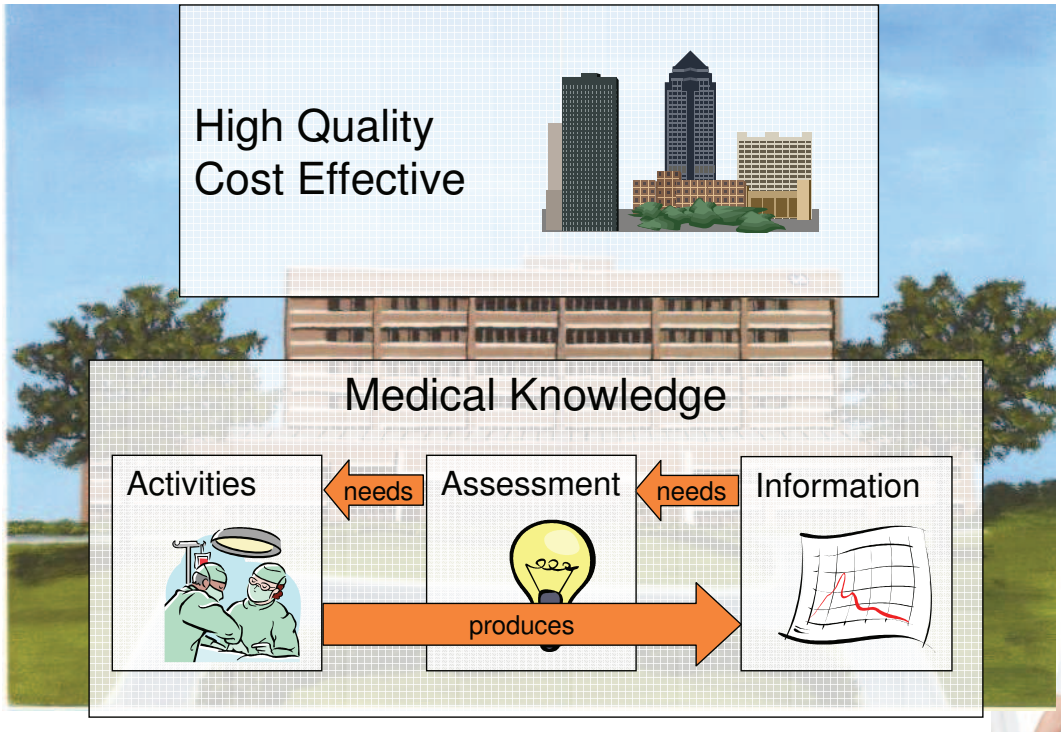
## Agenda

- Clinical Decision Support Systems
  - Current Healthcare Process
  - Pain Points
  - Types of CDSS
  - CDSS Selection Criteria
- Organization and Management of Healthcare Services
  - How to equip the taskforce
    - Health Informatics Professionals
    - IT Project Management
    - Change Management
- Expectations Managed
  - Incidents of patient confidentiality breach
  - Risks Analysis
  - Policy, Procedures and Means to protect patient data

# Clinical Decision Support Systems

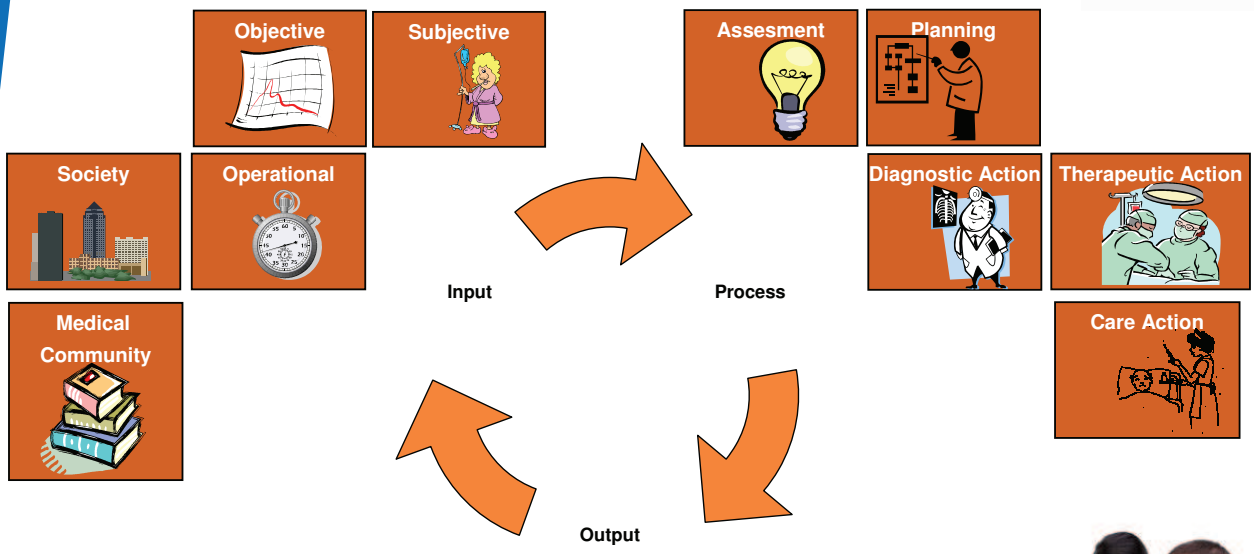
## Current Healthcare Process

## The Hospital




Source: Dr. Dirk Colaert MD, "The Pain Points in Health Care and the Semantic Web", Advanced Clinical Application Research Group, Agfa HealthCare.

