

Holistic Approach to Healthcare Asset Management



Ir. Al-Khairi Mohd Daud

Ir. Al-Khairi Mohd Daud,
Chief Consultant, Faqeh
Management/Institution of
Engineers, Malaysia.

Healthcare facilities such as hospitals, rehabilitation centres and clinics are called “living buildings” because these are constantly undergoing changes due to changes in service needs, technological requirements and increase in patient loads. When a hospital is being built, considerations as to suitability of location, risks and future needs must be factored in to allow future expansion plans or refurbishments.

The key to extending the life of healthcare facilities is good operation and maintenance practice. There are many healthcare facilities which are in poor conditions and this will compromise the safety of patients and staff. Instead of being a place of healing and recuperation, the hospital will be a source of medical errors and hazards. Here, we will discuss the interaction between facilities development, operations and maintenance practices in the holistic concept of asset management.

INTRODUCTION

Healthcare facilities include hospital, rehabilitation centres and clinic. By definition, a hospital is a health care institution providing health treatment with specialised staff and equipment. Unlike other commercial building and facilities, a hospital building is most complex, due to many services and infrastructure requirements. These complexities come from the different requirements needed to serve the clinical service delivery while ensuring patients’ health, safety and wellbeing.

A hospital can be classified into the following categories:

General	Huge complex and multidisciplinary with specialisation and referral centre for the state.
District	Multidisciplinary with some specialties. Referral from sub-district hospitals.
Specialised	Dedicated to a particular disease or sickness such as cancer, heart or psychiatric problems.
Teaching	Facilities provide teaching for healthcare professionals and clinical services for patients.
Clinic	An outpatient consultation place for new patients and follow-up services.

For a hospital to function properly, the following services must be available:

Core services: Trauma and Emergency Department, Imaging and Radiology Department, Operation Theatres and Critical Care Services, Surgical and Medical Wards, Specialist service e.g. Oncology, Dialysis, Dental etc.

Clinical support: Pathology, bio-laboratories, pharmacy, nuclear physics medicine, rehabilitation services, social and counselling, food and dietetic.

Non-clinical Support: Consumables stores, kitchen and cafeteria, biomedical and engineering (utilities plant rooms), housekeeping, linen and laundry, retail outlets, grounds and car park etc.

The challenge in designing a hospital is to ensure that patient flow and staff delivery services process are located at the most optimum positions. The workflow design and utilities requirement such as HVAC and electrical systems must also meet healthcare standards.

Beyond the need for basic facilities, healthcare installation will now promote a healing hospital concept so that patients feel comfortable as this will promote faster recovery. The new hospital design places greater emphasis on requirements for disabled persons, lively colour wall and a facade that promotes therapy, fresh air, water features in term of greenery, energy efficiency and environment friendly. The other critical aspect is the privacy and security of the staff and the patients when the latter undergo treatment in the hospital.

In planning the location for a hospital, things to consider are that it should be safe from natural disasters such as floods and that the environment is healthy. The size and services will depend on the demographic of the population

it serves as well as the type of sickness that occurs in the area of coverage. Due to the complex utilities requirements, hospitals are rarely demolished or relocated, so most expansion plans will be made within the existing area. It is thus very important for the hospital management to have a strategic long-term development plan so that patient flow and clinical services can match the requirements of the patients while minimising the cost of operation and maintenance as needs grow.

HOSPITAL FACILITIES: MAINTENANCE MANAGEMENT

Before a hospital can operate, there are many rules and regulations that need to be complied with. Some of these are:

- Act 586: Private Healthcare Facilities and Services Act 1998
- Act 737: Medical Device Acts 2012
- Act 615: Mental Health Act 2001
- Act 341: Fire Service Acts 1988

When it's up and running, operations have to meet the hospital quality standard in the certification survey. The main thrust of the accreditation is to ensure patient and staff safety. In Malaysia, the two main accreditation bodies are Malaysian Society for Quality in Healthcare (MSQH) and Joint Commissioning International (JCI).

Other accreditation requirements have also been adopted, such as HACCP and GMP for food and pharmaceutical preparation and, more recently, the adoption of Asset Management Standard under PAS55:2008/ISO55000 standard and Energy Management Gold Standard (EMGS)/ ISO50000.

ASSET LIFE-CYCLE ISSUE

Hospital equipment and facilities are constantly changing, due to expansion of services, new equipment and technology, new standards, rules and regulations and obsolete equipment that needs to be upgraded. Though it is easy to replace mobile equipment, advanced imaging equipment such as MRI, CT scan or Tomotherapy machines, requires properly designed technical room and support utilities.

