



Overview of eHR Development



Where are we today?

•Hospital Authority

- ▶ 8 million patient records
- ▶ 800 million laboratory results
- ▶ 340 million prescribed drugs
- ▶ 34 million Xray images
- ▶ 3 million transactions per day

•Department of Health

- ▶ essential health data, e.g. vaccination
- ▶ preparing for eHR

•Private hospitals

- ▶ mainly billing and financial systems
- ▶ electronic record lacks sharing capability

•Private clinics

- ▶ mostly paper-based record
- ▶ electronic record lacks sharing capability

•Private laboratories / allied health providers

- ▶ not connected





Guiding principles of eHR Development

- Government-led model for development
- Compelling but not compulsory record sharing
- Data privacy and security of paramount importance
- Open technical standards for private participation
- Building block approach

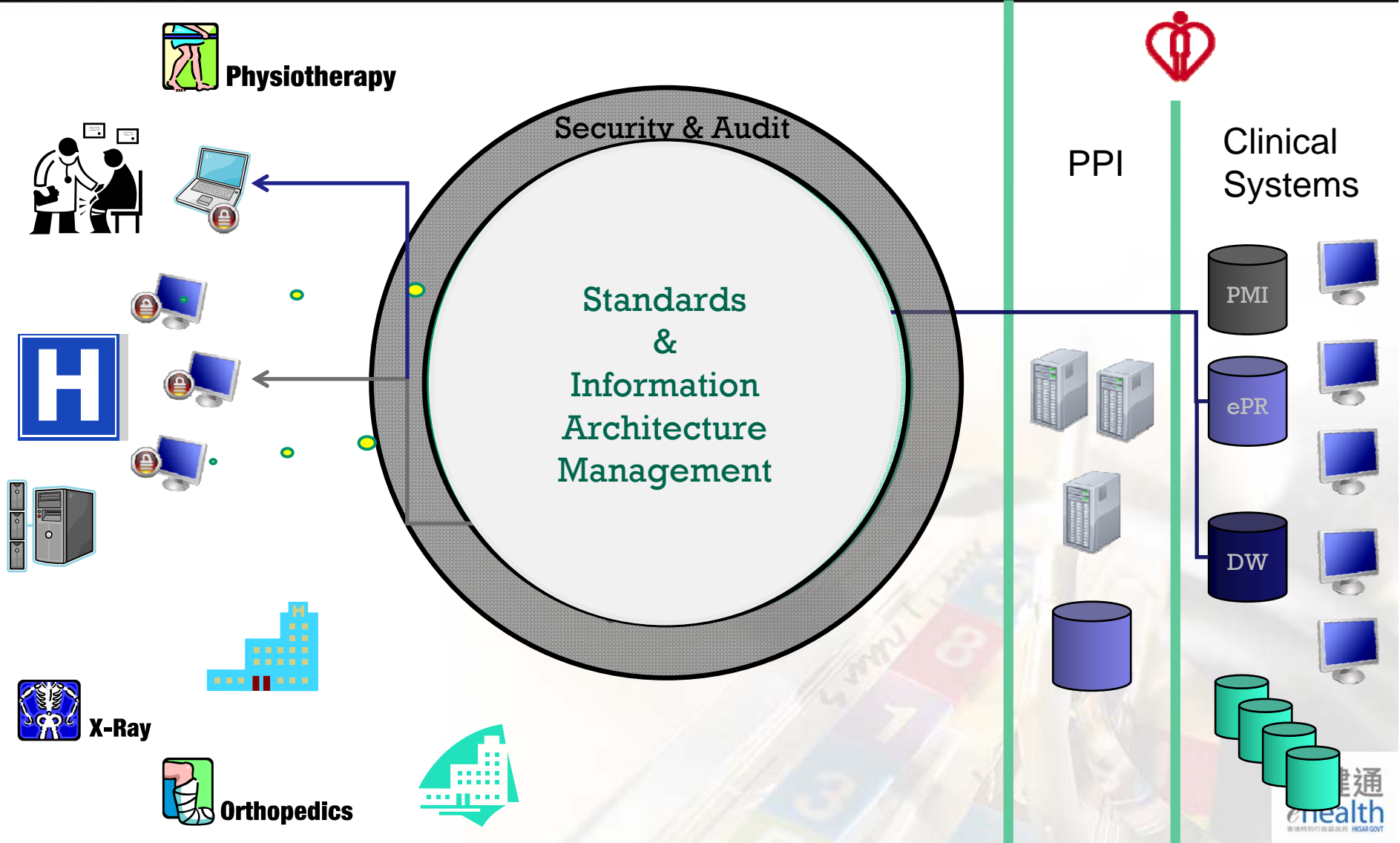


Core Components & Dev. Phases

- 3 Core Components
 - eHR Sharing Infrastructure
 - CMS Adaptation and On-ramp
 - Standards definition and Interface Pilot
- 2 Phases for Development
 - Phase 1 (2009/10 to 2013/14)
 - *Phase 2 (2014/15 to 2019/20)*