# Healthcare as a Process



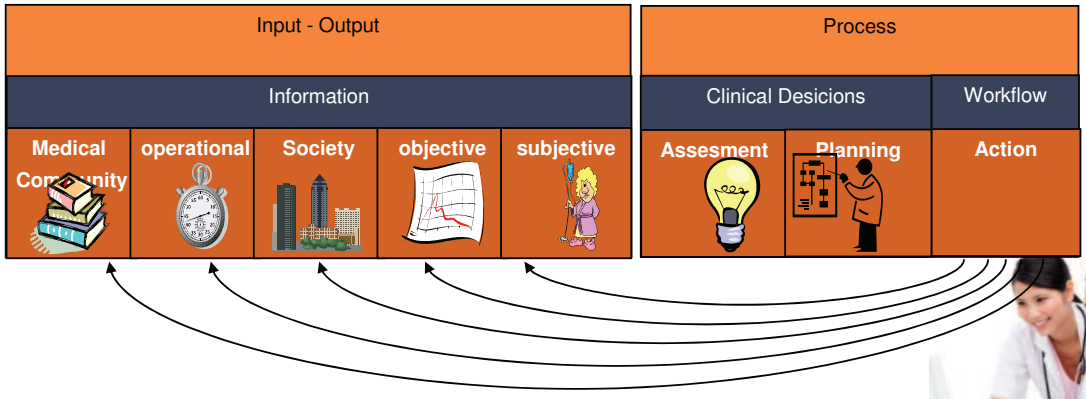
Source: Dr. Dirk Colaert MD, “The Pain Points in Health Care and the Semantic Web”, Advanced Clinical Application Research Group, Agfa HealthCare.

# Clinical Decision Support Systems

## Pain Points

# Healthcare as a Process: Pain Points

- Isolated information
- Fragmented information
- Not accessable information
- Too much information
- Bad information presentation
- Only clinical data is kept (no knowledge)
- Some information is not computer usable (free text, image features, (genome in the future))
- No feed back to medical community and society
- Complex desicions
- Lack of training
- Changing knowledge
- Medical errors
- Inefficient workflow
- Understaffing
- No operational information
- No infrastructure information
- No common language

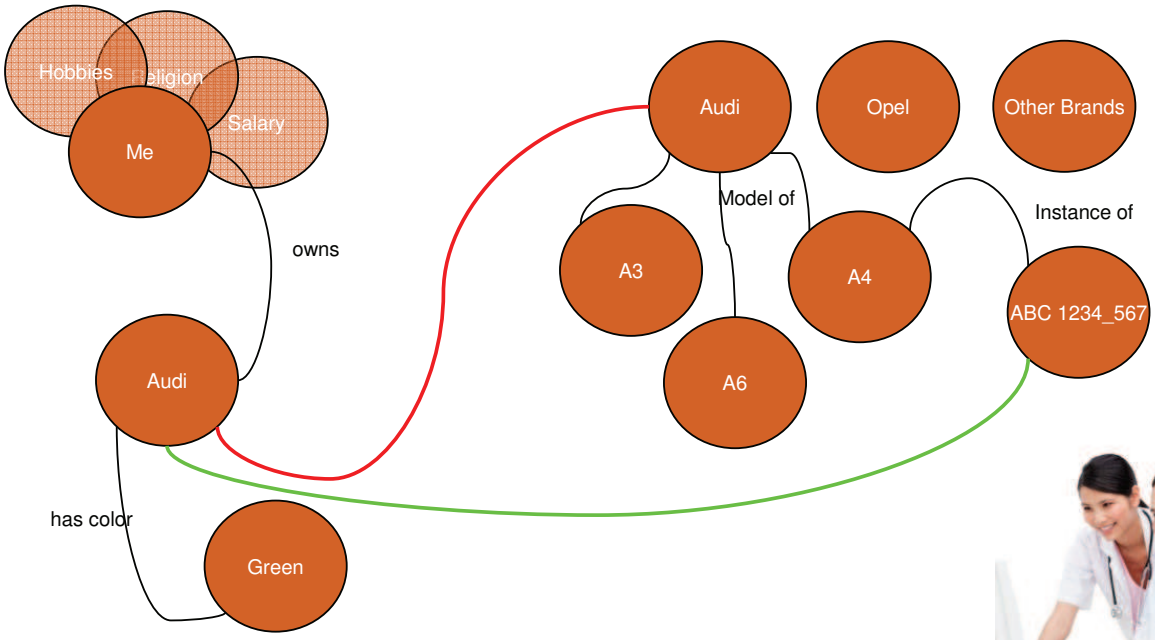


Source: Dr. Dirk Colaert MD, "The Pain Points in Health Care and the Semantic Web", Advanced Clinical Application Research Group, Agfa HealthCare.

# Connected Knowledge

- Data -> Information -> Knowledge
- Knowledge = Collect facts (Data) + Organise data (Information) + Associate meaning (Understanding)
- Intelligence: Latin 'Intellectus ' comes from Intelligere meaning connect between
- A formal description of a domain, using connected facts and concepts is called 'an ontology'
- By linking ontologies they are merged to "connected knowledge": very powerful yet dangerous!

# Simple ontology




Source: Dr. Dirk Colaert MD, "The Pain Points in Health Care and the Semantic Web", Advanced Clinical Application Research Group, Agfa HealthCare.

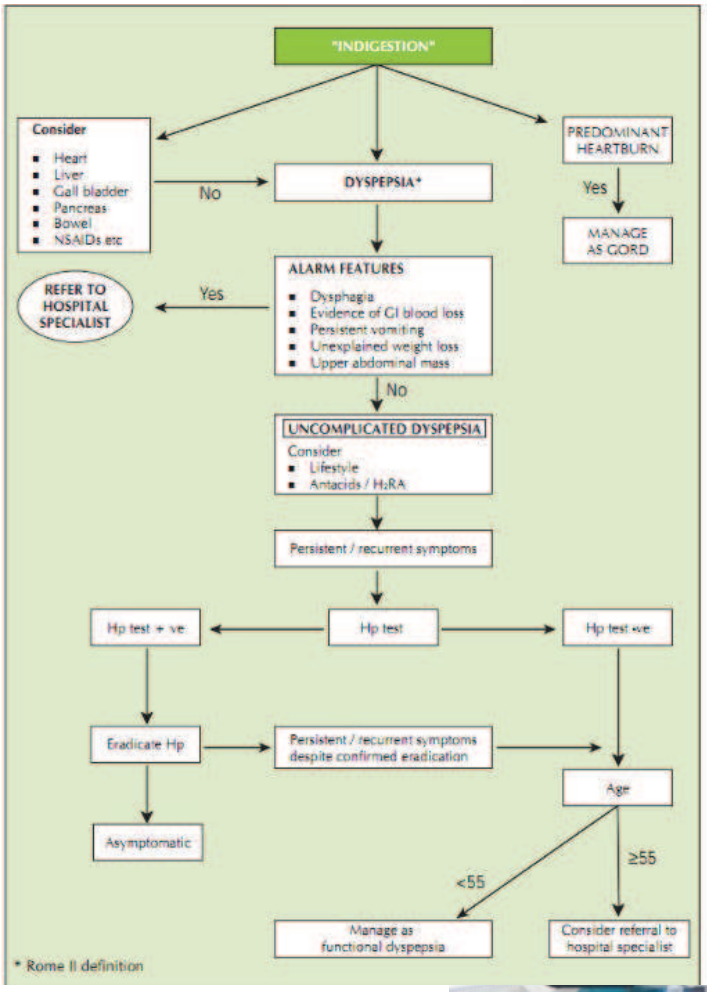
# Knowledge: Traditionally 'assumed'

