Implementing a hospital wide ICT infrastructure development in the second largest hospital in Sri Lanka: Experience at Teaching Hospital - Kandy

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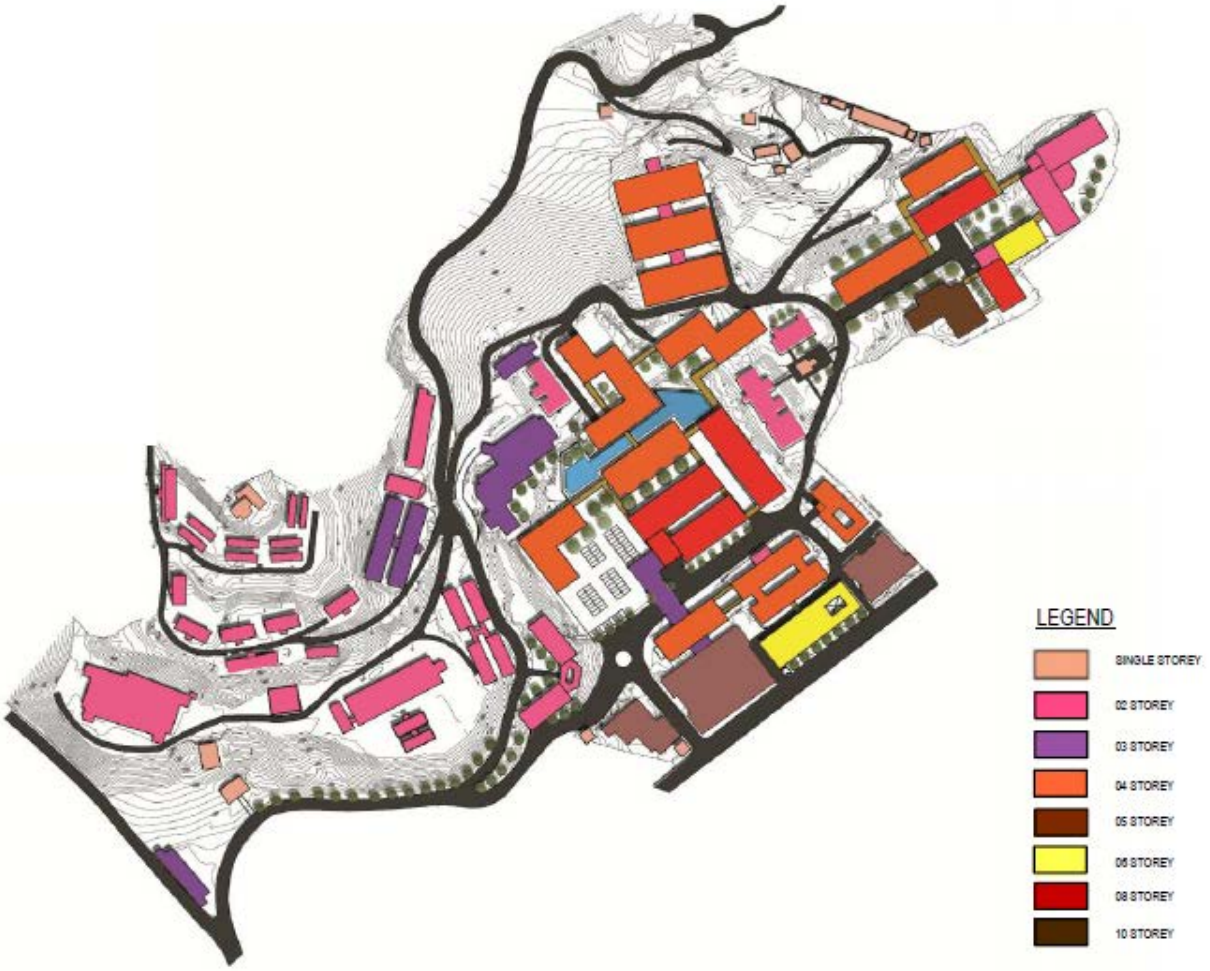
Introduction and background

