Delivering Successful Projects from Clients Perspective

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Outline of presentation

1. Health Facility Project Planning Process in MoH
2. Stakeholder in Health Facility Projects in Malaysia
3. Criteria / Definition of Successful Projects
4. Issues and Challenges
5. Way Forward

Health Facility Planning (HFP) And Development:

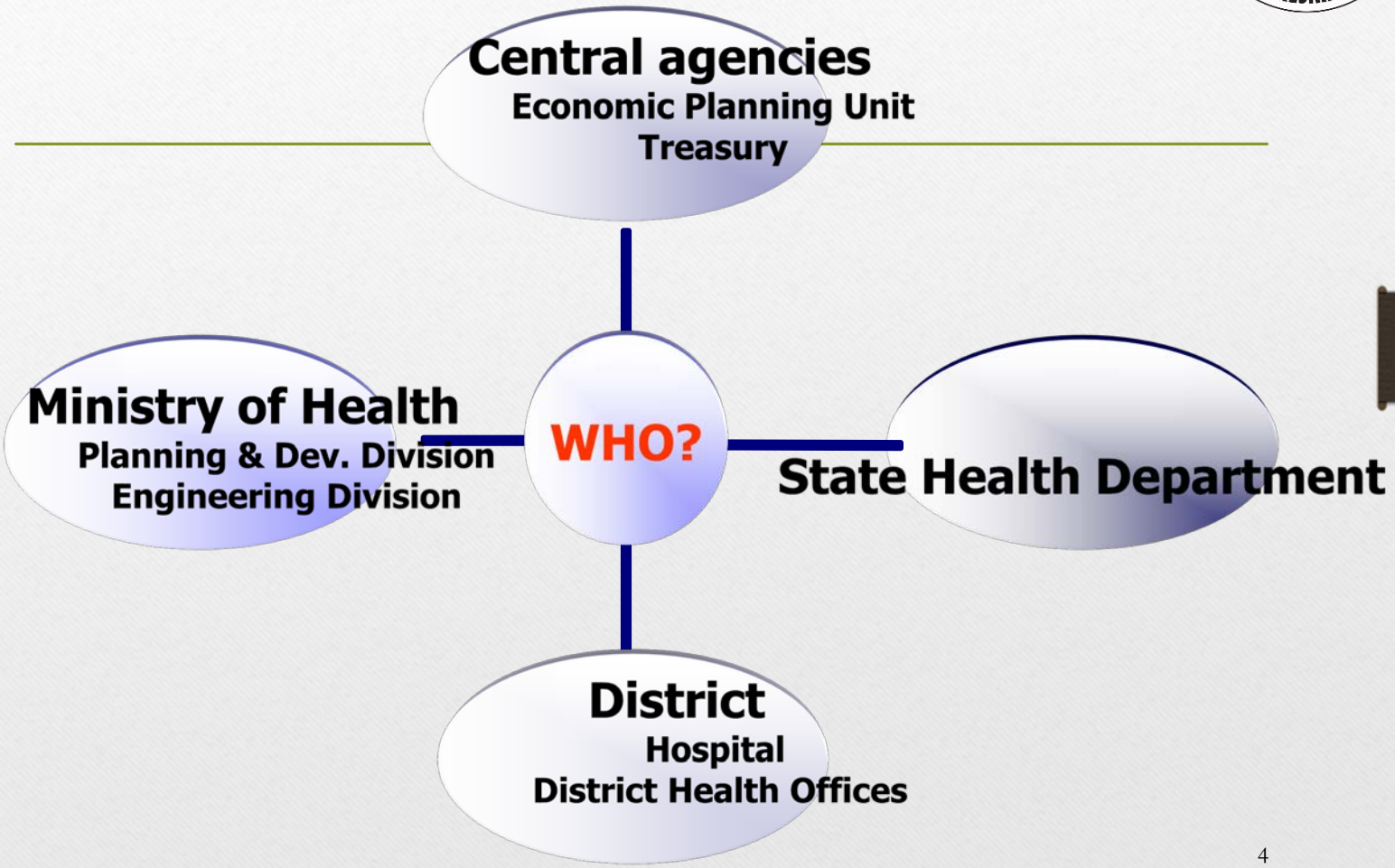
Objectives

a. To provide appropriate environment and equipment required for healthcare services and health related activities.