- Complaint: Dyspepsia
- Doctor would prescribe some antacids (e.g. Mylanta) or H2 blocker (e.g. Pepcidine)
- To ease Dyspepsia (epigastric discomfort) empirically

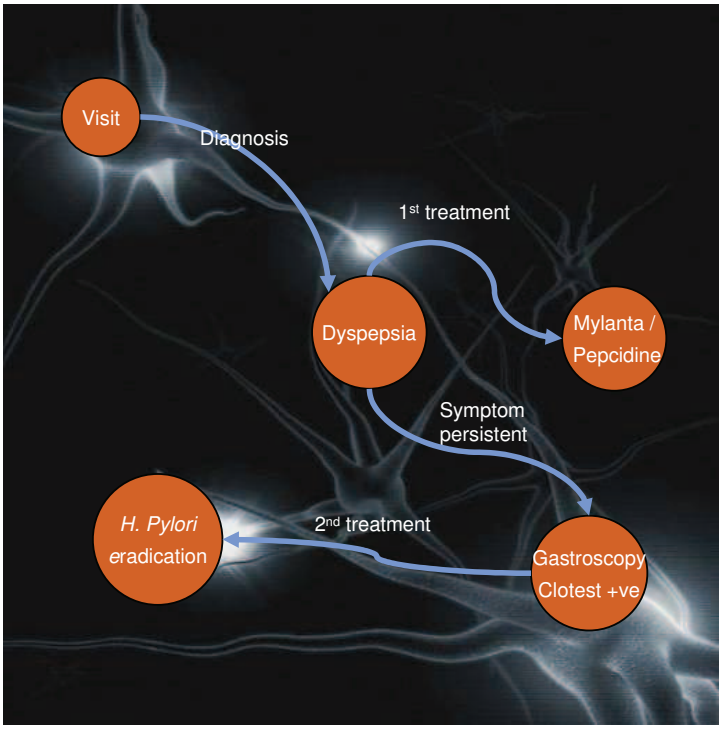
# Knowledge: Traditionally 'assumed'

# Connected Knowledge: explicit

- Now with the help of clinical decision support system, doctors may make their diagnosis and give treatment more adherence to Evidence based medicine (/ guidelines)
- For example, the doctors are guided to assess the patients (such as considering the risk factors, perform appropriate tests) and make appropriate decision.



# Connected Knowledge: explicit



# Connected Knowledge

- Examples of ontologies and rules: medical vocabulary, patient clinical data, infrastructural data
- Because ontologies are formaly described, computers can use them, take rules and reason about the concepts.
- Technologies, able to connect facts into ontologies, connect ontologies to each other and reason about it with rules gives us the means to improve vastly the current painfull processes in healthcare.
- Examples:
  - Use of a Terminology Server for Controled Medical Vocabulary
  - Decision support and clinical pathways

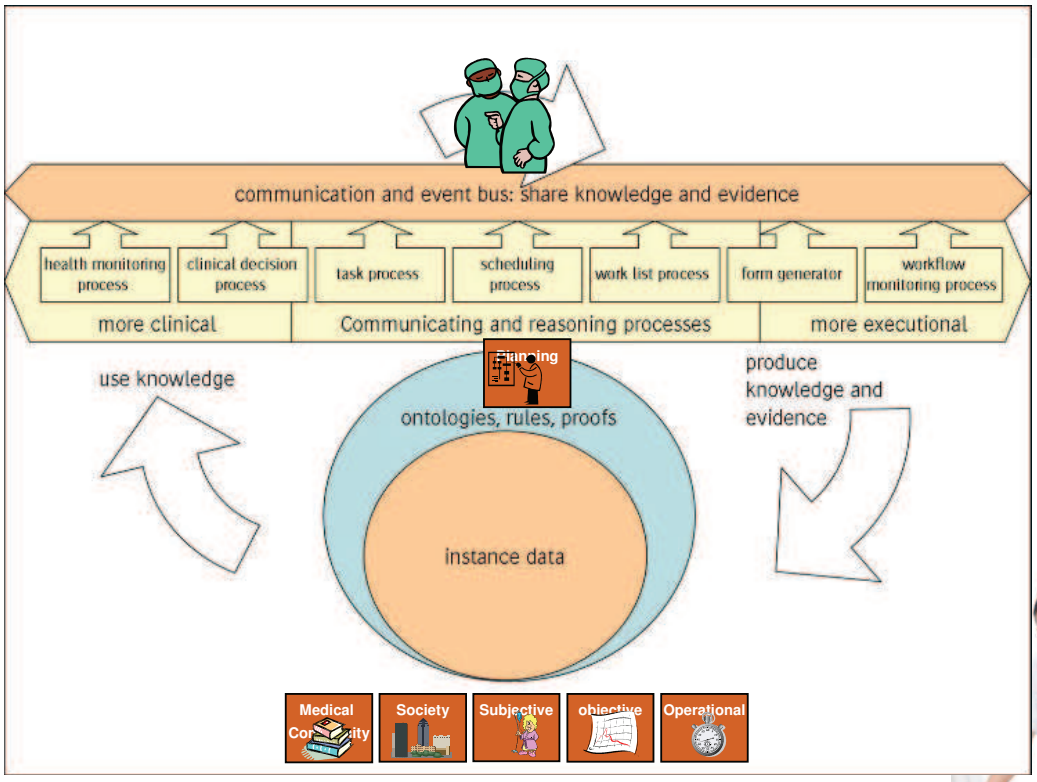
Source: Dr. Dirk Colaert MD, “The Pain Points in Health Care and the Semantic Web”, Advanced Clinical Application Research Group, Agfa HealthCare.