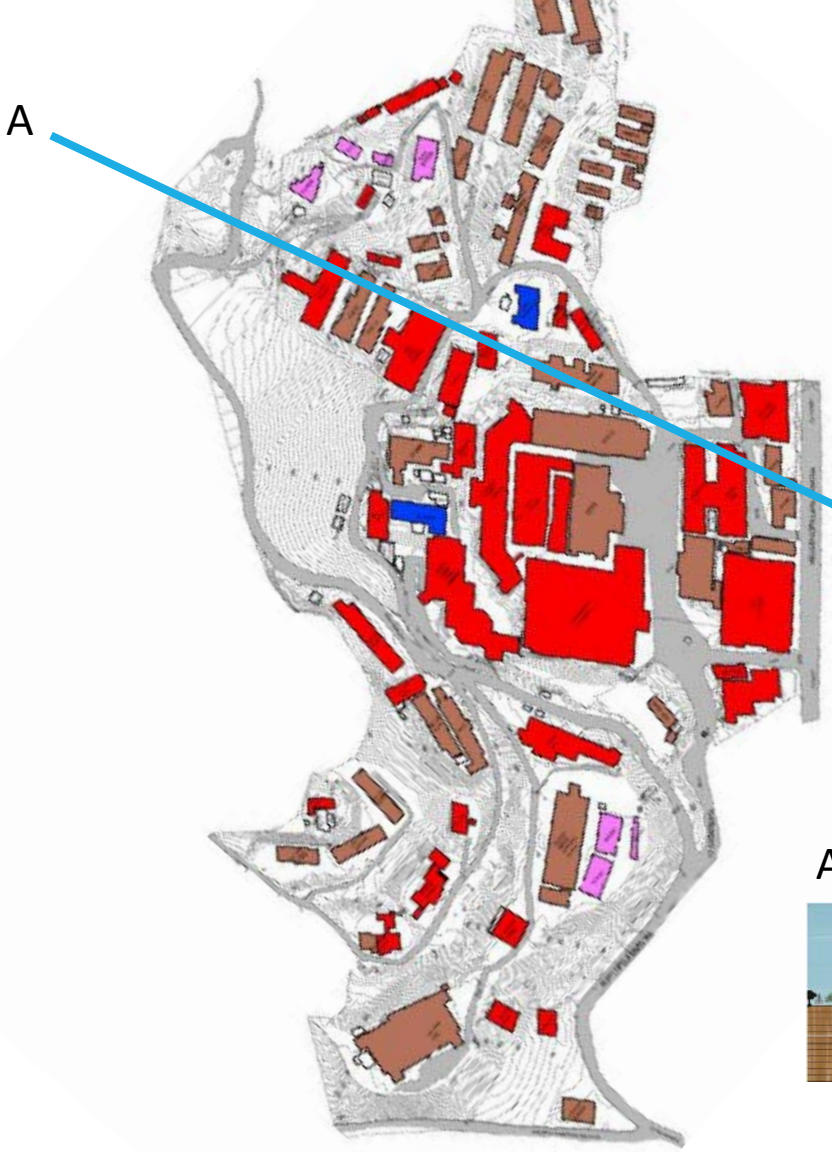
- The hospital is situated in Kandy , Capital City of the Hill Country of Sri Lanka
- Bed capacity is 2305.
- Extent of the hospital land is 58.4 acres.
- Daily average admissions 700/d.
- OPD treatment 1500/d.
- Specialized clinic visits 3500/d.
- We have 46 specialties under one roof.
- Currently most information and records are manual and there is a Medical Records Room with millions of Bed Head Tickets, and x-ray films, which are retrieved manually to facilitate hospital work. In almost all clinical areas there are a few computers but with no standard software to enable integration of data for decision making in both clinical and administration departments.

Nature of Hospital Environment

- A large number of building in a small area
- Most of them are old buildings and multi storied
- None of the buildings had a complete set of architectural plans
- Outside floor are consists of roads or concrete and tiled
- Underground water, telephone, electricity, gas pipe lines without proper layout diagrams
- Rodent attacks are expected on fiber, racks, etc

DISTRIBUTION OF BUILDINGS ACCORDING TO HEIGHT





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Overall goal of Hospital ICT Strategy and implementation

- Establishing a strong ICT infrastructure to support hospital operations by providing the means to capture, transmit, store and retrieve information in an accurate and timely manner through a Hospital Information Management System, thereby enhancing the efficiency and effectiveness of the hospital in providing health care in the hospital.

ICT Strategy for the Hospital

- Establishment of the Communications Network Infrastructure
- Acquisition and deployment of a Computer Systems Infrastructure
- Acquisition and deployment of the Applications Software Infrastructure
- Capacity Building for staff through the provision of General and specific ICT/HIMS training.