Overview of eHR Development & Implementation

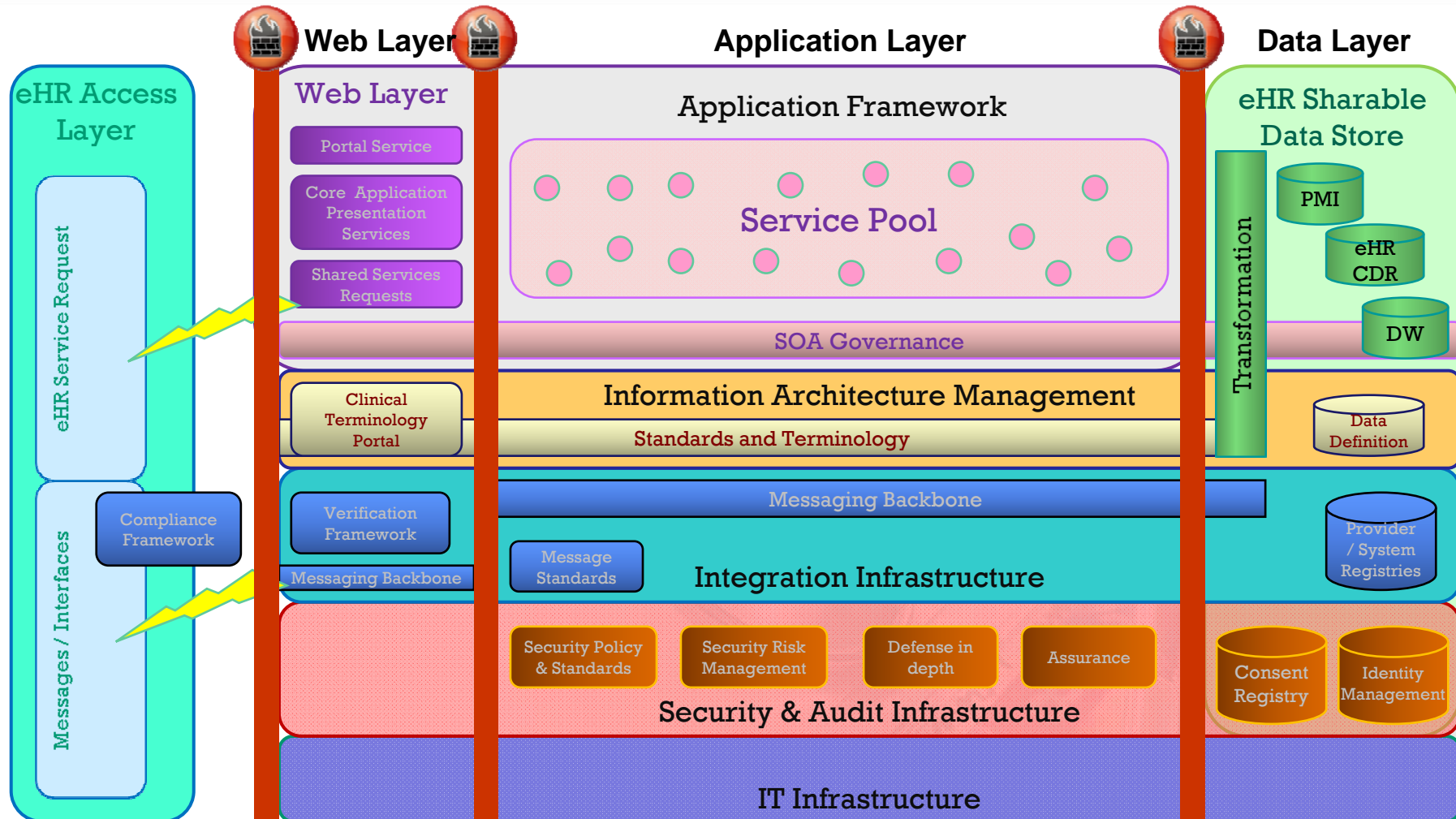


eHR Projects

09/10		10/11		11/12	12/13	13/14
	Blueprint for core infrastructure			eHR Certification Scheme	Dr portal	
		Core Repository and Data services				
		Application Framework				
	PPI-ePR and pilots					
	Blueprint for CMS extension	HA CMS adaptation				
		CMS on ramp				
	Interface pilots					
	Standardization					

