FACILITIES MANAGEMENT INITIATIVES AND EMPOWERMENT FOR CONSTRUCTION INDUSTRY IN MALAYSIA



Zuhairi Abd. Hamid Syahrul Nizam Kamaruzzaman Mohd Khairolden Ghani Ihfasuziella Ibrahim



# FACILITIES MANAGEMENT INITIATIVES AND EMPOWERMENT FOR CONSTRUCTION INDUSTRY IN MALAYSIA



# Copyright

Published in 2021 by CONSTRUCTION INDUSTRY DEVELOPMENT BOARD MALAYSIA (CIDB) 10<sup>th</sup> Floor, Menara Dato' Onn, World Trade Centre, No. 45, Jalan Tun Ismail, 50480 Kuala Lumpur, MALAYSIA

Copyright © 2021 by Construction Industry Development Board Malaysia (CIDB) ISBN 978-9672-971-11-5

All Rights Reserved. No part of this book may be reproduced, stored and transmitted in any form, or by any means without prior written permission from CIDB Malaysia

# FOREWORD

When the COVID-19 pandemic struck the world in 2020, it changed the way we work, live and play. For construction industry, the entire supply chain has had to adapt to the new realities of the pandemic. Business focus and construction practices has to be relooked. This is where we believe this will be able to make a difference.

Facilities Management (FM) had over the years sat at the background of the more visible and often highlighted activity of construction. The general public do not have much information of it and many construction industry players had not given it much thought. Nonetheless, FM plays a significant role and involves significant processes within the construction value chain. The Ministry of Works have rightfully included the development of Facilities Management (FM) as among the focus areas in the National Construction Policy (NPC) document.

Thus the publication of this book as a comprehensive guide on facilities management in Malaysia, is indeed very timely. It covers the current scenario of FM in Malaysia, the challenges surrounding it and the way forward for FM practices.

It is our sincere hope that many construction industry players will benefit from this publication.

Thank you.

#### DATUK IR. AHMAD 'ASRI ABDUL HAMID

Chief Executive Construction Industry Development Board (CIDB) January 2021

# PREFACE

Starting from 2020, we should adopt new norm in our life especially for construction industry since pandemic COVID-19 strikes our country. Since then, the construction industry has changed tremendously. Industry players need to embrace the technology as an option for daily life. The whole construction supply chain must adapt to the repercussions of pandemic including facilities management (FM). FM has contributed a lot to Gross Domestic Product (GDP) of the economy. During this trying time, FM is set to be a tougher job for FM managers and personnel to handle building maintenance and daily operation of the premises. Many construction companies lost their jobs, workers are retrenched and uncertain prospects. Industry should be innovative in creating jobs through diversification of business.

Most public and industry players did not understand FM explicitly. Not many reference books on FM published in Malaysia particularly for the construction industry. Therefore, the publication of this book is timely to address the needs of FM to society. CIDB has foresee FM will become a green field for the construction industry to be ventured off by players since COVID-19. One of the good prospects is that the FM industry deals with managing building and its daily operation. Opportunities for industry players to explore emerging technologies and digitalisation in FM as explained in this book is lauded.

*CIDB Strategic Plan (CSP) 2021-2025* has put forward the need for a mindset change to make it more socially and environmentally conscious in construction. This book is indeed a good book reflecting the whole basic knowledge on FM especially for graduate students, industry players and society at large. I would like to thank and congratulate the Construction Research Institute of Malaysia (CREAM) for making this book happen. It will reflect the enrichment of knowledge by researchers and industry togetherness.

Thank you,

# **TABLE OF CONTENT**

# CHAPTER 1: DEVELOPMENT OF FACILITIES MANAGEMENT IN MALAYSIAN CONSTRUCTION INDUSTRY

| 1.1<br>1.2<br>1.3 | DEFII<br>Role<br>Curi                              | NITION OF FACILITIES MANAGEMENT<br>S AND FUNCTION OF FACILITIES MANAGEMENT<br>RENT POLICY AND REGULATIONS FACILITIES MANAGEMENT IN MALAYSIA | 01<br>02<br>04 |  |
|-------------------|--|---|----------------|--|
|                   | 1.3.1  | ISO 41001: The World's First International Facilities Management System (FMS)   |                |  |
|                   |  | Standard  | 05             |  |
|                   | 1.3.2  | Scope of Facilities Management System (FMS) and Certification to Standard   | 07             |  |
|                   | 1.3.3  | Malaysian Total Asset Management Manual (TAMM)  | 08             |  |
|                   | 1.3.4  | Malaysian Total Asset Management Policy   | 10             |  |
|                   | 1.3.5  | Relevance of the Government Asset Management Approach   | 11             |  |
|                   | 1.3.6  | Total Asset Management Implementation Strategy  | 12             |  |
|                   | 1.3.7  | Existing Act & by-Law, Regulation and Guidelines  | 16             |  |
|                   | 1.3.8  | Compliance with Laws and Acts   | 18             |  |
| 1.4               | THE  | MPORTANCE OF FACILITIES MANAGEMENT  | 18             |  |
|                   | 1.4.1  | Sustainable Environment and Function Facilities   | 18             |  |
|                   | 1.4.2  | Promote Business Growth   | 19             |  |
|                   | 1.4.3  | Human Capital Development   | 19             |  |
| 1.5               | FACI   | LITIES MANAGEMENT INITIATIVES MILESTONES IN MALAYSIA  | 20             |  |
| СНА               | PTER   | 2: GAP, OVERLAPPING AND CHALLENGES OF FACILITIES  |                |  |
| MA                | NAGE   | MENT IN MALAYSIAN CONSTRUCTION INDUSTRY   | 22             |  |
| 2.1               | INTR   | ODUCTION  | 22             |  |
| 2.2               | ESSE   | NTIAL COMPONENT RELATED TO ASSET AND FACILITIES MANAGEMENT  |                |  |
|                   | SERV   | 'ICES   | 23             |  |
|                   | 2.2.1  | Serious Consideration for Facilities Management   | 23             |  |
|                   | 2.2.2  | Institutionalisation of the Practice  | 23             |  |
|                   | 2.2.3  | Capacity Building   | 23             |  |
|                   | 2.2.4  | Treatment within the Lifecycle of Assets  | 24             |  |
| 2.3               | CHAL   | LENGES FACED BY FACILITIES MANAGER IN ORGANISATION  | 25             |  |
| 2.4               | KEY ISSUES OF FACILITIES MANAGEMENT IN MALAYSIA    |   |                |  |
| 2.5               | RESOLUTION INNITIATIVE FOR FACILITIES MANAGEMENT 3 |   |                |  |

01

# CHAPTER 3: CIDB INITIATIVE ON ASSET AND FACILITIES MANAGEMENT

01

| 3.1   | FACI                               | FACILITIES MANAGEMENT PROGRAM FOR MALAYSIAN CONSTRUCTION |  |    |  |  |  |
|---|------------------------------------|--|--|----|--|--|--|
|   |                                    |  |  |    |  |  |  |
|   | 3.1.1                              | .1.1 CIDB Strategic Plan (CSP) 2021 – 2025               |  |    |  |  |  |
|   | 3.1.2                              | .2 National Construction Policy (NCP) 2030               |  |    |  |  |  |
|   | 3.1.3                              | Construe   | ction Industry Transformation Programme (CITP) 2016 – 2020       | 01 |  |  |  |
|   |                                    | 3.1.3.1  | Quality, Satety and Professionalism in Facilities Management     | 01 |  |  |  |
|   |                                    | 3.1.3.2  | Sustainability in Facilities Management                          | 01 |  |  |  |
|   |                                    | 3.1.3.3  | Up-Skilling the Local Workforce in Facilities Management         | 01 |  |  |  |
|   |                                    | 3.1.3.4  | Technologies Adoption in Facilities Management                   | 01 |  |  |  |
|   | 3.1.4                              | Construe   | ction Industry Master Plan (CIMP) 2005 – 2015                    | 01 |  |  |  |
|   |                                    | 3.1.4.1  | CIMP Roadmap of Framework and Plan Implementation                | 01 |  |  |  |
| 3.2   | TRAII                              |  | COMPETENCY PROGRAMME   | 02 |  |  |  |
|   | 3.2.1                              | Certified  | Facilities Management Executive (FME) and Facilities Management  |    |  |  |  |
|   |                                    | Manage   | r (FMM)  | 01 |  |  |  |
|   | 3.2.2                              | Building   | Information Modelling Facilities Management (BIMFM)              | 01 |  |  |  |
| 3.3   | FACILITIES MANAGEMENT FOR BUILDERS |  |  |    |  |  |  |
|   | 3.31                               | Definitio  | n of Construction Work According To Act 520 (Amendment 2011)     | 01 |  |  |  |
|   | 3.3.2                              | Categori   | es and Specialisation of Facilities Contractors                  | 01 |  |  |  |
|   | 3.3.3                              | Code an  | d Facilities Specialisation                                      | 01 |  |  |  |
| 3.3.4 General Requirement Facilities Contractors Registration |                                    |  |  |    |  |  |  |
| СНА   | PTER                               | 4: CRE   | AM RESEARCH INITIATIVES ON FACILITIES                            |    |  |  |  |
| MAN   | IAGEI                              | MENT   |  | 01 |  |  |  |
| 4.1   | INTR                               | ODUCTIO  | N  | 02 |  |  |  |
| 4.2   | MEAS                               |  | PERFORMANCE MEASUREMENT IN FACILITIES MANAGEMENT                 | 02 |  |  |  |
|   | 4.2.1                              | Definitio  | n Of Performance Measurement                                     | 01 |  |  |  |
|   | 4.2.2                              | Perform  | ance Measurement Tools   | 01 |  |  |  |
|   |                                    | 4.2.2.1  | Key Performance Indicators (KPIs)                                | 01 |  |  |  |
|   |                                    | 4222   | Performance Appraisal  | 01 |  |  |  |
|   |                                    | 4221   | Mission and Vision Statements                                    | 01 |  |  |  |
|   |                                    | 4.2.2.1  | Management Dashboards  | 01 |  |  |  |
|   |                                    | 4221   | Lean Management and Six Sigma                                    | 01 |  |  |  |
|   | 423                                | Advanta  | des and Disadvantages of Measuring Performance Management Tools/ | 01 |  |  |  |
|   | Instrument                         |  |  | 01 |  |  |  |
|   |                                    |  |  |    |  |  |  |

|     | 4.2.4 | Issues and Key Challenges of Performance Management                          | 01 |
|-----|-------|--|----|
|     | 4.2.5 | The Importance of Performance Management in Facilities Management            | 01 |
|     |       |  |    |
| 4.3 | HUM   | AN CAPACITY BUILDING   | 02 |
|     | 4.3.1 | Introduction   | 01 |
|     | 4.3.2 | Human Capacity Building For Malaysian Facilities Management                  | 01 |
|     | 4.3.3 | Cooperation and Collaboration in Human Capacity Building                     | 01 |
|     |       | 4.3.3.1 Formulating A Plan For The Identification And Delivery Of HCB and    |    |
|     |       | Legal Frameworks in Malaysia   | 01 |
|     | 4.3.4 | Strategic Approach to Training Needs for Facilities Management in Malaysia   | 01 |
| 4.4 | SUPP  | LY CHAIN MANAGEMENT  | 03 |
|     | 4.4.1 | Introduction   | 01 |
|     | 4.4.2 | Facilities Management Supply Chain   | 01 |
|     | 4.4.3 | Supply Chain Component   | 01 |
|     | 4.4.4 | Supply Chain Risks   | 01 |
|     | 4.4.5 | Role of Facilities Management in Supply Chain Management                     | 01 |
| 4.5 | LEVER | AGING ICT IN FACILITY MANAGEMENT   | 02 |
|     | 4.5.1 | Introduction   | 01 |
|     | 4.5.2 | Strategy, Policy And Procedures For The Development Of Ict In Facilities     |    |
|     |       | Management In Malaysia   | 01 |
|     | 4.5.3 | The Type of ICT Applications Used for Facilities Management Organisation     | 01 |
|     | 4.5.4 | The Level of Maturity In the ICT Utilisation In Facilities Management        | 01 |
|     | 4.5.5 | Framework on Strategic Approach for ICT Utilisation in Facilities Management | 01 |
| СН  | APTER | 5: STRATEGIC FACILITIES MANAGEMENT FOR MALAYSIAN                             |    |
| HE/ | ALTHC | ARE SECTOR   | 02 |
| 5.1 | INTR  | ODUCTION   | 02 |
| 5.2 | FACI  | LITIES MANAGEMENT IN THE MALAYSIAN HEALTHCARE PERSPECTIVE                    | 02 |
| 5.3 | FUNC  | TION OF FACILITIES MANAGEMENT IN HEALTHCARE                                  | 02 |
|     | 5.3.1 | Project Life-cycle Approach for Hospital                                     | 01 |
|     | 5.3.2 | Plan and Design of Hospital  | 01 |
|     | 5.3.3 | Construction of Hospital   | 01 |
|     | 5.3.4 | Operation and Maintenance of Hospital Facilities                             | 01 |
|     | 5.3.5 | Transfer of Hospital Back to Owner/Client                                    | 01 |

| 5.4  | HOSP  | ITAL PERFORMANCE MANAGEMENT IN MALAYSIA  | 02 |  |  |
|------|-------|--|----|--|--|
|      | 5.4.1 | Criteria in Performance Management   | 01 |  |  |
|      | 5.4.2 | Facilities Management as a Strategic Function in Hospital                        | 01 |  |  |
| 5.5  | STRA  | TEGIC INFORMATION TECHNOLOGY IN HEALTHCARE                                       | 02 |  |  |
|      | 5.5.1 | Total Hospital Information System (THIS) in Malaysia                             | 01 |  |  |
|      | 5.5.2 | Strategic Application IT in Facilities Management to the Malaysian Health Sector | 01 |  |  |
|      | 5.5.3 | Relevance of Strategic Information Technology in Facilities Management           | 01 |  |  |
| CHAI | PTER  | 6: ASPIRATION & WAY FORWARD  | 02 |  |  |
| 6.1  | INDUS | STRY READINESS IN MALAYSIAN FACILITIES MANAGEMENT                                | 12 |  |  |
| 6.2  | FACIL | ITIES MANAGEMENT GROWTH  | 21 |  |  |
| 6.3  | THE R | OLES OF STAKEHOLDERS   | 33 |  |  |
| 6.4  | THE W | AY FORWARD OF FACILITIES MANAGEMENT IN MALAYSIAN                                 |    |  |  |
|      | CONS  | TRUCTION INDUSTRY  | 13 |  |  |
| BIBL | IOGR  | APHY   | 02 |  |  |
| INDE | INDEX |  |    |  |  |
|      |       |  | -  |  |  |

# **LIST OF ABBREVIATIONS**

| AFM   | Asset and Facility Management                              |
|-------|--|
| ASL   | Agreed Service Levels                                      |
| BEM   | Board of Engineers Malaysia                                |
| BIFM  | British Institute of Facilities Management                 |
| BIFM  | Building Information Modelling Facilities Management       |
| BIM   | Building Information Modeling                              |
| BMLT  | Build, Maintain, Lease and Transfer                        |
| BMS   | Building Management System                                 |
| BPR   | Business Process Re-engineering                            |
| BSI   | British Standard Institution                               |
| CAFM  | Computer Aided Facilities Management                       |
| CAMIS | Capital Asset Management Information System                |
| CBIFM | Certified British Institute of Facilities Management       |
| CCD   | Continuous Contractor Development                          |
| CFM   | Certified Facilities Manager                               |
| CHFM  | Certified Healthcare Facility Manager                      |
| CIDB  | Construction Industry Development Board                    |
| CIMP  | Construction Industry Master Plan 2005 - 2015              |
| CIPD  | Chartered Institute of Personnel and Development           |
| CITP  | Construction Industry Transformation Programme 2016 - 2020 |
| CMMS  | Computerised Maintenance and Management System             |
| COP   | Communities of Practice                                    |
| CREAM | Construction Research Institute of Malaysia                |
| CSF   | Critical Success Factor                                    |
| CSP   | CIDB Strategic Plan 2021 - 2025                            |
| DBOT  | Design, Build, Operate and Transfer                        |
| DCP   | Dealing with Construction Permit                           |
| DPAK  | Government Asset Management Policy                         |
| EPU   | Economic Planning Unit                                     |
| FM    | Facilities Management                                      |
| FME   | Facility Management Executive                              |

| FMM     | Facility Management Managers  |
|---------|---|
| FMS     | Facilities Management System  |
| GDP     | Gross Domestic Product  |
| HCB     | Human Capacity Building   |
| HIRARC  | Hazard Identification, Risk Assessment and Risk Control             |
| HLS     | High Level Structure  |
| HRM     | Human Resource Management   |
| HSS     | Hospital Support Service  |
| HVAC    | Heating, ventilation, and air conditioning                          |
| IAPG    | Inter Agency Planning Group   |
| IBS     | Industrialised Building System                                      |
| ICT     | Information Communication Technology                                |
| IEM     | Institution of Engineers Malaysia                                   |
| IFMA    | International Facility Management Association                       |
| IoT     | Internet of Things  |
| IR 4.0  | the Fourth Industrial Revolution                                    |
| ISO     | International Organisation for Standardisation                      |
| JKR     | Public Works Department   |
| JPAK    | Government Asset Management Committee                               |
| KONSPAK | Asset Management Strategic Convention                               |
| KPI     | Key Performance Indicator   |
| KSF     | Key Success Factor  |
| LHP     | Lifetime Health Plan (LHP)  |
| LHR     | Lifetime Health Record  |
| MAFM    | Malaysian Association of Facility Management                        |
| MAMPU   | Malaysian Administrative Modernisation and Management Planning Unit |
| MAPMA   | Malaysian Asset and Project Management Association                  |
| MEP     | Manufacturing Extension Partnership                                 |
| MIS     | Management Information System                                       |
| MTDC    | Malaysia Technology Development Corporation                         |
| MyCESMM | Malaysia Civil Engineering Standard Method of Measurement           |
| MySPATA | Immovable Asset Management System Application                       |
| NAFAM   | National Asset and Facility Management Convention                   |

| NCP     | National Construction Policy 2030                    |
|---------|--|
| NHS     | National Health Service                              |
| NOSS    | National Occupational Skill Standard                 |
| NPV     | Net Present Value                                    |
| PDCA    | Plan-Do-Check-Act                                    |
| PFI     | Private Finance Initiative                           |
| PICC    | Putrajaya International Convention Centre            |
| PMM     | Performance Measurement and Management               |
| PPP     | Public Private Partnership                           |
| PSPAI   | Infrastructure Asset Management Strategic Convention |
| PWD     | Public Works Department                              |
| QLASSIC | Quality Assessment System in Construction            |
| R&D     | Research and Development                             |
| ROI     | Returns on Investments                               |
| ROS     | Registration of Societies Malaysia                   |
| SCM     | Supply Chain Management                              |
| SKK     | Skills Certificate of Competence                     |
| SKM     | Cooperative Commission of Malaysia                   |
| SKP     | Certificate of Management Competence                 |
| SSM     | Companies Commission of Malaysia                     |
| TAM     | Total Asset Management                               |
| TAMM    | Total Asset Management Manual                        |
| THIS    | Total Hospital Information System                    |
| TPS     | Toyota Production System                             |
| TQM     | Total Quality Management                             |
| TWG     | Technical Working Group                              |
| UiTM    | Universiti Teknologi MARA                            |
| UTM     | Universiti Teknologi Malaysia                        |
| WLC     | Whole Life Cost                                      |

# INTRODUCTION

This book provides useful insight into the definition, journey, gap and challenges and initiatives of Facilities Management (FM) in construction industry. It will present the scenario of FM from government and industry perspectives. It includes the latest and up to date the implementation planning and policy towards empowerment FM in construction industry.

This book is designed for tertiary students and post graduate and also for industry players as a reference to have a general understanding of FM. This book contains a compendium of theses, technical reports, articles, and conference proceedings and features special topic on strategic FM for healthcare sectors.

We hope that the book would be a useful guide for all readers to understand the importance and the future direction of FM in construction industry.

Thank you,

Zuhairi Abd. Hamid Syahrul Nizam Kamaruzzaman Mohd Khairolden Ghani Ihfasuziella Ibrahim

January 2021

# **CHAPTER 1: DEVELOPMENT OF FACILITIES MANAGEMENT IN MALAYSIAN CONSTRUCTION INDUSTRY**

# 1.1 DEFINITION OF FACILITIES MANAGEMENT

Facilities Management (FM) has been one of the growing industries for over a decade. The management of facilities as addressed has become a multidisciplinary topic. Countries such as Singapore, Hong Kong, and most other countries in Asia follow the same definition adopted by the International Facility Management Association (IFMA). The following are some of the meanings for FM.

"FM is a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology".
IFMA (2011)
"FM is an integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities".
(BIFM) (2010)
"The FM association has strong relationships with the association's fundamental operations and it is not just routine maintenance of work facilities and business properties".
(Jensen, 2011)

FM is also responsible for reconciling demand and supply elements of the company with time. In other words, FM can incorporate knowledge of both facilities and management to work efficiently. Successful FM contributes to places of work that better help productive processes while adding value and reducing costs. The value of the FM in Malaysia is to ensure the sustainability of the sector, develop and maintain social and economic infrastructure through the Strategic Thrust 7 of the Construction Industry Master Plan (CIMP 2006-2015). The management of physical and non-physical facilities and unpredictable

business needs may be defined by FM. The organization priorities are expected of all professionals practicing management.

Professional practice involves work performed by architects, landscape architects, interior designers, structural engineers, building supervision, assessment, quantity surveys, etc., and the management and functions of the buildings. In addition, FM involves consulting consultants, construction conservation, building repair, construction cleaning, safety, parking, electricity, telephone, fire removal, air conditioning, lifts, landscape and other facilities. But the spectrum of FM operations is not yet well established. Due to their own understanding, many dominant FM divisions such as land management, building maintenance and asset management are defining FM. The FM uses different approaches and has distinctive goals in - region. There are broad divergences in views and opinions on the FM conception in different countries.

## **1.2 ROLES AND FUNCTIONS OF FACILITIES MANAGEMENT**

In an organisation, FM plays a major role in maintaining a stable and safe work environment for employees. Comfortable work facilities help maximise and inspire employee productivity and job satisfaction. On the other hand, bad workplaces will frustrate work, reduce productivity and even cause them too ill. In addition, the office reflects the picture of an organisation visually, and is used by most organisations to attract and retain employees and customers.

The IFMA, which involves the cooperation of people, locations, procedures and technologies, is an interdisciplinary discipline. FM can find management solutions by putting itself at the crossroads of these variables. As shown in Figure 1.1 below, the four variables are interdependent and are directly interdependent. The location of FM at the core implies enhanced collaboration, among the main factors for any organisation.