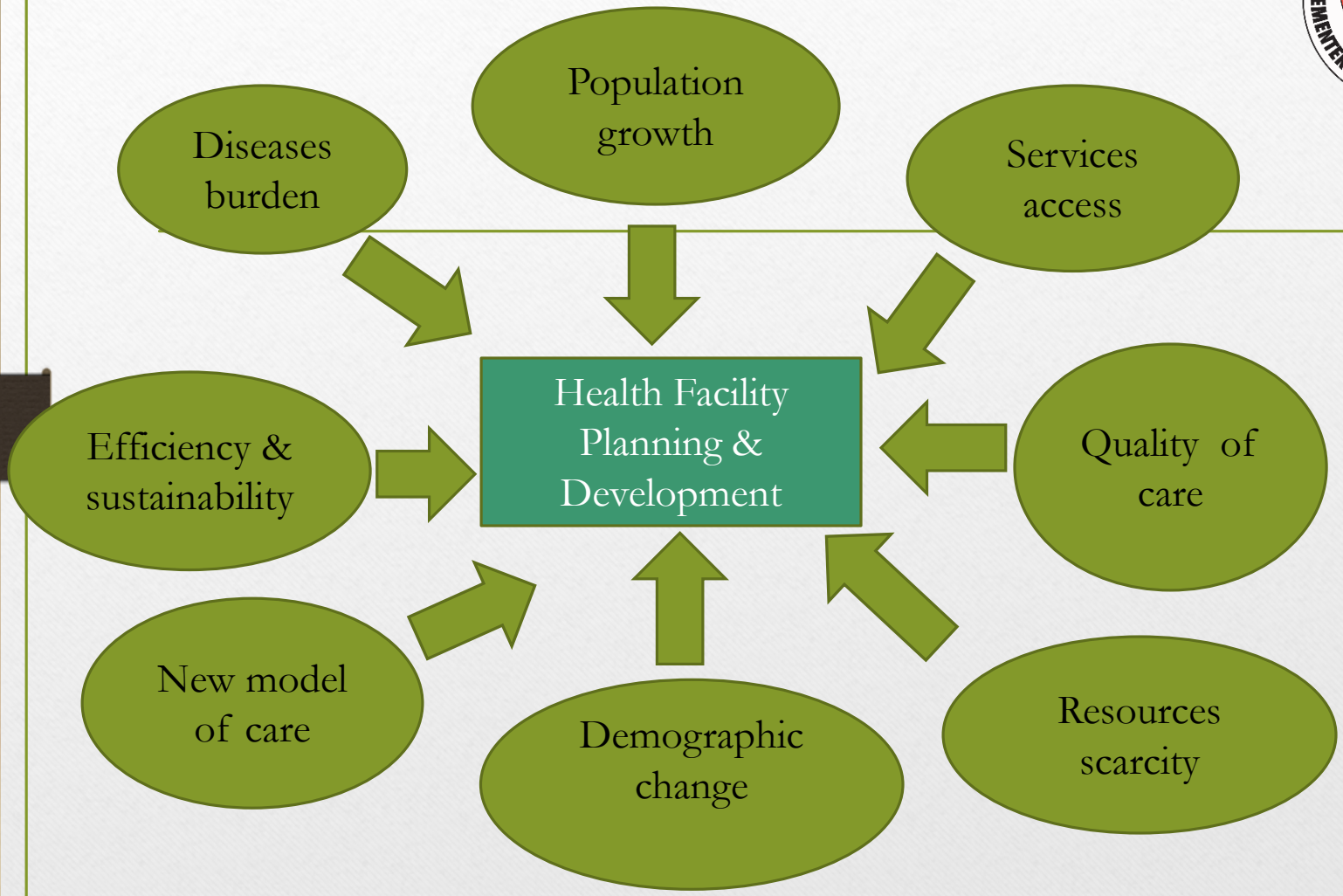
b. To improve access to health care services as required by Malaysian population