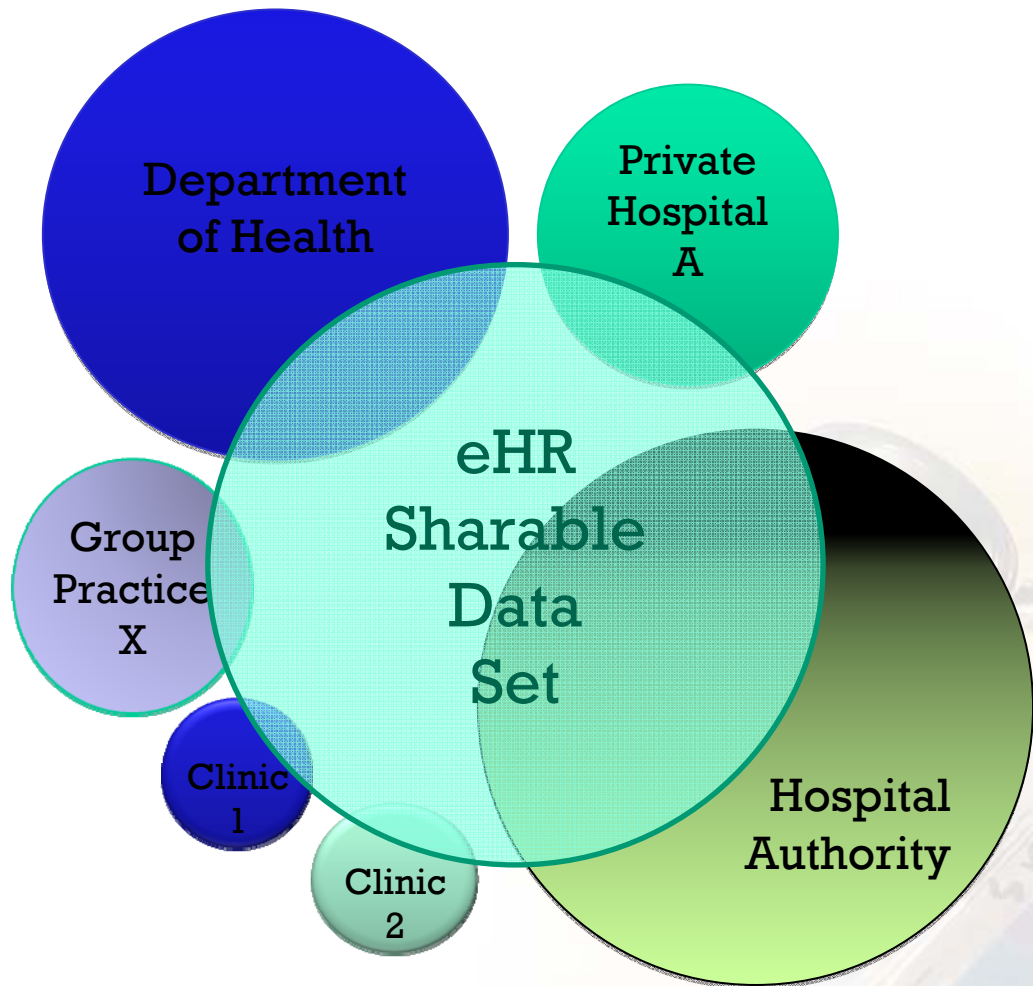


Architectural Components





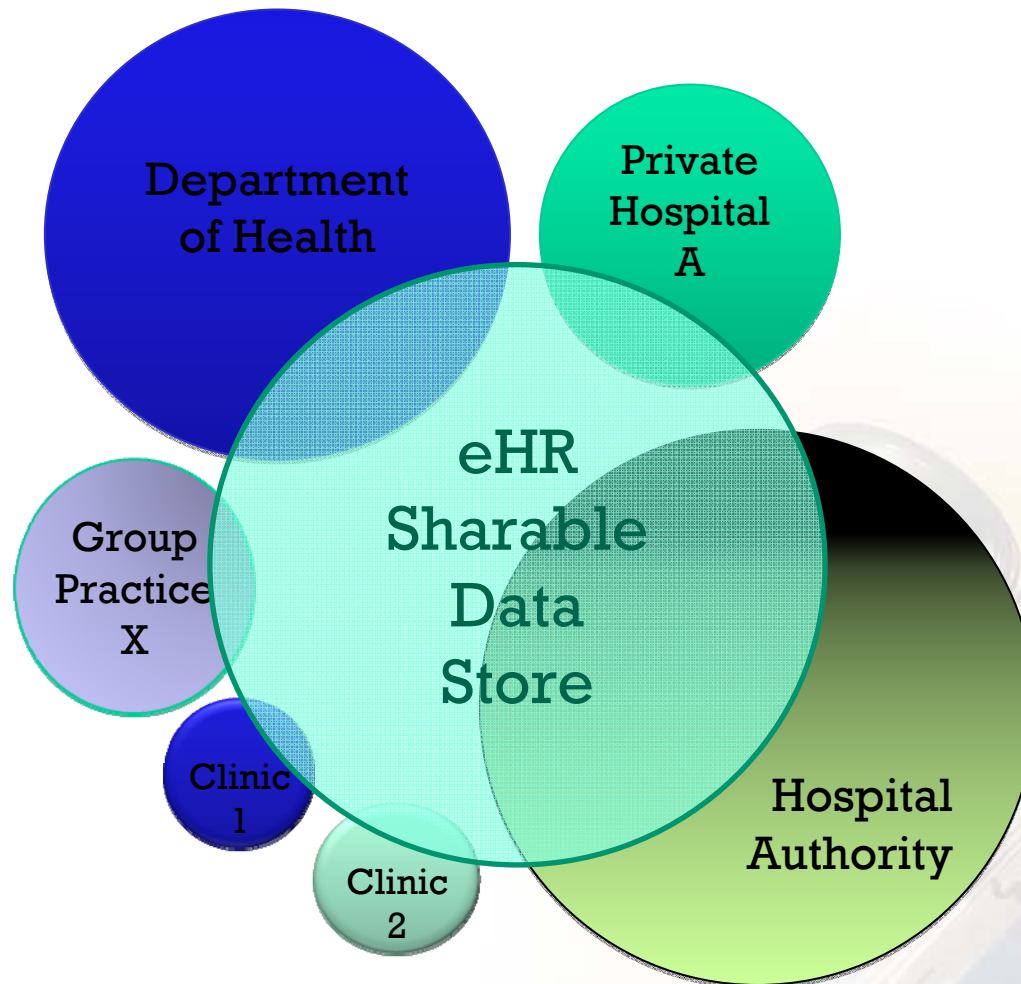
eHR Sharable Data Set



- Each institution maintains own complete set of operational data
- Contributes sharable data to eHR
- eHR Sharable Data Store keeps & shares for all



eHR Sharable Data Store



- *Facilitate a lifelong longitudinal view of people's electronic health records*
- *Data to survive beyond the life span of people and systems*
- *Available 7days x 24hours*
- *Aim for a single version of truth*
- *Stored in a secured manner*

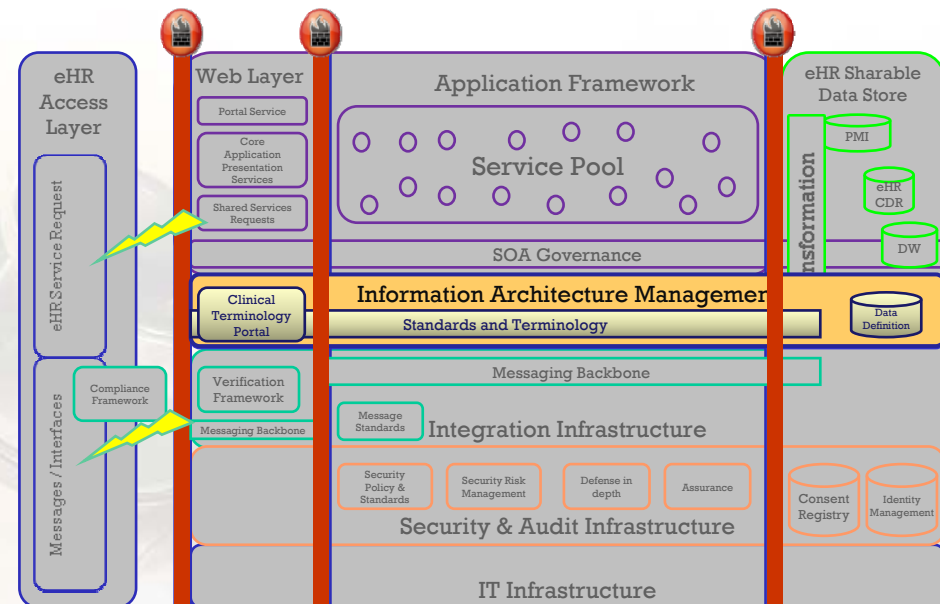


eHR Sharable Data Store

- Key sharable data sets:
 - Person Master Index
 - eHR Clinical Data Repository
 - Data Warehouse
 - Patient Consent Registry
 - Provider Registry
 - System Registry
 - Clinical Terminology Repository

Information Architecture Management Framework

- **Function**
 - To support the development, collaboration, implementation and on-going maintenance of the Information Model
- **Information Model**
 - Gives meaning to the captured clinical data to ensure consistent semantics and to allow flexible and meaningful presentation of clinical data to healthcare practitioners
- **Key Components**
 - Reference Terminology Repository (HK Clinical Terminology Repository)
 - Reference Terminology Engine
 - Terminology Services
 - Clinical Terminology Portal