Figure 1.1: The International Facility Management Association (IFMA) Model

Facilities managers are expected to be qualified and to have learned a broad range of management and leadership skills. In addition, FM can incorporate both facilities and management skills to function effectively. Each organisation depends on a combination of functions and services to provide critical support for its core operations. The field of facilities management is responsible for ensuring the correct type, quality and cost of this assistance. This help can be given.

FM is also the multidisciplinary work that encompasses a wide variety of practices, roles and skills. Figure 1.2 below illustrates the requirements for FM and the relationship of all interrelated functions. The current scope is summed up to illustrate that FM is acting as an intermediary and combining agent on the demand and supply side of facilities in an enterprise.

| People  | Place   | Process   | Technology  |
|---|---|---|---|
| <ul> <li>Crucial to facilities<br/>management<br/>success</li> <li>Communication<br/>and interpersonal<br/>skills help facility<br/>managers work<br/>better with tenants</li> <li>FM systems help<br/>occupant efficiency <ul> <li>Supports the<br/>corporate<br/>strategy</li> <li>Supports<br/>"attract and<br/>retain"</li> </ul> </li> </ul> | <ul> <li>Second most<br/>expensive asset<br/>after humans</li> <li>Accountability: <ul> <li>On-site<br/>facilities - office<br/>buildings, plants<br/>and property</li> <li>Off-site,<br/>alternative<br/>workplaces</li> </ul> </li> </ul> | <ul> <li>Includes policies<br/>and procedures<br/>to guide occupant<br/>health and safety<br/>efforts</li> <li>Policies identify<br/>high-level<br/>areas requiring<br/>governance</li> <li>Procedures identify<br/>actions needed to<br/>meet policy and<br/>access facilities<br/>services</li> </ul> | <ul> <li>Hardware and<br/>software systems<br/>to organize, store<br/>and distribute<br/>information</li> <li>Use technologies to<br/>manage buildings<br/>and facilities<br/>organisations</li> <li>Integrated<br/>workplace<br/>management<br/>systems (IWMS)</li> <li>Computer-<br/>aided facility<br/>management<br/>(CAFM)</li> <li>Computerised<br/>maintenance<br/>management<br/>systems<br/>(CMMS)</li> <li>Building<br/>information<br/>modeling (BIM)</li> </ul> |

Figure 1.2: Criteria of Facilities Management Functions

# 1.3 CURRENT POLICY AND REGULATIONS FACILITIES MANAGEMENT IN MALAYSIA

To conduct business lawfully and in compliance with Malaysian laws and regulations, a company must register with legislative and authority bodies. To obtain registered licenses and business registration, FM Service Providers must register with different bodies and compliance agencies. Contractor managers should always have access to law such as updated acts, legislation, orders, regulations etc., through online systems, paper copies and so on. To register a company, businessmen in the field of FM must register and obtain a license registration with different bodies and compliance bodies.

Irrespective of operational requirements which determine the services results (output) of FM services, the FM organisation plan for design contains certain limiting external factors. It shall comply with the existing rules, legislation, acts and regulations. The variables will also be the new policy of the government that is directly or indirectly applicable to the industry. However, only the guide and based on local area are available guidelines and best practices.

## **1.3.1 ISO 41001: The World's First International Facilities Management System** (FMS) Standard

The International Standard for the Management of Facilities (FMS), ISO 41001:2018, was introduced in April 2018. This is the first FMS standard issued by the International Organisation for Standardisation (ISO). Previous guidelines for the management of facilities were issued by the British Standards Institute (BSI) in 2006. The standards for En 15221 were not replaced by ISO 41001, but they did use several elements of these standards and controlled them.

ISO 41001 offers a structural strategy that allows organizations to continually monitor their service delivery and assets to ensure efficient operations, to reduce excessive costs and to extract real value for their enterprise. Coherence is crucial to the rising demand for flexible FM services, and FM providers have started to increase global capability and increasing international usage. Meanwhile, ISO 41001 goals is to raise awareness and encourage successful facility management regimes to create, introduce and sustain all industries and business worldwide. It also raises the profile of FM as a profession and acknowledges its significance as part of the strategic path of the organisation.

The release of the standard was preceded by the release of a suite of supporting documents, released between April and July 2017 namely:

- ISO 41011:2017 Facility management Vocabulary
- ISO 41012:2017 Facility management Guidance on strategic sourcing and the development of agreements
- ISO/TR 41013:2017 Facility management Scope, key concepts and benefits

The FMS is, monetarily speaking, the second most costly of all organisations, with few exceptions, and can, where applicable, make a major contribution to the final stage, according to the International Organisation for Standardisation (ISO) (2016). The services offered must be in line with the corporate plan and goals, as FM progresses towards integrated facilities management. ISO 41001 is based on the ISO high level structure (HLS) for all management systems that provides a common framework. Performance and effectiveness can be improved if different management system principles are harmonised. Consequently, ISO 41001 is generally integrated in quality control, ISO 55001 and environmental management. Figure 1.3 below shows the Plan-Do-Check-Act cycle as part of ISO 41001:2018:



Figure 1.3: Plan-Do-Check-Act (PDCA) cycle as part of ISO 41001:2018

### 1.3.2 Scope of Facilities Management System (FMS) and Certification to Standard

Relating to the definition of FM outlined in ISO 41011, as shown in Figure 1.4, FM covers a wide range of areas.





ISO 41001 sets the criteria for reliable, strategic, tactical and practical FMS and FM activities to be developed and enforced. The norm also supports FM-outsourcing organisations. Those service providers who are willing to show compliance with the requirement are confident of their methodology and procedures. FM businesses that achieve standard certification will also ensure that consumers and future customers comply. This improves marketability and gives them the edge to compete with non-certified FM firms.

#### 1.3.3 Malaysian Total Asset Management Manual (TAMM)

The Government of Malaysia took a leap forward in maintaining and protecting public assets in 2009 with the introduction of the property management plan and manual. The government formed an Asset Management Committee to develop policy and guidelines for the management of assets for all government agencies.

The Total Asset Management Manual (TAMM), which focuses on the systematic management and holistic management of government assets, is one of the methods in government asset strategy to maximise asset value. It also outlines the terminology and methodologies of asset management applications for all public bodies.

However, this TAMM only extends to federal agencies and ministries. Governments, local authorities and regulatory bodies shall be subject to their individual ability and willingness to act. Despite the initiative being initiated in 2009, its implementation is only in the early stages. In general, the Government Asset Management's Structuring Documentation is divided into 4 stages, namely the legislation, manual, procedure and supporting document in Figure 1.5 below:-



Figure 1.5: Government Asset Management Documentation Structure (Source: General Circular No 1 Year 2009, Prime Minister Department, Malaysian Government) At present, TAMM on non-mobility properties is being enforced by the Government. Three (3) types of government non-moving properties are included, i.e., property, building and road, sewer, and drainage facilities. The incorporation of all central government departments into a single asset management system will be carried out. This framework for asset management is called an Immovable Asset Management System Application (MySPATA).

The system is developed by The Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) and the Public Works Department (JKR). The aim of MySPATA is the creation of a database that systematically, coordinately and freely manages and records detailed and accurate data on unmovable assets. The system is still being controlled by the government agencies and this registration system is currently reacted by all 24 ministries.

The Malaysian government property management documentation framework consists of four stages. Stage 1 paper clarifies the approach of government-wide asset management. It defines the path, concepts and execution of the asset management strategy to be implemented by Malaysian government agencies. In Stage 2, the document describes the definitions, procedures and responsibilities of the Government Asset Management Policy through the Total Asset Management Manual (TAMM), divided into five chapters, namely (1) Introduction, (2) Total Asset Management (TAM) Concepts and Principles, (3) Total Asset Management General Practice and Responsibility, (4) Total Asset Management Specific Practice and responsibility, and (5) Conclusion.

The TAM Operation Order in Stage 3 document follows the particular asset type. This illustrates the operating assets mechanism in line with TAMM procedures. Finally, the Stage 4 document supports the guidelines for processes supporting asset management procedures. Subject to the particular asset specifications, supporting documents are drawn up. These documents contain requirements, specifications, code of conduct and guidelines.

In accordance with the 2009 Total Asset Management Manual (TAMM), which includes movable assets, real estate (land, facility or building) as well as living assets and intellectual property, state assets have been defined as property owned or managed by government. The TAMM manual covers all government properties as stated above except for intellectual property.

In this manual, the Malaysian Government has committed itself to providing quality services to its people by providing assets properly managed:-

- i. Each agency is responsible for the government properties under its controls;
- ii. All government properties shall be dealt properly through asset management in systematic and strategic approaches; and
- iii. Each agency must implement the TAM approach in managing the government assets.

#### 1.3.4 Malaysian Total Asset Management Policy

Government Asset Management Policy (DPAK) outlines the path, principles and policies that must be adopted by all government agencies for the implementation of asset management. The Government places serious emphasis on asset management thanks to its massive investment in asset creation and provision. Systematic, systematic and coordinated asset management should be built in line with the policy on the continuous improvement of the public service delivery system.

The objectives of the Malaysia asset management policy include:



In Malaysia, reactive maintenance by ad hoc planning is the existing form of governmental maintenance without a formal routine maintenance approach. Reactive maintenance has many disadvantages, including a non-asset maintenance strategy, reducing the life span of properties, long-term uneconomic costs, slow repair, and the burden of growing agencies. The government has taken measures against this which not only include TAM, but not exclusively for maintenance management.

#### 1.3.5 Relevance of the Government Asset Management Approach

Since government agency programs are increasingly complex for most agencies located within government properties every day, support facilities like parking, security, landscaping and other facilities must be considered to ensure their service delivery. Furthermore, the government plans to develop facilities management that includes overall operations and maintenance management.

However, in view of sustainable development, the government has intended that the degree of productivity, security, health and the environment should be addressed by people outside facilities management. This incorporates TAMM as part of its implementation plan, the best asset management approach known as TAM. The relationship between maintenance management, plant management and TAM is shown in Figure 1.6 below:



Figure 1.6: Relevance of the Government Asset Management Approach (Source: Total Asset Management Manual (2009))

### 1.3.6 Total Asset Management Implementation Strategy

The policy implementation is based on the following strategy approach:

### 1. Governance

| Area       | Strategy                                   | Explanation  |
|------------|--|--|
| Governance | Clarify the Control<br>Officer's liability | <ul> <li>Follow the circulars.</li> <li>Ensure structural asset management<br/>mechanisms such as Asset Management<br/>Division and Asset Management Committee at<br/>agency level.</li> </ul> |
|            | Implementation of the Management Review    | Assessment and improvement of asset management at least once a year.   |

### 2. Systems and Processes

| Area                    | Strategy   | Explanation   |
|-------------------------|--|---|
| System and<br>Procedure | Identification of Assets                                 | • Each agency should identify assets under<br>its responsibilities and control according to<br>the asset classification to ensure proper and<br>effective implementation of asset management.                   |
|                         | Adopting the Total<br>Asset Management<br>(TAM) approach | <ul> <li>Each agency must emphasize TAM concepts,<br/>principles and practices based on the full<br/>interest in the performance of government<br/>asset life cycle management.</li> </ul>                      |
|                         |  | <ul> <li>Asset management procedures in force should<br/>fully comply with the planning, creation,<br/>acceptance, registration, use, inspection,<br/>maintenance, disposal and write-off of assets.</li> </ul> |
|                         | Measure the output of the asset services                 | <ul> <li>Use of measurement indicators such as Agreed<br/>Service Levels (ASL) or Key Performance<br/>Indicator (KPI)</li> </ul>  |
|                         | The Asset Management<br>Status Report                    | <ul> <li>Each agency provides a status report on asset<br/>management and is presented at the agency<br/>level to the Government Asset Management<br/>Committee.</li> </ul>                                     |
|                         |  | <ul> <li>Quarterly report of Government Asset<br/>Management Committee at the agency level<br/>should be submitted to the Ministry of Finance.</li> </ul>   |

## 3. Technology

| Area       | Strategy   | Explanation   |
|------------|--|---|
| Technology | Develop a monitoring<br>system for asset<br>management | <ul> <li>Government will build an asset management control system based on the new uniformity information technology and the best returns.</li> <li>Each agency can use this method in the management and control of its properties.</li> </ul>           |
|            | Foster research and development                        | <ul> <li>Research and development programs in asset<br/>management should be implemented using<br/>smart government, universities and industry<br/>partnerships.</li> <li>Government will make asset management one<br/>of the priority areas.</li> </ul> |

#### 4. Human Resources

| Area           | Strategy   | Explanation   |
|----------------|--|---|
| Human Resource | Providing qualified officers   | Adequate officers for each agency.  |
|                | Develop asset<br>management skills   | • Each agency must prepare a human resource development plan to improve the competence of TAM officers.   |
|                | Regulate service<br>provider capacity in<br>government asset<br>management | <ul> <li>Guidelines for measuring the competence and<br/>capacity of external service providers should be<br/>developed by governments.</li> </ul>  |
|                | Promote proper<br>maintenance culture                                      | <ul> <li>Each agency fosters awareness of asset<br/>maintenance and asset appreciation cultures.</li> <li>Agencies need to create and continuously<br/>implement awareness programs.</li> </ul> |

During National Asset and Facility Management Convention (NAFAM) 2007 the idea of asset management was promoted, and the government was thus led to formulate a new public asset management strategy. A Committee chaired by the Chief Secretary of the Government of Malaysia set new guidelines on the management of public goods through a life cycle approach for ministries, departments and agencies. This latest strategic approach applies to the entire lifecycle of physical assets in the planning of the project and in the operational to disposal management process. The new strategy was then introduced in Figure 1.7, focused on an overall approach to asset management, as shown below:



Figure 1.7: Asset Life-Cycle

There are currently two associations established in Malaysia, formed by an interest group, to promote and develop asset and FM initiatives. The associations shall be as follows:

- a) Malaysian Association of Facility Management (MAFM)
- b) Malaysian Asset and Project Management Association (MAPMA)

#### 1.3.7 Existing Act & By-Law, Regulation and Guidelines

At present, there are no consolidated acts and legislation, regulations and guidelines for the activities of Asset and Facilities Management (AFM) in Malaysia. In general, however, AFM activities are regulated in the shape of written and enforceable acts and laws and regulations by different government ministries, departments and agencies. Most AFM practitioners in Malaysia refer to the current laws, regulations and guidelines. The lists of the documents in question are:

#### Act and By-Law

- Architect Act 1967
- Building and Common Property (Maintenance and Management) Act 2007 (Act 663)
- Computer Crime Act 1997
- Construction Industry Development Board Act 1994
- Electricity Supply Act 1990: Act 447
- Energy Commission Act 2001: Act 610
- Engineers Registration Act 1967
- Environmental Quality Act 1974: Act 127
- Factories and Machinery Act 1967: Act 139
- Fire Services Act , 1988
- Gas Supply Act 1993: Act 501
- Insurance Act 1996: Act 553
- Land Titles (Strata)(Chapter 158)
- Malaysian Communication and Multimedia Commission Act 1998: Act 589
- National Land Code Act 1965
- Occupational Safety And Health Act 1994: Act 514
- Pesticides Act, 1974
- Street, Drainage and Building Act 1974: Act 133
- Suruhanjaya Perkhidmatan Air Negara Act 2006
- Telecommunication Act, 1950
- Uniform Building (Amendment) By-laws (UBBL) 1991.
- Valuers, Appraisal and Estate Agents Act 1981 (Act 1981)

#### **Regulations**

- Occupational Safety & Health Act (Safety and Health Committee) Regulations 1996
- Occupational Safety & Health Act (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 1997
- Occupational Safety & Health Act (Notification of Accident, Dangerous Occurrence, Occupational Poisoning and Occupational Disease) Regulations 2004

- Factory Machinery Act (Building Operations and Works of Engineering Construction) (Safety) Regulations 1970
- Factory Machinery Act (Steam Boiler and Unfired Pressure Vessel) Regulation 1970
- Factory Machinery Act (Noise Exposure) Regulations 1989
- Pesticides (Highly toxic pesticides) Regulations 1996
- Radiation Protection (Basic Safety Standards) Regulations 1987
- Construction Safety) Regulations 1986
- MS.IEC 364:1996 or BS 7671:1992 (IEE Wiring Regulation)
- Communications and Multimedia (Technical Standards) Regulations 2000

#### **Guidelines**

- Other Government Departments, utility or local authorities, Licensees and Companies having jurisdiction of the relevant Services and Facilities.
  - a) Pekeliling Am Bil. 1 Tahun 2002 Garis Panduan Peranan Jawatankuasa Penyelarasan Penyenggaraan Bangunan Gunasama Persekutuan
  - b) Surat Pekeliling Am Bil. 2 Tahun 1995 Pengurusan Penyelenggaraan Pewujudan Sistem Penyelenggaraan yang dirancang
  - c) Peraturan Mengenai Penggunaan, Pengurusan dan Penyenggaraan Kenderaan Kerajaan d. Perintah-Perintah Am Bab E Rumah dan Bangunan Pejabat Kerajaan 1974
  - d) Perintah-Perintah Am Bab E Rumah dan Bangunan Pejabat Kerajaan 1974
  - e) Pekeliling Perbendaharaan Bil.5 Tahun 2007 Tatacara Pengurusan Aset Alih Kerajaan
- Manual Pengurusan Aset Menyeluruh, Mac 2009

The lists given above are not exhaustive as other applicable laws, regulations and guidelines may be relevant and may require a thorough understanding of use and implementation. The following guidelines may have a direct connection to AFM practices. A separate study by a qualified authority on the topic is therefore strongly recommended to discuss the question of this Legislation and legal implications. The goal of this primary information is to provide AFM practitioners with a framework for preparing, implementing, tracking, organizing and improving the deliverability of services in accordance with Malaysian law. A further analysis or examination will involve expert opinion from different fields to create specific AFM regulations.

#### 1.3.8 Compliance with Laws and Acts

This provision specifies that when conducting contract works and other duties under the contract, the contractor shall comply with all applicable requirements. In carrying out its services, the contracting company for FM is required by common law, even though there is no explicit provision for that purpose in the contract, to comply with all applicable statutory requirements. In this respect, some of the general specifications of the FM Agreement are:

- Requirement of Occupational, Safety and Health Act 1994 (OSHA) and the Environmental Quality Act 1976 (EQA).
- Requirement of Employment Ordinance 1955 and the amendments thereto and the statutory contributions under the Employee's Provident Fund and SOCSO schemes for all its workmen.

## **1.4 THE IMPORTANCE OF FACILITIES MANAGEMENT**

The management of facilities is currently a rising sector and has been recognised by many countries worldwide. This field also extends to a company in the public or private sectors. As stated previously, FM is linked to three things: personnel, workplace and procedure. The value of FM in Malaysia has also been pointed out in this respect:

#### **1.4.1 Sustainable Environment and Function Facilities**

The phenomenon of the construction and the ceiling collapse recently also threatened rising public safety with the crash of the Middle Ring Road 2 (MRR2). Over several years, our construction efficiency, lack of supervision during construction and lack of maintenance and lack of awareness of the available health care facilities have deteriorated in number of potential contributors. Furthermore, a project that has just been finished involving government projects has been applied in several cases. Incidents that help lose property and death can be prevented by ensuring proper performance of all individuals involved in their respective positions. By delivering valuable returns, risks, and the whole sustainability of infrastructure building, the government has invested billions of dollars in improving the asset management industry and the nation to sustainable growth. All the installations require adequate maintenance to ensure that national installations are working well and that their life cycle is accomplished.

Consequently, certain costs for maintaining and operating a facility in an organisation, to prevent repeated and unused public funds or unnecessary accidents, are deemed necessary. Management of installations involves both physical and non-physical installations, as well as the identification of needs of investment and industry. These include professional guidance, construction management, building maintenance, cleaning of buildings, car parking, electrical facilities, telecommunications, firefighting, landscape, air-conditioning, arrangements for rentals, etc.

#### 1.4.2 Promote Business Growth

In addition to the maintenance and complete lifecycle, the Government focuses on private and public collaborations that are known as the PPP (Public Private Partnership) and the Private Finance Initiative (PFI), in which PPP explores new fields in FM. In most businesses today PPP or outsourcing is a method of management. Outsourcing is a concept in which external parties perform their roles in an organisation. In other terms, it is a concept that seeks expertise in carrying out certain tasks outside of their own organisation. The Government announced the "Tenth (10) Malaysia Plan" Strategy in June 2010 for the national development journeyed towards the realisation of the 2020 Vision to realise the value of FM in Malaysia. One of the main proposals for sharing the PPP is a plan to address the shortage of funding sources and the elimination of operational costs.

Under the 10th Malaysia Plan, the Malaysian Government allocates RM 20 billion (10th Malaysia Plan) to promote investment in projects of strategic interest to the country and multiply the impact of high-fund funding. If we follow those principles, principles of good governance, depending on competition and creativity, to deliver profitable returns in both parties, the performance of the PPP can be achieved. PPP also holds high significance in the procurement of novel technologies to assess returns on investment finance (Noour & Pitt 2009). The PPP approach is accomplished by means of arrangements for risk sharing which takes account of the entire life expense and success payment. For Malaysia to become a developed country and a high income nation, the role of FM in Malaysia is extremely significant.

### 1.4.3 Human Capital Development

To build an effective FM system, the service or product is to be designed to deliver the quality of services and goods to consumers easily, smoothly and accurately. In this sector there are two main elements, workers or internal customers, and external customers or consumers. Services and product design and production should be completely aligned with customer requirements. Knowledge of the value of asset and FM can be obtained from individual and community management. In this regard the Government undertook a variety of activities to produce the human capital knowledge and competent as an asset management and facilities convention in 2007 and 2009, the establishment of The Malaysian Asset and Project Management Association (MAPMA) and the Malaysian Association of Facility Management (MAFM).

Indirectly, individual knowledge and abilities and community will be strengthened and able to handle the facilities efficiently and effectively. The Malaysian Government has also added a wider opportunity to cater the needs of the workforce in this field through educational programs at Universiti Teknologi Malaysia (UTM) and Universiti Teknologi MARA (UiTM) in the master level. This implies that human capital growth is important in producing high-income nations and has world-class infrastructure.

# 1.5 FACILITIES MANAGEMENT INITIATIVES MILESTONES IN MALAYSIA

In the 1980s a new and more holistic management specialty began to be developed focused on infrastructure, which gradually acknowledged the value of managing not only structures, but also people-related buildings, and incorporated them into the concepts of the management and development process. FM began in Malaysia in the 1990s with government funding. In 1996, three FM companies were privatised by the government in government hospitals, the biggest FM transaction in the government at the time.