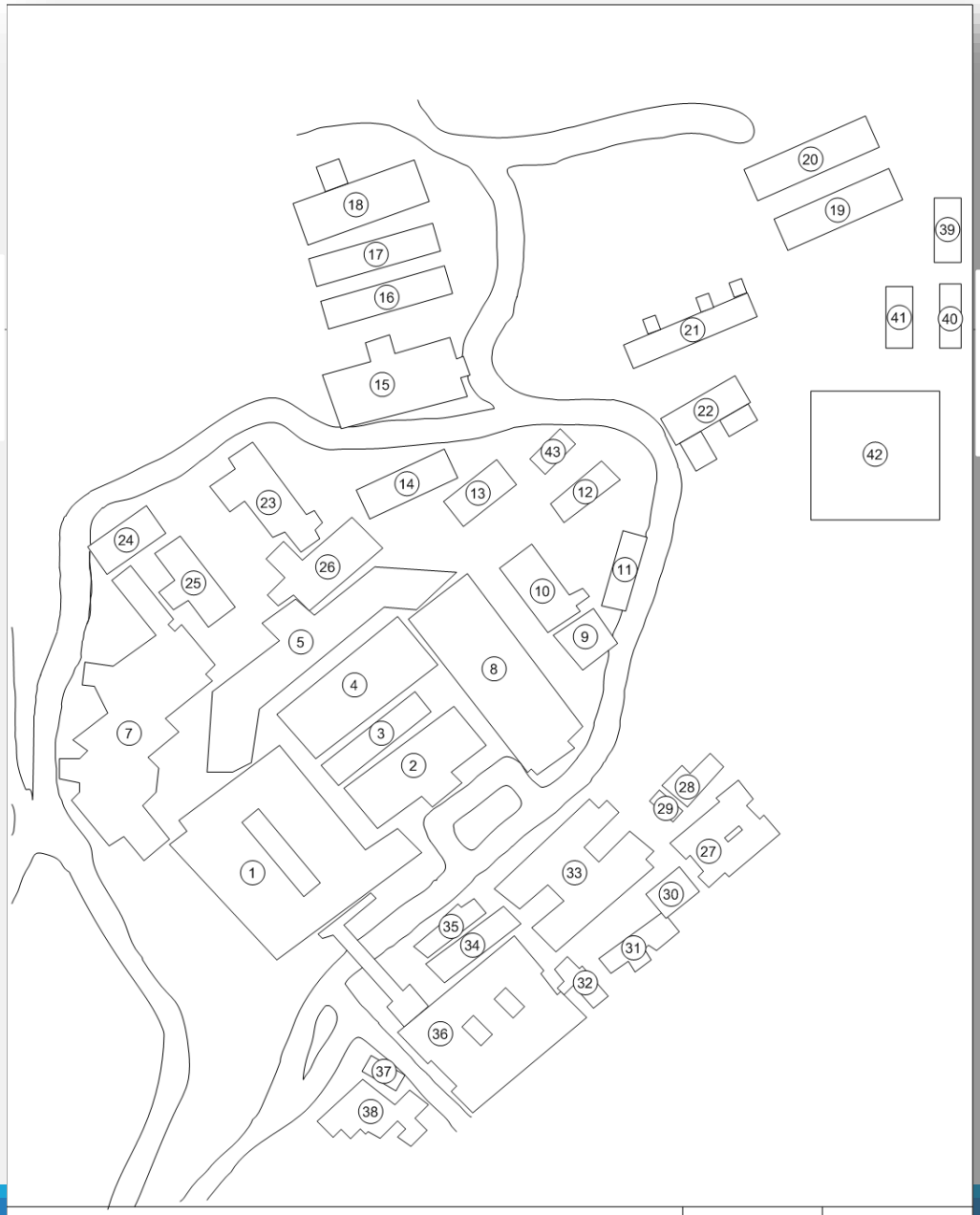
Establishment of the Communications Network Infrastructure

Communication Network Infrastructure

Summary of Requirements:

1. Network Designing/ Site Preparation
2. Decision on Cables
3. Network Redundancy
4. Enhancement Features Provision (Wireless, Voice, Video, Security)
5. Internet Connectivity