Application Framework

- **Functions**

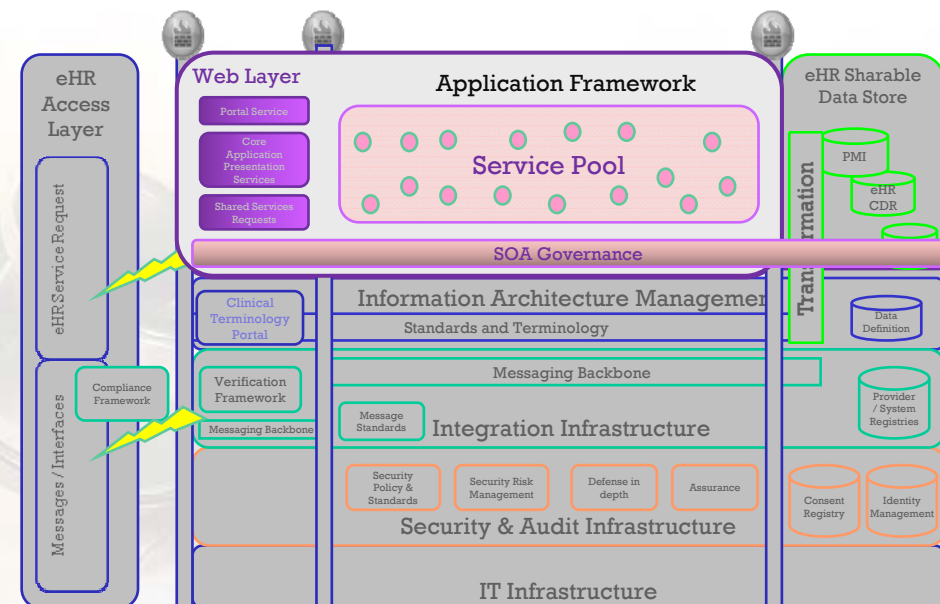
- Provide a central, secured gateway for real-time, synchronous communication with partner EMR systems
- Host the eHR Core application logics for data or service requests processing

- **Components**

- Portal Services
- Core Application Services
- Technical Services pool

- **Development Approach & Platform**

- Building blocks approach
- Service Oriented Architecture (SOA)



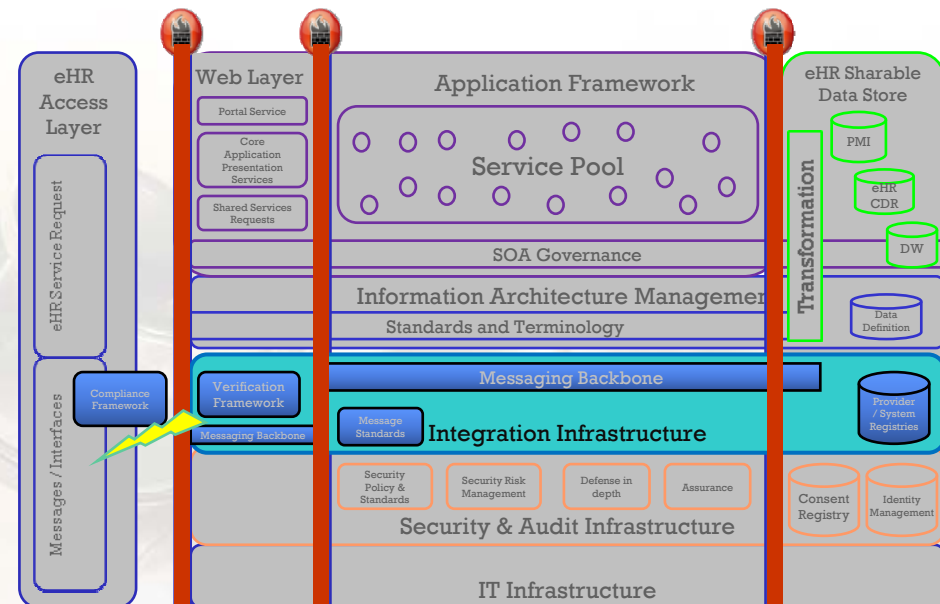
Integration Infrastructure

- **Functions**

- Provide a standard integration platform for information interchange

- **Components**

- Message Standards Catalogue and Standards portal
- Compliance assessment and message standards verification platform
- Registries of providers and systems
- Message backbone
- Integration services

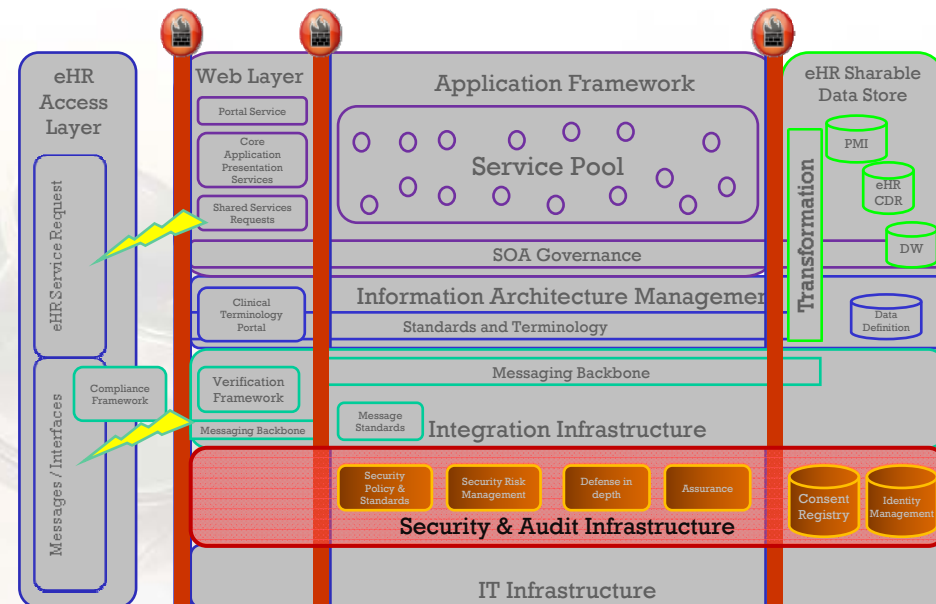


Security and Audit Infrastructure

- **Functions**

- Establish a standard and consistent set of security policy and protocols for the eHR and partner IT projects
- Define a proactive, protective & defensive security framework and toolsets to protect the eHR data
- Specify the on-going security and audit measures