Furthermore, the introduction of the National Asset and Facility Management System (NAFAM) in 2007 demonstrates a strong government's dedication to systemic management. This can be connected to a part of the one trillion ringgits in Malaysia (RM) for public building maintenance in 2006 under the Ninth Malaysian Program. This support was also intended to express his dissatisfaction in 2001 with the need to redesign the quality level of public services at that time. The Deputy Prime Minister article (CIDB, 2010). Later in 2009 also, a framework called mySPATA was created for the management of immovable properties. All government programs demonstrate that government reform is taking place slowly by offering guidelines, policies and handbooks on quality of service. No concrete guidelines on FM practices have, however, been established for both the public and government sectors.

In supporting efforts by government, the construction sector has an important role to play in developing and sustaining social and economic infrastructure, maintaining the flow of national development projects and maintaining public infrastructure. While this generates business opportunities, it is important that the importance of the assets be valued by an efficient and scheduled maintenance culture. This is an acceptable way of thinking. The construction industry in Malaysia has a good potential for development and prosperity in line with facilities management practices. Several physical projects carried out in conjunction with the scale of a major development are factors that should represent the number of physical installations. This paradigm is the product of the Government's continued efforts to build and improve the country. The achievements of the FM initiative in Malaysia are shown in Figure 1.8.

| Year | Milestones   |
|------|--|
| 1974 | <ul> <li>Construction maintenance rules, public roads, sewerage building and Public<br/>Works Department (JKR) responsibilities are circulated</li> </ul>  |
| 1989 | Launching of Excellent Work Culture Movement   |
| 1992 | <ul> <li>Public Service Guidelines in Total Quality Management and Quality<br/>Improvement Strategies issued.</li> </ul>   |
| 1996 | Privatisation of non-clinical support services in government hospitals   |
| 2001 | Deputy Prime Minister alarming statement towards the quality of public service delivery  |
| 2006 | <ul> <li>Announcement of budget allocation for renovation and upgrade as part of the<br/>9th Malaysian Plan's development budget</li> </ul>  |
| 2007 | <ul> <li>Movable Asset Management Guidelines</li> <li>NAFAM First Convention</li> <li>Building and Common Property Act 663, 2007</li> </ul>  |
| 2009 | <ul> <li>Policy of Government Asset Management</li> <li>Second NAFAM convention</li> <li>Development of Immovable Asset Management System Application (MYSPATA)</li> </ul>   |
| 2012 | Infrastructure Asset Management Strategic Convention (PSPAI 2012)  |
| 2014 | Government Asset Management Strategic Convention (KONSPAK 2014)  |
| 2015 | <ul> <li>Malaysian Certified Healthcare Facility Manager (CHFM) competency training<br/>Programme introduced by CIDB and recognise by Ministry of Health</li> </ul>  |
| 2016 | <ul> <li>CIDB strategic planning through Construction Industry Transformation<br/>Programme (CITP) 2016 - 2020</li> </ul>  |
| 2017 | Registration of FM Contractors by CIDB Malaysia  |
| 2018 | Third NAFAM convention held at Putrajaya International Convention Centre     (PICC)  |
| 2019 | <ul> <li>Technical Working Group (TWG)/ Inter Agency Planning Group (IAPG)</li> <li>Workshop Sector Services-Construction Industry, Ministry of Works</li> </ul>   |
| 2020 | <ul> <li>NAFAM Resolution Workshop</li> <li>First Training for Facility Management Managers (FMM) and Facility<br/>Management Executive (FME)</li> <li>Development of National Construction Policy (NCP) 2030</li> </ul> |
| 2021 | CIDB Strategic Plan (CSP) 2021 - 2025  |

Figure 1.8: Facilities Management initiatives milestones in Malaysia

# **CHAPTER 2:** GAP, OVERLAPPING AND CHALLENGES OF FACILITIES MANAGEMENT IN MALAYSIAN CONSTRUCTION INDUSTRY

### 2.1 INTRODUCTION

Being at the growing stage, the AFM industry is far behind other countries such as the USA, the UK, Australia and New Zealand where awareness, knowledge and best practices are already common between most of the stakeholders. As a developing country whose concentration are mostly put on the construction industry, very little emphasis or recognition are laid on strategic management and best practices for the built environment.

In 2007, the first National Asset and Facilities Management Convention (NAFAM) were held in August to address the current issues and future challenges in managing national assets and facilities. This convention showed that the FM profession has evolved and adapted to meet the demands of a fast growing built and human environment industry. Agreeing to an annual NAFAM, the Prime Minister has urged both the public sector and private sector to come up with a more effective and efficient procedural framework in order to continuously improve the management of national assets and facilities. This convention was a major revolution to the future changes with regards to the perception of FM professions and practices in Malaysia.

Professional bodies like the Board of Engineers Malaysia (BEM) and the Institution of Engineers Malaysia (IEM) seem to emphasise more on developing engineers for the design and construction industry, but not for engineers involved in the built environment who bear titles such as Facilities Manager, Operations Manager or Building Manager. Currently there is no proper planning for the development of the AFM industry in Malaysia. There is no single body or organization taking any role to plan, guide, develop, evaluate and monitor the progress of the AFM industry in the Malaysian business market. The industry promoters are generally moving on their own directions without being nurtured to undertake future challenges in the ever-changing economy climate.
# 2.2 ESSENTIAL COMPONENT RELATED TO ASSET AND FACILITIES MANAGEMENT SERVICES

When it comes to understanding some fundamental issues that are related to Assets and Facilities Management, there are four (4) key areas that we need to pay close attention: firstly, serious considerations for facilities management, secondly, institutionalising the practice, thirdly capacity building, and last but not least, its treatment within the lifecycle of assets.

#### 2.2.1 Serious Consideration for Facilities Management

In regards to serious considerations for FM, it is a known fact that it is currently not given the due attention it deserves, especially where FM is often not considered important enough to be an integral part of the design process. This situation has, in turn, resulted in negative effects that affect productivity as a result of poor or unsatisfactory management of assets, for example, the inability of changing even bulbs in mosques due to very high ceiling heights, facilities that become non-conducive work environments and health risks to users.

## 2.2.2 Institutionalisation of the Practice

The second issue is related to the institutionalisation of the practice where there is a lack of clear structure in the industry with no regulations in place to accredit qualified Assets and Facilities Managers and Maintenance Contractors. There are also no policy guidelines to register Assets and FM companies. As a result, there is an imbalance amongst asset owners who do undertake scheduled FM in their deliverables and others who do not.

## 2.2.3 Capacity Building

The lack of clear structure in FM will in turn, have influence on the enhancement of capacity building initiatives for resources required by the FM companies. Additionally, the appropriate criteria within which these companies should operate have not been clearly defined. The government has established JPAK (Government Asset Management Committee) to look into Total Assets Management and this initiative will focus on the aspect of policies formulation, manuals and guidelines. In tandem with this move, the private sector should embark on similar initiatives for private sector-driven projects. In order this becomes a national initiative, CIDB is embarking on AFM Programs that will go hand-in-hand with the government in terms of ensuring that private sector assets are duly managed and maintained.

## **2.2.4 Treatment within the Lifecycle of Assets**

Another critical area is creating critical mass in the near future to ignite the 'boom' in this postimplementation stage of the construction value chain. The process of optimising the delivery of a value and making the appropriate decision is asset management. Asset management comprises of opportunities, balancing of costs and threats against the desired level of performance of assets, which is essential for the greatest return on investment and to attain the main objectives of the organization. An essential part of asset management understanding the asset management lifecycle, which is broken down into four stages. The four key stages of the asset lifecycle are:

- Planning
- Acquisition
- Operation and Maintenance
- Disposal

# 2.3 CHALLENGES FACED BY FACILITIES MANAGER IN ORGANISATION

There are always new challenges and constraints in the world of FM, which means that managers constantly have to be up to date and adapt to new paradigms and technologies. It is crucial for them to identify these issues and to work to overcome them in the most effective and efficient way possible. Below listed the five (5) biggest challenges faced by facilities managers in an organisation:

| 1. Managing<br>failures efficiently   | 2. Managing<br>expectations   | 3. Controlling<br>costs   | 4. Managing time   | 5. Implementing right technology  |
|---|---|---|--|---|
| <ul> <li>Efficiency in<br/>fixing damaged<br/>equipment<br/>is crucial for<br/>successful FM,<br/>as customers<br/>expect repair<br/>times.</li> <li>Managers<br/>must invest in<br/>a maintenance<br/>management<br/>system that<br/>centralises<br/>information,<br/>tracks daily<br/>work, makes<br/>communication<br/>easier<br/>and helps<br/>track repair<br/>times with<br/>Service-Level<br/>Agreement<br/>(SLA)s.</li> </ul> | <ul> <li>Managing<br/>customer<br/>demand and<br/>expectations<br/>is a challenge.<br/>If the service<br/>quality a<br/>customer<br/>perceives<br/>exceeds their<br/>expectations,<br/>the experience<br/>was positive<br/>and the service<br/>provided was<br/>excellent.</li> <li>Facilities<br/>managers<br/>need to be<br/>aware of the<br/>outcomes their<br/>clients expect<br/>to deliver good<br/>service.</li> </ul> | <ul> <li>Managers are<br/>under pressure<br/>to save the<br/>company<br/>money and<br/>address budget<br/>constraints.</li> <li>Few solutions<br/>include<br/>improving<br/>inventory<br/>management,<br/>negotiating<br/>price with<br/>suppliers,<br/>conducting<br/>energy audits.</li> <li>Investing in<br/>technology<br/>that will help<br/>save long-<br/>term costs for<br/>organisations.</li> </ul> | <ul> <li>Facilities<br/>manager must<br/>juggle to hold<br/>meetings, write<br/>letters, budget,<br/>organize<br/>several teams,<br/>execute audits,<br/>negotiate with<br/>vendors, attend<br/>conferences,<br/>etc.</li> <li>With several<br/>unplanned<br/>events<br/>occurring every<br/>day, facilities<br/>manager may<br/>have time<br/>management<br/>issues.</li> </ul> | <ul> <li>Investing<br/>the right<br/>technology in<br/>organisation.<br/>Managers must<br/>choose the<br/>best operating<br/>software to<br/>reduce costs to<br/>ultimately bring<br/>their service's<br/>overall quality</li> <li>For example,<br/>CMMS can<br/>be incredibly<br/>helpful to<br/>manage and<br/>prioritise tasks<br/>and easily run<br/>multiple clients,<br/>buildings and<br/>places.</li> </ul> |

## 2.4 KEY ISSUES OF FACILITIES MANAGEMENT IN MALAYSIA

CIDB being entrusted to look into the development of the construction industry has taken the first step to address the issue in FM with collaboration of the industry practitioners and players in the market today. Few series of workshops and seminar on the development of FM for the Malaysian construction industry has been conducted as to determine the gaps and challenges affecting the FM development in Malaysia. Seven (7) issues have been brought up which included Recognition, Awareness, Financial, Human Capital, Performance Measurement, Regulations, and Common Voice.

## 2.4.1 Recognition

There are few factors that determine the success implementation of FM practices in Malaysia. Among the first obstacle to overcome is the recognition, especially from the policy makers within the Government bodies. The government's involvement could be made possible in the following areas:

- Monetary (if possible);
- Awareness to promote cultural change;
- Providing incentives and/or awards for industry best practices; and
- Encouraging expansion of knowledge through formal education programmes.

CIDB, being the government agency responsible to develop the Malaysian construction industry, is identified as the best organization that can contribute towards the excellence of FM development in Malaysia. In line with its objective, CIDB could develop the capacity of the industry through the enhancement of service delivery quality plan, placing great emphasis on professionalism, promoting research and innovation, and proving high value training programmes.

## 2.4.2 Awareness

The management of assets and FM are normally faced with issues and challenges related to top management direction and support, policy, organization structure, logistics, monitoring, reporting and data/ records keeping. Apart from this, there is also no proper monitoring body that is well equipped to guide and monitor the FM programme implementation. In fact, top management awareness and knowledge on FM is generally lacking. This lack of awareness and knowledge might be caused by broken chain of information flow from the operational team to the management as well as unclear roles and responsibilities of the FM functions. It was also discovered that FM is not regarded as a strategic function in most public and private organizations, scope of functions are commonly confined to maintenance activities only and very little attention given in defining the overall scope of work for the FM organisation.

In addition to these issues, such high expectations of service delivery with less budget allocation given and unclear definition of service level requirements are other challenges coming from the customer perspective. Hence, the following issues and challenges have been identified as crucial and need to be addressed in order to successfully move forward:

- Lack of awareness on the 'value' of AFM towards achieving organisational objective by the top management
- No proper authorities to regulate the practices. This occurs at both organisational and national levels
- · Lack of understanding on the importance to inculcate 'maintenance culture'
- Broken chain on information flow from the operational team to the management
- FM professionals are not recognised at the strategic level of an organization
- · Poor definition of roles, responsibilities, functions and authorities

## 2.4.3 Financial

The main area of concern for FM industry with regard to finance has always been related to financial model, capital, return-on-investment, life-cycle costing and value for money on the overall service delivery. The typical problem claimed by most of the facilities managers is that there is always insufficient budget provision for an efficient delivery of the defined scope of works. The top management is unable to appreciate the justifications presented by the technical team. This creates other problems that will hamper the effort to perform better in delivering high value service to the client or end-users. Also in many cases when it comes to FM budget, it will either be reduced or rejected as FM is not regarded as a 'value adding' profession. To certain extent, the FM team is often regarded as "a cost centre" and therefore it is the highest priority to ensure that costs are kept as minimum as possible.

Apart from the budget issue, the facilities managers are also facing difficulties in establishing FM service level which can convince and provide the right perception to the asset owners and end-users. In addition, current practice of FM contract tendering process is still inclining towards low-price consideration as priority of awarding contract. The 'task-based' nature of most AFM tenders also contributes to having financial issues as certain elements may not be appropriately budgeted against the scope of works. To summarise above arguments, the key financial issues in FM are listed as follows:

- No FM financial model outline available as a guide
- Maintenance budget always rejected / reduced
- FM not regarded as 'value adding' to the overall property value
- FM team has always regarded as 'a cost centre'
- FM professionals having difficulties in justifying the budget allocation request
- Competitive tendering exercise always go for low-pricing only
- Mismatch of task-based requirement against budget proposal

## 2.4.4 Human Capital

The discussion on human capital issues in the AFM industry mainly focused on manpower supply, skill level and training programme. One of the most important issues highlighted was the lack of skilled, trained and competent experts in the area of FM in the Malaysian market. This was followed by limited understanding on asset and FM knowledge at the strategic level among the professional managers. These are among the two most discussed and deliberated by the workshop participants.

Although most facilities manager comes from engineering and science background, their academic and practical exposure on asset real estate, design, operation & maintenance, refurbishment and disposal are generally superficial. Apart from that, extensive exposure and experience in the overall scheme of implementation are also one of the most lacking among the manpower resource available in the market today. Acquiring people with broad AFM knowledge and experience are seen by the study group as the major challenge for the industry.

As for training initiatives, it is also found that the current collaboration between the industry and higher learning institutions is very limited. This lack of communication might be the contributing factor to the slow development programme on competency and skill enhancement among the FM related workforce market. A gap between the needs of the industry and output from the higher learning institution must be addressed immediately to ensure success in future implementation of FM programme. Thus, the following key points are taken into consideration as the major contributor to the human capital issues and challenges:

- Difficult to get knowledgeable, experienced and competent personnel in the Malaysian market
- Lack of collaboration between FM industry and academic centres
- Lack of collaboration and discussion amongst the professional in the management of physical built environment i.e. engineers, architects, surveyors, property managers etc.
- Lack of integration of various expertise/disciplines
- Lack of understanding by the FM manager in other fields related to assets (e.g. real estate, design etc.)

## 2.4.5 Performance Measurement

Currently, FM performance is measured and managed through various non-standardized mechanisms. With the lack of industry experts, index and benchmarks, measuring the performance and customer satisfaction is very subjective. There is a need to formulate and standardise a set of Key Performance Indicator (KPI) for FM performance measurement. One way of doing this is through the establishment of industry index and benchmarking by an independent body or association which will enable the industry to establish its own standard for implementation. Through an association or a governing body, the industry will also be able to access information and data which can be used as reference and guidelines for best practices.

## 2.4.6 Regulations

The Valuers, Appraisers and Estate Agency Act 1981 are currently the prevailing act 'governing' the industry. This act generally states that registered Valuers (i.e. persons registered with the Board of Valuers, Appraisers and Estate Agents) are the only professional issued with 'power' to practice valuations of land and buildings, including furniture, fixtures, trade stocks, plant or machinery and other effects for similar purpose. They are also allowed to carry out the 'property management' function as described by the client's service requirement.

The main concern is that this act has successfully 'covered' (directly or indirectly) the whole exercise that relates to planning, management, operation and maintenance of an asset (in this case it is called property) can only be performed by a registered valuer. This may not be fully applicable to those scope of works fall within the jurisdiction of other professional body e.g. Board of Engineers for all technical and engineering services. These overlapping functions and confusing situation need immediate solution to avoid future problems.

## 2.4.7 Common Voice

Having said all the changes needed to elevate the standard of AFM in Malaysia, a common 'voice' should be gathered to give a significant impact on the government and the society. A collective common interest should be forwarded to the policy makers in order to make the changes happen as smoothly as it could be. For this to be realised, it is time for an association of this purpose to act. Based on the research conducted with the Registrar of Society Malaysia, there has been an association known as "Persatuan Pengurusan Fasiliti Malaysia" or the Malaysian Association of Facility Management being registered in 2005. Among the objectives of MAFM are:

- To provide a forum for MAFM members to share best practice in the field of FM
- To provide networking opportunities for facilities managers
- To organise Continuous Professional Development events for members in all subjects related to FM
- To develop an understanding of FM at strategic, tactical and operational levels
- To examine the concept of total building life and ways in which construction professionals can 'add value'
- To be recognised as an expert pool of knowledge

## 2.5 RESOLUTION INITIATIVE FOR FACILITIES MANAGEMENT

#### **Resolution 1:**

Creating a Center Industrial Excellence Asset & Facility Management at National Level

#### Issues:

- The existence of too many professional associations and institutes with overlapping roles such as MAFM (Facilities Management), MIPFM (Property Manager) & MAPMA (Project & Asset Management). Therefore, the COE to consolidate existing associations and making existing associations champions based on their respective fields.
- 2. No specific authority or government body accountable for standard practice & procedure, credentials competency certification for FM.
- 3. Absence of one body to coordinate the development of the AFM industry which includes the following tasks:
  - a) Blueprint for AFM industry
  - b) Benchmarks / benchmarking at home and abroad for industry
  - c) Regulator of industry / Industrial Regulatory Agency

#### **Proposed Solution:**

- 1. Centre of Excellence as alignment or coordination center includes Research and Development center to help in development of AFM training and competency programme
- 2. Act requirements study should be conducted to stakeholders or related parties
- 3. AFM best practices that can be applied to the public and private sectors Business model, contracting model and delivery model that can be used
- To achieve AFM management excellence, we need to achieve World Class rating ISO 55001 for Asset Management and ISO 41001 for FM Department policy on the percentage of placement of officers should be re-examined

#### **Resolution 2:**

Provide a strategic model of procurement based on the principle of Total Life Cycle Asset Management for the provision of high performing assets to direction of sustainable development

#### Issues:

- Asset planning where it does not fully involve all asset players and stakeholders at the planning stage. Planning to create new assets does not take into account existing assets, optimization asset utilization, facility sharing and improved access to existing facilities. The aspects of asset maintenance, asset performance and asset sustainability are not taken into account at the level planning. Also, the development budget estimates do not take into account the Life Cycle Cost (LCC) and Return on Investment (ROI).
- 2. Poor design of new assets and existing assets including restoration, renovation, upgrading, retrofitting and conservation.

## **Proposed Solution:**

- 1. Improvement of Asset Creation Planning guidelines provided by the Economic Planning Unit (EPU) under the supervision of the Prime Minister Office.
- 2. Improvement of the asset creation design process by taking into account the following elements:
  - i. Integrated planning
  - ii. Sustainability
  - iii. Adaptation of the latest technology,
  - iv. Maintenance factor
  - v. Life Cycle Cost (LCC) approach to key asset components
- 3. Procurement procedures are improved with Conditions of Contract which take into account the cost of life cycle.
- 4. Create a contractor registration category based on the new procurement model.
- 5. Make the involvement of expert vendors as part of the requirements to complete.

## **Resolution 3:**

Creating a strategic framework Asset & Facility Management practices compatible with Industrial Revolution (IR 4.0)

#### Issues:

- 1. To prioritise related IR 4.0 technology drives/pillars related to asset management:
  - i. Autonomous robots
  - ii. Big data analytics
  - iii. Cloud computing
  - iv. Internet of Things (IoT)
  - v. Additive manufacturing (3D Printing)
  - vi. System integration
  - vii. Cybersecurity
  - viii. Augmented reality
  - ix. Simulation
- 2. Data architecture
  - i. Fragmented record / decentralised data
  - ii. Unstandardized data formatting
  - iii. Outdated data
  - iv. Limited data accessibility
  - v. Data reliability and security

#### **Proposed Solution:**

- 1. Prioritise technology pillars related to asset management according to importance
- 2. Centralised data ownership and standards

#### **Resolution 4:**

Improving the planning methods of the Ministry of Finance Malaysia and the preparation of a special budget for government asset management based on asset life cycle.

#### Issues:

- 1. Procurement issues under contractor evaluation as follows:
  - a) Existing guidelines need to be improved
  - b) There is profiteering activity in bidding
  - c) There is a risk that contractors who do not meet the qualifications are appointed
- 2. Existing Assets Accrual Accrual accounting still in the early stages of implementation and needs a lot of improvement.

#### **Proposed Solution:**

- 1. Each asset creation application must determine whether by asset solution (new asset development) or non-asset solution (making good existing assets).
- 2. Asset planning should take into account the entire asset life cycle from phase planning until the disposal phase.
- 3. The LCC analysis report should be prepared covering the expected cost of creation asset creation and asset maintenance.
- 4. Acquisition of assets is recommended as much as possible in Design, Build, Operate and Transfer (DBOT) through open tender.
- 5. Contractors who show excellent performance during construction can considered to continue for the above maintenance operations activities the same assets.

#### **Resolution 5:**

Strengthen the Asset Monetisation Policy for generation purposes income from Government existing assets.

#### Issues:

- 1. Source of power
- 2. Asset data
- 3. Optimal use of assets
- 4. Comprehensive asset performance appraisal for all government premises

#### **Proposed Solution:**

Source of Power

- 1. Monetisation initiatives should refer to existing acts to identify feasibility.
- 2. Establish assets / circulars / guidelines for asset monetisation.
- 3. Provide a mechanism to enable FM department to be eligible for monetisation revenue.
- FM authority needs to provide systematic recording and reporting of monetisation results for current use the process of reclaiming monetization results that have been obtained according to the prescribed format.