# Decision Support and Clinical Pathways

- Clinical Pathway: a way of treating a patient with a standardized procedure in order to enhance the efficiency, increase the quality and lower the costs.
- Usually represented in a script book and/or flow chart diagram
- Issues with conventional Clinical Pathways:
  - Not very dynamic: “one size fits all”
    - Not adapted 100% to the individual patient
  - Not mergeable
    - How can you enroll a patient into 2 pathways?
  - Difficult to maintain: mix op procedural and declarative knowledge

Source: Dr. Dirk Colaert MD, “The Pain Points in Health Care and the Semantic Web”, Advanced Clinical Application Research Group, Agfa HealthCare.

# Adaptable Clinical Workflow Framework



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# Organisation and Management of Healthcare Providers

## What is eHealth Systems?

- Healthcare practice supported by electronic processes and communication

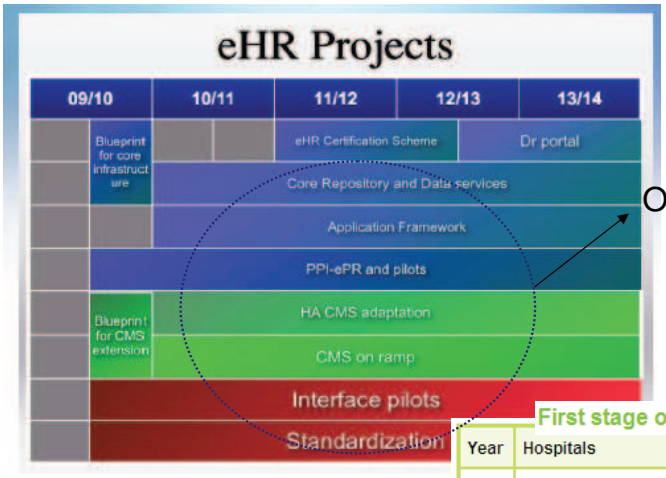
- Interchangeable with health informatics with a broad definition covering electronic/digital processes in health

# What is eHR?

- A record in electronic format containing health-related data of an individual

- Stored and retrieved by different healthcare providers including doctors and other healthcare professionals for healthcare-related purposes

# eHR Projects Timeframe




On going development

**First stage of Development Programme (2009/10 to 2013/14)**

| Year | Hospitals | Clinics | Ancillaries |
|---|---|---|---|
| 2009 | Radiological image sharing with private hospitals; Integration of Healthcare Voucher scheme with eHR | | |
| 2010 | Pilot use of SmartID for patient authentication | | Laboratory sharing |
| 2011 | Clinical Management System (CMS) adaptation basic modules | Community Person Master Index (PMI) | |
| 2012 | Begin patient enrolment | Clinical Management System (CMS) on ramp | Hong Kong Drug table |
| 2013 | Shared records in Doctor Portal | | |

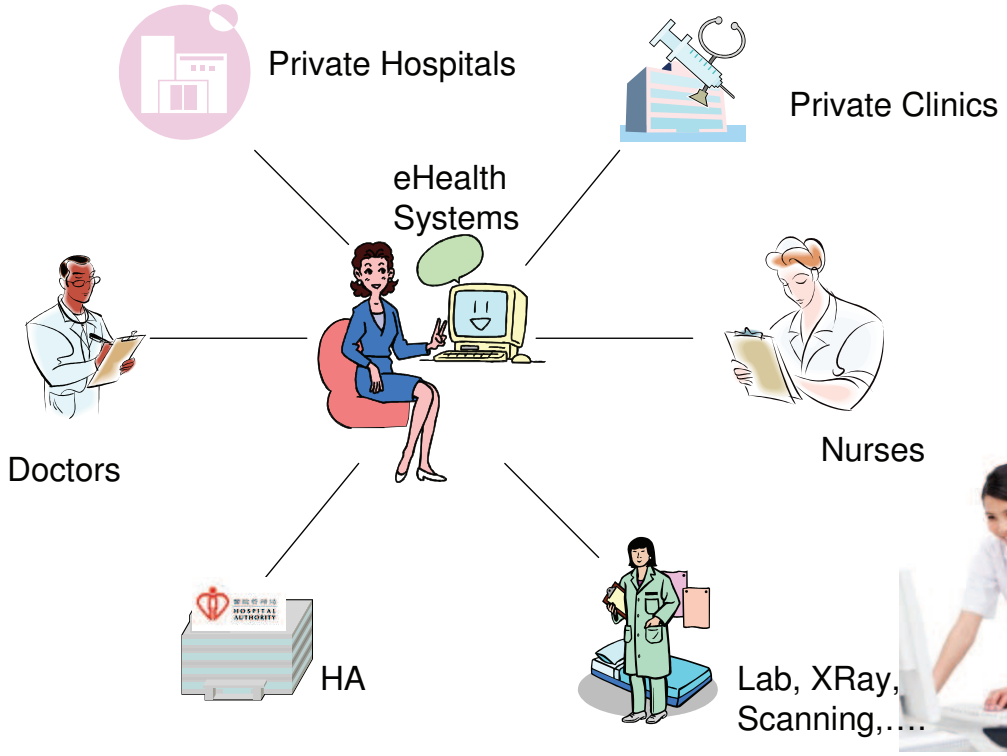
# Phase 1 Roadmap

- By 2014
  - eHR Sharing Infrastructure Core Component
    - To Design & Build core eHR sharing infrastructure between eMR/ePR systems by individual health care providers
  - HA CMS Adaption and Extension Component
    - To facilitate the adoption and deployment of Hospital
  - Standardization and Interfacing Component
    - To develop technical standards for different IT systems to interoperate and interconnect through the eHR sharing infrastructure.