c. To provide better healthcare services in terms of quality and safety

Parties involves

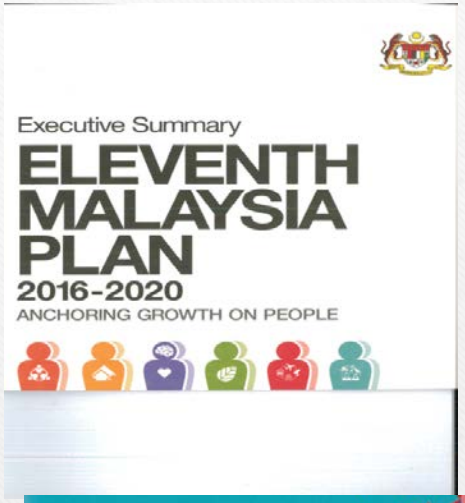


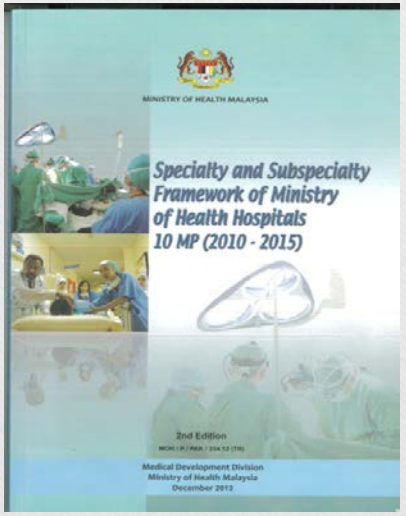
HFP: The Driving Forces



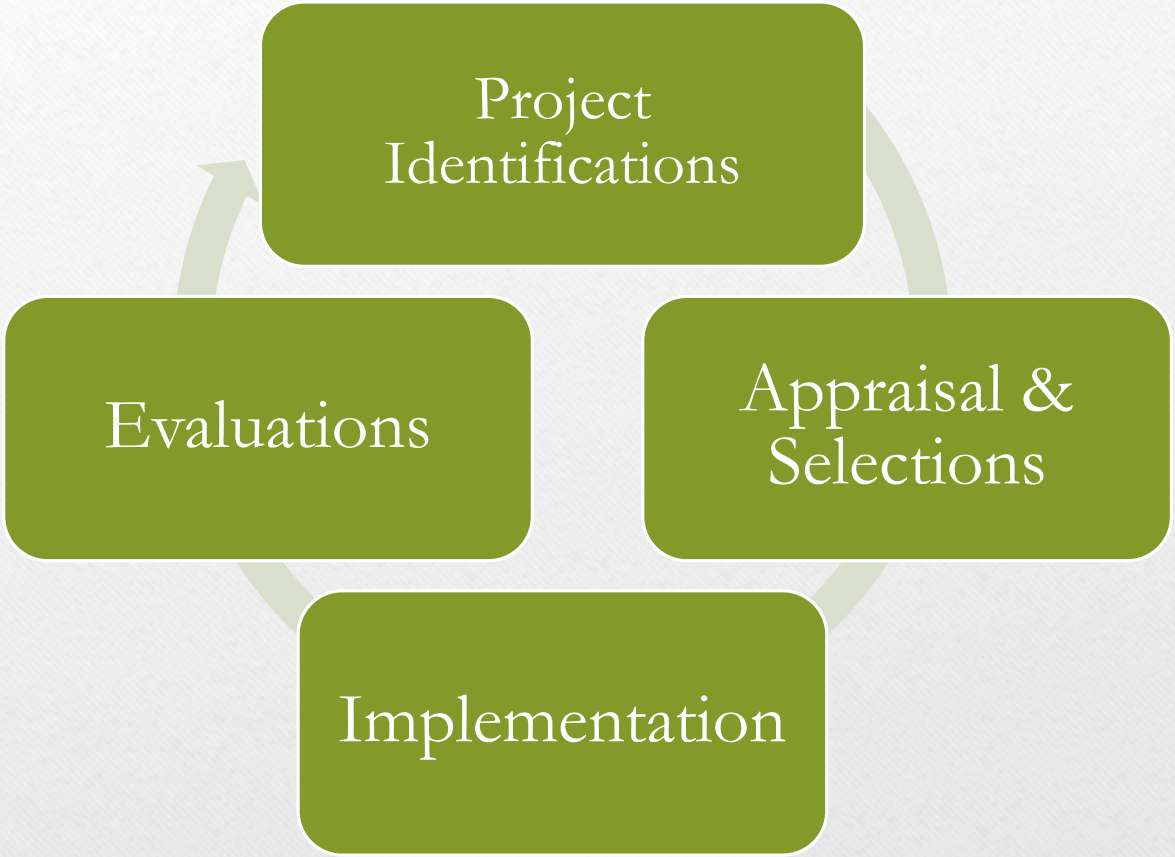
HFP: The Basis & Guiding Principles

- National 5 Year Development Plan (11th Malaysia Plan)
- MOH Strategic Plan (2016-2020)
- Specialty and sub specialties framework of MOH hospitals
- PSTM 2016-2020 KKM





Health Facility Planning Process in MoH



Project Identification & Selection Process

State Health Departments – state's priority (UPEN Input +/-)

Ministry of Health Malaysia

EPU
ECONOMIC PLANNING UNIT
PRIME MINISTER'S DEPARTMENT, MALAYSIA