Tender issued for an external consultant to review and advise on a comprehensive security and audit framework for eHR





Approach on CMS Extension

- Leverage key HA CMS III functionalities
- With eHR standards, inter-operability, and security control
- **Built with private healthcare sector participation**

CMS Adaptation (for private hospitals and group practice)

- **Developed as a series of modules**
- Deployed by Compliant Service Provider (CSP)/Hospital or Clinic IT

CMS On-ramp (for private clinics)

- **Open source**
- Deployment by Compliant Service Provider (CSP)




Implementation Strategy

- Support and Training to Private Sectors

- Technical Specifications
 - User guide
 - Deployment/installation guide
 - Interface specifications
- Trainings (Technical and Application)
 - Skill transfers or “train-the-trainer” approach
- Compliant Service Provider (CSP) establishment
 - On deployment, installation, user training, and on-going user support
- On-going support for Compliant Service Provider (CSP)
 - Major upgrade on policy implementation and bug fix



CMS Adaptation Building blocks approach

Approach	Description	Target users
Building Blocks	Integrate some of the CMS Adaptation modules into the existing clinical systems (include eHR standards & interoperability, and security control)	Those already have their own clinical systems and interest in some of the CMS Adaptation modules (Private hospitals, group practice) 



CMS Adaptation Module

History Enquiry Doctor Perspective Nurse Perspective Medical Record Officer Perspective Report Maintenance

Form Layout PDF Layout Display Item

Discharge Items

- Coding With Diagnosis
- Follow-Up Appointment
- Diagnosis
- Investigation
- Discharge Information
- Medication On Discharge
- Discharge Note
- Plan Of Management
- Doctor-In-Charge
- Procedure
- Drug Allergy
- Remarks
- Drug Allergy Information

Doctor Perspective

- Drug Allergy
- Diagnosis
- Discharge Note
- Procedure
- Investigation
- Plan Of Management
- Medication On Discharge

Nurse Perspective

Medical Record Officer Perspective

Internet Explorer browser window showing a patient's Allergy / Adverse Drug Reaction / Alert page.

Address bar: http://172.29.40.103:8080/patientpanel/webconnect.html?app=Allergy / Adverse Drug Reaction / Alert&url=http://172.29.40.103:8080/EhsAlertModule/1

Page Title: Allergy / Adverse Drug Reaction / Alert

Patient Information: TAM, HO (譚好) HKIC no: A123456(8) DOB: 01-Feb-1961 Age: 49 years Sex: F Ward: 5A-X12 Adm. Medical Record no: A123456(8)

Alerts:

- Allergy**
 - (1) **PENICILLIN** Last Update By / Date Time: user01 / 14-Oct-2010 11:42
Certain: Allergic contact dermatitis
- ADR**
 - (1) **ACERTIL (PERINDOPRIL TERTBUTYLAMINE)** Last Update By / Date Time: user01 / 14-Oct-2010 11:42
Severe: Angioedema
- Alert**
 - (1) **G6PD Deficiency** Last Update By / Date Time: user01 / 14-Oct-2010 11:42