5. Provide additional financial incentives to FM department that can generate monetisation revenue as motivation.

## Asset Data

- 1. Determination of asset ownership status.
- 2. Collection of asset data should be carried out through accrual accounting.
- 3. Obtain the current asset value of the asset to be implemented with the monetisation initiative through revaluation method according to market price.
- 4. Completed or measurable drawings need to be updated.

## Optimal use of assets

- 1. FM agencies need to identify non-strategic assets (assets that do not contribute to key activities) for monetisation purposes.
- 2. FM agencies need to prepare a list of non-strategic assets.
- 3. FM agencies need to identify appropriate Monetisation methods of assets
- 4. Royalty fee for intellectual property
- 5. Joint venture with agriculture land or farms
- 6. Value creation for any activity or process that yields higher non-monetary value results than the condition of existing assets

## Comprehensive asset performance appraisal for all government premises

- 1. Perform asset performance evaluation to determine assets in good condition for monetization purposes.
- Strategic implementation of asset management using existing standards (ISO 41000 and ISO 55000).

# **CHAPTER 3:** CIDB INITIATIVE ON ASSET AND FACILITIES MANAGEMENT

# 3.1 FACILITIES MANAGEMENT PROGRAM FOR MALAYSIAN CONSTRUCTION INDUSTRY

The building industry has a duty and a responsibility to ensure that development takes place today and that the standard of living in the future is pursued by wealth today. The Construction Industry Development Board (CIDB) has been given the authority to lead and develop construction works, value for money, and respond to consumer sentiment about construction performance, understanding the importance of its stakeholder role. It was made compulsory in the CIDB for all local and foreign contractors to be enrolled in one of the seven grades of registration before entering into business in Malaysia.

Knowing the need to support our national requirements, the Ministry of Works has proactively established a strategy for the Malaysian Construction Industry through the Construction Industry Development Board (CIDB) that sets essential strategic goals and milestones for upgrading the construction industry Malaysia to the next level. Several of the strategic planning that CIDB has put in place for the construction industry includes the Construction Industry Master Plan (CIMP), the Construction Industry Transformation Program (CITP) and the most recent CIDB Strategic Plan (CSP) 2021 – 2025.

In order to achieve the success of the programme, the government and the private sector have to function synergistically. The leadership position taken by the Ministry of Works in leading this collaboration is therefore timely and vital, as the results obtained from and within each sector of the industry will ensure the nation's socio-economic well-being.

## 3.1.1 CIDB Strategic Plan (CSP) 2021 – 2025

A five-year plan of Construction Industry Development Board (CIDB) addressing the rethinking of CIDB's role in shaping the future of the construction industry. The strategic planning is continuity plan from the Construction Industry Transformation Programme (CITP 2016-2020) to drive and change the mind set of the industry to be more resilient and robust in facing the advent of The Fourth Industrial Revolution 4.0 (IR 4.0).

FM is one of new focus areas to be empowered by construction industry. The FM has big role and inspires to improve current services benchmarking and stand tall with world class FM industry in future. FM would improve productivity and some initiatives have been placed under strategic objectives as below;

- a) FM strategic plan for the industry
- b) FM policy in supporting the CR4.0 and big data initiative using technology as facilitating platform
- c) FM database on whole life cost (WLC)
- d) FM practitioner's competency through enhancement of training modules according to registration classification covering both building and healthcare sectors
- e) FM personnel competency development programme
- f) FM data intelligence analysis and salient benchmarking parameter for FM

Through this strategic plan, it is hoped that FM would be position at the right track to shaping construction industry forward.

## 3.1.2 National Construction Policy (NCP) 2030

Under Budget 2021, the government should continue spending on infrastructure projects, leading to an economic recovery in Malaysia. According to Datuk Seri Fadillah Yusof, Senior Works Minister, investment in infrastructure projects would also lead to higher gross domestic product (GDP) figures. To boost the economy further, the Government should also allocate enough funding to the Construction Industry Development Board (CIDB) to promote the construction industry.

"With enough allocation, CIDB can invest further on Industrial Revolution 4.0 (IR4.0) initiatives such as robotics, automation, Internet of Things (IoT), Big Data, Virtual Reality and Artificial Intelligence. Such projects will help the Works Ministry to fulfil the aspiration of the National Construction Policy (NCP) 2030."

(Minister of Works, 2020)

National Construction Policy (NCP) is key initiatives by the government in transforming the whole

construction sector towards the digitalisation era as well as key reference and guide for both the public and private construction sectors with respect to achieving inclusive and sustainable national development by 2030. NCP intends to achieve some of the following objectives:

- 1. To develop a wholesome, inclusive and people-centric policy through the integration of planning, designing, procuring, constructing or producing, altering, repairing, maintaining and demolishing infrastructures.
- 2. To stimulate and enliven people's mindset and instill a culture in demanding high standard quality of construction sector.
- 3. To develop a comprehensive guide and strengthen capability through good governance and best practice.
- 4. To embrace future trends in the construction sector.

To achieve the objective, the National Construction Policy has developed six strategies thrust shown in Figure 3.3 as follows:



Figure 3.3: Six Thrust of National Construction Policy (NCP)

## 3.1.3 Construction Industry Transformation Programme (CITP) 2016 – 2020

The Construction Industry Transformation Program or CITP, launched in 2015, is a national transformation program that sets strategic outcomes and milestones to develop Malaysia's construction sector into a world-class industry that can compete locally and internationally. The 4 strategic thrusts of quality, safety and professionalism; sustainability of the environment; productivity and internationalisation have been designed to resolve the number of issues and problems that need to be tackled in order to turn the construction industry into one that is highly efficient, environmentally sustainable and safety and quality. In line with the CITP's tagline "Driving Construction Excellence Together", CIDB in collaboration with more than 300 industry captains from the public and private sectors has continued to work rigorously towards realising these CITP aspirations as shown in Figure 3.1 below:



Figure 3.1: Construction Industry Transformation Program (CITP) aspiration

The Eleventh Malaysian Plan (RMKe-11) forecasts that the construction industry will contribute up to 5.5 per cent of GDP in 2020 and will have a double multiplier effect on growth with more than 120 industries depending on the construction sector. CITP pointed out that the construction sector consumes 15 per cent of total economic productivity. Therefore, the inclusion of CITP in the Eleventh Malaysian Plan under Chapter 8 (Focus Area D) is only appropriate as an indication of the importance of construction to the country's physical growth.

Malaysia's construction business continuity is, therefore, almost certain. Therefore, in order to ensure effective and efficient delivery of the necessary built environment, robust construction is essential, hence the Construction Industry Transformation Programme.

## 3.1.3.1 Quality, Safety and Professionalism in Facilities Management

#### **Improving Quality Standard**

Ensuring that the construction industry achieves a maturity level that can be viewed internationally, quality and safety issues remain fundamental. Consumers should only obtain their construction products safely or the quality they paid for. Therefore, CIDB has placed very high regard on efforts to achieve a high quality built environment securely.

The CITP strongly emphasises the improvement of quality standards in the industry. It lays out initiatives to increase the implementation of the Quality Assessment System in Construction (QLASSIC). QLASSIC is a system that measures the quality of the workmanship of facilities based on the Construction Industry Standard, which acts as a standard and also serves as a broader construction quality assurance. The incentive to achieve higher QLASSIC scores will encourage the adoption of technology and modern construction methods, such as Industrialised Building System (IBS), to improve material accuracy and workmanship. Figure 3.2 shows a new CITP requirement to improve the quality of living standards for FM workers.

| Room                                      | <ul> <li>Minimum room size and height</li> <li>Proper bed, lighting and ventilation</li> </ul>                           |
|---|--|
| Sanitary facilties<br>(toilet, bathroom ) | <ul> <li>Minimum no. of toilets with proper sewerage system</li> <li>Minimum bathroom size</li> </ul>                    |
| Cooking and Dining                        | <ul> <li>Mnimum kithecn size and height</li> <li>Dining area to have proper ventilation &amp; disposal system</li> </ul> |
| Leisure and Social                        | Provide community hall for workforce above a certain size  |
| Others                                    | <ul> <li>Provide proper signage,community relation management plan,<br/>safety committee, etc.</li> </ul>                |

Figure 3.2 Improved workers' living standards

The CITP also suggests training a sufficient number of trained quality assurance staff and the addition of independent evaluators for objective quality assurance and quality compliance. Rising quality standards in construction will not only benefit the industry, but will also improve public, consumers, and the overall economy.

#### **Promote Safety Measures**

Ensuring safety is strictly adhered to by all stakeholders, the sufficient availability of FM workers in the construction industry is essential. The CITP puts out steps aimed at improving the level of protection in the industry. More strict occupational safety and health standards will be added. A minimum set of requirements for worker amenities will be established through amended regulations. In addition, guidelines and Codes of Conduct will be established regulating construction safety and health. These recommendations were finalised for use in order to assist the industry in ensuring safety in facilities management:

- 1. Guideline for Safe Design of Building & Structure
- 2. Guideline for Site Supervision known as "Program Latihan Penyelia Tapak Binaan Bagi Tujuan Pentauliahan Dan Akreditasi Penyelia Tapak Binaan"
- 3. Guideline for Supervision known as Supervision of Construction Works

The Temporary or False Work Guideline design is finalised after public comments have been received. Meanwhile, Draft the Risk Management Guideline, confirmed by the completion of Hazard Identification, Risk Assessment and Risk Control (HIRARC) in December 2018.

#### **Enhancing Professionalism**

The number of contractors registered under the category of Facilities Management (FM) F01 for General Building & Infrastructure Facilities and F02 for Healthcare Facilities has gradually increased, which is a positive sign to ensure that FM contracts are granted to only eligible contractors. The Dealing with Construction Permit (DCP) is one of the World Bank ratings to decide the ranking for ease of doing business among 190 countries. The ranking for Malaysia improved from 13 in 2017 to 3 in 2018.

The registration portal for contractors is a one-stop online registration portal that allows local and international contractors to register with the appropriate licensing agencies, thus removing the need to individually deal with each agency. The portal aims to streamline the requirements for registration to avoid duplication by exchanging information, saving time and costs for contractors and improving the ease of doing business in the construction industry.

#### 3.1.3.2 Sustainability in Facilities Management

In order to showcase Malaysia as a low-carbon, sustainable facilities and infrastructure hub, sustainability calls for compliance with environmentally sustainable practices. Main problems to be tackled are reckless disposal of building and demolition waste as well as harm and repair spending after natural disasters. Malaysia has made a voluntary pledge, recognising its role in achieving a more sustainable global economy, to reduce its carbon per GDP emissions by 40 percent from 2005 levels by 2020.

CITP calls for the creation of a leading research platform in Malaysia to promote the excellence of sustainable construction in the sector, recognizing the relevance of sustainability to the national interest. With incentive programs to facilitate sustainable initiatives, holistic rating tools will be built and promoted. Recycling centres for building and demolition waste are recommended in priority areas with high construction activity levels to prevent reckless waste disposal.

As a leading example for the sector, CITP also suggests adding sustainability criteria within the procurement process for public facilities and infrastructure for key ministries. Imposing a tax system on excessive waste would improve the regulation of illegal dumping. The industry would be beneficial since recycled materials can then be used for other projects and purposes. Implementing better waste management practices would further benefit the sector players by decreasing waste management waste and minimising the size of the material collected from the start.

#### 3.1.3.3 Up-Skilling the Local Workforce in Facilities Management

The primary driver of growth towards the high-income goal of Malaysia is productivity. Today, however, the construction industry has become one of the lowest levels of productivity in the economy. The relatively low level of productivity reflects the need for the industry to embrace modern technologies, reduce its reliance on low-skilled construction workers, and continue investing in human capital development in construction. The relatively low level of productivity reflects the need for the industry to embrace modern technologies, reduce its reliance on low-skilled construction workers, and continue skilled construction workers, and continue investing in human capital development in construction.

The CITP puts forward steps to increase productivity levels by empowering Bumiputera human resources by expanding high-skill training and accredited professional programs to improve their efficiency, productivity, and expertise in the construction industry. Construction-related training courses will be reviewed, streamlined, and upgraded or developed nationwide where appropriate, thereby increasing the quality and quantity of trainers. In 2018, 14,252 Bumiputra contractors were trained under Continuous Contractor Development (CCD) in the technical, managerial and financial fields. These CCD points are essential in order to renew the registration of the contractor. In total, trained contractors are 42,702 against the target of 22,500 since 2016.

One of the new additions to the CIDB trade specialisation is the specialisation under FM. To date, only 587 contractors registered. It is only appropriate to include this program for Bumiputra training to boost their chances of registration. In 2018, 174 were trained in FM against 200 Bumiputra contractors. In addition to FM, to increase the competitiveness of Bumiputra, IBS and specialist trades are also rigorously pursued.

## 3.1.3.4 Technologies Adoption in Facilities Management

The CITP also calls for increased Information Communication Technology (ICT) adoption and mechanisation in the industry, and innovations in facilities research. To that end, collaborative partnerships will be enabled between the industry and universities to co-develop research and programs on modern construction methods and technologies. In addition, the CITP calls for the adoption and utilisation of modern construction methods and technologies to address productivity challenges in the industry.

The Malaysian version of the Civil Engineering Standard Method of Measurement, MyCESMM has been developed to promote a standard measurement method for all civil engineering works and a better-equipped Malaysian construction industry with a very important international tendering and contracting procedure.

The CITP builds on existing measures to accelerate the adoption of Industrialized Building Systems (IBS). For example, it recommends improving the economics of IBS adoption, raising the enablers for IBS adoption by introducing a comprehensive IBS catalogue harmonised with a Building Information Modeling (BIM) design library, and improving overall regulatory support.

## 3.1.4 Construction Industry Master Plan (CIMP) 2005 – 2015

The first consolidated draft of the Master Plan is the "Malaysian CIMP (Construction Industry Master Plan) Framework 2005-2015." CIMP is then organised into six parts as a framework to ensure that the construction industry is well placed to support the national overall economic development and face numerous challenges, such as the need to increase efficiency and quality across the value chain of the construction industry. CIMP outlines the vision and mission of seven strategies thrust and 21 concrete recommendations to inform Malaysian construction industry growth for decades (2006-2015). A strategy to make the Malaysian construction industry a sector that meets international competition requirements and takes advantage of world market opportunities and contributes significantly to the national aspirations and the well-being of its people. Designed to make it a world-class global supplier of creative and knowledgeable solutions to help decide the future course of the industry, CIDB, therefore, has the strategic roles of:

- 1. **Construction Manpower Development:** To develop optimal and proud construction workers with knowledgeable skills
- 2. **Construction Business Development:** To promote and improve construction business environment and capacity building
- 3. **Construction Technology Development:** To enhance construction quality, productivity, innovation and sustainable development.

A number of strategic directions are followed in terms of vision, mission and critical success factors. Seven thrusts have been developed, and performance keys have been established for the overall CIMP. The recommendation has been developed to address the key issues identified in Table 3.1 below:

| STRATEGIC THRUSTS   | RECOMMENDATIONS  |
|---|--|
| ST1 : Integrate the construction industry value chain to enhance productivity and efficiency                  | <ul><li>1.1 Consolidate the industry</li><li>1.2 Standardise and integrate administrative practices and Procedures</li></ul>   |
| ST2 : Strengthen the construction industry image  | <ul> <li>2.1 Enhance the professionalism of the construction industry</li> <li>2.2 Enhance the procure-to-pay (P2P) strategy</li> <li>2.3 Raise the sophistication level of the construction community</li> </ul>                          |
| ST3 : Strive for the highest standard of quality, occupational safety and health, and environmental practices | <ul> <li>3.1 Foster quality and environment-friendly culture</li> <li>3.2 Enhance occupational safety and health</li> <li>3.3 Adopt Malaysian Standard (MS) in the manufacture or import of building and construction materials</li> </ul> |

| ST4 : Develop human resource capabilities<br>and capacities in the construction industry    | <ul> <li>4.1 Enhance and enforce the use of skilled labour (building capability)</li> <li>4.2 Nurture the desire to work in the construction industry amongst the local workforce (building capacity)</li> </ul>   |
|---|--|
| ST5 : Innovate through research and development and adopt new construction methods          | <ul> <li>5.1 Continuously innovate construction processes and techniques</li> <li>5.2 Stimulate R&amp;D activities through the resource-pooling initiative amongst key players and the provision of R&amp;D infrastructure</li> </ul>  |
| ST6 : Leverage on ICT in the construction industry  | <ul><li>6.1 Encourage knowledge sharing for continuous improvement</li><li>6.2 Develop local construction software industry</li></ul>  |
| ST7 : Benefit from globalisation including the export of construction products and services | <ul> <li>7.1 Ensure industry sustainability in the liberalised environment</li> <li>7.2 Market the construction industry in a focused, global manner</li> <li>7.3 Ensure the financial services sector's development is in line with industry's needs</li> <li>7.4 Develop complementary industries</li> </ul> |

Table 3.1: CIMP strategic thrusts and recommendation

The table above is based on the roadmap strategy for developing the construction industry in Malaysia from 2006 to 2015. Therefore, this CIMP framework were recommended and established to improve Malaysia in the future and make a significant contribution to Malaysian people's aspirations and welfare.

## 3.1.4.1 CIMP Roadmap of Framework and Plan Implementation

The strategies and the action plans of CIMP need to be implemented using approach covering within 10 years period from 2006 to 2015. This has been adopted into the growth in the capabilities construction industry of Malaysia. Implementation of the strategies addresses to be a roadmap of the construction industry in Malaysia, and they are divided into 3 phases:

Phase 1: (2006 – 2008) Strengthen domestic capabilities in all key areas. This phase, the immediate priority seeks to resolve the construction industry, focuses as new strengths and capabilities to practice or external developments that perpetuate inefficiency and low growth rates in the industry.

Phase 2: (2009 - 2012) Further strengthen existing capabilities in all key areas to compete effectively with global peers. This 2nd phase will focus on developing new capabilities and

building a strong foundation for the industry to venture overseas. This is a strategy for competing effectively with its peers in the global marketplace.

Phase 3: (2013 – 2016) Increase presence and enhance stature in the global construction arena. The long term plans in this 3rd phase will fulfil the vision to be a world-class, innovative, and knowledgeable global solution provider, to establish a secured footprint for the construction industry in the global construction marketplace.

| SEQUENCING FRAMEWORK AS A ROADMAP                             |      |                   |  |      |      |                      |   |      |      |
|---|------|-------------------|--|------|------|----------------------|---|------|------|
| 2006  | 2007 | 2008              | 2009   | 2010 | 2011 | 2012                 | 2013  | 2014 | 2015 |
| PHASE 1 :<br>Strengthen domestic<br>capacity in all key areas |      | nestic<br>⁄ areas | PHASE 2 :<br>Further, enhance existing capabilities<br>to compete effectively with global<br>peers |      |      | oabilities<br>global | PHASE 3 :<br>Improve visibility and boost<br>global stature construction<br>arena |      |      |

Table 3.2: CIMP roadmap in construction

The implementation of this CIMP has been monitored, reviewed and updated accordingly (if needed) by CIDB to ensure its relevance and applicability.

## 3.2 TRAINING AND COMPETENCY PROGRAMME

## 3.2.1 Certified Facilities Management Executive (FME) and Facilities Management Manager (FMM)

The role of the facilities contractor is challenging and important. There is an apparent need for the facility contractor to continuously grow and acquire better skills, wider knowledge and more effective work procedures in line with advancements in technology and socio-economy to be globally competitive.

In order to improve the capabilities of the registered facility contractor, the competence level of the company director and technical officers must first be assessed and accredited through the FM Manager and FM Executive Accreditation Program based on the competency standards developed by the Board of Directors. The Board has made a requirement that only firms with an assessed and accredited Company Director or Technical Officer are eligible to be registered as F01 and F02 Specialisation Facility Contractors.

However, accreditation is not confined to construction personnel involved in or, employed by a contractor. Still, it is open to any eligible construction personnel and meets the requirements set by the Board. For registration purposes with the Board for the facility contractor of F01 and F02 specialisations, it is compulsory and much encouraged for the company director and technical personnel or any other construction personnel directly involved in facility management to apply for accreditation the Board.

The objectives for accreditation are:

- 1. To elevate the construction FM quality through implementation by qualified, accredited and competent personnel.
- 2. To ensure that both the facilities manager and facilities executive comply with the National Occupational Skill Standard (NOSS) or any newly formulated industry standard.
- 3. Ascertaining Facility Contractor of F01 and F02 specialisation code registration regulations are adhered to.
- 4. Provision of a systematic, registration and accreditation platform.

## **3.2.2 Building Information Modelling in Facilities Management (BIMFM)**

Successful Management of FM is all about preserving accurate data. The key to quickly responding to unknown problems and anticipating maintenance knows where your assets lie and fixing things that are broken. Having new facilities created using Building Information Modelling (BIM) offers many rich data, from anticipating a facility's energy costs to knowing when maintenance may be required for that new equipment. When everyone on the project team is committed to using BIM, as-built documentation will be much closer to reality.

This programme designs a comprehensive training programme to provide skills and knowledge on Building Information Modelling Facilities Management (BIMFM) to the professionals and individuals involved in building and construction industry generally, and BIM and FM sectors specifically. Besides, it also addresses the fundamental areas relating to these two imperative areas of BIM and FM, starting from the theory introduction to the theory and innovative tools' hands-on implementation.

The main objectives of this training programme development are:

- 1. To establish a comprehensive training programme for FM stakeholders by forming a standard and complete set of documented materials required in training.
- 2. As a reference to benchmark the competency levels of Building Information Modelling Facilities Management (BIMFM) stakeholders.
- 3. As a reference to clients or property owners to determine or gauge the skills and standards required in outsourcing the FM contracts.

In addition, this programme offers knowledge and skills identified to be paramount for BIMFM. The knowledge and skills are linked to BIMFM success and will be measured according to the designed assessment.

## 3.2 FACILITIES MANAGEMENT FOR BUILDERS

The concept of integrated service facilities and buildings and infrastructure maintenance has become a current trend for owners of large-scale, sophisticated, and prestigious building complexes. Facility care practices are a combination of operational and maintenance activities as well as facility services. The development of this facility services industry is quite encouraging.

FM in Malaysia, like most other countries around the world, stresses the importance of maintaining the designed facilities and environment to follow the design and purpose of the building and give customers and users satisfaction. In the future, the position of the facilities contractor is expected to be more demanding and meaningful. In order to succeed internationally, there is a need for facilities contractors to continue developing and gaining more specialised skills, wider expertise and more efficient work procedures in line with technical, economic and social advances.

CIDB records show facility service and building maintenance works are now implemented by contractors registered in various specializations such as building, civil engineering, mechanical, and electrical. It results in difficulties on government and private agencies to identify truly skilled and competent contractors in this field. In addition, there have been increasing incidents involving completed buildings where maintenance and management work is not done properly, resulting in injuries, loss of life and property.