# How to equip the Task Force?

- Health Informatics Professionals
- IT Project Management
- Change Management

# Health Informatics Professionals

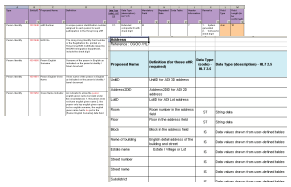


# Existing eHealth Systems

- Different systems in different healthcare service providers
- Different standard among different healthcare service providers. For example
  - Person Identity: HKID No, Surname, Given name, Chinese Name, Other Name
  - Date of Birth: dd/mm/yyyy or mm/dd/yyyy or dd-mon-yyyy or ddmmyyyy
  - Marital Status: Single/Married/Divorced,.. or S/M/D
  - Sex: Male/Female/Undefined or M/F/U
  - Type of Document: HKID, Passport,…
  - Address
  - Phone Number: With/Without area code
  - Different data type and data length
  - ….

# What IT can do for “existing eHealth Systems”?

eHR Standard Interface and format



Private Hospital

Sex: Female/Male
DOB: dd-mm-yyyy
Martial Status: Single/Married/Divorced
Type of Document: HKID/ENP/DI,…

Private Clinic

Sex: F/M
DOB: dd/mm/yyyy
Martial Status: 1,2,3
Type of Document: HKID, Entry Permit, Document of Identity,…

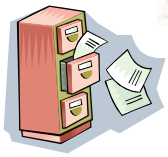
Transformation Process

Sex: F/M
DOB: EDMY
Martial Status: S/M/D
Type of Document: ID/EN/DI

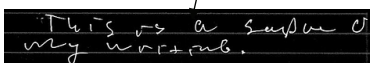
HA

# NO eHealth Systems

- Disadvantage
  - Difficult to obtain patient information
  - Paper Loss
  - Storage
  - Security
  - Not systematic to keep track of
    - Medical History
    - Treatment Details
    - Prescription Details,….
  - Handwriting
    - Cannot read
    - Misunderstand



"You've gotta help me! I can't read my own writing!"

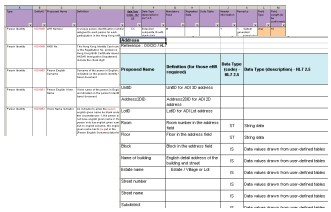


# What IT can do for “No eHealth Systems”?

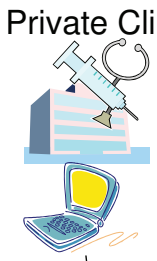
- Build infrastructure
  - Design & Build core eHR sharing infrastructure between eMR/ePR systems

- Follow eHR standard
  - Standardization and Interfacing Component

eHR Standard Interface and format

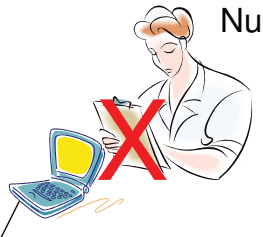


- Build Clinical Management System



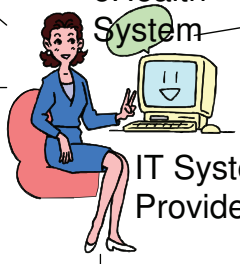

Doctors

Nurses



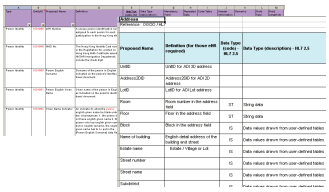
Lab, XRay, Scanning,….

eHealth System



IT System Providers

eHR Standard Interface and format



HA

Sex: F/M
DOB: EDMY
Martial Status: S/M/D
Type of Document: ID/EN/DI

# Benefits of eHR sharing system

- Patients Benefits
  - Comprehensive online record for healthcare providers
  - Timely and accurate information
  - Reduce duplication of tests and treatment
- Clinicians Benefits
  - Efficient and quality assured clinical practice
  - Reduce error associated with paper records
- Social Benefits
  - Improve disease surveillance and monitoring of public health
  - Help gather more comprehensive statistics of formulating public health policy
  - Bring efficiency gain in total health expenditure

# IT Project Management

# IT Project Management

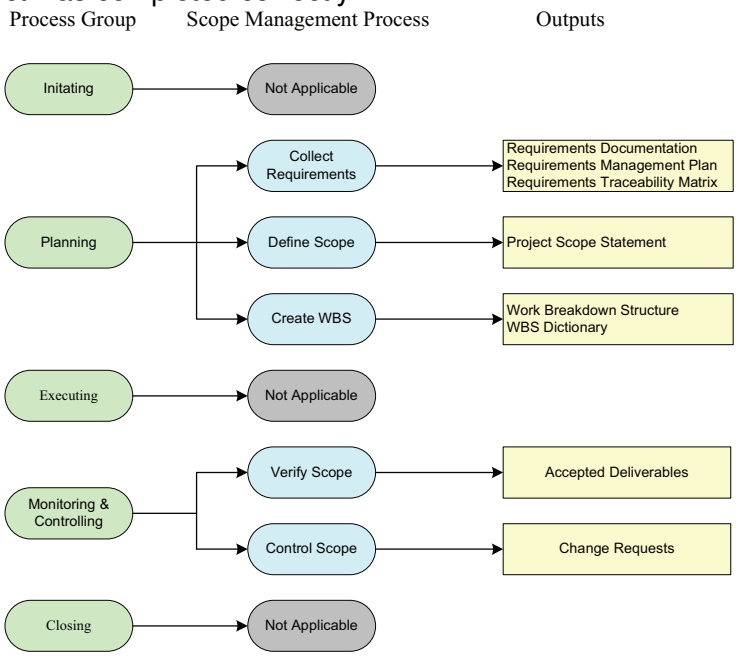
# Integration Management Process

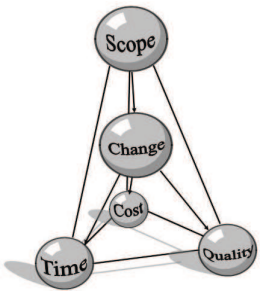
- Integration management is the practice of making certain that every part of the project is coordinated

| Process Group | Integration Management Process | Outputs |
|---|---|---|
| Initating | Develop Project Charter | Project Charter |
| Planning | Develop Project Management Plan | Project Management Plan |
| Executing | Direct & Manage Project Execution | Deliverables<br>Work Performance Info<br>Change Requests |
| Monitoring & Controlling | Monitor & Control Project Work | Change Requests |
| | Perform Integrated Change Control | Change Requests Status Updates |
| Closing | Close Project or Phase | Final Product, Service or Result Transition |

