The Road Less Travelled - Clinical IT in the Hospital Authority

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Agenda

- Introduction - Healthcare in Hong Kong
- The Hospital Authority’s Clinical Management System & Electronic Patient Record
- Delivering business (clinical) benefits

Hong Kong

- Area 1100 km²
- Population 7 million
- Tourists 22 million / year
- Proximity to likely future health hotspots

Healthcare in Hong Kong

- Primary Care 70%
- Secondary & Tertiary Care 30%
Hospitals in Hong Kong

Hospital Authority

40 Hospitals with inpatient service
15 Emergency Departments
36 Specialist Outpatient Clinics
14 Integrated Clinics
50 General Outpatient Clinics

The Clinical Management System (CMS) & Electronic Patient Record (ePR)

The journey - built in-house since 1991
The system - one integrated system for 6.5 million patients
**The Journey**

- 1990 – “Green fields”
- 1991 – Patient Administration
- 1992 – Pharmacy system
- 1993 – Lab results online
- 1994 – Obstetric specialty system
- 1994 – Radiology information system
- 1995 – Clinical Management System
  - Direct clinician documentation and order entry
- 2000 – CMS Phase II
  - Electronic Patient Record (ePR)
  - Generic modules
- 2003 – eSARS
- 2005 – CMS Phase III

**CMS Today**

- 6.5 million patient records
- 12000 workstations
- 29000 clinical users

**Success Factors**

- A strategic vision of clinical IT and top level support
- Sustained funding allowing continuous development
- Development of informatics and technology capabilities
- Engaging the clinicians
- Delivering organizational value

**IT Governance Structure**

- Hospital Authority Board
- Supporting Services Development Committee
- IT Advisory Committee
- IT Policy Group
- Head Office Directors
- Cluster Chief Executives
- Chair: ERP Project Steering Committee
- Chair: Clinical Informatics Steering Group
- Chair: IT Technical Reference Group
- Other Members/Advisors
IT Governance

- HA Board Supporting Services Development Committee
- Information Technology Policy Group
- Clinical Informatics Program Steering Group
- Enterprise Resource Planning Project Steering Committee
- Information Technology Technical Reference Group

IT Capabilities

Application Development Process Maturity

Assessment Scale
- 0 = Non-Existant (Not Applicable)
- 1 = Initial
- 2 = Documented
- 3 = Formalized
- 4 = Measured
- 5 = Leading

Maturity Target

User Requirements
- Skills
- Building & Test
- Measures & Metrics
- IT Capability
- Project Management

Informatics-led Design

Operational Layer
- Database
- Workflow
- Scheduling
- Partnerships
- Knowledge Management
- Imaging
- Clinical (forms) engine
- Terminology engine

Front End
- User
- Audit

aPRI Layer
Clinician Engagement
The Key Success Factor

- Overcome skepticism and resistance
- Demonstrate success
- Gain widespread clinician buy-in
- Clinicians become the drivers

A system built by clinicians for clinicians

Successful Engagement - “PUSH” Becomes “PULL”

- Pre-2000
  - Informatics and ITD developed functions
  - Convince hospitals to use
  - Intensive training and implementation effort

- Post-2000
  - Clinicians demanding more and more
  - ITD unable to meet all demands
  - Informatics role increasingly one of demand management

Single Logon

Hospital Authority
Clinical Management System
Version 2.0 050503

Important Notices
1. All patient information is strictly confidential
2. Staff only use the OMS for authorized purposes
3. All access to OMS is logged
4. Please log in/then log out after use
5. Please ensure you have verified the content before you sign the computer paper
Medication Order Entry

Operating Theatre Record

Clinical Data Framework

Electronic Patient Record (ePR)
ePR Laboratory Results

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ePR Digital Image Distribution Project

- Make use of the existing CMS/ePR infrastructure
- View digital radiological image in the HA wide network using ordinary clinical workstations
  - Images can be viewed wherever the patient presents
- 7 major hospitals joined by year end
- Cost - US$2m

Central Archive for Corporate-Wide PACS

- Visually lossless compression
- Cost effective use of storage and network

Delivering business benefits

- Cost savings
- Risk management
- Quality improvements
- Infection control (the SARS experience)
- Sharing the patient record (creating the EHR)
**Annual Planning process**

- Community
- HOC
- HA Strategic Plan
- GOV
- Gov Policy
- COC
- Clinical Needs Assessment
- Head Office and Hospital Suggestions
- HA Service Programs
- HOS
- Needs Assessment and Prioritized Schedule
- Work Out Resource Allocation with Hospitals
- Hospital and HA Annual Plans
- Different Service Areas
- Consulation

**IT Costs Benchmark vs Peers**

- External Service Providers
  - $0
  - $75,451
- Disaster Recovery
  - $10,779
- Occupancy
  - $12,689
- Personnel
  - $365,106
- Telecommunications
  - $58,307
- $102,466
- Software
  - $103,548
  - $107,377
- Hardware
  - $256,932
  - $524,570

**Risk Management**

- Medication checking
- High risk patient alert
- Flagging elderly patients at-risk
- Notifying on admission/discharge
- Diabetes monitoring
- Infection risk alert
- Implanted device recalls
- Medication recalls
- G6PD deficiency flag

**Registries**

The Registry is Dead! (Long Live the Registry!)

- ePR
- Standard forms
- Departmental data
- Disease documentation
- Workflow
- Decision support
- Communications
- Alerts & Reports
**eSARS**

- Managing the SARS outbreak in real time
  - Suspect, confirmed and “not SARS”
  - Updated clinical status
  - Data entry by clinicians at the wards
  - Created and deployed Hong Kong wide in 3 days
  - Built upon the CMS/ePR infrastructure
  - Possible because of the informatics culture already in place

**eSARS Architecture**

**Communicable Disease Information System**

**eFlu**

- Date of Onset
- Symptom Onset
- Last Meal
- Departed
- Name
- Date
- Age

- Diagnosis
- Contacts
- Name
- Date
- Age

- Laboratory Tests within 3 weeks
- Negative
- Positive
- Unknown

- Isolate
- Place of Residence
- Occupation
- HOSFID
- Other Information

- Laboratory Results
- Influenza A
- Influenza B
- H1N1
- H3N2
- Other

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ePR Sharing with Private Sector

Integrating Healthcare Sectors

- Addressing the imbalance between public and private care
- Communicating with private practitioners
  - Courtesy note on receiving referrals
  - Reply letter on discharge
  - Sharing HA’s electronic patient record
- Creating the shared EMR
- Enhancing the sustainability of the health care system

Summary

- Leadership and support from the top
- Engage clinicians
- Deliver clinical and organizational value

Thank you