ICT in Healthcare

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ICT in healthcare, in recent years, has been widely used to help doctors, nurses and other practitioners to give better care to patients across Singapore's healthcare landscape, in both administrative and medical fields. (1) One of the examples include Electronic Medical Records Exchange, which allowed sharing of medical records between hospitals and polyclinics to facilitate and provide more efficient healthcare to the public.

1. Overview

1.1 Healthcare infrastructure

In Singapore, the government manages the public healthcare system through the Ministry of Health; its mission to ensure good and affordable basic medical services is available to all Singaporean (2). Of which two major public healthcare providers are SingHealth and National Healthcare group. Currently, there are 7 public hospitals comprising 5 acute general hospitals, a women's and children's hospital and a psychiatry hospital, in addition to the 6 specialist centres. (3)

Healthcare is also enforced in the private sector, where it takes up to 80% of primary healthcare (4) provided to the public. On top of that, there are 13 hospitals in the country catered to the public.

1.2 ICTs' role in healthcare infrastructure

In recent years, the government has placed much emphasis in the restructuring the healthcare infrastructure in order to keep up with the rate of technology advancement. Nevertheless, it is mainly because the government recognises the immense potential of ICT in the healthcare field, not just applications in medical field, but also administrative uses that can greatly improve the efficiency of its services.

Today, we are experiencing a phenomenon which Intel calls "shift left", where A*Star explained that healthcare are to be increasingly revolving around patients. In respect to healthcare providers, it would mean less visits to hospitals, reduction in healthcare cost to make medical care more affordable, (in Singapore, bill size of Hospital admission goes up to thousand and more)(5) in addition to development of technologies that enables remote monitoring and personalised healthcare. A*Star too identifies a second trend, in which there is a greater need than ever for connectivity and inter-operatability; enabling data integration in hospital to increase efficiency and reduce errors. (6)

Gradually, we can observe that Healthcare systems are moving from Propreitary to Open Systems, and ICT plays a critical role in this; a key benefit being providing healthcare practitioners with access to timely and accurate information and complementing their decision-making process with clinical decision support system. Currently, many technologies are implemented in hospitals to meet the needs and demands of patients and also to improve general healthcare standards. Some examples of ICT usage include, Computer-aided Tomography(CT), pacemakers for heart patients where anomaly readings can be transmitted and databases for medical records.

2. History/Milestones

- How ICT is being introduced into healthcare system
- What is the first ICT application?
- Describe timeline of ICT from first application to now.

3. General approaches

In the Ministry of Health budget Speech on 6 Mar 2007, Health Minister Mr Khaw Boon Wan highlighted the need to transfer healthcare so as to gear up Singapore for our healthcare needs of 2020. He recognises the need to innovate to meet diverse needs of patients to improve efficiency, reduce prices and providing customised and personalised medical care to patients. Moreover, in the iN2015 report by the Healthcare and Biomedical Sciences, the committee has also called for the following as its iN2015 goal for the healthcare sector.

"To accelerate sectoral transformation through an infoomm-enabled personalised healthcare delivery system to achieve high quality clinical care, service excellence, cost-effectiveness and strong clinical research."

This is in conjunction with the Ministry of Health's policy to provide quality, cost effective healthcare and would help achieve transformation of its healthcare system to a well-integrated quality one.

In response to our current healthcare system and major trends in demographics, disease burden and medicine, IDA has hence implemented programmes to promote ICT in the healthcare sector, not just collaborating with Ministry of Health, but also seeking cooperation with the project sector.

3.1 Call-for-Collaboration (CRC)

(See CRC Project)

The Healthcare call-for collaboration is project initiated by the Ministry of Health, Infocomm Development Authority of Singapore, and the Enterprise Challenge. It aims to improve overall healthcare quality and efficiency through innovative use of ICT by bringing healthcare providers and the infocomm companies together to develop and pilot innovative solutions and products.
This collaboration aims to exploit ICT maximally, as a key enabler in healthcare transformation and to promote innovation to change work processes and how care is delivered.

3.2 Chronic Disease Management

[see Chronic Disease Management programme]

In year 2006, the Ministry of Health (MOH) announced its plan to improve the care for chronic diseases, starting with four conditions - namely diabetes, hypertension, lipid disorders and stroke. The level of care will be raised through the promotion and extensive use of systematic, evidence-based chronic disease management programme. Through this, patients with such chronic diseases will be encouraged to work with their doctors, particularly their Family Physicians, to actively manage their disease, through regular monitoring, appropriate medical treatment and lifestyle changes.

For this programme to be a success, ICT is expected to be instrumental in the implementation of this nationwide programme.

3.3 Electronic Medical Record Exchange

[See EMRX]

4. Application of ICT

Currently, in Singapore, there are many applications of ICT available, regardless of whether it is in medical fields, for information transfer or medical services provided to patients. Shown below are some examples that have been implemented in Singapore's public healthcare system:

1. Medical Procedures

2. Information sharing
   - Electronic Medical Record Exchange
   - Chronic Disease Management (CDM)
   - Emergency Department System

3. Medical services to patients
   - Interactive Patient Guide: An online guide developed by Changi General Hospital to allow patient to obtain information on treatments, surgical procedures and aftercare of 25 common medical conditions through videos and printable text online in the comfort of his home.
   - Billing information with respect to public hospital wards and operation procedures
   - Receiving of test results via telephone, email or SMS
   - Home Telecare solution: At the National Health Centre and SGH, this aims to integrate the Internet, SMS, Web Portal and mobile phones to monitor the vital signs of patients. The system sends an SMS alert to both the doctor and patient when their vital signs are beyond set thresholds.

4. Other
   - E-diet: Wireless meal service for patients; they are able to order their meals through PDAs and it would be delivered to their besides.
   - Pharmacy Management System (E-pharmacy)

5. Case Studies / News

5.1 Severe Acute Respiratory Syndrome

[See SARS]

5.2 Iranian Twin Sisters

[See Iranian Twin sisters]

5.3 News

[See news in Healthcare]

5. Future

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Introduction

- ICT in healthcare
- Brief description of Healthcare scene in Singapore. (Statistics)
- How has ICT helped in achieving success in extensive and effective healthcare infrastructure/systems?
- Singapore was ranked 6th in the World Health Organization’s ranking of the world’s health systems in the year 2000. (wiki)

History/Milestones

Statistics/Others

2. Health $ as % of GDP: 3.6 - 3.7% from 2003 to 2004.

Chronic disease death: No. of deaths due to chronic disease - 15k, total no. of deaths - 18k

Healthcare systems are moving from Propietary to Open Standards.

Phenomenon 1: Intel calls it “shift left”.

in2015 Roadmap for Healthcare and Biomedical Services. (Worth reading)
(www.vtt.fi/liitetiedostot/cluster1_tieto-ja_viestintateknikka_elektronikka/ehealth_04122007_woonkwong.pdf)


http://healthcare-economist.com/2008/01/14/singapores-health-care-system/

News


(E-government)


INFOCOMM video

Infocomm technology is revolutionizing Singapore healthcare industries. Digital wards, paperless hospital, EMRX are made possible by local companies thru the innovative use of technologies. Today, Sg is a digital living land for the development and testing of sophisticated healthcare solutions.

"Emotion technology are important for healthcare professionals to deliver high quality ma and personalized treatment for the patient.

CTRU and public healthcare providers will continue working closely with IDA to explore appropriate it services to best support and add value to the delivery of patient care and research in Sg."

Partner with Sg for a healthier Asia. Combining innovation and technology to bring an era of social benefits and economic growth. That’s Singapore.

6. Reference