Facility levels (Hospitals , Clinics, DHO)

-Needs assessments ,
-Feasibilities

Relevant Divisions Input

Kami Sedia Membantu
KEMENTERIAN KESIHATAN MALAYSIA

Factors Determining Project Selection

1. Project is accordance to the country development objective & priority

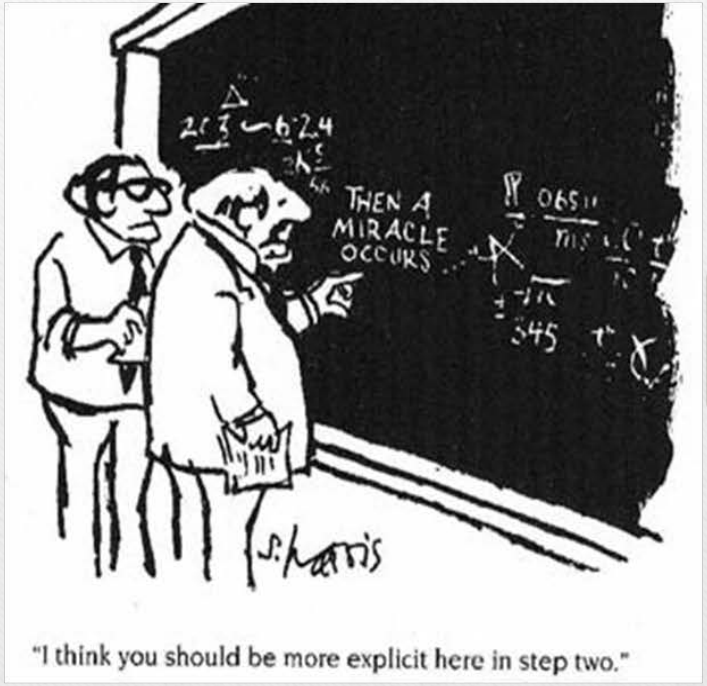
2. Impact on health problems

3. Relationship to needs & demand

4. Financial implication
   - Cost benefit, cost effectiveness and cost containment

5. Constrain of implementation
   - site constrain
   - service ownership
   - lack of trained manpower

6. Others – political, social…..



"I think you should be more explicit here in step two."