In line with the core of the Construction Industry Transformation Plan (CITP) to improve the quality of safety and professionalism of the construction industry, the CIDB has set up an industry committee to discuss and develop categories and conditions specifically for registration and development, represented by government agencies and industry experts from associations and universities. A series of dialogues to obtain feedback on the registration were also held with interested agencies and associations.

In addition to the registration of facilities contractors, one of the elements emphasized is the competence of company directors and technical officers of the contractor. CIDB is developing competency standards and training modules for contractors and technical officers. The management training module for contractors has been completed, and training started in October 2016.

## **3.3.1 Definition of Construction Work According To Act 520 (Amendment 2011)**

Construction work is the construction, extension, installation, repair, maintenance, renovation, relocation, renovation, alteration, renovation or demolition: -

- a) Any building, structure, large building, structure, wall, fence or chimney, whether constructed in whole or in part above or below ground level;
- b) Any road, port, railway, cable line, canal or airport
- c) Any drainage, irrigation or river control work

- d) Any electrical, mechanical, water, gas, petrochemical or telecommunication work
- e) Any bridgework, earthwork dam, pipeline, tunnel or redemption work.

And includes;

- A) Any work that forms an integral and integral part or is preparatory or temporary for the work described in paragraph (a) to (e), including site clearing, soil research and repair, land transfer, excavation, laying of foundation stones, restoration and site landscaping; or
- B) Procurement of building materials, equipment or workers, which must be required in paragraphs (a) to (e).

## 3.3.2 Categories and Specialisation of Facilities Contractors

Integrated service facilities and maintenance of buildings or infrastructure that include engineering services and services related to consumer needs.

| CATEGORY               | SPECIALISATION  |
|------------------------|---|
| F                      | F01<br>General Building and Infrastructure Facilities<br>(Fasiliti Bangunan dan Infrastruktur Am) |
| Facility<br>(Fasiliti) | F02<br>Healthcare Facilities<br>(Fasiliti Bangunan Penjagaan Kesihatan)                           |

## 3.3.3 Code and Facilities Specialisation

| CODE | SPECIALISATION                                    | DESCRIPTION  |
|------|---|--|
| F01  | Building Facilities And<br>General Infrastructure | Integrated service facilities and maintenance<br>of buildings or infrastructure which covers<br>engineering services and services related to<br>consumer needs                         |
| F02  | Healthcare Building<br>Facilities                 | Integrated service facilities and maintenance<br>of buildings or infrastructure that include<br>engineering services, biomedical engineering<br>and services related to consumer needs |

## 3.3.4 General Requirement Facilities Contractors Registration

- 1. Registered with the Companies Commission of Malaysia (SSM) in Syarikat Sdn. Bhd. or Berhad or the Cooperative Commission of Malaysia (SKM) in Koperasi Berhad or the Department of Registration of Societies Malaysia (ROS) in the Organization.
- 2. The type of business registered should cover construction work or related to facilities and maintenance.
- 3. Has a fixed paid-up capital
- 4. Directors have a Certificate of Management Competence (SKP) in the field of Facilities and Maintenance Services OR have the qualifications recognised by CIDB as follows :
  - Certified Facilities Manager (CFM) IFMA
  - Facilities Management Professional (FMP) IFMA
  - Certified British Institute of Facilities Management (CBIFM) BIFM
  - Bachelor / Master / Doctor of Philosophy degree recognised by the government in asset / facility management / maintenance with three (3) years of relevant work experience.
- 5. Technical Personnel has established qualifications.
  - Skills Certificate of Competence (SKK) in facility services and or maintenance
  - Experienced in facility or maintenance services

\*Disclaimer: The general requirement as of January 2020 subject to change and review by the committee CIDB

# **CHAPTER 4:** CREAM RESEARCH INITIATIVES ON FACILITIES MANAGEMENT

## 4.1 INTRODUCTION

In recent years, Construction Research Institute of Malaysia (CREAM), a research institute establish under CIDB has actively undertaken several initiatives to improve the FM system through workshops in collaboration with a number of stakeholders. Four FM strategic focus areas for the construction industry in the Malaysian context have been identified through the Industry Workshop Report, which encapsulates Performance Management, Human Capacity Development, Supply Chain Management and Information Communication Technology (ICT). For FM to be successful in the industry as a whole, the strategies need to be precisely outlined to achieve efficient and productive FM fully. First, performance-based measures should be implemented to ensure KPI measurement dynamics at all levels of work. Systematic and structured policies, processes, and procedures should be used to address stakeholders' needs in the delivery process. Second, maximise the use of technology in order to make full use of ICT infrastructure in the management of operations and maintenance activities. Third, the organisation should also consider focusing on the development of human capital through ongoing management and staff training at all levels of work. In addition, continuous and sustainable improvement and constant review of service delivery planning, quality and standards of assets and facilities must be carried out (CIDB, 2009).

# 4.2 MEASURING PERFORMANCE MEASUREMENT IN FACILITIES MANAGEMENT

#### 4.2.1 Definition of Performance Measurement

Performance measurement is a part of the performance management whereby people have transformed complex reality into a simplified concept that can be easily communicated and act that is a requirement of successful management. According to CIPD (2009), performance management involved people management, consisting of learning and development. Performance management is a method for achieving the goals and objectives of the organisation by establishing mutual understanding and supporting the team groups of the organisation. This implies that performance management creates an environment that allows individuals to perform best in achieving the goals and objectives of the organisation.

Therefore, the performance management is a process that provides a control system that integrates the corporate and functional strategies into business processes include the activities, tasks and personnel and feedback. Feedback is obtained through performance management systems that enhance the decision-making process to achieve goals and enhance the performance of organisations.

There are generally two (2) main principles of performance measurement:

- i. Focuses on program outcomes, or actual results, rather than only on the quantity of service provided by the organisation
- ii. Focuses on the individual's needs in defining the outcomes

The performance measurement of the facilities consists of three (3) primary elements: physical, functional and financial performance. Physical performance relates to the behavior of building fabrics and includes structural integrity, heating, lighting, energy efficiency, preservation, and durability. Secondly, functional performance focuses on the relationship between the buildings and occupants. It relates to space, layout, ergonomics, image, ambience, communication, health and safety, and flexibility. Thirdly, the financial performance arises from the building's physical and functional performances and includes the capital and recurrent (life-cycle) expenditures, depreciation and efficiency of use, etc. To sum up, in order to achieve the goals and objectives of the organisation, performance management is increasingly important for general management and support management to be practiced within FM organisations.

The performance measurement revolution has spread into many disciplines, including construction and FM. FM, particularly in Malaysia, is a relatively new discipline. Performance measurement aims to achieve organisational goals that have been developed as FM is growing and enhancing into this business. However, as business performance becomes revolution, the need for learning, growth, and innovation becomes crucial.

#### 4.2.2 PERFORMANCE MEASUREMENT TOOLS

Performance management systems in FM come in many forms, from simple operations and maintenance plans and spreadsheets to complex integrated technology systems. Based on the analysis, the organisation will know the shortfall and credential they have and gaps that need to be improved further to generate business profitability. To achieve this, the organisation needs to derive the results obtained and translate it into the strategic step and plan in the overall composition to bring value to the organisation. The performance management is a tool for an organisation to level its capacity with other similar organisations. Therefore, the performance management definition is beyond collecting data, reporting, and it is more on people management. Performance management is established and normally used to describe performance analysis and does reporting or use for people management in an organisation either in a small or big scale process.

Strategic performance represents a change in the normal functioning of the organisation. It addresses the performance gap between the strategic objective of the organisation and the expected performance. CIDB identified several measures to achieve successful strategic performance management in Figure 4.1 below:



Figure 4.1: Successful Strategic Performance Management Measures

CIDB Malaysia has introduced the Balanced Scorecard Program and Policies. CIDB Malaysia acknowledges the need for corporate organisations to achieve performance results targeted within a short period. The dynamic leadership of any organization leads CIDB Malaysia to take on the challenge of transforming the industry into successful and powerful industry development captains. According to CIDB Malaysia (2016), to become world-class construction industry and to be a credible organisation, CIDB has taken the step with the strategy and performance management through CIDB Corporate Strategy Map 2014-2015.

From a recent global survey of over 3000 organisations, it is found that the most popular performance management tool, which obtains highest ranking compared to other performance management tools, is the Key Performance Indicators (KPIs). KPIs scored usage rate of about 75%, while the second top is performance appraisals with 60% of usage among survey respondents, thirdly is mission and vision statements with a usage rate of 55%, management dashboards tool with a usage rate of 53% and lean management and six sigma tools with a usage rate of 45%. The five management tools are used to benchmark over other performance tools and the best tool for managing the performance to be considered in figure 4.2.





#### 4.2.2.1 Key Performance Indicators (KPIs)

Key Performance Indicators or popularly known as KPIs, is to measure organisational objectives and goals. According to CIDB (2016), KPIs are the level of achievement expected of the average resource given the current operating environment. KPIs are high-level snapshots of the performance of an organisation based on specific predefined measures. KPIs allow management to monitor indicators which include both measures and target. It needs to comply with the mission and the identification of stakeholders to achieve goals. Whenever KPIs are selected, the organisation goals and the key to its success should be identified. The attributes of the KPIs differ and may change as the organisational policy and approach to achieving the KPIs change. The following are the pre-requisite in identifying KPIs:

- 1. The predefined organisational process
- 2. Clear business objectives for the process
- 3. Quantitative and qualitative methods
- 4. An active approach to finding and correcting variances in the enterprise

Atkin and Brooks (2009) stated that the purpose of KPIs is to enable management to measure, understand and monitor progress in each of the critical success factors (CSFs). The CSF will reflect the result of KPIs in terms of goals and objectives are met satisfactorily. KPIs should be linked to the strategy. Once the indicators have been agreed, defined and mapped, the strategic objectives of KPIs will be used to track progress and gain relevant insights to help manage and improve performance. Although KPIs can be a powerful performance management tool, however, organisations should also take precaution measures. In an organisation, KPIs will give better value in terms of time and effort that has been taken. In summary, as a set of indicators used to measure data to meet the requirements of the organisation, KPIs can be simplified. In the end, KPIs would assist an organisation to appraise their desired goals. Therefore, KPIs should reflect to the respective business strategy and hence will affect the change. It could be achieved through proper communication within organisation whereby information is spread out in proper channel effectively.

#### 4.2.2.2 Performance Appraisal

Performance appraisals are said to be the second most commonly used as a performance management tool. The tool is effective in supporting the goals with the strategic aims of the organisation. It is measured through manual techniques and being measured, reported and improvised. As such, it can be categorised as a key result indicator. The performance assessment system must therefore have the following characteristics:

- i. The assessor must be fair, neutral and equitable. It must include the element of trust and confidence;
- ii. The methods of performance should be acceptable and actively participated with collaboration from the members;
- iii. The questions should be reliable, stable, dependable, and consistent. The good question will reflect a result of decision-making. It will impart significantly to the organisations;
- iv. It must be able to select the group of respondents in the organisations to get better result and input that indicates the degree of effectiveness;
- v. It must be sound, practical, clear and unambiguous so that all parties understand its implications.

Performance appraisal means an evaluation of performance through the multi-stage communication process. Managers should plan to keep the objectives of resources and financial in order.

#### 4.2.2.3 Mission and Vision Statements

The method will enable the management team to develop clear visions in organisation objectively. In order to achieve that, the management needs to have a strategy to achieve the vision. A vision of what the leadership will achieve for the organisation for short, medium and long term. The vision can be in the form of product and also individual. A vision must be something quantifiable and realistic to be achieved. There are seven primary characteristics of visions:

- a. It must be compelling and convincing to people with a clear statement and its strategies to achieve the objective.
- b. A vision statement should be achievable by the staff and management.
- c. A good vision statement should incorporate visions and the challenges to achieve the goals that can inspire people to think beyond their limits.
- d. The vision must relate and align with the culture, people, and history in the organisation.
- e. The vision statement needs to consider the broader aspects of the organisation, such as involvement from different departments and work scope.
- f. It must show that such organisation has a unique and distinctive approach to introduce and attract people.
- g. People must clearly understand a vision in order to convey the goals and objectives of the organisation. Besides a clear statement, the vision should be simple and easy to interpret.

The management should be able to create a good vision statement that relates to their goals and KPIs. Input from the staff needs to be gathered and formulate it into vision development. The achievement is being measured when the effective leaders use the business strategies to keep the team updated and well-articulated.

#### 4.2.2.4 Management Dashboards

The fourth most popular performance management tool is management dashboards. The dashboard contains performance information such as graphs, charts and traffic lights to be easily communicated and understood by the users. Dashboards are becoming more popular among organisations to do data management and analytical capabilities.

Many types of dashboards are available. Generally, the objective dashboard is to utilise visualisation techniques and display all information on a digital screen. The display information on the screen will include graphs, break-even analysis model, cost-volume-profit relationships and financial inputs.

From the Data Warehousing Institute, the concept has been around for many years and widely adopted by half of the business organisation from 473 organisations. A dashboard is a tool that includes performance measures to assist the manager to process information and translate into a business strategy. Some factors have to be considered in the development of the dashboard; namely technical infrastructure and performance management techniques such as the Balanced Scorecard.

Thus, performance reporting and managerial bias in information processing are several considering factors driving dashboard application for organisation. Recently, dashboards have evolved from general purpose of monitoring performance to more advanced analytical process. The dashboard has been acknowledged in business technologies as integration work in workflow management systems. Four goals outlined using dashboards, namely:

- i. Monitoring
- ii. Consistency
- iii. Planning
- iv. Communication

Monitoring is the fundamental function process of the dashboard that runs the day to day evaluation of metrics. The result of monitoring will then be made corrective action. Consistency is use as an alignment of measurement procedures in the department and unit. A dashboard is a tool used for planning and scenario analysis, communication, and value organisation performance to its stakeholders.

#### 4.2.2.5 Lean Management and Six Sigma

Lean management is an approach which originated from the Toyota Production System (TPS). Lean management focuses on reducing both costs and cycle time, resulting in a more agile and market-driven responsive without compromising the end product. In simple way, Lean management is the integration of strategy and leadership, people and culture, problem solving and integration of external partners.

The usage of lean management approaches has been widely used in organisation to improve efficiencies and cost optimisation. Through lean management, the potential for waste can be easily removed and managed. The ultimate aim of lean management is to improvise by delivering tangible and measurable benefits.

## 4.2.3 Advantages and Disadvantages of Measuring Performance Management Tools/Instrument

Several advantages and disadvantages of performance management tools have been outlined and summarised in Table 4.1 as shown below:

| Instrument / Tools                   | Advantages   | Disadvantages  |
|--------------------------------------|--|--|
| Key Performance<br>Indicators (KPIs) | Identifying the vital indicators of the<br>company success will help establish<br>accurate performance targets.<br>KPIs should concentrate on aspects<br>of organisational performance that<br>are most critical to the current and<br>future success of the organisation.   | Performance management targets<br>can be a disadvantage if the KPI<br>progress does not follow the<br>progress.<br>KPIs are not only for measurement,<br>but it is more than that. It enables<br>data-driven performance and<br>decision- making.  |
| Performance<br>Appraisals            | This approach is the deal between<br>the manager and their staff over<br>the performance. Feedback from<br>the staff over their performance will<br>determine the success and meet the<br>KPI of the organisation. A structure<br>plan and goals of the organisation<br>in a year will be briefed to the staff.<br>Rewards and merit will be given to<br>the successful staff.   | It is time-consuming because it<br>involves staff and manager. The<br>approach can create dissatisfaction<br>between two parties. The evaluation<br>is based on human factor and<br>behavior and potential to bias and<br>mistake.   |
| Mission and Vision<br>Statements     | A mission statement must be<br>vertically and horizontally consistent<br>with the company's overall objectives<br>and encourage managers to keep an<br>eye on the critical success factor.<br>Another advantage is that the<br>management board members can<br>easily make a quick reference to<br>a mission statement in the time of<br>conflict and argument. This tool<br>also acts as an effective framework.<br>Managers can easily use this as a<br>guide in discharging their everyday<br>management functions. | The chances of its design and<br>implementation being wrong are<br>very high. A mission statement<br>can easily be vague, empty and at<br>best confusing. When not properly<br>developed, one part of a mission<br>statement can contradict the other<br>and eventually lead to conflict. The<br>mission and vision statement takes<br>the time to be drawn up, and it<br>wastes time if the ultimate reason<br>for developing the statement is not<br>achieved. |

| Management<br>Dashboards        | Dashboards can be built in a way<br>that will allow them to be custom<br>focus and user friendly. The<br>executive user may see a high-level<br>graph of department productivity<br>while the department manager could<br>see the specific details by staff, and<br>the department staff would see their<br>specific details for the month.<br>This allows each person to see the<br>level of details they need in order<br>to get their job done and meet their<br>goals. They are not overloaded<br>by too much detail, and a lack of<br>information does not limit them. It is<br>important to consider the ability to<br>drill into information when building<br>dashboards. If the executive sees a<br>high-level diagram of the amount of<br>recurring business that the company<br>is generating they should then drill<br>down and see which clients are<br>generating that business.<br>This gives them the ability to see<br>the details behind the summary<br>information if they wish to but keeps<br>that detail from the standard view<br>unless it is deemed necessary. | The most dashboard tools are pure<br>chart visualisations with no ability<br>to deep dive when needed (e.g. ad-<br>hoc comparison with past data or<br>with other metrics).<br>It is very easy to create a new<br>dashboard that faces risks to<br>create the so-called "homeopathic"<br>analytics- too many coloured pie<br>charts/ dashboards without a real<br>value.<br>As the business evolves, the KPIs<br>change. Try to save important<br>metrics from the very beginning.<br>Therefore have them available when<br>needed. Check if the dashboard<br>tool can pull the history data<br>without limitations (from external<br>applications like Facebook or<br>Google Analytics) and if it can also<br>store the custom data (e.g. logs<br>from database) and how much is<br>the charge for that. |
|---------------------------------|--|---|
| Lean Management<br>or Six Sigma | Customer-driven. Involve the entire<br>process behind the production.<br>It is proactive rather than reactive  | Rigidity and potential bureaucracy Customer-focus only.   |

Table 4.1: Advantages and disadvantages of Performance Management tools

## 4.2.4 Issues and Key Challenges of Performance Management

The performance assessment understanding of FM remains relatively undeveloped. The research done on performance management is very few to assess the organisational performance. However, there are trends researchers have been looking for on strategic development of performance management.

Among the challenging performance, managements look into nature that requires multiple outputs that relate to identifying the KPIs. KPMG (2010) identified five (5) common problems in managing performance in its organisation. Among the critical problems are; failure to implement strategy effectively, goals and objectives of the organisation are not clearly defined, and excessive measurement tools are used only to report and monitor.

Another problem faced is a lack of strategic alignment whereby business units in the organisation have different sets of direction and have a high target of compliance compared to other departments. Most facilities managers often fear when the performance card will be used as a punishment rather than to find ways to rectify the damage.

The evaluation conducted for facilities is not recognised and much appreciated. Rather, it is viewed more as self-administered, and it happens to be in most European countries. Furthermore, among the main challenges in the performance management system in any organisations as follows;

- Lack of a structured system of the framework to distinguish between actual measures and baseline measures
- Lack of relationship of strategic objectives and implementation plan
- Absence of flexibility to allow organisation to efficiently and effectively manage the performance
- Difficulties in measures the system relationship with the performance facilities

Table 4.2 below shows Six (6) attributes for determining FM performance management issues and recommendations:

| Issues     | Recommendation  |
|------------|---|
| Management | Establish internal Key Performance Indicators (KPI) in FM organisations.<br>A representative with FM background to sit in the Board of Directors in<br>non-FM organisation. |
| Methods    | The urgency to establish and standardise rating systems based on performance criteria to facilitate performance merit or reward program to the FM organisations.            |
| Money      | Published company accounts and comparative data relating to Returns on Investments (ROI).   |
| Manpower  | Ground training and enhancing the competence of employees. FM<br>organisations need to obtain recognition as a professional body<br>by organisations such as the International Facilities Management<br>Association (IFMA) and BIFM.<br>Impose related professional recognition policy by government agencies<br>and the private sector in FM.   |
|-----------|--|
| Machine   | The quality of the machine/equipment used in FM projects in terms of<br>their reliability and energy efficiency. Also on the issues of preventive and<br>reactive maintenance, environmental friendliness and efficiency.<br>The FM operator should avoid manual or labor intensive operations,<br>segregation of department process, decentralised and which supports a<br>self-reporting system.<br>Mobilise the customer service department at the time when the machine<br>is operating.<br>Zero break-down of machine to achieve high efficiency for the operation. |
| Materials | Transformation through asset and materials record.<br>Assets must also be registered for record and traceability purposes.<br>Materials should focus on sustainability rather than having a sole focus<br>on aesthetics.<br>The FM organisation needs to strive towards the purchase of items in<br>packaged sets for transparency and to avoid defective products being<br>bought in a loose fashion.<br>The dependence on a single sole supplier also needs to be addressed to<br>provide better life cycle value and sustainability.                                  |

Table 4.2 Six (6) Performance Management attributes and recommendations:

## 4.2.5 The Importance of Performance Management in Facilities Management

The need for performance to be measured and assessed can be a basis for an organisation to know its strengths and weaknesses. From the analysis, the organisation will know the shortfall and credential they have and thus need to be improved further to generate business profitability. In order to address this, the organisation needs to derive the results achieved and translate into the strategic step and planning of the overall component of the organisation. Otherwise, the organisation will fail in performing the overall strategy effectively.

Performance management provides an opportunity for an organisation to evaluate facilities specification to meet their requirements from standpoints. Performance can be assessed in two reasons:

- 1. To improve the current situation through evaluation
- 2. To assist FM professional to design and consider future buildings characteristics

The Key Success Factors (KSF) for the successful implementation rely on four main components; namely culture, system, people and process. These components are the starting points to be adopted for organisation, especially from the top management for performance implementation. However, performance is always regarded and correlates with performance and customer satisfaction. The performance in other words can also be accessed and set as the benchmark against other buildings so that the relative performance can be justified.

Meanwhile, performance is categorise into two dimensions of efficiency and effectiveness. The parameter efficiency is measured from the aspect of resource utilisation and cost reduction. There are three indicators played role for hospital facilities based on performance indicators, budgeting and resource. Hence, it is clear that the existence of linear correlation between performance and level of expenditure exists. There is significant evidence to say that performance reflects the level of resources invested per annum. Less resource will affect the hospital's service and quality from time to time. The second dimension is effectiveness from the aspect of service quality, customer satisfaction, growth and safety.

Cost and quality are the two main parts of the performance that an organisation should focus on. The main objectives of performance are to provide service with good quality and customer satisfaction. The cost factors also play a pertinent role to the organisation as it would support the organisation. It can be achieved through good strategies and long-term planning of the organisation. As performance measures are needed to contribute to the management of quality, value and risk, FM performance measurement in organisations is therefore essential.