Most hospitals in the country are headed either by a doctor or an accountant. While the doctor is better at understanding service requirements and the accountant fully understands financial requirements, there is also a need to ensure the sustainability of hospital assets. Few hospitals, however, have a professional engineer specialising in health care operations and who can assist the hospital to match facilities requirements with services requirements and ultimately meeting the financial requirement. Hospitals usually only engage a consulting architect and engineer to look at the development in isolation rather than come up with a long-term strategic master plan for hospital development.

A typical life-cycle for an asset is depicted in Figure 1. It is important to note that the decision during asset creation (conceptual design and installation) will have a significant impact on the cost of operation and maintenance of equipment.



Figure 1

Accountants normally focus on capital expenditure requirements for acquiring assets. They are more interested in the financial return for the year. So it is the duty of an engineer to guide the accountant on the operating cost so that the overall cost of owning the asset can be ascertained. A typical total cost of ownership pattern is shown in Figure 2. The hospital management may be persuaded into acquiring cheaper equipment but in the end, has to pay for expensive repairs and maintenance services. If the hospital does not practise good maintenance regimes, then the equipment will fail to work, resulting in an interruption of services and costlier equipment replacement.

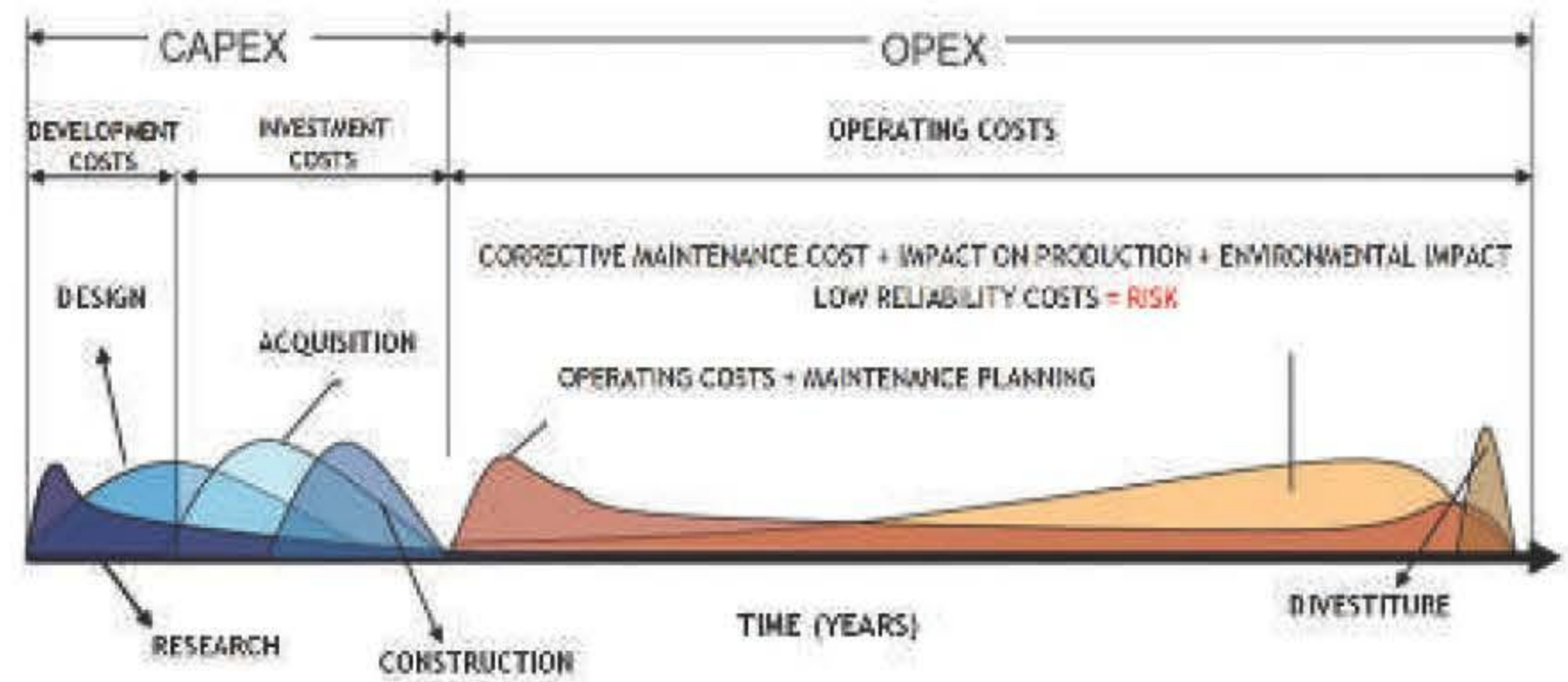


Figure 2

ASSET MANAGEMENT STRATEGY

Thus it is important that the hospital adopts a long-term strategy for asset management to avoid service interruptions or even worse, place the patients’ safety and health in jeopardy.