# Scope Management

- Scope management is a presentation of logical processes to understand requirements, define, break down, and control the scope of the project, and verify that project was completed correctly.



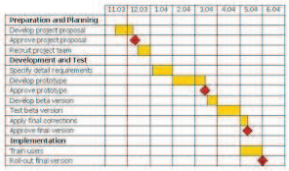



# Scope Management Cont'd

*A clear project title means one target, one arrow.*

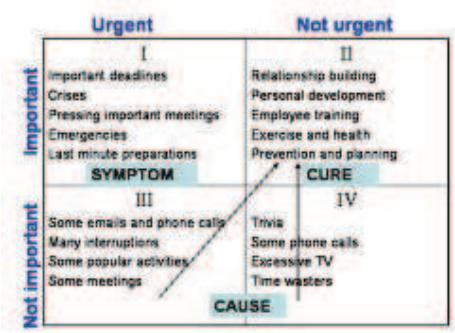
# Time Management

- Time management is the act or process of exercising conscious control over the amount of time spent on specific activities, especially to increase efficiency or productivity.



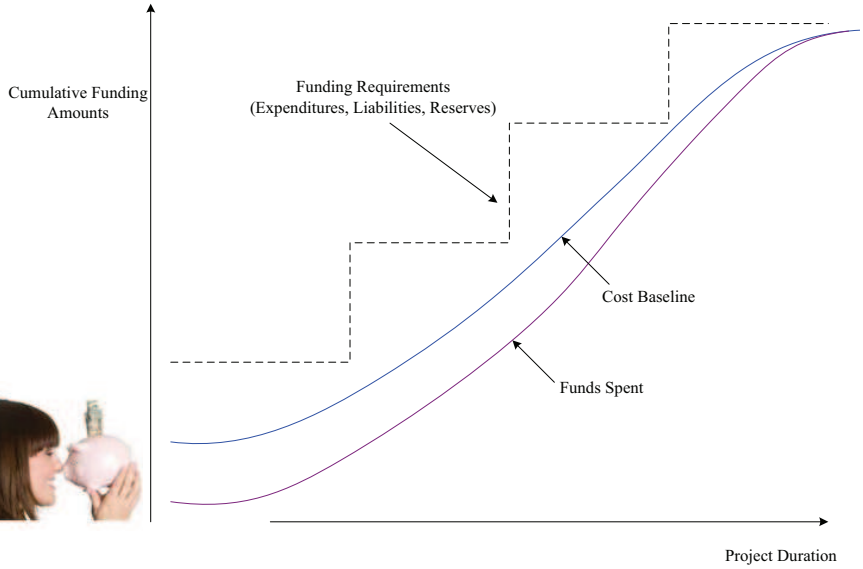
| Process Group | Time Management Process | Outputs |
|---|---|---|
| Initating | Not Applicable | |
| Planning | Define Activities | Activity List |
| | Sequence Activities | Project Schedule network diagrams |
| | Estimate Activity Resources | Activity resource requirements, resource breakdown structure |
| | Develop Schedule | Project schedule, Schedule baseline |
| Executing | Not Applicable | |
| Monitoring & Controlling | Control Schedule | Work performance measurement, change requests |
| Closing | Not Applicable | |

# Time Management Cont'd



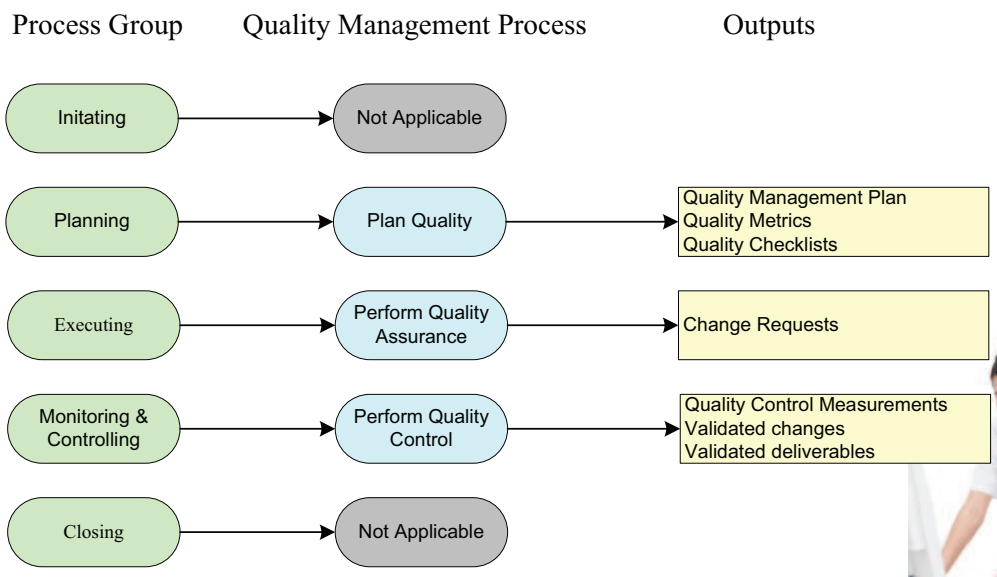
# Cost Management

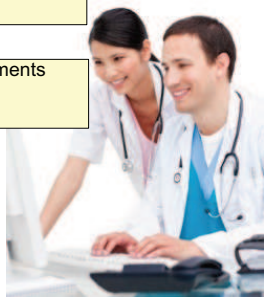
- Cost management is the process by which companies control and plan the costs of doing business. Individual projects should have customized cost management plans, and companies as a whole also integrate cost management into their overall business model. There is no single accepted definition for this term, because it has such broad applications and possible strategies.