Quality aspect in facilities is important when it is related to performance in organisation. It is because quality service is part and parcel of support process of primary activities and organisation objectives. The quality objectives are to ensure that delivery meets its objectives, processes, and continuous quality improvements achieved in any organisation. The total quality management (TQM) in FM is to enhance and help practitioners refine and solve work problems to be better performance and productivity.

The TQM helps improvement in FM process of customers, audits and contracts. While FM is projectoriented, quality performance through TQM will help the project team achieve organisational goals. The end users must have sufficient skills and knowledge to achieve performance such as knowledge, processes and tools. The quality service is imperative to measure and improve service delivery The quality service is defined as the quality to be delivered and meet the requirement, meet the demands, and satisfy end users in the organisation. Hence, quality can be considered as a set of characteristics to meet FM service requirement. Clients, customers, end-users and society must adhere to all the requirements set to achieve. Therefore, some considerations need to be considered;

- a. The needs and objectives of quality and process of interpretation in an organisation
- b. Clients, customers and the satisfaction of the end user over perception
- c. Financial and resources in organisation

There are some reasons for clients to have quality management in its organisation;

- a. To deliver the final output / delivery
- b. To ensure services delivered on time
- c. To take action in non-conformance and discrepancies arise
- d. To measure the quality through indicators and processes

The quality management is a process within FM organisation. The processes concerned on the dependency and directly on the efficiency and productivity of FM activities. Normally, the quality process consists of three tiers of the organisation;

- a. Strategic level (the process of meeting the objectives especially high-level management group)
- b. Tactical level (the process to satisfy the needs of the customer and the indicators outlined)
- c. Operational level (the process to operationalise and to meet the indicators to satisfy end users)

The performance management that relates to quality has some functions as follows:

- a. Creating transparency Performance management leads to transparency and plays accountability in organisation. Thus, the organisation has a clear vision of what they need and want to achieve and what cost are involved.
- b. Learning By using performance management, such organisation can learn what needs to be improved further in terms of process, capacity and so on.
- c. Appraising The evaluation to be appraised by the organisation or third party involved and awards to the staff.
- d. Sanctioning The performance will also influence the assessment of the organisation either if the performance outcome is not satisfying; it can be positive, good or negative sanction.

Some of the benefits of having performance management in the organisation:

- a. Performance management leads to transparency in managing the facilities. The transparency could be both ways, either internal or external function. Internal factor means the organisation's activities are not clear on what they want to contribute to the primary process. Thus, to become more productive and meet the performance targets, innovation and incentive are introduced. External factor suggests that success would be used to account for services rendered by other organisations to track and balance the affairs of individuals such as education, community and healthcare. Thus, the performance will benefit people to be more secure, peaceful and receive fair distribution income.
- b. Performance management is also output-based and processes like. It is a form of output steering and the organisation is rewarded by incentives based on good planning and formulating goals and objectives. The managers plan the goals by optimising resources and preferences.
- c. Performance management will promote learning processes inside and outside organisations. The comparison between one agency and another agency in terms of best practices, different methods used can make the performance process better. The differences could be in the form of incentives, scores, communication strategies and so on. While within organisation, practitioners play their roles by not intervene in different departments to do their job. Thus, the different output

is an opportunity to learn and discuss further internally, and there is reason to start asking each other questions. The output may thus be an incentive for learning processes.

- d. Performance management produces information which can be used to improve professional services. The output may be used to improve organisation intelligence. The intelligence helps professionals clarify the output that enables the measurement being done correctly, thereby improving the facility.
- e. Performance management are divided into three categories.
  - Controlling Measures are used in a top-down approach to guide and control people's behavior and actions. Measures are used to set goals or rules, to achieve goals and feedbacks. In this context, measures are often regarded to reward and recognition
  - External reporting and compliance Measures are used to inform external parties and comply with regulations and information requests.
  - Learning and empowerment Measures are used to empower staff to equip themselves with the information they need to learn and make decisions on the improvement. Measures are used as evidence to inform management decisions for continuous learning and improvement

10 principles of good performance management need to be adopted either government or public sector organisation. The principles include;

- 1. Create clarity and agreement about the strategic aims
- 2. Collect meaningful and relevant performance indicators
- 3. Indicators for extraction relevant insights
- 4. Positive culture of learning from performance information
- 5. Cross organisational buy-in
- 6. Aligning organisational activities with strategic aims outlined in the performance management
- 7. Strategic objectives and performance indicators up to date
- 8. Reporting and communicate performance information
- 9. Provide IT infrastructure to support performance activities
- 10. Adequate manpower and resources to manage performance strategically

## 4.3 HUMAN CAPACITY BUILDING

## 4.3.1 Introduction

The new economy has created a new dimension for human capacity building (HCB). HCB recognises that knowledge and skills development in the new economy is critical, requiring a comprehensive approach. The strategy aims to provide an effective response to the current and future need to transform the digital divide into digital opportunities, taking advantage of ICTs, so that the benefits of the new economy can reach all players in the FM domain. New and effective human capacity-building approaches are required to reduce disparities and provide comprehensive access to the benefits of the new economy.

Knowledge, information, and how they are used today determine prosperity. The expansion of the international alliance is driven not only by innovation and creativity, but also by information and communication technology networks, organisational and structural changes and a suitable combination of know-how, policy and capacity building. This is the new economic framework that includes, among other features, e-business, e-services, e-learning, and e-society.

Success in developing human capital is crucial to harvesting the unparalleled possibilities of the new economy, including FM services. IT and knowledge advances are transforming the global economy's landscape. While the globalisation of trade, finance, and data flows can help all industries, there is also the possibility that the speeding up the pace of change may widen the divide between digital and knowledge, with investment, skills, and other resources flowing to economies with a stronger knowledge base.

## 4.3.2 Human Capacity Building For Malaysian Facilities Management

The concept of the capacity building refers to the people, institutions and practices that enable units, organisations, or countries to achieve their developmental goals. Capacity building can also be defined as planned development of (or increase in) knowledge, output rate, management, skills, and other organisation capabilities through acquisitions, incentives, technology and training. The compound word 'capacity building' entails identifying and analysing problems, making rational choices, formulate solutions, and implement actions designed to achieve set objectives. The key factors for capacity building success are shown in Table 4.3 below:

| Key Factors                          | Description   |
|--------------------------------------|---|
| Strategic<br>Management              | Strategic management involves identifying and clarifying strategies to<br>achieve better performance and a competitive advantage in alignment<br>with the initial goals. It involves a bundle of planning stages and decision-<br>making processes with thorough knowledge and analysis to make the right<br>decisions and take the right actions.<br>Three (3) main stages in developing and achieving a workable facilities<br>management strategy: 1) Top-level analysis of requirements 2) Develop<br>solutions – find the best option 3) Implementing solutions – implementing<br>the plan   |
| Policy Development<br>and Management | Policy development in FM refers to the activities involved in the development and implementation of the FM policies of the institution.<br>Activities include: identification of new/revised policy requirements; enacting research; designing, reviewing and revising policy proposals based on response collected; design and advice policy documents; assessing draft policy documents based on feedback obtained; producing and submitting final policy documents. Formulating a policy is based on best available knowledge, while management should engage some rational application, allocation and handling of available resources. |
| Ethics of Good<br>Governance         | Good governance is associated with knowledge, mediation, resource<br>allocation, implementing and maintaining key relationships. It includes<br>elements like ethical leadership, accountability, integrity, transparency,<br>honesty, and responsiveness. Instead of relying solely on a political will or<br>personal will that may not be sustainable over the longer term, as growth<br>is based on that matter, a good governance model should be built on the<br>quality of organisations.  |

| Performance<br>Management                               | Business performance means the manner or quality of service associated<br>with the capacity of the facilities to contribute to the fulfillment of their<br>intended use functions. Performance management can be seen as a<br>systemic mechanism in which the overall performance of an organisation<br>can be improved by enhancing individual performance within a team<br>setting. It means cultivating superior performance by communicating goals,<br>identifying positions within the necessary structure of competence, and<br>setting achievable benchmarks.   |
|---|--|
| Human Resource<br>Development and<br>Management         | Capacity building involves the production of human capital as an integral<br>part of growth. Appropriate human resources ensure that the right number<br>and form of employees are available to an organisation at the right time<br>and place in order to meet organisational needs.<br>Two key elements should be considered when providing sufficient human<br>resources: 1) Human resource acquisition-planning of human resources;<br>recruiting; selection or screening and orientation 2) Managing human<br>capital - Training and development; assessment of performance; incentives<br>and recognition; retention and substitution. |
| Target Setting  | Defining the aim begins with precise and clear targets and strategy<br>formulation. Goal setting is a simple, but not a trivial, job, a concept that<br>can radically change the way organisations conduct their work. Targets<br>guide all aspects of the joint effort of the organisation and provide a real<br>motivational obligation to all participants. It will lead to concentrated<br>actions, key activities that need to be completed productively, and<br>processes that need to be updated in order to ensure that the most critical<br>items are accomplished first.   |
| Benchmarking /<br>Monitoring and<br>Evaluation          | Benchmarking is a multi-step process that enables an organisation to<br>compare performance aspects, recognise disparities, seek alternative<br>approaches, analyse opportunities for progress, introduce change, and<br>track results. It can all start with an internal review, measuring your own<br>organisation's output matrices over time. These matrices may include<br>operating costs, use of space, activities of operation and maintenance,<br>movements, and FM personnel in the FM sector.   |
| Service, Delivery,<br>Performance and<br>Customer Focus | In order to respond to customer demands and provide outstanding<br>customer support, service delivery and customer attention are essential.<br>Performance can be measured either internally or externally by researching,<br>identifying and responding to the needs of clients. It can be accomplished<br>by using effective questioning techniques; developing and sustaining<br>excellent customer relationships; listening to input from customers and<br>treating all customers equally and with regard to diverse needs.  |

| Project Management   | Project management typically refers to applying information, expertise<br>and strategies to successfully and efficiently conduct projects. For<br>organisations, it is a strategic competency that helps them relate the<br>project outcomes to business objectives. Project management procedures<br>are divided into five classes that initiate strategy, execution, evaluation,<br>control and completion.  |
|--|--|
| Entrepreneur<br>Development  | Entrepreneurship development aims to expand entrepreneurship<br>foundation to accelerate the pace at which new ventures are created to<br>accelerate job creation and economic development.<br>Entrepreneur development is essential in an organisation and requires<br>a proper selection process that attempts to identify those target groups<br>that fulfil entrepreneurial success. It encourages new innovation, creation,<br>growth potential, and business venture with well-structured entrepreneurial<br>development to ensure long-term business sustainability.  |
| Team Building  | Team building is a host of techniques to improve the internal functioning of working groups and refer to the various activities undertaken to motivate team members and increase team performance. In capacity building, teambuilding skills are critical to achieving its effectiveness. With strong team building, a team can accomplish something much bigger and work more effectively and efficiently than a group of self-employed individuals. The crucial element of team building success is that all efforts are directed to the same distinct goals, the team goals.  |
| Managing and<br>Leading Strategic<br>Change                          | Under rapid technological and societal change, organisation cannot<br>be granted to stagnate without constant improvement. Strategic and<br>systemic change is required to help successfully create and sustain their<br>competitive edge. Three main procedures in leading the strategic change:<br>1) Defining strategic direction 2) Ensuring successful implementation 3)<br>Maintaining long-term high performance. Strategic change management's<br>art is balancing processes and structure required for change with the right<br>strategies and content focus.   |
| E – Government<br>/ Business and<br>Management<br>Information System | <ul> <li>E – Government refers to the capacity of the public sector and the willingness to deploy knowledge enhancement and information to serve citizens. Key factors such as cost reduction and efficiency gains, improved service delivery quality, increased government capacity, improved transparency and accountability could be achieved by examining e-government options.</li> <li>With e-government realisation, the Management Information System (MIS) project must serve as strong ground support and foundation for better efficiency. Management Information System (MIS) includes software systems and the entire set of business processes and resources used to collect information from functional or tactical systems.</li> </ul> |

| Time Management                      | Time management is the act of deliberately taking control over the amount<br>of time expended on particular operations. Time management also refers to<br>efficiently managing time where the right time is allocated to the right task,<br>allocating unique time assignments to tasks according to their value, and<br>making the best use of time as time is often limited.<br>Time management requires efficient planning; setting targets and goals;<br>setting deadlines; delegating duties; prioritising tasks according to their<br>significance; and investing the right time on the right operation.                      |
|--------------------------------------|---|
| Customer Care                        | The secret to success is providing a successful product and being able<br>to deliver the service level they need. Via customer support, a consistent<br>and flexible way of handling customers and gaining knowledge about the<br>delivery service through feedback are required.<br>Customer service is about the relationships of the whole organisation and<br>management with consumers who have certain abilities to monitor and<br>handle. It would improve retention and promote their loyalty by offering<br>a better service to existing customers, which is more cost-effective than                                      |
| Effective<br>Communication Skills    | attracting new customers.<br>For the success of personal interactions and organisational<br>communication, good communication is essential. Good communication<br>is an essential element of success for any organisation, director, manager,<br>supervisor, and employee. Therefore, effective communication skills are<br>important in the real working world, knowing how to use one or more<br>communication modes to bring ideas to the right party without wasting a<br>lot of time and effort. Strong and efficient communication skills are also<br>considered to be important for creating a cohesive and productive team. |
| Negotiation Skills<br>and Management | Negotiating is a way in any relationship, regardless of circumstances, to accomplish individual objectives. Negotiation is, moreover, a technique of discussing issues among themselves and reaching a conclusion that will benefit all the parties involved in the discussion. This is done to avoid conflicts and tensions essential for peace and harmony. It is important to understand the situation holistically and decide on something that will benefit all. Negotiation skills require attributes such as tactfulness and smartness to handle all situations and reach a suitable conclusion.                             |
| Total Quality<br>Management (TQM)    | Total Quality Management can be described as a method to continuously<br>improve the output of all activities in order to provide principles; tools<br>and techniques to ensure customer satisfaction. In addition, overall<br>quality control for a customer-focused company that includes all workers<br>in performance improvement can be summarised as a management<br>framework. It uses strategy, data and effective communication to<br>incorporate quality discipline into the culture and activities of the<br>organisation. Total Quality Control involves a thinking process mindset.                                    |

| Business Forces Re-<br>engineering     | Business Process Re-engineering (BPR) concerns the fundamental<br>rethinking and radical redesign of a business process to achieve significant<br>and sustainable changes in efficiency, cost, operation, lead time, flexibility<br>and creativity. New IT technologies like multimedia, image processing<br>and expert systems can reduce the number of non-value-added activities.<br>Organisational reform, like job redesign, may be used to enhance products<br>and services delivery.   |  |
|--|---|--|
| Change Management                      | <ul> <li>The change management process should adopt the best human resource management practices. Management of change has five principles:</li> <li>1) Involve and agree with support from people within the system</li> <li>2) Understand where you or the organisation is.</li> <li>3) Understand where you want to be, when, why and what measures to take.</li> <li>4) Develop the above plan inappropriate measurable stages.</li> <li>5) Communicate, engage and facilitate the participation of individuals as quickly, openly and as fully as possible</li> </ul>  |  |
| Crisis Management                      | The crisis may be a series of unexpected unwanted incidents on extremely<br>short notice, causing panic and confusion, leading to significant workplace<br>disruptions. Crisis management is created to protect an organisation from<br>the adverse effects of the crisis by identifying early signs of crisis, taking<br>decisive action, and making fast decisions. Crisis management team<br>focuses mainly on recognising early signs of crisis, finding trouble areas,<br>addressing identified areas of concern, preparing crisis management<br>strategies that work best in emergencies, ensuring morale and support<br>during crises, and helping companies recover from difficult times and<br>prepare for the future. |  |
| Creative Thinking                      | The creative thinking process is considered a crucial element in skills and capabilities such as versatility, challenging assumptions, adaptability, seeing more than one side of a problem, taking perspective, and selecting, synthesising, and reassembling knowledge. However, suppose the definition is related to the management of facilities. In that case, the question must be answered as to what generates the potential for creative thinking and, in particular, the ability to use both creative thinking abilities and other analytical skills in a way that can contribute to professional achievement and fulfilment.   |  |
| Problem Solving and<br>Decision Making | Understanding problem solving is necessary to distinguish between<br>problem symptoms and cause. Identifying the cause of the problem is the<br>key to the statement of the problem. Decision-making is the cut-off point<br>to stop the thinking process and start the activation process. Decision-<br>making should be done through an in-depth discussion of all aspects of<br>the issue and face-to-face worker discussion.  |  |

| Investment Appraisal | Investment assessment is an integral part of capital budgeting and applies<br>to areas that may not easily quantify returns such as staff, marketing, and<br>training. Investment appraisal function is to reveal the general feasibility of<br>a project. This assessment will include projected cash flows and projected<br>quarterly or annual profits, normally including a net present value (NPV)<br>analysis. Having both cash flow and net present value will present an<br>indication and idea of a project's likely profitability in both current and long<br>term. |
|----------------------|---|
|                      | An investment assessment will not only demonstrate the relative financial feasibility of the project, but will also assess how well the proposed project moves forward with strategic goals or how well it fits into the organisational structure, which will have broader financial implications.  |

Table 4.3: Key factors for Capacity Building Success

With the implementation of FM in Human Capacity Building, there are challenges associated with it. Challenges to the human capacity building include non-existence/ non-robust training policy. Other challenges are inadequate budgetary allocation, which includes the cost of training and miss-management of funds. The lack of a common understanding of the importance of capacity building, lack of requisite capability and capacity to conduct effective training, and ineffective collaboration between key parties are also noteworthy challenges. Similarly, a Political, Economic, Social, Technology, Legal and Environmental (PESTLES) factors would also count barriers in the implementation of human capacity building in given contexts.

## 4.3.3 Cooperation and Collaboration in Human Capacity Building

Cooperation and collaboration should be initiated in HCB through:

- 1. Joint training and education on FM provisions
- 2. Joint funding and investment in capacity building
- 3. Cooperation in show-casing demonstration projects and best practice activities in capacity building
- 4. Inter-firm collaborative initiatives in HCB:
  - Coaching
  - Job-rotation
  - Secondments
  - Shadowing
  - Building Communities of Practice (COP) in HCB

Level of readiness on HCB among FM practitioners should be considered. Assessment tools are used to assess readiness further and clarify needs. Gathering the data will provide a baseline of current status and can be used to develop a business case or future needs. Briefing about the need for HCB, including its purpose and goals, the requirement to make the initiative a success should be conducted. The level of readiness on HCB can be explained as in Figure 4.3.

|  | Less Capacity/<br>Readiness   | Greater Capacity/<br>Readiness                         |
|--|---|--|
| <ul><li>High Need</li><li>Low Need</li></ul> | <ul> <li>Careful about<br/>timing<br/>(postpone)</li> <li>Do not proceed</li> </ul> | <ul><li>Prime candidate</li><li>Less urgency</li></ul> |

Figure 4.3: Level of readiness on HCB among FM practitioners

## 4.3.3.1 Formulating a plan for the identification and delivery of HCB and legal frameworks in Malaysia

## 1. Partnerships

- a. Establishing HR group
- b. Assess HR situation availability and education and training
- c. Identify HR resource needs by understanding the external environment and the organisational strategies to ensure whether assumption on the needs are appropriate and the extent of scale-up needed

## 2. Staff/workforce availability

- a. Establish HR recruitment, selection and retention plan/ strategy
- b. Define competencies (including levels of competencies) of FM professionals

#### 3. Staff/workforce education and training

- a. Funding for human, resource education, training and development.
- b. Develop FM education and training materials and identify/establish capacity.
- c. Plan and strategies for education and training (in-house and external) roll-out.

## 4. Implementation

- a. Monitoring and improving Improving the strategy based on the result of monitoring and periodic evaluation. In this stage, monitoring is referring to what it is currently doing after that evaluating stage is how well it appears to be doing it, and assessing whether the current level of effort is appropriate over time. This information can be used to improve future organisational performance.
- b. Quality control and certification regime

In summary, HCB in Malaysia is explained in diagram 4.4 below:



Figure 4.4: HCB for FM in Malaysia

Human Capacity Building Plan identification and delivery can be carried out as below:

- 1. Establish/constitute HR working group/ task force.
- 2. Assess HR situation and availability (Including education and training).
- Identification HR Resource needs and extent of scale-up needed for each aspect/ component.

- 4. Consider and establish HR recruitment, selection and retention plan /strategy.
- 5. Define competencies (including Levels of competencies) of FM professionals.
- 6. Plan and strategies for education and training (in-house and external) rollout.
- 7. Develop FM education and training materials, and identify capacity for FM education and training delivery.
- 8. Identify, develop and obtain requisite funding for human resource education, training and development.
- 9. Identify and put in place appropriate quality control and certification regimes.
- 10. Establish appropriate monitoring, performance management regime(s) and continuously improve.

The action plan identifies the specific steps that will be taken to achieve the initiatives and strategic objectives where the rubber meets the road. Each initiative has a supporting action plan attached to it. Action plans are geared toward operations, procedures and processes. These action plans describe who does what, when it will be completed, and how they know when the steps are completed. With such initiatives, action plans require monitoring progress on objective, for which measures are needed. The process is shown in figure 4.5.



Figure 4.5: Objectives, Initiatives and Action Plans

## 4.3.4 Strategic Approach to Training Needs for Facilities Management in Malaysia

Competencies can be defined as the lasting characteristics of an individual that result in the superior performance of a person on the job or an underlying feature that results in ineffective and/or superior job performance (Boyatzis, 1982). These are areas of personal capacity that enable employees to perform their jobs by successfully achieving outcomes or performing tasks. It is important to identify the skills necessary for each job and the knowledge, skills, behaviour and personality characteristics underlying each skill.

Key competencies for facilities managers are:

#### • Operations and Maintenance

Maintenance is a process in which the working condition of plant or machinery is maintained at the optimum level to give maximum output. It can be done through repair, partial replacement, total replacement and corrective measures. Operation and maintenance competence is needed in facility manager to achieve full capacity utilisation of the facilities, increase production, reduce wastage, ensure the safety of workers and operators and ultimately increase the operational effectiveness and efficiency.

#### Real Estate

Real estate is referred to land plus anything permanently fixed to it, including buildings, sheds and other items attached to the structure. Examples of real estate include undeveloped land, houses, condominiums, townhomes, office buildings, retail store buildings and factories.

#### • Human and Environmental Factors

It is essential to determine the human and environmental factors as it will affect the operation. Human factors refer to environmental, organisational and job factors, and human and individual characteristics that influence behavior at work to affect health and safety. A simple way to view human factors is to think about three aspects: the job, the person and the organisation, and how they affect the behavior of people related to health and safety. While the environmental factors is referred to an identifiable element in the physical, cultural, demographic, economic, political, regulatory, or technological environment that affects the survival, operations, and growth of an organisation.