1. Establishment of the Communications Network Infrastructure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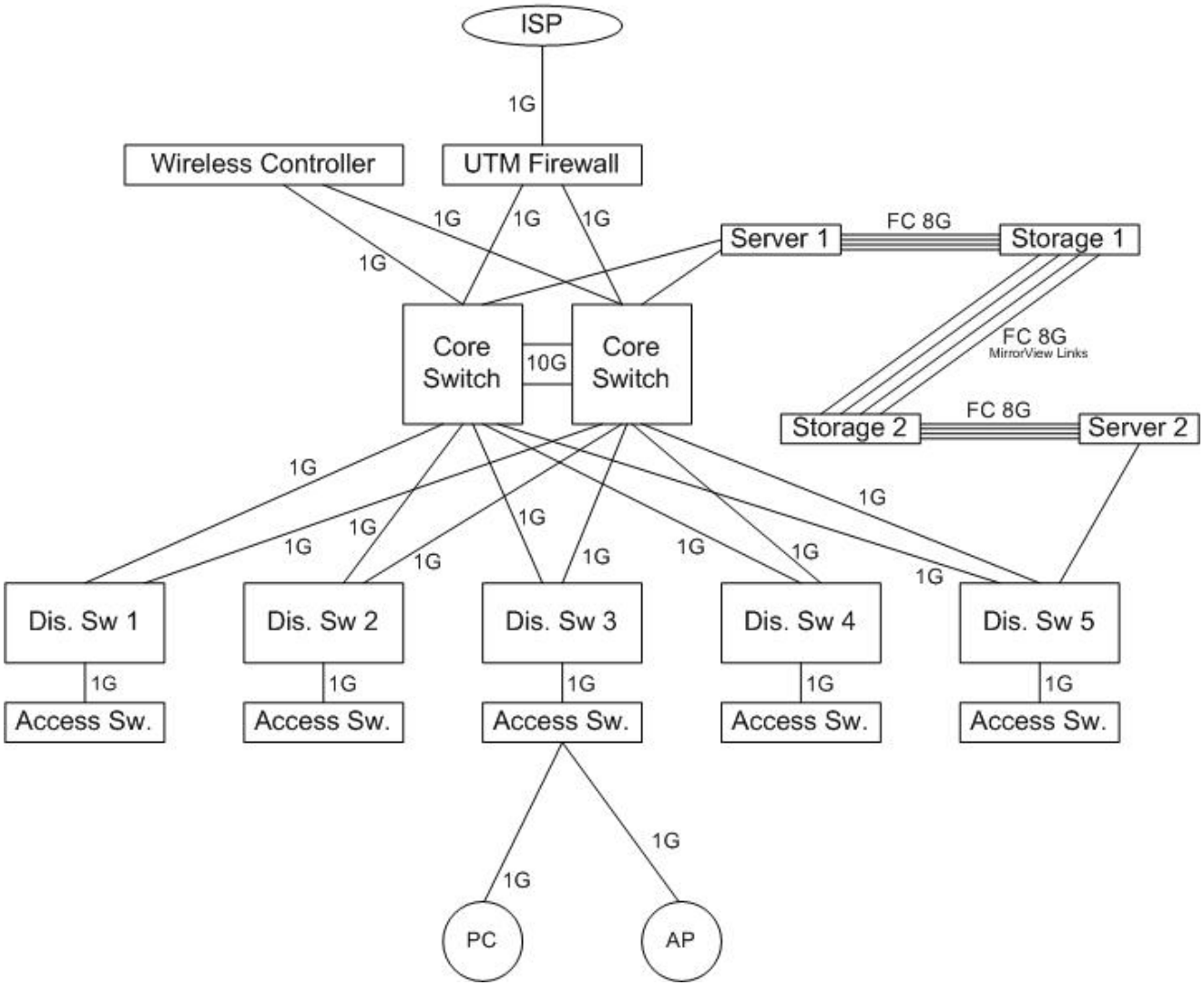
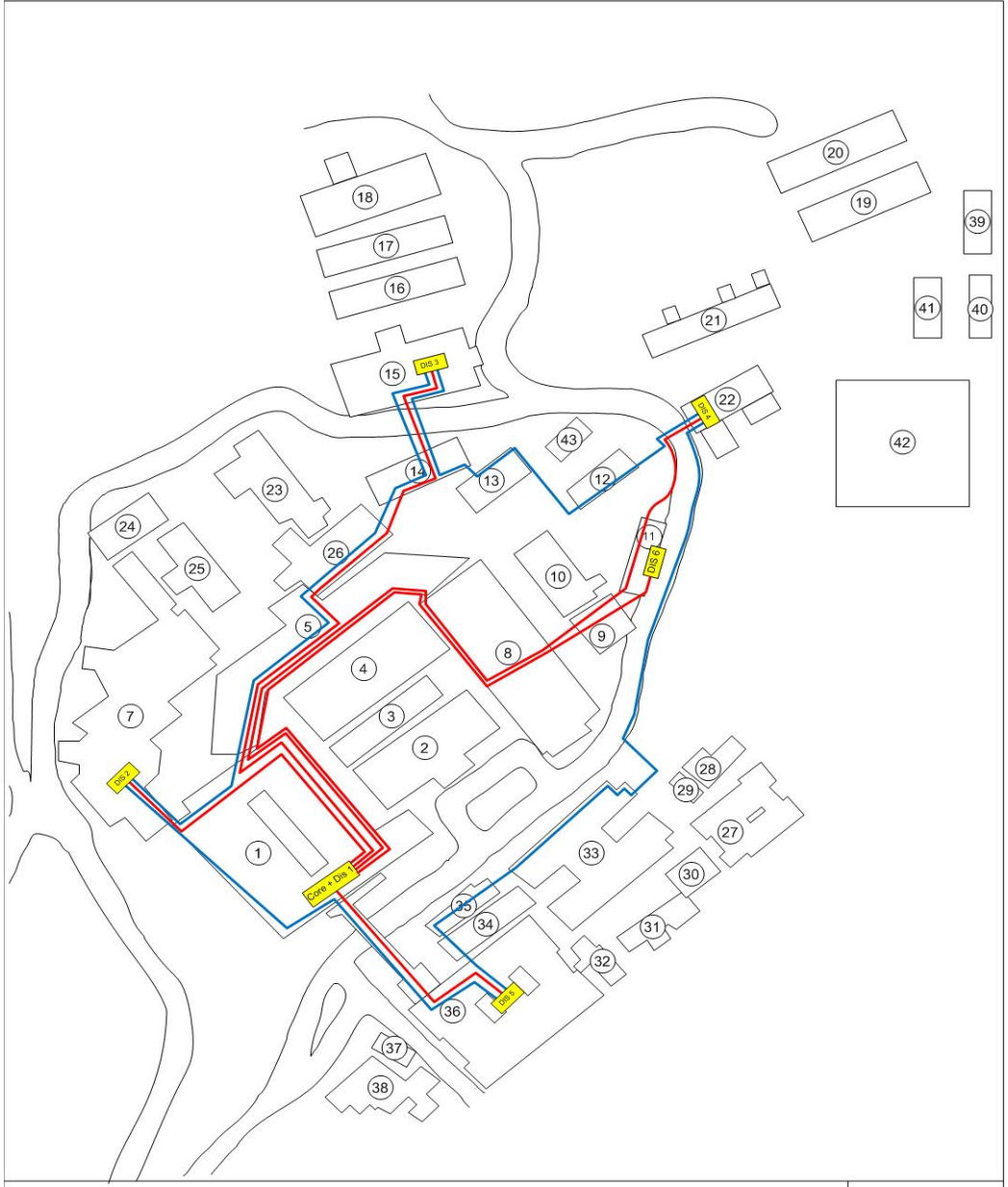
Network and Server Connectivity Diagram – Teaching Hospital - Kandy