# Quality Management

- Quality management can be considered to have three main components: quality planning, quality control, quality assurance. Quality management is focused not only on product/service quality, but also the means to achieve it.



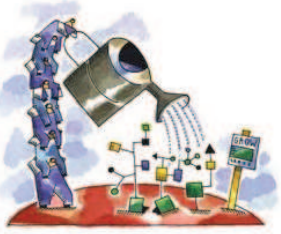



# Quality Management Cont'd

# Human Resource Management

- Human Resource management is to define a role for everyone on the project and to define the responsibilities for each of these roles.

| Process Group | Human Resource Management Process | Outputs |
|---|---|---|
| Initating | Not Applicable | |
| Planning | Develop Human Resource Plan | Human Resource Plan |
| Executing | Acquire Project Team | Staff Assignments<br>Resource Calendars |
| | Develop Project Team | Team Performance Assessment |
| | Manage Project Team | Change Requests |
| Monitoring & Controlling | Not Applicable | |
| Closing | Not Applicable | |

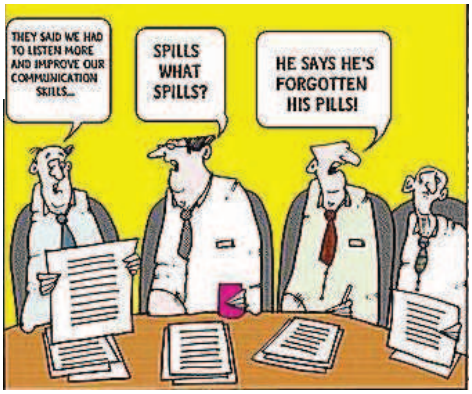


# Communications Management

- Communications management is the systematic planning, implementing, monitoring, and revision of all the channels of communication within an organization, and between organizations; it also includes the organization and dissemination of new communication directives connected with an organization, network, or communications technology.

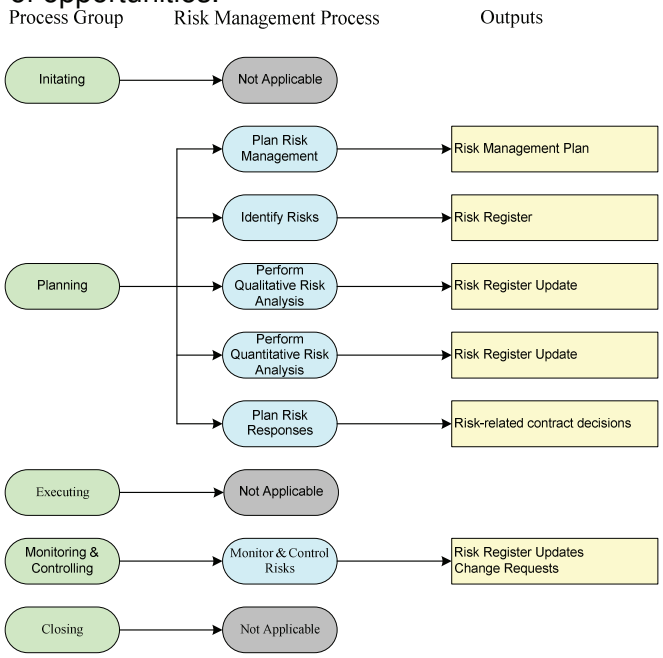
| Process Group | Communications Management Process | Outputs |
|---|---|---|
| Initating | Identify Stakeholders | Stakeholder Register |
| Planning | Plan Communications | Communications Management Plan |
| Executing | Distribute Information | Requested Changes |
| | Manage Stakeholder Expectations | Change Requests |
| Monitoring & Controlling | Report Performance | Performance Reports<br>Change Requests |
| Closing | Not Applicable | |

# Communications Management Cont'd



# Risk Management

- Risk management is the identification, assessment, and prioritization of risks as *the effect of uncertainty on objectives*, whether positive or negative) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities.



# Risk Management Cont'd

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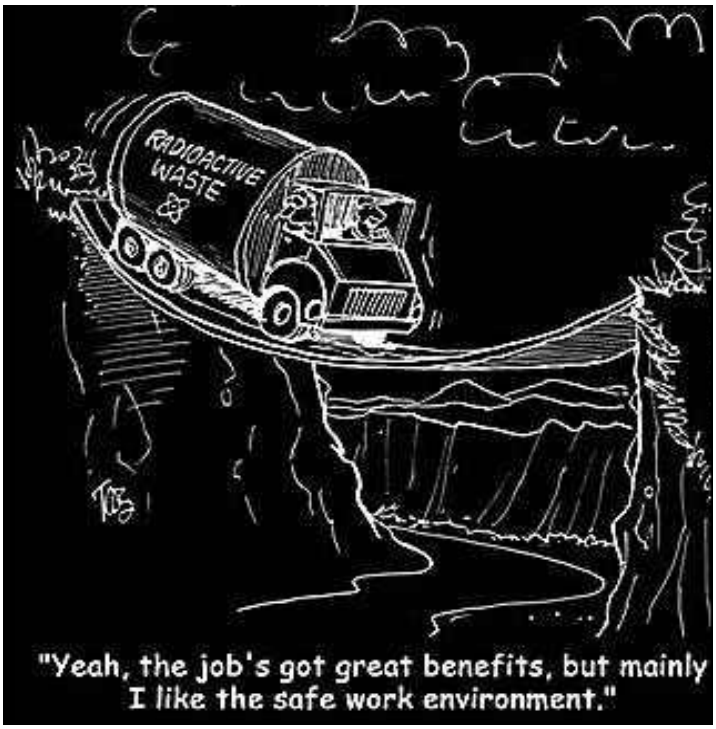
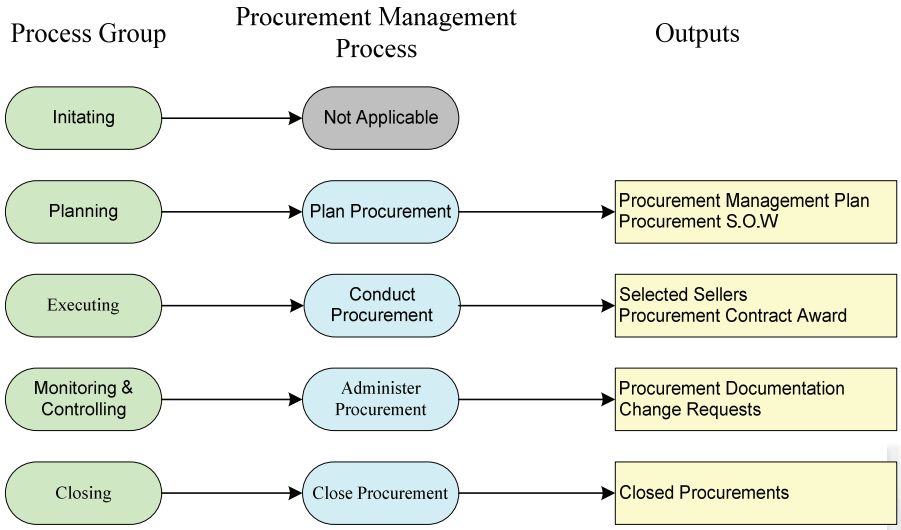