#### • Planning and Project Management

Project management refers to applying knowledge, skills, and techniques to execute projects effectively and efficiently. It is a strategic competency for organisations, enabling them to tie the project results to business goals. Project management processes are divided into five groups: initiating, planning, executing, monitoring and controlling and closing.

## • Leadership and Management

Leadership and management skills are the crucial elements that help to maximise efficiency and to achieve organisational goals. Leadership is viewed as important to initiate action and synchronise organisational goals with proper and effective coordination. Leadership is not all about supervising, but also guiding subordinates, a guiding role for them to perform their work effectively and efficiently. True leadership will create confidence among the team members and contribute to building morale

and healthy work environment among the subordinates. A morale booster can add value to achieving full co-operation to achieve common goals.

#### • Finance

Financial is one part of complex activities in a firm, and it is deemed important for a running business. Facilities managers need to have the skills to take care of the significant financial functions of an organisation. He or she should be a fast learner and maintain farsightedness in order to ensure the funds are utilised most efficiently and effectively. The actions taken will directly affect the stability, growth and goodwill of the organisation. The few mains activities relating to finance are usually: the raising of funds for cash and liquidity dealing with debt and equity, allocation of funds as in budgeting for short term and long term period; profit planning to ensure the sustainability of business; and understanding the capital market and the sub-markets by evaluating all the risk involved.

#### Quality Assessment and Innovation

The quality of product and services decide the success or failure of an organisation. Therefore, quality is usually an important aspect of satisfaction. Thus, quality management and assessment have become very important as far as any organisation is concerned. Since quality assessment is objective oriented, it can be achieved through statistical quality control. The quality of product or service is assessed if the proper designing and process are followed. It should be done periodically according to the plan during the initial stage and updated along the way. With stringent quality control and consistent quality assessment, an organisation will reduce wastage, ensure quality maintenance, give satisfactory, and increase productivity and efficiency.

#### • Communications

Effective communications play a large part in maintaining morale and motivating employees at all levels. Communication is important to ensure a smooth flow of information among managers working towards a common goal. The message has to be clear enough, direct and straight to the point and well understood ineffective communication. There two ways of communication flow which are upward and downward. Both of the communication flow cannot be taken lightly to avoid miscommunication. Upward communication is essential for the subordinates to share their view with mangers on their nature of work, job responsibilities, and managers to provide reporting and explanation to the shareholders and top management. Meanwhile, downward communication occurs when information passes from managers to subordinates by providing them with instructions and directions on what to do and how to do various tasks.

## • Technology

Technology can be facilitating a key factor in assisting the change in operations and production management. The advent of technology in operation management will be able to increase the productivity and efficiency of an organisation. Managers have to be technology competence in order to be updated about the current new functions and features available in the market. Certain technologies have been shown to reduce costs and increase the efficiency of the organisation. However, it is critical for managers to plan and to understand to laying risks and concerns as it might not always be feasible to use technology in all aspects with the challenge coming through high initial cost of investment, high cost of maintenance and management

## 4.4 SUPPLY CHAIN MANAGEMENT

## 4.4.1 Introduction

A supply chain is defined as integrating core business processes across the supply chain to create value for customers and stakeholders (Lambert, 2004). Supply chain management can also be described as a combination of spreading management, logistics, marketing, customer relationship, materials management, purchasing and procurement, and standard production and operations management fields. The concept of supply chain management was introduced the late 1950s since inter-organisational relationships are important. Nowadays, the study of supply chain management is growing rapidly due to high integration needed in managing an organisation.

In the construction industry, supply chain management is defined as the network of facilities and activities that provides customer and economic value to the functions of design development, contract management, service and material procurement, materials manufacture and delivery, and FM. Unlike design development, contract management, service and material procurement, as well as materials manufacture and delivery that are only taken part in pre-construction and construction stages, facilities management is involved in a project from pre-construction to post-construction stages. Hence, it is proven that FM is important to support the core business in the long-term aspect.

FM is gradually involved with managing supply chain issues associated with the facilities management functions, especially when an organisation takes over a building and operates its business. It is therefore essential to understand the role of FM in the business environment and resource management. FM is as simple as managing the facilities of a building and actively involved in creating and delivering the final product or system to support the core business activities. The need for interaction and integration with an external supply chain of facility service providers, internal customers, clients or organisations is emphasised.

## 4.4.2 Facilities Management Supply Chain

Organisations usually formulate strategies into three major levels, which are corporate, business and functional. Corporate strategy is the highest level that determines the mission, objective, and vision of organisations. Next, business strategy deals with competition within the specific area of operations. Then, the functional level plays a role in supporting other strategies. Thus, FM is positioned on the functional level as its role is to support the core business.

In FM, the supply chain is perceived as the system used to deliver products or services for supporting the core business. Essentially, the FM supply chain involves stakeholders, including the client, customers, building users and visitors, all those who make up the demand side of the chain, and suppliers, contractors and other collaborating parties involved in the provision of FM services. The parties involved in the supply chain in facilities management, as shown in Figure 4.6. Therefore, facilities management support functions are a combination of internal demands and external provisions. Both internal value chains and external supply chains must be taken into account.



Figure 4.6: Facilities Management supply chain Source: Jensen (2011)

Since FM is seen to be providing support activities in organisations, the detailed description of activities in the supply chain includes:

- Procurement activities include procurement of raw materials, energy, laboratory equipment, office equipment, as well as buildings and systems.
- Maintenance activities include instance maintenance, planning and operation of facilities, operation, and buildings used for corporate and business activities.
- Corporate infrastructure activities include cross-organisational planning, finance and relations to authorities.

To enhance the effectiveness of FM supply chain, facilities managers should take some of the challenges as supply chain managers do to improve their capabilities required in supply chain management. The challenges are:

- Upgrading moving away from the purely blue-collar level, supporting supply chain management's boardroom relevance by focusing on strategic and creative abilities. People skills will also be required.
- Change management all the changes in supply chain design (outsourcing, increasing responsiveness etc.) will continue to influence supply chain efficiency. Ability to communicate effectively and influence others is the required skill.
- Learning learning should be continuous and comprises four major components:
- The acquisition of new knowledge
- The ability to conceptualise knowledge into true understanding and practice
- The belief, passion and energy to do something differently
- The actual practical experience of doing something different/changing behavior.

Supply chain management can be applied in the delivery of FM services. It ensures mutual understanding among the internal organisations, FM team, and external facility or service providers. Hence, strategic business operations for sustainable market position in a rapidly changing and competitive environment can be achieved with facilities management services.

## 4.4.3 Supply Chain Component

Although supply chain management is widely used in the business world nowadays, effective management is not easy to be achieved. Numerous implementation barriers to effective supply chain management must be avoided, include:

- Lack of top management support
- Non-aligned strategic and operating philosophies or policies
- Inability or unwillingness to share information
- Lack of trust among supply chain members
- Unwillingness to share risks and rewards
- Inflexible organisational systems and processes
- Cross-functional conflicts
- Inconsistent/inadequate performance measures
- Resistance to change
- Lack of training for new mindsets and skills

Commonly, there are six viewpoints adopted by organisations in the implementation of supply chain management. However, the viewpoints might not applicable or suitable for any organisation. The applicability and suitability are solely depending on the organisation strategy.

The viewpoints and their brief descriptions are shown in Table 4.4.

| Viewpoint  | Description  |
|--|--|
| Functional   | Business SCM is developed based on a different functional model of divisions. Within each functional section, no interdepartmental link is established.                    |
| Procurement  | Relies on the supply chain context. Supplier relationship initiative is essential as a component of business sourcing measures   |
| Logistics  | In this context, SCM deals with moving physical products from production to end users, involving transport and warehousing management                                      |
| Information system   | Relies on better integrations of SCM methods for both internal and external links through IT application   |
| "Business process<br>reengineering" (BPR) and<br>operations innovation | Relies on waste disposal and improving quality. This SCM view<br>underpins BPR as an effort to maintain competitive advantage across<br>multiple companies within the SCM. |
| Strategic  | SCM is a strategic approach and a key method for the survival of organisations.  |

Table 4.4: Supply Chain Management (SCM) viewpoints Source: Ayer (2006)

In most of the organisations, departments or supply chain memberships are separated with the individual functional paradigm. They are limited to their management or unit boundaries. This boundary reflects a level of management and scope of control of management. The supply chain management might not be effective in an organisation due to lack of cross-functional relationships among supply chain members. Thus, FM comes into action to combine all the supply chain members and achieve mutual understanding.

Furthermore, supply chain practices are vital in delivering long-term value to organisations, rather than simply seeking to generate short-term benefits. Partnering or procurement approaches is often determined as the mechanism for delivering this value. In order to improve the efficiency and effectiveness of supply chain, management of relationships among organisations, customers, contractors, suppliers, and service providers is required. Significantly, the needs of organisations and customers, as well as the capability of contractors, suppliers, and service providers, must be identified by facilities managers. Hence, long term partnership or procurement can be obtained.

FM must take all the essential supply chain management viewpoints into consideration to obtain effective supply chain management benefits. The benefits are:

- Unique products and services
- Faster research and development cycle times
- Superior quality
- Cost competitiveness
- Shorter order cycles
- Flexible customer response
- Enhance delivery performance
- Better asset management
- Increased cash-to-cash velocity
- Superior channel relationships

## 4.4.4 Supply Chain Risks

The management of supply chain risk is compulsory to ensure sustainability and profitability of organisations and business operations. Supply chain risk management could be defined as identifying and managing risks within the supply chain and externally through collaboration and coordination among supply chain members to minimise supply chain weaknesses. It plays a role in successfully proactively managing business processes.

The organisation could address the issue of supply chain risk management along two dimensions; they are:

- i. Supply chain risk operational risks or disruption risks.
- ii. Mitigation approach supply management, demand management, product management, or information management.

The first dimension addresses the level of risk that exists in certain events. Operational risks refer to the intrinsic uncertainties include uncertain customer demand, uncertain supply, and uncertain cost; In contrast, disruption risks relate to the disruptions affected by a natural and human disaster such as earthquake, tsunami, floods, hurricanes, terrorist attacks, or economic crises such as currency evaluation or strikes.

In order to mitigate the negative implication of supply chain risks, four basic approaches that an organisation could adopt through a coordinated or collaborative mechanism as shown in Figure 2. The approaches are intended to improve supply chain operations via coordination or collaboration. In supply management, the organisation can work together with the upstream partners such as suppliers and service providers, to ensure effective supply of materials or services along the FM supply chain. The organisation should then understand the need and demand from downstream partners like customers or users in demand management. Third, in product management, the organisation can modify the products, facilities, or services to meet the customer or user demand. Finally, the supply chain partners

can improve their coordination and collaboration by sharing private information that is available to individual supply chain partners in information management.



Figure 4.7: Four basic approaches for managing Supply Chain Risks Source: Tang (2006)

In general, there are three flows of major risks, include material, information and financial flows. The occurrence of these major risks is inevitable in operating a supply chain. The material flow risk involves physical movement within and between supply chain elements. Next, financial flow risk involves the inability to settle payments and improper investment. Then, information flow risk involves value-adding activities in a supply chain. In order to mitigate the risks, supply chain management requires specific and appropriate responses such as techniques, attitude and strategies for management of risk.

Since FM supply chain risks are slightly different from the production supply chain risk, the elements of major risks are filtered and tabulated in Table 4.5. This is to reflect the supply chain risks and solutions of FM.

| Flow Risk   | Element   | Solution  |
|-------------|---|---|
| Material    | Single sourcing risk  | <ul><li>Multiple sourcing</li><li>Alternative sourcing in and out</li></ul>   |
|             | Sourcing flexibility risk   | <ul><li>Resilience supply chain</li><li>Procurement contract model</li></ul>  |
|             | Supply product or service<br>monitoring/ quality                            | Alternative sourcing in and out   |
|             | Supply capacity   | <ul><li>Outsourcing</li><li>Build a flexible web or partners</li><li>Early supplier involvement</li></ul>   |
|             | <ul> <li>Supplier or service provider<br/>selection/ outsourcing</li> </ul> | <ul> <li>Alternative sourcing in and out</li> <li>Selection model based on cost, quality,<br/>responsiveness, strategic and operating<br/>constraint</li> <li>Incentive conflicts and coordinating contracts<br/>model</li> </ul> |
|             | Operational disruption  | <ul><li>Alternative sourcing in and out</li><li>Supply chain design</li><li>Operational hedging</li></ul>   |
|             | Political risk  | Operational hedging   |
|             | Supply chain partners     relationship                                      | <ul><li>Discount contract module</li><li>Improvise contract with aligned incentives</li></ul>   |
| Information | Information accuracy  | <ul><li>Aligning interest</li><li>Application of best practices</li><li>Improvise inventory data handling and policies</li></ul>  |
|             | Information system security     and disruption                              | <ul> <li>Contingency planning</li> <li>Assess and manage the information system of<br/>the firm and supply chain partners</li> </ul>  |
|             | Information outsourcing   | <ul><li> 'Value-added' outsourcing</li><li> Improve visibility</li></ul>  |
| Financial   | Price and cost risk   | <ul><li>Framework to enable supply chain driven profit growth</li><li>Real options application</li></ul>  |
|             | Financial strength of supply<br>chain partners                              | <ul><li>Early-payment programs</li><li>Stock-price benchmarking</li></ul>   |
|             | Financial handling and<br>practice  | Early-payment programs  |

In fact, there are several key decision makings for mitigating supply chain risks in FM. This includes:

- · Spread out the supply chain among multiple suppliers and service providers
- Up-front risk management
- Proactive risk management

Spreading out the supply chain among multiple suppliers and service providers is the most effective method in tackling supply chain risks. Whereby, decision making focuses on how to shift orders or projects capacity to different suppliers and service providers, rather than solely relies on one supplier or service provider. Then, proactive risk management will provide a systematic procedure for management to follow up on risk. It could be argued that proactive risk management is able to make difficult decisions prior to the risks when timing is less critical and negative emotions are less involved.

Such decision-making, however, is often neglected by organisations because it can be cost-prohibitive. Most of the time, the organisations would not consider these decisions until they realise the risks. Indeed, the costs of risk management undertaking are an investment in potential loss. Hence, supply chain risk management must be taken into account in business operations and FM.

## 4.4.5 Role of Facilities Management in Supply Chain Management

FM is no longer only dealing with building maintenance and operations related matters. However, it focuses on achieving the organisation business and strategic objectives. In supply chain management, it delivers services by dealing with varying degrees of sophistication in managing contracted relationships. To ensure the efficiency of the supply chain for FM, facilities professionals must be competent:

- i) Understanding business organisations
  - Understanding the behavior of organisations
  - Understanding business strategy
  - Developing facilities management strategy
- ii) Managing people
  - People management
  - Communication
  - Working with suppliers and specialists
- iii) Managing premises
  - Property portfolio management
  - Understanding building design
  - Building fabric maintenance

- iv) Managing services
  - Managing building services
  - Managing support services
  - Project management
  - Managing customer services
- v) Managing the working environment
  - Environmental issues
  - Space management
- vi) Managing resources
  - Procurement
  - Risk management
  - Financial management
  - Quality management
  - Information management

The value of supply chain management principle is to bridge the gap between the demand and supply of FM service delivery through an innovative partnership approach. Therefore, building and maintaining successful collaborative relationships among the supply chain stakeholders is the main function of FM in supply chain management.

## 4.5 LEVERAGING ICT IN FACILITY MANAGEMENT

## 4.5.1 Introduction

The emergence of the new economy has created a new dimension for the implementation of the Information Communication and Technology (ICT) strategy for FM. Ideal FM software is an integrated system that allows all of the activities in a complex facility to be managed and operated. Single point access to coordinate all the activities needed for the smooth operation of the facility. The Building Management System (BMS) should be closely integrated with the FM software in order to enable the operation of building systems through the FM interface as well. FM Software is the following:

- Management Information System (MIS) for facilities managers. It is a repository of information that allows the control and maintenance of the facility. Information stored in the system includes building geometry and properties as well as equipment details.
- Workflow automation system. It should permit a smooth flow of information through various stages of performing tasks related to the FM. The scope of ICT use in FM generally is diverse and covers: strategic management, building and engineering services management, environmental management, domestic services (such as cleaning, security and utilities supplies), administration and services support. The main roles and responsibility of facilities manager are to facilitate and

enable their clients to focus on their core businesses while facilities manager takes care of the service function that supports them. Thus, FM can be seen as a strategic issue to its recipient. The clients' demand is also increasing and become more complex that lead FM roles to be embedded and move into core operational functions of clients. In relation to this scenario, ICT is potentially seen to reduce costs and increase service level and quality.

## 4.5.2 Strategy, Policy and Procedures for the Development of ICT in Facilities Management in Malaysia

Generally, there are obvious motivations for developing an integrated ICT application to the maximum FM practice point in Malaysia. The awareness of the potential of ICT application in FM is also evident due to great exposure to its potential benefits within the industry. Currently, at the operational level in Malaysia, FM practice has enabled to consolidate its work process within an existing building. The FM application is used mostly in large scale commercial buildings, and type of ICT application used most are building and engineering services, domestic services and administration and service support. However, there is still lacking ICT used at environment management and strategic level. Reason for this include the reluctant to invest heavily into integrated ICT, FM system is not normally put in place upon the handover of the building to the owner and lacks a strategic approach for ICT utilisation in FM.

However, it was noted that there had been several ICT initiatives in Malaysia, including those related to FM. Examples include the SCALA system and the e-perunding system developed by the Ministry of Finance for the appointment of consultants. It was mentioned that Public Works Department (JKR) is open to implementing Building Information Modeling (BIM). In particular, an effort to bring the transition of ICT used in FM from the operational level to strategic approach is now where the government plays a significant role in achieving this target.

**Strategy:** One of the most important aspects of a strategy plan of ICT used in FM in Malaysia is government – business-led. New ICT application means a change in the basic operation of a business that needs to be process-led and not ICT-led. It is recommended to go phase by phase starting from the government and big industry players. A policy has to be first adopted by the government, which will encourage people to follow suit. For example, it could be stipulated in government projects that the contractors should use BIM. Government agencies should have the policy in their organisations to implement ICT in FM. Before the policy is implemented, a study on the readiness of the industry to move towards ICT in FM should be conducted. Therefore, the industry may identify their current capability and plan to improve prior ICT investment.

There should be efforts to develop a pool of skilled personnel to apply ICT in FM. Examples include comprehensive training, BIM certification, value-added to the University syllabus through close collaboration with the industry, introducing ICT at very early stages like primary school, use of games to attract young people, etc. Research and Development (R&D) funds for the university and industry should be allocated for addressing issues that affect the adoption of ICT in practice. The R&D project

collaboration between academia and industry should be encouraged and promoted, and also more efforts should be made towards standardisation.

**Policy and Procedure:** The formulation of good policies and guidelines should promote the features of the FM system to facilitate the life cycle of the building. The careful formulation and design of such policies should be taken place with close collaboration between respective government agencies such as JKR, Construction Industry Development Board (CIDB) and universities and industry. The FM system should use as a built model in the form of BIM with a user-friendly interface since BIM is emerging as a widely accepted standard. In order to make BIM available for FM operations, incorporation of BIM should be mandatory for obtaining planning permission. Economic Planning Unit (EPU) should take the lead in this. At the end of the construction, BIM should be handed over to the client (instead of as-built drawings as hard copies), and the client will become the owner of the BIM. These policy directives have to be developed by organisations such as JKR and CIDB.

## 4.5.3 The Type of ICT Applications Used For Facilities Management Organisation

Types of ICT applications for FM can be classified into strategic management, building and engineering services, environmental management, domestic services, administration, and service support. There is limited evidence on the use of an application for strategic management in Malaysia. However, in other categories there is more widespread use of applications particularly for larger facilities, sometimes using in-house developed applications. Some examples are listed below:

## Strategic management:

- Some large organisations use space and asset management applications tools like Archibus.
- Other asset management applications such as Computer Aided Facilities Management (CAFM), Capital Asset Management Information System (CAMIS), Artra and Maximo are occasionally used.

#### **Building & engineering services:**

- Computerised Maintenance and Management System (CMMS), C-Works oriented towards inventory, work order and preventive maintenance
- MySPATA (used at JKR) records type of repair, maintenance schedule, equipment list, etc. It contains as-built drawing of the facility.
- Building Automation Systems for Heating, Ventilation and Air-Conditioning (HVAC) and lighting.
- Abacus for maintenance management (planned maintenance and troubleshooting)

## **Environmental management:**

- Autodesk Revit (Manufacturing Extension Partnership (MEP), C&S and Architectural) at the design stage
- Ecotect and Green Studio for building energy management

#### **Domestic services:**

• Mostly In-house software for basic data management

#### Administration & service support

- Some software provides support for waste management
- Specialist applications such as health Information Systems used in hospitals

## 4.5.4 The Level of Maturity in the ICT Utilisation in Facilities Management

- The general overview of the workshop is that the level of maturity of ICT use in FM in organisations is at a responsive level, wherein the facility manager mainly uses ICT dictated by others.
- Most of the ICT application used is unable to meeting all the requirements for strategic and tactical elements
- Limited numbers of large well-established organisations are using ICT to monitor the asset and provide life cycle costing.
- Some of the organisations are still using the traditional paper method in managing their assets. While some of them still prefer using a common system like MS Office (MS Word, Excel, etc.)
- Evident found that none of the organisations used integrated drawings from the construction stage, which described the FM element and did not consider it during the initial stage of construction.

The role of the FM manager is likely to maintain the building in order to meet specific building requirements, statutory obligations and service level agreements within budgetary constraints.

## 4.5.5 Framework on Strategic Approach for ICT Utilisation in Facilities Management

The proposed framework is organised around four entities, namely, people, process, environment and infrastructure. In summary, for the most effective utilisation of ICT:

- People should be trained adequately
- Processes should be defined correctly
- Infrastructure should support the needs of ICT usage
- The environment should be ready

The use of ICT involves capturing, storing, manipulating and transmitting relevant data for FM tasks such as property acquisition, building usage, change of use, lease management, space utilisation planning, budgetary control, risk management, life cycle cost appraisal maintenance, monitoring and control of building systems and post-occupancy evaluation. Many software systems with varying capabilities are already available for these tasks. Barriers to adopting these solutions include lack of man power with adequate ICT skills, current processes do not permit easy software usage, lack of IT infrastructure and the non-acceptance of key stakeholders. The framework aims to address how these barriers might be overcome.

#### People

Capacity development through training is the key to developing a pool of personnel skilled in using ICT solutions. Various options for doing this are already discussed under Objective 4. In addition, effective management of skilled people is important. Skilled people should be motivated to remain in the industry and encouraged to apply innovative solutions.