PROPOSED FIBER OPTIC BACKBONE

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போதனா மருத்துவமனை கண்டி
Teaching Hospital Kandy

Fiber Optic Cable (Core to Distribution) – SM, 12 Core, Outdoor Cable

Fiber Optic Cable (Distridution to Distribution) – SM, 12 Core Outdoor Cable

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Teaching Hospital Kandy

36-E	OPD	3RD FLOOR

Rack

Communication Network Infrastructure

Summary of Requirements:

1. Network Designing/ Site Preparation / Civil Works
2. Decision on Cables
3. Network Redundancy
4. Enhancement Features Provision (Wireless, Voice, Video, Security)
5. Internet Connectivity

1. Establishment of the Communications Network Infrastructure

Cable Installation

- Outdoor fiber cabling suitable for inter-building
- Indoor fiber is suitable for large buildings, main rack to access racks
- For user and wireless access point connectivity, UTP cabling to be used

1. Establishment of the Communications Network Infrastructure

Cable Installation…ctd

- 1 Gbps can be used throughout network
  - Access Switches to User Computers
  - Distribution Switches to Access Switches
  - Core Switches to Distribution Switches
  - Core Switches to Servers
- 10 Gbps most appropriate for backbone
  - Core Switches to Distribution Switches
  - Core Switches to Servers

1. Establishment of the Communications Network Infrastructure

Communication Network Infrastructure

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1. Establishment of the Communications Network Infrastructure

Network Redundancy

Redundant connection are required for:

- Core to Distribution Fiber Connections
- Core to Server UTP/Fiber Connections

If financials permits

- Distribution to Access Fiber/UTP connections redundancy is more suitable

1. Establishment of the Communications Network Infrastructure

Network Redundancy....ctd

Mandatory

- Core Switches Redundancy

Essential

- Distribution Switches Redundancy
- Server Redundancy (using a clustering software)

1. Establishment of the Communications Network Infrastructure

Communication Network Infrastructure

Summary of Requirements:

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1. Establishment of the Communications Network Infrastructure

Enhancements to the Communications Network

- Wireless Network Access Points
- Voice / Telephony Services (PABX Systems)
- Security Systems (CCTV, Access Control and hardware safety)

1. Establishment of the Communications Network Infrastructure

Internet Connectivity

The Internet connectivity service will support:

- Electronic Mail (e-Mail)
- Outgoing access to the World Wide Web
- Virtual Private Network (VPN) services for incoming remote connectivity

Components:

- 1.4.1 Broadband Digital Subscriber Line (DSL) connection
- 1.4.2 Communications Services:
  - Web Server (remote hosting)
  - E-Mail server
  - Firewall Appliance