Identification & Selection phase

SON
(Statement of Needs)

End users

MBOR
(Medical Brief of Requirement)

End users + Planning Division

TBOR
(Technical Brief of Requirement)

HODT /HOPT

TENDER

Implementation Phase

Value Management

10

TENDER

- NCR

CONSTRUCTION

1. MASTERPLANNING
2. INTER DEPARMENTAL ZOONING
3. INTRA DEPARTMENTAL ZOONING
   - RDI
4. TSA (TECH SPEC ADHERENCE)
5. INTERNAL AND EXTERNAL FITTING INTERACTION (BUILTS-IN LAB BENCH, ID, EXTERNAL COLOR SCHEME ETC)
6. LOOSE FURNITURE, IRONMOGGERIES, SIGNAGES
7. MOCK-UP

TESTING & COMMISSIONING

HANDING OVER

RTR INSPECTION – DEFECT LIST

DLP

Under RMK-11, Classification of MoH hospitals:

- State Hospital (49 specialty and subspecialty)
- Hospital Without Specialist
- Hospital with Specialist
  - Minor Specialist Hospital (10 basic speciality)
  - Major Specialist Hospital (20 resident specialist)
- Special Institution (10)

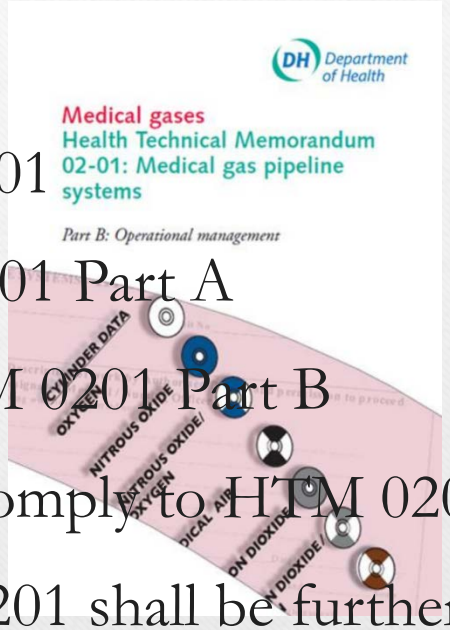
Relevance to Mechanical Engineering

Minor Specialist	Major Specialist Hospital
1. General medicine	Minor +
2. General surgery	1 Nephrology
3. Paediatrics	2. Dermatology
4. Orthopaedics	3. Respiratory medicine
5. O &G	4. Infectious Diseases
6. Anesthesiology	5. **Neonatology**
7. Emergency medicine	6. Maternal fetal
8. Radiology	7. **ENT**
9. Pathology	8. **Opthalmology**
10. Psychiatry	9. **Paediatric dental**
	10. **Oral Surgery**

Mechanical Work For Hospital

- Services : Medical Gas

- Standard Compliance to HTM 0201



- Design shall comply to HTM 0201 Part A
- Installation shall comply to HTM 0201 Part B
- Quantity and type of gas shall comply to HTM 0201 Part A
- The optional gas listed in HTM 0201 shall be further study to
- determine the all the future hospital job for practical approach
- Location of AVSU preferably nearer to Nurse Station

Elevator Specifications

- ICU Bed Lift
  - Dimension – 1.8 x 2.7 m
  - Opening – 1.4 m
  - 35 passenger
- Normal Bed Lift
  - Dimension – 1.5 x 2.4 m
  - Opening 1.2 meter
  - 24 passenger

Success Factors in HC Projects*1

*1 Identifying success Factors of Healthcare Facility Construction Project in Iran, Reza etal.2016.

Scope

- The processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.

- Value Assessment
- Value Engineering

Time

- Timely completion – is the most important factor in healthcare projects.
- Planning, scheduling, political reasons and lengthening of correspondences – challenges time

Cost

- Planning
- Budgeting
- Financing
- Managing
- Controlling

Human Resource

- Project Team

Quality

Quality policies, objectives and responsibilities so that the project functions as it determine to functions

- Standard Compliance
- Cost estimation
- Proper building method
- Role of subcontractors
- Machinery
- Technology
- Quality material

Risk

- Risk Management

Environmental

- Environmental protection

- External Matters
  - Politics
  - Economy
  - Rules and Regulations

…..Is this hospital project a success?

- **Case 1**: Project: **Blok Tambahan Hospital Jeli (Design & Build)**
  - Scope: (2 wards – 56 beds; 2 OT; CSSU, medical record and lab)
  - SST: 11 March 2013
  - Tarikh Siap Asal: 10 September 2015
  - Tarikh Siap Sebenar: 9 December 2015 (EOT 1)
  - Tarikh CPC: 9 December 2015
  - DLP: 10 December 2015 – 9 December 2017
  - Serah: 10 April 2016
  - Rasmi: 12 Ogos 2017


HOSPITAL
JELI
HOSPITAL JELI
KELANTAN

…..Is this hospital project a success?