# Procurement Management

- Procurement management is the process companies use to purchase economic resources and business input from suppliers or vendors. This process helps companies negotiate prices and get the best quality resources for production processes.



# Change Management

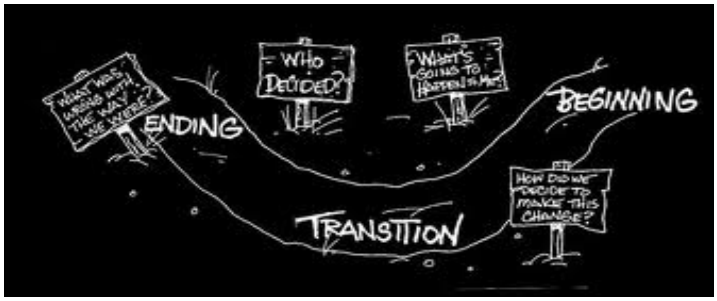
# What is Change Management?

- **Change management** is a structured approach to shifting/transitioning individuals, teams, and organizations from a current state to a desired future state.

- It is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment

# Change Management

- 5 Common Observations
  - Different people react differently to change
  - Everyone has fundamental needs that have to be met
  - Change often involves a loss, and people go through loss
  - Expectations need to be managed realistically
  - Fears have to be dealt with



# Different People react differently to Change

- The following diagram represents a spectrum of change

  Stability ---------- Change

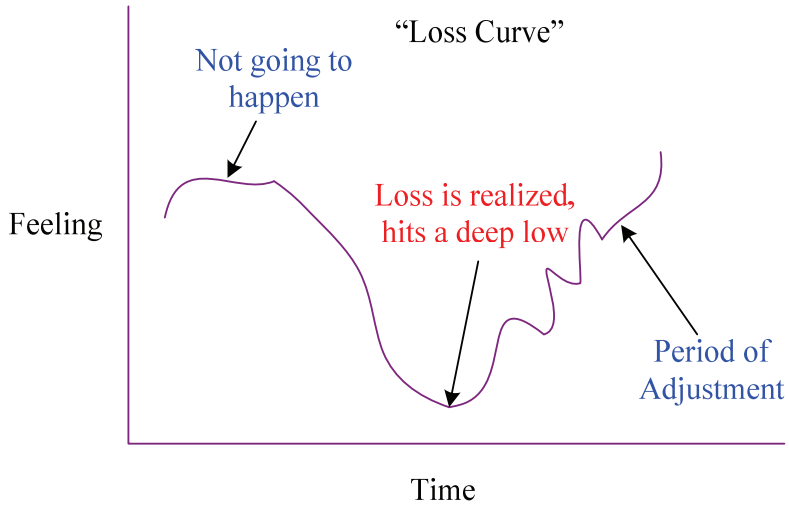
- Some people like to be at the STABILITY end of the spectrum, but some like to be at the CHANGE end
- Problem arises
  - Strong dissatisfaction
  - Stress
  - Negative attitudes
  - Resistance to change
  - Loss of rational judgment

# Everyone has Fundamental needs

- 3 basic needs of fundamental importance in people's reaction to change
  - The need for control
  - The need for inclusion
  - The need for openness
- Vary between people in any change process, there is always
  - some degree of need
    - for control over environment/destiny
    - to be included in the process of forming the change that is taking place
    - For managers/leaders to be open with information

# Change Often Involves A Loss

- The relevance of the “Loss Curve” to a change management programme depends on the nature and the extent of the loss.



# Change Often Involves A Loss Cont’d

- Loss Curve – “Sarah”
  - S-hock
  - A-nger
  - R-ejection
  - A-cceptance
  - H-ealing

## Managed Expectations

- Expectations have to be set a a realistic level

## Fears have to be dealt with

- Fears need to be addressed
- Help people to recognize how eHealth/eHR can benefits the patient/Clinician/society

## Tips to apply change management

- Give people information (don't give overoptimistic speculation)
- For large groups, produce a communication strategy the ensures the information flow efficiently and comprehensively
- Give people choices to make
- Give individual opportunity to express their concerns and provide reassurances
- Give people time
  - Support their decision making
  - Provide coaching
  - Counselling as appropriate

# Conclusions

- Health Informatics Professionals
  - Build eHealth & eHR with standardized and interfacing format
- IT Project Management
  - Scope
  - Time
  - Quality
  - Risk
- Change Management
  - Align expectations
  - Information flow efficiently and comprehensively
  - Coaching & Counseling

# The End

Systematic Training Programme and Certification for Healthcare and IT Practitioners