1. Establishment of the Communications Network Infrastructure

www.kandy-hospital.health.gov.lk

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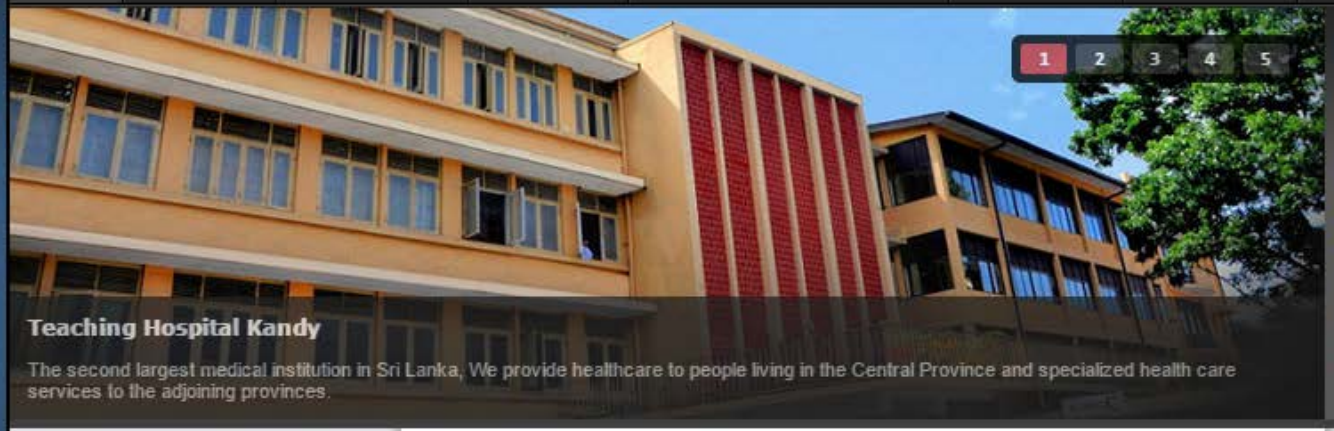

Emergency? Don't Panic

If you're in a situation where you or someone else is in danger, first and foremost important thing is to call Emergency Services. Call
110 - Fire and Rescue
119 - Explosions, Report Suspicious Unlawful Activities
First aid knowledge will give you the confidence to act.
Learn more...

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Home

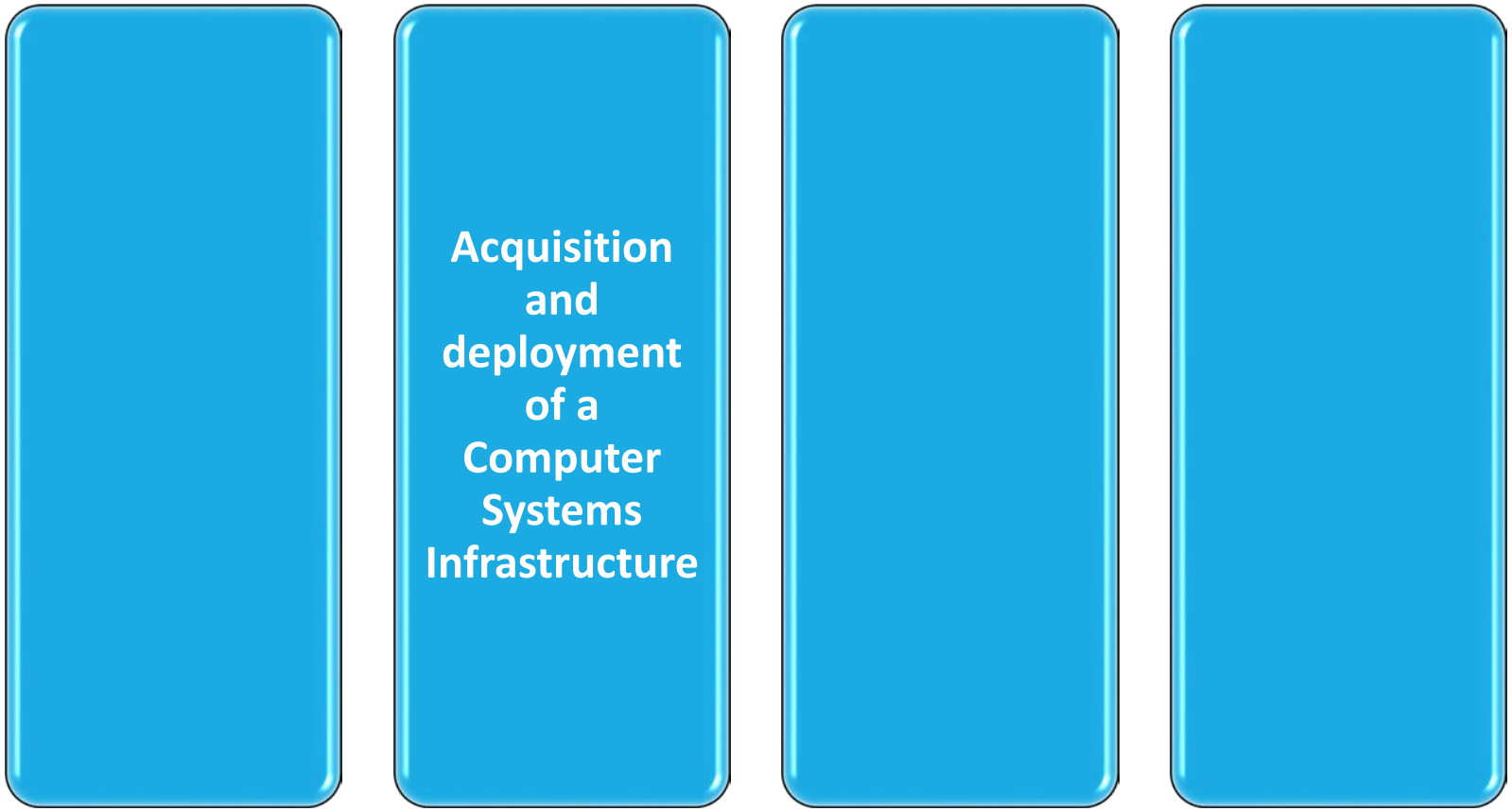
Welcome to Teaching Hospital Kandy, Sri Lanka