Buttons: Update Close

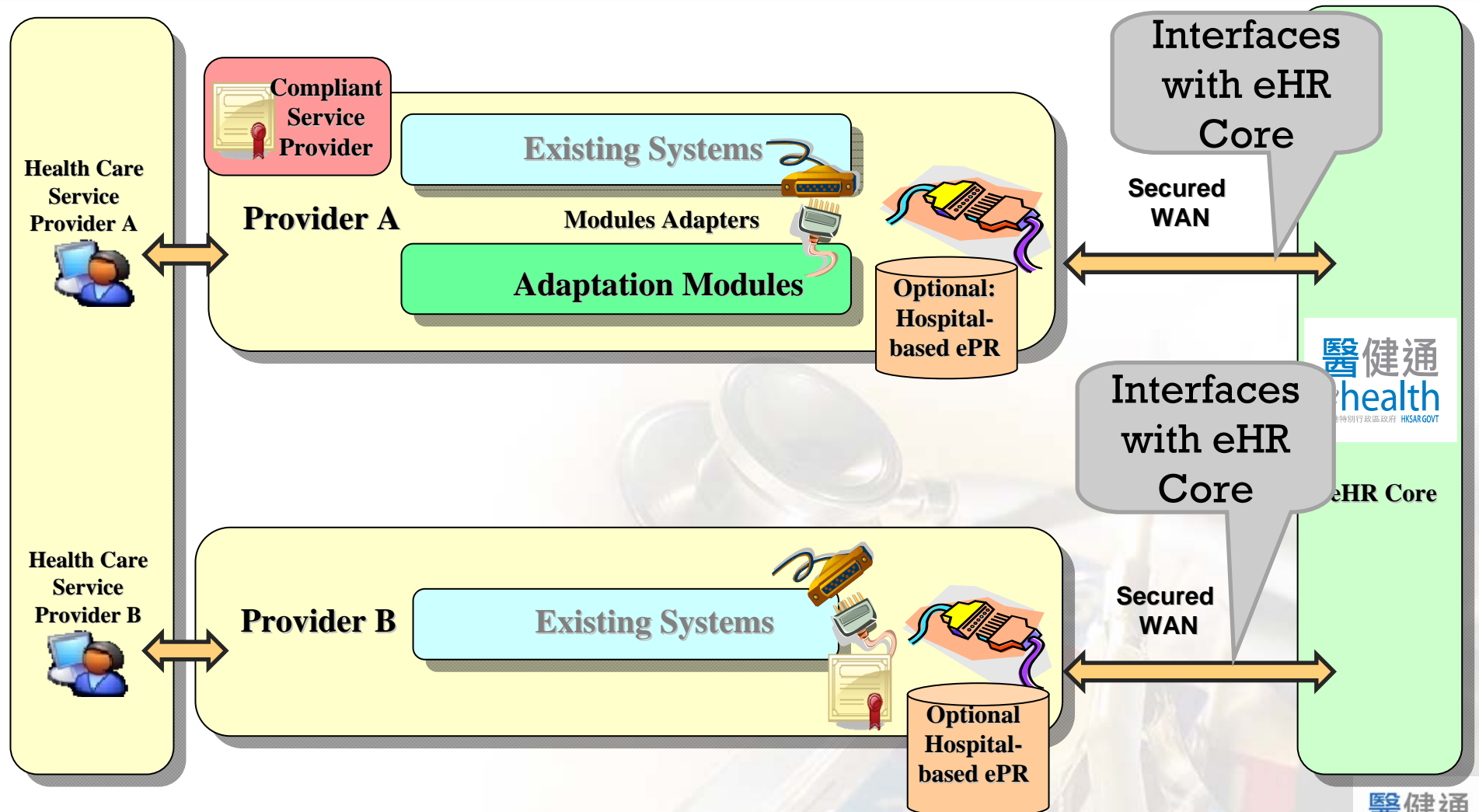


Potential CMS Adaption Modules

- Allergy/Alert
- Discharge Summary
- Medication Order Entry (MOE)
- Diagnosis and Procedure Coding
- Hospital ePR
- Person Master Index
- Pharmacy System
- Investigation request
- Immunization
- E-Referral
- Integration with eHR
- Nursing Assessment
- Charting/Chronic Drug List
- Scanning



CMS Adaptation Development Strategy





CMS On-ramp Objectives

- To develop an **open-source** clinical application for private clinics
- Aim to support **basic** operation in private clinics
- **Conform to eHR data standard for sharing**

CMS On-ramp Prototype

The image displays two overlapping screenshots of the CMS On-ramp Prototype web application. The background window shows the 'Patient Registration' form, and the foreground window shows the 'Consultation' details for a patient named TONG, MIKI.

Patient Registration Form (Background Window):

- Search: [] Search
- eHR No: [] HKID: A123456 (3)
- Medical Record Number: PH00001 Document Type: []
- *Surname: CHAN Document Number: []
- Given Name: SU KUEN *Sex: Male Female
- Other Name: [] Marital Status: []
- Chinese Name: [] Nationality: []
- *Date of Birth: 09-09-1990 Date, Month and Year Age: 22 years Religion: []

Consultation Details (Foreground Window):

- Name: TONG, MIKI (湯美琪) HKIC no: A000875(6) DOB: 08-Sep-1990 Age: 20 years Sex: F
- Alert: Allergy: CLO-TEST, PERACETIC ACID TEST Smoking: Non-Smoker Drinking: Non-Drinker
- Consultation History:

Visit Date	Created By	Clinic
15-Nov-2010		Kowloon Bay Clinic
11-Aug-2010		Kowloon Bay Clinic
07-Aug-2010		Kowloon Bay Clinic
- 16-Nov-2010
Body Temp: 38.9°C
BP: 95/55mmHg
Pulse: 72/min
RR: 72/min
Weight: 66kg
Height: 174cm
BMI: 21.9
Urine Sugar: trace
Albumin: trace
Remarks: assessment remark
- Clinical Notes:
null
FU x asthma
SOB and wheezing relieved by puff, compliance ok
sleep ok, nocturnal symptoms subsided
- Diagnosis / Notes / Prescription: 16-Nov-2010
Diagnosis / Notes / Prescription: Billing Letter
Assessment:
Chronic Problem: []
Attending Reason: []
Diagnosis: []
19-Oct-2010 Cholera Active
Upper respiratory tract infection
Note:
Clinical Notes [LRTI] Plan of Management
Fever, Stuffy nose, RN, cough, sore throat, fatigue for days
Chest: Clear
Abdomen: soft
Increase fluid intake
Monitor Temperature
Re-attend as required
Prescription:
Save as New Drug Set: Choose a Drug Set
Drug Dose Route Frequency PRN Duration Total Qty