CASE 1: Blok Tambahan H Jeli (Design & Build)

- **Interviewee 1: Yes**

  Project successfully completed and its functional.

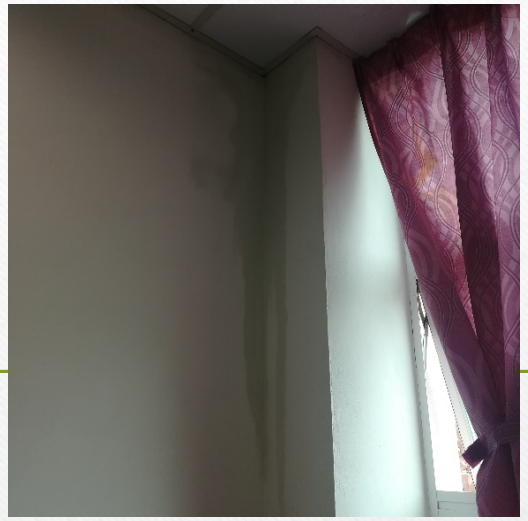
- **Interviewee 2: 50 – 50**

  a) Meeting all the prescribed specification of the contract;

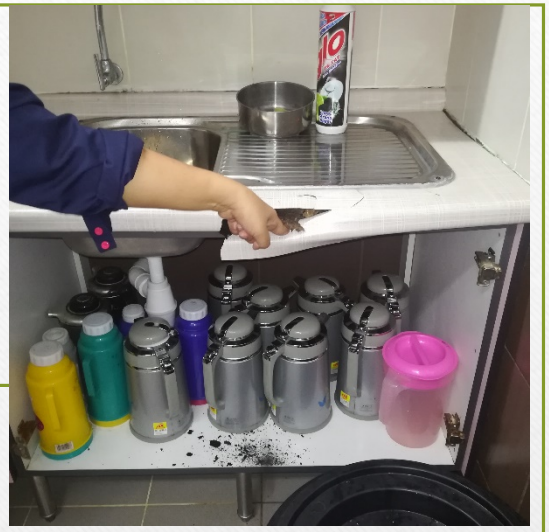
  b) All equipment and system supplied of quality and last at least 5 years without fail;

  c) All defects occur during DLP shall not disturb hospital operations that will compromise KKM image;

Condensation at air Cond duct without / improper insulation



Water mark detected at the wall – on call room



Sink top with HPL finished (not accordance with spec)

Humidity of Isolation rooms in all wards are not stabil – repeated defect

Results of uncontrolled humidity in 24 h air condition room

Define…Success

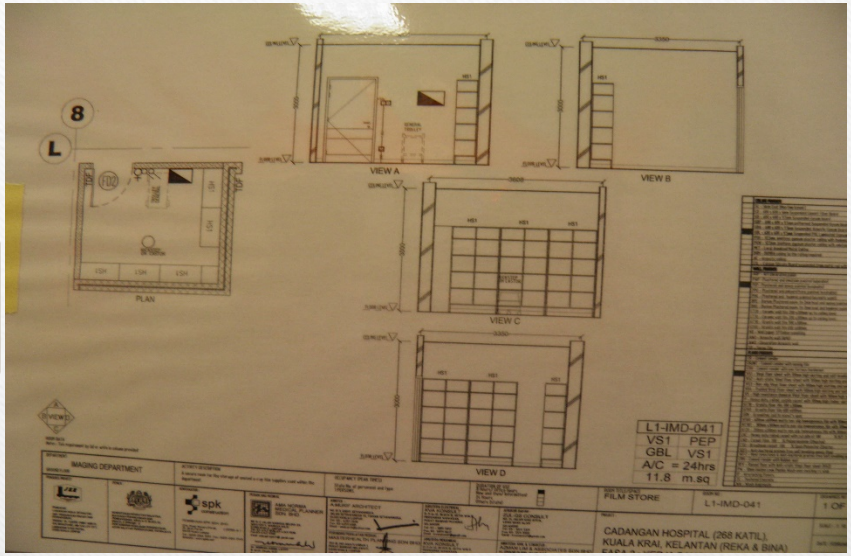
- Interviewee 3 (Stakeholder)
  - TIME IS THE GOLD STANDARD
  - NO VO and FUNCTIONAL;
- Interviewee 4 (implementers)
  - NO VO
  - NO EOT
  - SUPERB COORDINATION AMONGST TEAM