The Teaching Hospital Kandy is the second largest medical institution in Sri Lanka, established and administered under the purview of the Ministry of Health, Sri Lanka which is a key Government Hospital maintained by the Sri Lankan Government.

Find Us...

eHealth Asia 2015 ICT for Post 2015 Health Challenges

Biomedical Informatics Sri Lanka Quality Information for Better Healthcare


Acquisition and deployment of a Computer Systems Infrastructure

Computer Systems Infrastructure

Servers

- Hardware
- Server Operating Systems
- Services

The following services will typically be includes as part of the server purchase costs

- Installation and Commissioning / Configuration Services
- Client Access Licensing
- Maintenance and Support

2. Acquisition and deployment of a Computer Systems Infrastructure

Computer Systems Infrastructure ...ctd

Shared Storage

- Direct Attached Storage
- Network Attached Storage
- Storage Area Network

2. Acquisition and deployment of a Computer Systems Infrastructure

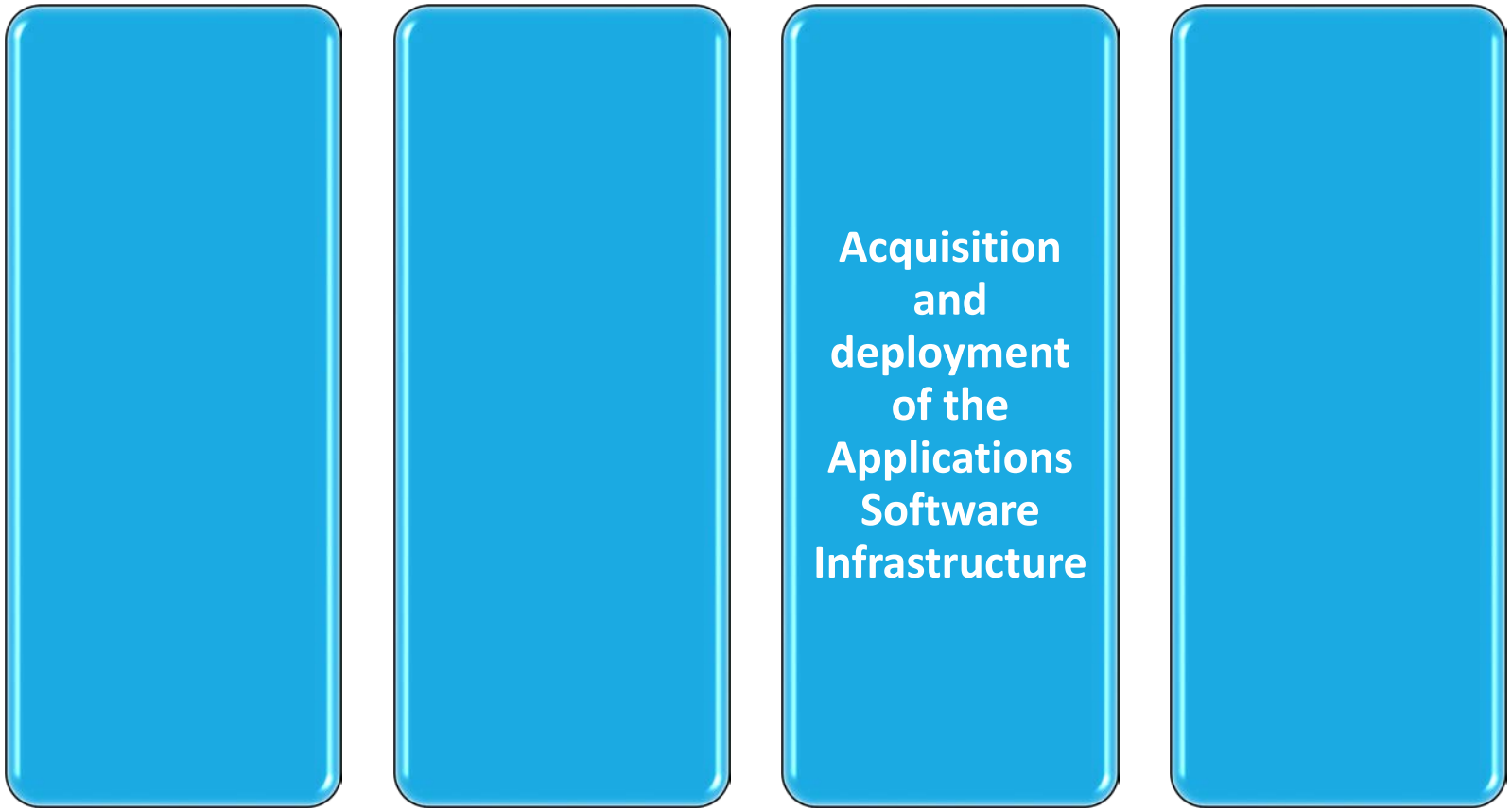
Computer Systems Infrastructure ...ctd

End User Hardware

- Desktops
- Laptops
- PDAs/Tabs
- Barcode Readers