The asset management framework for a hospital can be summarised using the graphical representation below:



Figure 3

A) MANAGEMENT SUPPORT

Instead of focusing on short-term issues and challenges, the hospital management must understand the importance of and support proper asset management for long-term benefits.

There must be an asset management policy that dictates asset acquisition, development, construction, operation and maintenance and disposal requirements. The policy has to outline the acceptable functional life-cycle for assets instead of depending on the depreciation method as per book value.

To implement the policy, there has to be a hospital management committee involving engineers as the drivers and the end users as the recipient of the asset.

B) ASSET AND MAINTENANCE MANAGEMENT STRATEGY

The Asset Management strategy and maintenance management strategy

must work together to cover the whole asset life-cycle requirements. The hospital has to closely monitor assets and conditions so that the assets meet service requirements. To simplify the process, we have adopted the quality concept of plan, do, check and act.

Asset Management

Stage	Activity	Deliverables
Plan	Asset Management Strategy	Asset Management policy, strategy and plan, Asset development committee
	Asset Needs Assessment	Asset management change procedures Contractual strategy
Do	Asset Development	Design and evaluation of total life costing, value engineering, Risk identification
	Asset Deployment	Construction and T&C procedures, Training and acceptance
Check	Asset Register	Asset register, AS BUILT drawings and O&M manuals
	Risk Management	Matching and hand over the operation and maintenance requirements, Consolidating asset listing
Act	Performance Review	Performance indicators, identify new needs
	Review long term Asset Strategy	Review the asset strategy

Maintenance Management

Stage	Activity	Deliverables
Plan	O&M Management Strategy	Operation and Maintenance policy, procedures, work instruction and checklist, Maintenance resource strategy
	Maintenance Planning	Condition Monitoring, Predictive/preventive maintenance, consumables and contractor management
Do	Maintenance Schedule	Permit to Work, JSA, FMEA
	Perform Maintenance	Work request/order/history
Check	Asset Performance	Equipment efficiency, availability, OEE
	Service Performance	Contractor performance, staff productivity
Act	Analyse Performance	RCA, Equipment health assessment, KPIs
	Adopt New Maintenance Strategy	BER, replacement, upgrading, rationalization of equipment and maintenance

Every time an asset is being developed or procured, there should be a consensus and input on how it will operate and be maintained. Without this understanding, the asset may not serve its purpose accordingly.

HEALTHCARE FACILITIES: MAINTENANCE CHALLENGES

There are many challenges in hospital maintenance. Listed here are some of the issues and the solutions.

Issues	Solutions
1. Lack of understanding in asset and maintenance management standard. The challenge is to meet the equipment and service requirements.	Team work approach in development plan where health care specialist professional engineers lead the team.
2. Short-term development plan and lack of continuous improvement initiatives.	Asset management policy, strategy, plan and procedures to ensure long-term asset planning is available. Regular performance review. Continuous improvement based on performance.
3. Maintaining ageing facilities and trying to match the current standard and legislation.	Develop a strategic plan to maintain, upgrade, replace or demolish asset and facilities. Enforcing the healthcare facilities standard for new asset.
4. Rapid change in technology and matching skills requirements.	Ensure there are trained professional engineers managing the facilities. Continuous professional development training for the maintenance team. Ensure there's technology transfer between equipment vendors and staff.

HEALTH CARE FACILITIES: WAY FORWARD

The hospital management has to adopt a long-term strategic plan for its assets to ensure that facilities meet service requirements and can be upgraded as required. With any asset acquisition, it must consider operation and maintenance requirements instead of just capital expenditure.

For this to happen, there has to be a Development Team comprising the asset owner, user and maintenance team. With constant changes in technology, the skill and competency of facilities engineers must also be continuously updated. Only with such understanding and skills can the maintenance strategy match equipment condition and performance. This way, the organisation will benefit from uninterrupted service while ensuring the health, safety and a pleasant environment for patients. ■