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)
# eHR Projects

<table>
<thead>
<tr>
<th>09/10</th>
<th>10/11</th>
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<tr>
<td>Blueprint for core infrastructure</td>
<td>eHR Certification Scheme</td>
<td>Core Repository and Data services</td>
<td>Dr portal</td>
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<td>Application Framework</td>
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<td>PPI-ePR and pilots</td>
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<tr>
<td>Blueprint for CMS extension</td>
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<td>HA CMS adaptation</td>
<td>CMS on ramp</td>
<td>Interface pilots</td>
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<td>Standardization</td>
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Architectural Components

- Hospital Authority - electronic Health Record

- eHR Sharable Data Store
  - PMI
  - eHR CDR
  - DW

- IT Infrastructure

- Security & Audit Infrastructure
  - Security Policy & Standards
  - Security Risk Management
  - Defense in depth
  - Assurance

- Identity Management

- Consent Registry

- Messaging Backbone
  - Message Standards

- Integration Infrastructure

- Information Architecture Management
  - Standards and Terminology

- Application Framework
  - Service Pool
  - SOA Governance

- Application Layer
  - portal Service
  - Core Application Presentation Services
  - Shared Services Requests
  - Clinical Terminology Portal
  - Verification Framework

- Web Layer
  - eHR Access Layer
  - eHR Service Request
  - Messages/Interfaces
  - Compliance Framework
  - Messaging Framework

- Data Layer
  - Data Definition
  - Providers / System Registries

- Hospital Authority - electronic Health Record
• Each institution maintains own complete set of operational data
• Contributes sharable data to eHR
• eHR Sharable Data Store keeps & shares for all
• 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
• **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
• **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

<table>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
<th>Target users</th>
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<tbody>
<tr>
<td>Building Blocks</td>
<td>Integrate some of the CMS Adaptation modules into the existing clinical systems (include eHR standards &amp; interoperability, and security control)</td>
<td>Those already have their own clinical systems and interest in some of the CMS Adaptation modules (Private hospitals, group practice)</td>
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</table>
CMS Adaptation Module
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

Health Care Service Provider A

Provider A

Compliant Service Provider

Existing Systems

Modules Adapters

Adaptation Modules

Optional: Hospital-based ePR

Interfaces with eHR Core

Secured WAN

Provider B

Existing Systems

Optional Hospital-based ePR

Interfaces with eHR Core

Secured WAN

Health Care Service Provider B
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
CMS On-ramp Function List

- Patient Registration
- Appointment Booking
- Structured Allergy and Alert
- Consultation and Prescription
- Drug Dispensing
- Drug Inventory Management
- Basic Billing
- Reports
<table>
<thead>
<tr>
<th>Modules</th>
<th>2010</th>
<th>2011</th>
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<tr>
<td>Focus group meetings for users requirement collection</td>
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<td>Prototype development</td>
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<td>Prototype testing by private practitioners</td>
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<tr>
<td>Final Product Development</td>
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<td>Product Release</td>
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• 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