- Printers

2. Acquisition and deployment of a Computer Systems Infrastructure

ICT Strategy for the Hospital



3. Hospital Information Management System (HIMS)

3. Acquisition and deployment of the Applications Software Infrastructure

Capacity Building for staff through the provision of General ICT-awareness training.

Capacity Building for ICT

Level 1: Basic Computer Operations

Level 2: Office Automation User Training

Level 3: Application-Specific Training

Level 4: Technical Training on HIMS

Level 5: Management Level Training

4. Capacity Building for staff through the provision of General ICT-awareness training.

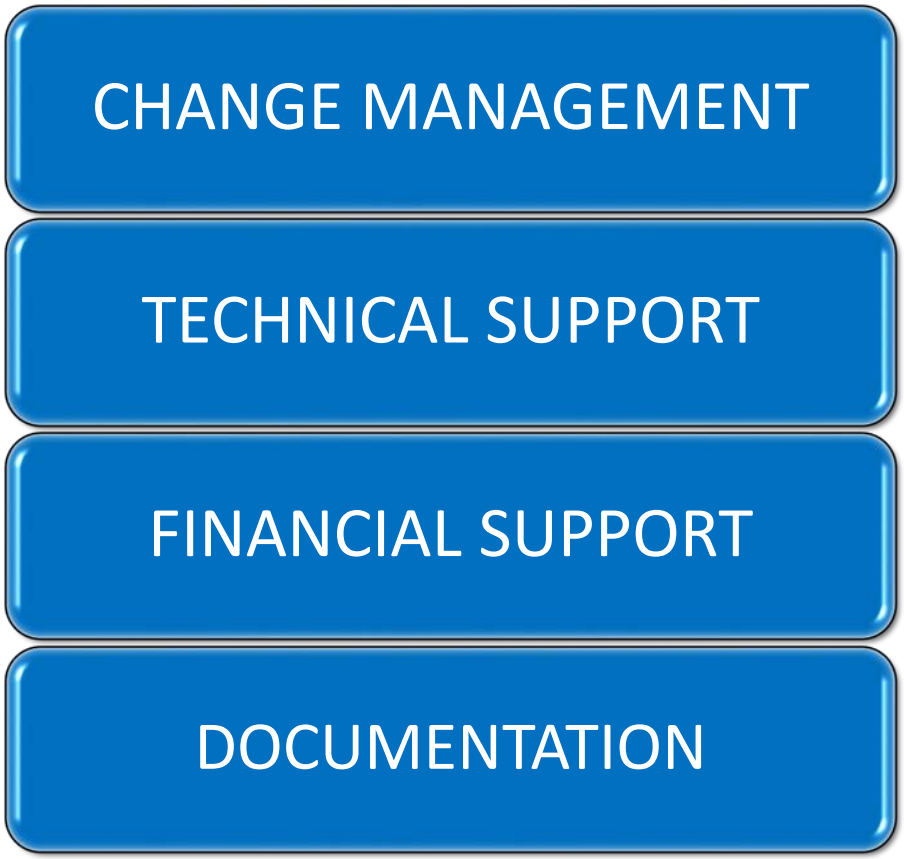
Hardware Maintenance Unit

Human Resources

- Network Administrator – 01
- Hardware Technician – 02
- Electronic Technician - 01

4. Capacity Building for staff through the provision of General ICT-awareness training.

Main Challenges



HIMS Implementation and Cloud Computing

All HIMS in each hospital to be accessed through private cloud owned by Ministry of Health

ALL PROBLEMS SOLVED

- Servers – not required
- Storage – not required
- Redundancy – not required

Thank You!