Issues and Challenges

- Most complex building
- Wide range of services & functional units
- Governed by various regulations, codes, guidelines etc.
- Requires specialised knowledge & expertise

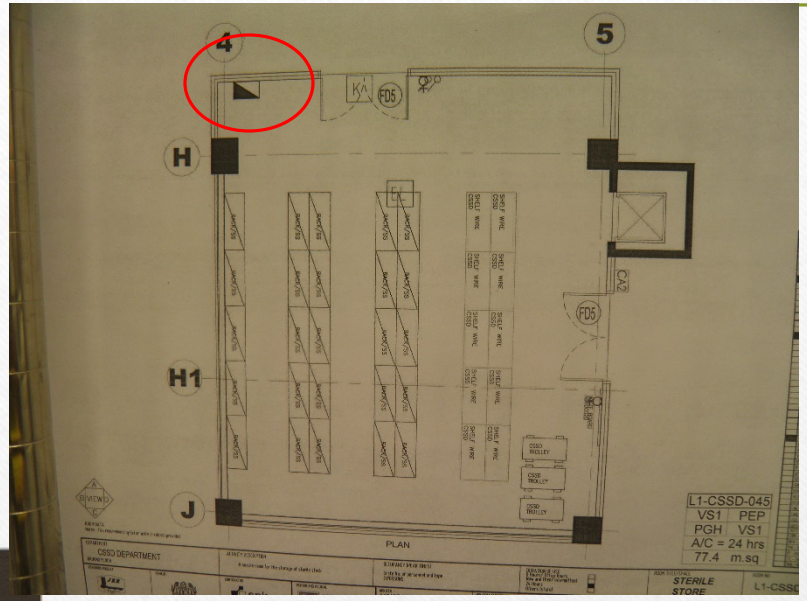
- Requires EXTREAMLY GOOD COORDINATION between specialist (Mechanical, Electrical, Medical Planner & Architect)

Lesson learnt from Project Hospital Kuala Krai



- DB room located in clinical / functional space

Film Store in Imaging Department

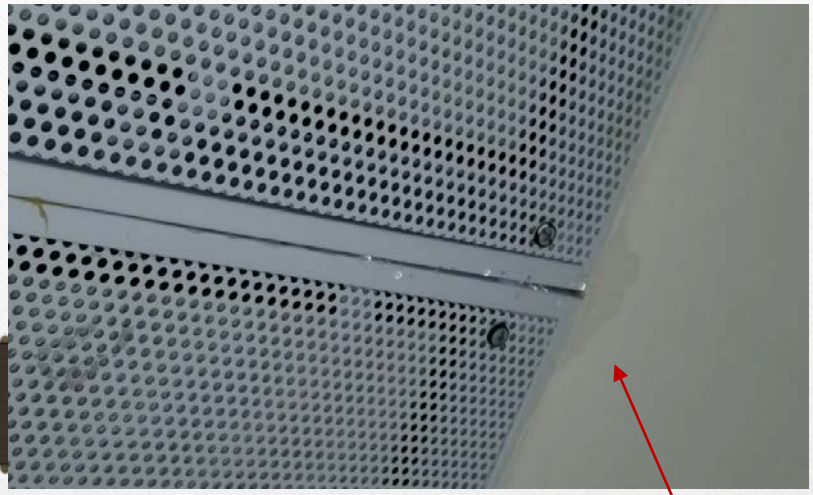


DB in Sterile Store CSSU

Fire door not properly set

Washer, drier and pass through hatch of no similar width / depth resulted ‘unflushed finishes’
(G1 mechanical)