CMS On-ramp Function List

- Patient Registration
- Appointment Booking
- Structured Allergy and Alert
- Consultation and Prescription
- Drug Dispensing
- Drug Inventory Management
- Basic Billing
- Reports

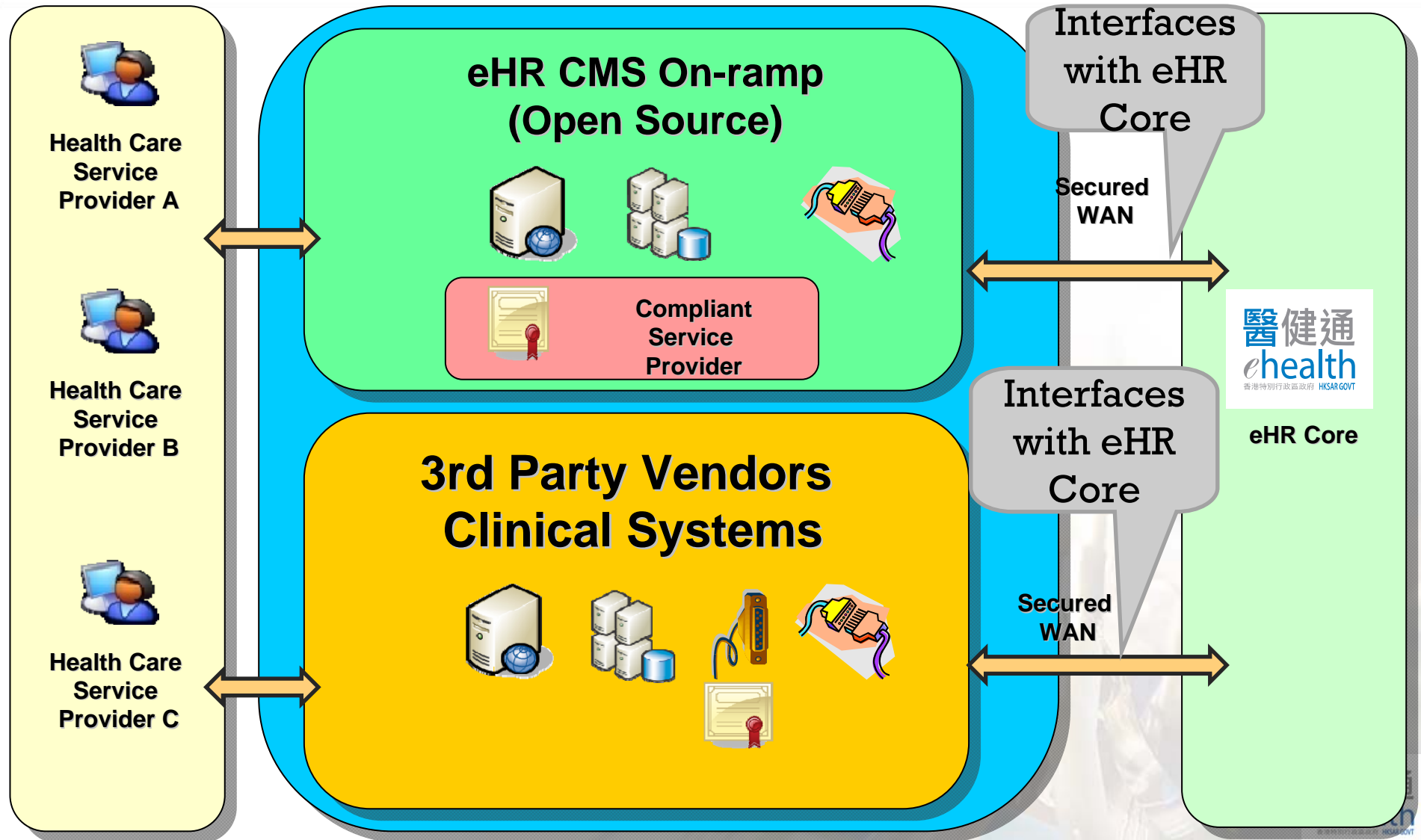


CMS On-ramp Project Plan

Modules	2010	2011	2012	2013
Focus group meetings for users requirement collection	Active			
Prototype development	Active			
Prototype testing by private practitioners		Active		
Final Product Development			Active	
Product Release				Active



CMS On-ramp Deployment Strategy





Standardisation & Interface

- Develop technical standards for different IT systems to interoperate & interconnect through eHR Sharing Infrastructure
- Clinical Related Standards
 - *Data content, Coding, Terminology, etc.*
- IT Related Standards
 - *Interface, Messaging etc.*
- Validation Platform
 - *Validation & Certification of IT systems against standards*



Thank you