Issues and Challenges – Bilik OT



- Air menitik di bilik OT

Issues and Challenges – AHU OT

- Design Faulty CSSD

Factors of Faulty Hospital Design*[2]

1. Defect in civil design – early stage;
2. Defect in architecture design – narrow stair, finishes material incompatible with climate;
3. Design defect in maintenance practicality and adequacy – improper planning;
4. Defect due to consultant lack of QA/QC;
5. Defect during constructions – lack of specification;
6. Defect due to construction drawing lack of reference

10 commons moisture problem in buildings – WHO (2009)

1. Rainwater or ground water leaking into the enclosure (roof, wall, window)
2. Plumbing leaks and spill;
3. Water wicking from capillary suction through porous building material;
4. Rainwater, condensation or plumbing water
5. Infiltration of warm or moist outside air through cracks, holes during warm weather;

Commons moisture problem in buildings – WHO (2009)

6. Exfiltration of warm or moist indoor air through cracks and holds during cold weather;
7. Insufficient dehumidification by heating, ventilating and air-condition;
8. Poor condensate drainage due to heating, ventilation and air-condition system deficiency;
9. Enclosure of wet material in building during construction.

- In Malaysia, the problem of leakage at buildings are due to tropical condition, improper design and poor workmanship;
- Normally workmanship problems are due to faulty of contractors;

(Ahzahar et al., 2011)

A Case Study on Moisture Problems and Building Defects – Hos Sultanah Bahiyah

- Most of the building defects are due to moisture problems - Leakages; water seepage; condensation and stagnant water;
- Causes:
  1. Environment – rainwater, wind and temperature;
  2. Poor workmanship – poor waterproofing quality; poor construction quality;
  3. Improper design which failure to consider impact of environmental factors;
  4. Ventilation factors due to exhaust fan ducting and air-conditioning system;

A Case Study on Moisture Problems and Building Defects

- Most of the building defects due to moisture issues
- Wall:
  - Fungus and algae infected due to continuous dampness of the wall, dirt collection on wall and natural causes.
  - Temp inside and outside the room is huge different causes sweating of wall due to condensation process.
- Roof:
  - Moisture problem due to water seepage and related to improper waterproofing installation.

Way Forward

"Deeper Knowledge – Better Design"

(John Weeks)

Way Forward

1. Project Initiation Stage;
   - Special budget for 'Initial Stage' – Value Assessment (site, scope and cost)
2. Project Implementation Stage – Value Engineering
3. Design Stage:
   - Flexibility in Design – enable to adapt for future expansion and change of function;

Way Forward

Design Stage

- People factors in design
  - Patient – care and cure;
  - Staff – deserve the best working environment;
  - Family – sympathetic environment & access to information;
  - HC Providers – design solution max value

Way Forward

Design Stage / Implementation Stage

- "Patient Centred Care" – patient is the focal heart of hospital design;
- "Design to Cost" vs "Costing the Design"
- "Sustainable design" & "Safety design"
- Room Data Interaction – standard design for common room eg CE, treatment, procedure room etc

Way Forward

Construction Stage /handing over /DLP

- Close monitoring to standard / QA / QC

Conclusion

1. Competence core team – KKM, JKR, Consultant and Contractor
2. Good coordination from beginning;
3. Good communication line;
4. Effective Risk management skill and knowledge

Acknowledgement

- 1. Datuk Dr. Rohaizat Yon
- 2. Dr. Engku Narzini (Mantan Pengarah Hospital Jeli) – interviewee 1
- 3. Dr Norzilawati (Pengarah H Jeli) – Interviewee 2
- 4. Mr. Maran (KPSU Bhg Pembangunan) – Interviewee 3
- 5. Pn Noraini (CKK) Interviewee 4
- 6. Dr. Siti Noraidah Jamal - outline presentation

References

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2. Sadi Assaf, Member, ASCE, Abdul-Mohsen Al-Hammad, and Mansoor Al-Shihah (1996), *Effects of Faulty Design and construction on Building Maintenance,* Journal of Performance of Constructed Facilities.
3. Llewelyn Davies, Healthcare (2014)
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THANK - YOU