## Process

Current FM processes should be critically reviewed to identify areas that do not support IT application. For example, paper-based tendering procedures restrict the scope of workflow automation. Electronic means of collaboration should be facilitated. Policies and strategies should be developed to encourage the use of ICT.

#### Infrastructure

While hardware is getting cheaper, software costs are still high, especially for high-level FM tasks. More efforts need to be put in to encourage the development of low-cost software solutions. Support could be provided for local software developers in the form of start-up grants and setting up incubation centres. It is noted that CWorks software comes from the incubation center of Malaysia Technology Development Corporation (MTDC).

Developing high-speed communication infrastructure is critical. Wireless and wired broadband connections should be available throughout the country. The recent proliferation of smartphones and tablets has created a favourable environment for mobile solutions for FM tasks. Local companies could take advantage of these.

## Environment

Key people in the industry should be ready to accept ICT in FM. Government and related organisations should support the use of ICT solutions. Owners and clients have a big role to play in enforcing the adoption of technology. Promotion activities such as roadshows will help to improve the awareness of the benefits of ICT.

# **CHAPTER 5: STRATEGIC FACILITIES MANAGEMENT FOR MALAYSIAN HEALTHCARE SECTOR**

## 5.1 INTRODUCTION

Preliminary design, construction and operation are the key stages in the service life of the facility that are most crucial to FM. Efficiency of the facilities is significantly affected by decisions concerning the strategy of the organisation that owns or uses the facilities. According to OECD 2011, health care is a key social and economic component of modern economies. Healthcare expenditure accounts for a significant proportion of the gross domestic product (GDP) in industrialised countries. Social, political and economic issues, such as an ageing community structure in developed countries, alongside rising healthcare and healthcare technology costs, result in cost-control pressures and improved patient care. In order to resolve this pressing health policy problem, a growing amount of attention is being paid to healthcare sector management strategies to make informed decisions.

FM now comprises a vast, complex sector. Demand to promote key business feature is rising rapidly, even higher than ever. Healthcare considers the function of FM as the process of promoting business objectives. By definition, healthcare 'FM' is similar to other industries. Detailed research that dwelt on every FM definition over these years concluded that a common keyword of 'workplace' is consistently related to the FM definition. Workplace refers to a workplace, which indicates that it is not specific to commercial buildings. Healthcare, for example, is the workplace. FM definition can then be described as workplace integrated management to enhance organisational performance. FM healthcare is defined as the management of health facilities, and these facilities are, in turn, places that offer healthcare that include clinics, hospitals, outpatient treatment facilities, specialist care centres, birth centres, and psychiatric care centres following the U.S. National Medicine Library descriptions.

As any health facility needs to ensure that its service delivery is competitive and survives a new market trend, more pressure has been placed on health care by a number of health facilities. Quality healthcare services must be chosen in order to achieve health equity and improve the quality of a healthy life, a fundamental need for all. The non-core operations of both healthcare organisations, including FM activities, have increased over time and the same applies to their effects on the quality and effectiveness of health services.

## 5.2 FACILITIES MANAGEMENT IN THE MALAYSIAN HEALTHCARE PERSPECTIVE

According to Pillay (2002), FM development in Malaysia began in the second half of the 1990s. The government has played a significant role in the growth of FM in Malaysia. In 1996, the government privatised three FM companies with non-critical support facilities for government healthcare. At the time, it was the largest FM contract for the government. It also marked the beginning in Malaysia of the new age of FM. Hospital facilities presented a large portion of the budget to the Malaysian Government in 2018, with some RM1.4 billion allocated to upgrade hospital facilities and infrastructure, in particular, to optimise government and private hospital facilities. The government has invested over RM 800 billion on infrastructure and services in the last 10 years alone. The country invested roughly more than RM 1.0 trillion worth of government assets in relation to the 1st Malaysian Programme in 1956.

FM is a dynamic topic that needs to be given more consideration and emphasis by such an organisation. However, only a few organisations place greater focus on the FM in their regular activities and annual budget. Flanagan (2014) stressed that facilities often entail high capital costs in operation and maintenance, especially in hospitals, and can even be up to five or six times a lifetime. They may not realise the importance of FM until they face system failure, safety and health concerns, risk, declining property value, and operational costs of buildings. Industries have always favoured the aspect that can generate instant profit rather than placing some budgets in FM. The industry players do not see any visible output of the FM assist operation behind the screen and involving groundwork dealing with bolt and nut issues. The issue of efficiency, productivity and professionalism in the construction sector can be achieved by adopting best practice.

Hospital aspects of FM could be grouped as design, construction-related activities and support services. Hospital design and construction activities include new hospital construction, redevelopment plans, renovation and refurbishment work, property management, space management, energy management, engineering/building maintenance, and ground maintenance service. The main focus of FM as a hospital support service is to provide value-for-money services to patients. Typical examples of hospital support services are providing catering, cleaning and ward housekeeping services, site management, clinical waste management, portering, linen supply, residential accommodation for doctors, car parking, and security. Healthcare FM is one of the key elements for the successful delivery of healthcare services. Integrating the two aspects mentioned by FM is critical as the activities are interrelated and share information. This relationship makes the project life-cycle approach important to FM professionals as it provides a link between hospital building and operation. Malaysia must therefore focus greatly on FM development, particularly in the public health sector.

## 5.3 FUNCTION OF FACILITIES MANAGEMENT IN HEALTHCARE

From a hospital perspective, strategic FM is commonly defined as an area-wide view of the land, buildings, plant, equipment and furniture of the hospital over their full life-cycles by providing a framework for planned acquisitions, maintenance, improvements or disposals, based on assessments of ongoing use and performance. FM in healthcare is a broad topic that encompasses areas such as human resources, physical workplace, environment, engineering services, structural, maintenance and financial management. FM can be subdivided into five core themes, as mentioned below:

- 1. Hospital facility planning and management,
- 2. Building operation and maintenance,
- 3. Real estate and finance,
- 4. Human and environmental factors, and
- 5. Risk evaluation.

A good strategic plan will enhance the performance of the hospital organisation, demonstrate leadership, and help the organisation remain focused. The first stage of any strategic planning process is to determine the objectives of the organisation. A strong strategic planning process includes deploying a leadership system beyond the simple assignment of tasks and targeting completion dates. Many organisations do not have written missions, visions, goals, objectives or policies for their FM departments. Hospital services are more than just a range of non-core activities; they are vital enabling functions that underpin the entire business activity of the hospital in all departments of the organisation.

FM has to tag the strategic direction of the objectives of the hospital. Hospital FM managers need to support the mission and objectives of the hospital by setting strategic objectives for FM departments. Strategic FM must be taken objectively by the management rather than focusing on short term operational functions. The FM strategy trend is to look forward over the next five years to reflect the planning cycle of the hospital, which includes all hospital sites and their estates, including their facilities.

Facilities managers at the hospital need to influence strategic decisions and demonstrate the contribution that facilities make to achieve organisational objectives and business targets. The top management in the hospital is committed in giving support to strategise FM activities. The patient satisfaction level regarding their illness recovery relies on support from the healthcare system such as FM, and these services must gain a high level of acceptability by the patients. Developing a strategic FM to collaborate with other activities should be an integrated effort between facilities professionals and stakeholders to facilitate the effective implementation of FM functions and other hospital activities.

## 5.3.1 Project Life-cycle Approach for Hospital

Generally, hospital construction facilities have been built to comply with a relatively low technology standard. The value of life-cycle costs and the need to provide a service according to contractual efficiency and performance standards have not been taken on board, such as hospital buildings and support services in general.

The new concept of hospitals and healthcare started the transition from the traditional "provider-centred" to a "consumer-centred" healthcare system. This is seen as only one among a number of profound and inter-related paradigm shifts currently active in shaping the emerging social and technological climate in which architects, healthcare and hospital administrators and planners, healthcare providers and public policy-makers collaborate to create hospital and healthcare facilities with quality, cost-effectiveness and flexibility.

This concept has made the medical administrators join from the beginning of the project with the right of the construction professional, which was not the case in conventional hospital construction. The new concept adopts the project life-cycle approach, where all parties work together and share the same vision. User requirements are identified as a pre-requisite to cover the entire life from the recognition of needs to the operation of the finished facility. In this process, it is important to recognise and emphasise the inter-dependency of construction activities throughout the project's duration. The project life-cycle for hospitals can be divided into four operations as follows:

- i. Plan and design of the hospital
- ii. Construction of the hospital
- iii. Operation of the hospital
- iv. Transfer the hospital back to owner

#### Facilities Management Initiatives and Empowerment for Construction Industry in Malaysia



Figure 5.1: Project Life-Cycle for Hospital

Figure 5.1 shows the life-cycle project for hospitals and the transfer of the information process across the life-cycle project for hospitals, based on the concept of professionals. The efficiency and behavior patterns of the workforce and the effectiveness of their IT and communication systems are of considerable importance, as FM continues to evolve to reflect this. Information on aspects of FM whether the design and construction-related, or as a support service, must be shared. Healthcare delivery functions, finance and administration, can be thoroughly integrated, and data can be disseminated communitywide, statewide, nationwide, and internationally.

## 5.3.2 Plan and Design of Hospital

Factors that appear to be fueling the redevelopment activity in any hospitals are as follows:

- i. Population growth
- ii. Ageing of the population
- iii. Consumerism
- iv. Ageing infrastructure
- v. Workforce and technology
- vi. Market share and utilisation gains

The ability to forecast and make decisions on the basis of information on these factors will assist planners and FM departments in the planning process. Inputs from these factors are a pre-requisite for simulation to predict the future development of hospital facilities.

## 5.3.3 Construction of Hospital

Apart from performing support services, FM departments are also engaged in hospitals physical development. A typical hospital development project includes renovation work, refurbishment or construction of a new building. Healthcare institutions must have a strategic vision, mission, goals, and plans in place before telling their architects and designers, what they think they need, even if the project is a modest change or renovation. The administrators, board members, medical staff, and other stakeholders are to undertake an intense planning process that focuses on the hospital's strategic future goals to see if there is agreement on where the institution should be constructed.

Information on structural building elements, mechanical and electrical components is critical during the installation of M&E engineering plants and equipment during construction and maintenance. Drawings on architectural, structural, shops, electrical, mechanical, plumbing systems, Heating, ventilation, and air conditioning (HVAC), fire and safety are the basic form of information to be digitised for future reference. These documents are assets in the operation of FM activities. With the current internet technology like Web Enabled Project Management, clients, consultants, and contractors can analyse the growing model of how to perform project management over the web.

## 5.3.4 Operation and Maintenance of Hospital Facilities

Workers from departments of human resources, finance, design, engineering, construction, and clinical and non-clinical departments were gathered to maintain hospital facilities. Good communication between these staff will ensure a high-quality service to run the entire life cycle of the hospital project. The project life-cycle approach considers the operational services and the maintenance of assets and facilities that constitute and add to the overall cost of the project.

In hospitals, strategic FM has developed into a visible contributor to enhancing frontline care, engaging in a direct interface with medical and nursing staff and the patients themselves. The operation of FM in the hospital is patient-driven. Other considerations such as environmental, energy efficiency and user-friendly facilities are also priorities in managing a hospital. Through strategic FM planning, human resources and finance manager will help the hospital deliver quality and value-for-money service to patients. With strategic operation and maintenance, the hospital can measure its performance and thus produce a record that could be benchmarked against other hospitals.

## 5.3.5 Transfer of Hospital Back to Owner/Client

At the end of any Private Finance Initiative (PFI), i.e. Build, Maintain, Lease and Transfer (BMLT) contract, hospital facilities' ownership will be reverted to the public sector client. This happens after 30 years, depending on the contract agreement between the client and the operator. After this date, the hospital's operation may be undertaken by the owner, a new contract may be offered to the previous operator, or a new consortium may be appointed. Whichever consortium is appointed for the new task will need all the relevant strategic information to operate the hospital. The transition and handing over of responsibilities from the previous operator will also involve the transfer of information. The continuity of this information must be maintained. Strategic management of information should be the way forward, rather than the rebuilding of a new database.

## 5.4 HOSPITAL PERFORMANCE MANAGEMENT IN MALAYSIA

Healthcare is considered a very significant organisation for individuals and has been known for supplying medical care people. Compared with other fields, FM must be given priority in healthcare since it deals with human life. In contrast to other organisations, service delivery and efficiency in the healthcare sector needed the most comprehensive approach. In terms of quality services offered by healthcare, people will still share their opinions in the media. Over the years, the question of service quality and efficiency has challenged healthcare across the nation.

Therefore, it is clearly outlined in healthcare's vision and mission to have a high top standard of services and continue to increase customer satisfaction from time to time. FM performance assessment in Malaysia is divided into six components: fire protection and repair, maintenance of mechanical services, maintenance of electrical services, management of asset life cycles, management policy and administration and sanitation services. Maintenance of mechanical and electrical services has been found to have contributed a large percentage to performance management. Requirements and solutions will be skillfully presented to customers through performance management.

The level of service on FM functions that include hotel, estates services, and facilities maintenance will have a strong influence on hospitals and healthcare performance. Hospital performance management can be described as a collection of management tools designed to ensure optimum performance of the health care system over time, in line with strategic objectives. In any organisation, which also includes
the hospital, company performance assessment has a number of uses. The following list explains the reasons why organisations measure business performance:

- 1. To monitor and control,
- 2. To drive improvement,
- 3. To maximise the effectiveness of the improvement effort,
- 4. To achieve alignment with organisational goals and objectives, and
- 5. To reward and to discipline

The level of service inwards must be maintained and upgraded. Quality FM services could contribute to the improvement of management performance in the hospital. Service quality and performance must be consistently measured to ensure the service standards are maintained, and the service level of agreement is met. In today's consumer-driven marketplace, healthcare organisations gain market share by demonstrating excellence in clinical outcomes and customer service. Patient satisfaction and staff satisfaction are changing and demanding. These are some typical requirements to be fulfilled by the facilities department at the hospital.

Patient experience and feedback will reflect the services they received in the hospital. Patients make their first contact with the hospital during their journey in an ambulance, then being admitted to a ward, receiving treatment, and being offered hotel services like catering, porter, linen cleaning, and discharge. Most patients will engage them with healthcare and FM activities, and patients expect to have a pleasant stay close to home, with excellent service. Service performance on FM activities has to be maintained, upgraded and measured consistently against benchmarks, often with other organisations, that have performed remarkably. The Balanced Scorecard is an example to measure performance and is an approach that considers four different perspectives of facility performance: the community, services, building, and financial perspectives, thus resulting in a facility performance profile.

### 5.4.1 Criteria in Performance Management

A rating system for assessing customer feedback on performance was implemented by Tucker and Pitt (2009);

- The efficiency of the delivery of services
- Criticality to the operation of the business
- Provision of service (in-house/outsourced)

| Rank | Quality and efficiency<br>(based on per cent<br>rating "good") | Critically (based on per<br>cent "very critical") | Provision (based on per cent rating "outsourced") |
|------|--|---|---|
| 1    | Reception  | M&E Engineering                                   | Waste management                                  |
| 2    | Health and safety  | Health and safety                                 | Cleaning  |
| 3    | Mailroom   | Security  | Catering  |
| 4    | Security   | Mailroom  | M&E engineering                                   |
| 5    | Helpdesk   | Reception   | Grounds and gardens                               |
| 6    | Catering   | Helpdesk  | Security  |
| 7    | Grounds and gardens  | Cleaning  | Building fabric                                   |
| 8    | Cleaning   | Building fabric                                   | Helpdesk  |
| 9    | M&E engineering  | Waste management                                  | Reception   |
| 10   | Waste management   | Catering  | Mailroom  |
| 11   | Building fabric  | Grounds and gardens                               | Health and safety                                 |

Table 5.1: FM Customer Benchmarks-Service Ranking (Source: Tucker and Pitt, 2009)

Mechanical and electrical engineering (M&E) services were rated as most critical but reciprocally rated at least in terms of efficiency in the analysis of Table 5.1 above. Compared to M&E engineering, other hard services such as construction fabric and waste management are rated least critical. In terms of quality and effectiveness, these two hard services components were also the least rated. From these results, an inference may be made. First of all, customers are often offered the "soft services" or recognised as "front line" as FM's most important and highest quality work. It will give such organisations a good image and credibility in the industry.

Seven (7) key factors have been outlined under the performance measurement framework. Criteria listed are;

- i. Leadership
- ii. Stakeholders focus customer and other stakeholders
- iii. Strategic management
- iv. Function and programme management-people, partners, suppliers, physical resources, intellectual capital and risk management
- v. Process management
- vi. Information and analysis
- vii. Work culture

The widely used maintenance performance metrics have been classified into three (3) groups: equipment performance, cost performance, and process performance measures. The cost structure of hospital FM is one of the components to be addressed in the use of capital resources. The advantages of cost-effectiveness relate to the programs, facilities, and activities of organisations and changes in the whole life cycle cost. In other opinions, the performance assessment framework should have four key organisational requirements, including successful policies, expertise and human resources, acceptable culture and agile system.

A few issues have been highlighted with regard to the link between Human Resource Management (HRM) and performance. Human resources engagement would also significantly impact the relationship between human resource practices, policy systems, and performance. HRM practices would contribute significantly to a performance by motivating employees to take the desired attitudes and behaviours to improve organisational performance. Therefore, the Performance Measurement and Management (PMM) system has been developed as the basis for an effective and workable design for integration into the organisation.

This interrelationship includes five systems used;

- a. Performance system
- b. Cost system
- c. Capability evaluation system
- d. Benchmarking system and;
- e. Planning system

The strategic control process of the organisation is critical, as problems would lead to motivation for staff, poor information flow mechanisms, and a low level of accountability. Costs are always the main criteria that must be considered in the scope of facilities. In addition, the assessment carried out focuses solely on procurement competitiveness rather than on cost efficiency. However, the process of service delivery can be controlled by the cost-effectiveness of facilities.

There are three critical financial control facets to achieve cost-effective budgetary control facilities; value engineering and competitiveness procurement, as shown in Figure 5.2. Three key elements, physical, functional and financial, should be included in the calculation of facilities. Physical performance refers to the behaviour of structures, such as heating and structural integrity. Functional performance relates to the occupant of the buildings, such as space, layout, and ergonomics, whereas financial performance will affect capital spending, depreciation, and total expenditure efficiency.



Figure 5.2: Three facets of financial control interrelationship (Source: Williams, 1996)





Figure 5.3 above is focused on customer satisfaction, made up of success in service efficiency. Once the consumer is satisfied, it will add value to the quality of the service and balance the efficiency of the service more perfectly. In terms of cost per patient, the cost factors will give the value of money and therefore, all these variables will significantly reduce operational costs across the core and non-core operations.

Feedback is an important aspect of all phases of the method of performance assessment. Both behavioural and outcome standards should have been set during the performance planning process. Throughout the performance assessment and rating systems, performance in all these areas should be addressed, and input was given on an ongoing basis. In addition to providing feedback if excellence or ineffective performance is detected, it is recommended to provide periodic feedback on day-to-day achievements and contributions. It should be a two-way contact mechanism for the feedback process to work properly, which is the shared responsibility of both managers and workers.

This method requires training both managers and employees on their performance feedback process responsibilities. Successful feedback should be prompt, constructive, accurate and balanced, based on the employee actions as to provide positive and improved information. It is important that feedback is based on behaviors rather than personal features and that these behaviors are related to performance that is effective versus ineffective.

Five criteria have been highlighted, such as schedule performance, cost, quality performance, technical performance functionality, and communication between the parties. The performance measurement parameters can be grouped into the following three categories:

- 1) Efficiency
- 2) Effectiveness
- 3) Flexibility

Efficiency measures are primarily concerned with how hospital management uses its financial resources to produce outputs or outcomes. Efficiency measurement consists of the following sub-indicators, such as resource use and cost reduction. Besides, efficiency can be measured in the following dimensions, such as service quality, customer satisfaction, growth and safety. Meanwhile, flexibility is a lead performance measure that focuses on analysing forward-looking, predictive and future performance comparisons. This can measure the ability or adaptability of a system to respond to diversity or change. Professional flexibility, instrument flexibility, process flexibility, volume flexibility, mix flexibility, expansion flexibility and new service flexibility exist.

### 5.4.2 Facilities Management as Strategic Function in Hospital

Strategic FM must move forward in tandem with the strategic objectives of the hospital. It was identified that most FM departments are functioning at an operational and tactical level but not at any significant strategic level. Facilities department are required to think and behave in a way that is customer-focused, value-for-money and integrated.

The hospital has often been claimed as lacking in delivering value-for-money services. Traditionally, support services in the hospital such as maintenance, catering, linen, porter and cleaning have been fragmented. A positive approach to the commercial development of integrating non-core services into a facilities management service division has started to influence the thinking and structures of hospital. Furthermore, linking support services such as FM with core business is crucial in any organisation. The broad perspectives of managing facilities are further divided into sections that could bring the bidder to a clear understanding of FM's role and its activities in hospital from its organisational functions that follow with its FM activities. The functions of the Facilities Department in delivering FM activities, in general, are divided into two categories as follows:

1. Hard FM and,

2. Soft FM



Figure 5.4: Strategic plan for FM in the hospital

### 5.5 STRATEGIC INFORMATION TECHNOLOGY IN HEALTHCARE

As healthcare is now a critical and growing part of economies worldwide, the healthcare services need to have a strategic Information Technology (IT). To provide a better quality of care, and value for money, billions of dollars are being spent on bettering information systems in healthcare organisations. In particular, the information system (IS) is being placed in place so that these decisions can be kept accountable by healthcare agencies and systems. In healthcare delivery, IS, and Information Technology (IT) have become central. Investments in IS healthcare have the ability not only to increase operating performance but also to improve the quality of service, patient satisfaction and quality of care.

Strategic IT has a lot to offer in managing healthcare costs, improving the quality of care, making healthcare systems safer, more affordable and more accessible. IS effectiveness may depend on the degree to which health-care organisations include goals and strategies in their process of information planning. ICT applications have immense potential to avoid mistakes and improve healthcare quality. As a method to observe sensitive applications such as energy expenditure, irregular use of buildings, critical device failures, and loss of perishable materials or damage due either to floods or leaks, ICT in FM is beneficial. ICT is also important in practice, e.g. help desk system, online service request system and other systems that can be implemented to improve and innovate.

### 5.5.1 Total Hospital Information System (THIS) in Malaysia

In 1997, Malaysia began developing strategic IT in the health sector known as the Telemedicine Blueprint of Malaysia under the banner of "Leading Healthcare into the Information Age" as the reference document for developing the strategic IT.

The Malaysian health vision is "to develop a nation of healthy individuals, families and communities through a health system that is equitable, affordable, efficient, technologically appropriate, environmentally adaptable and consumer-friendly, with emphasis on quality, innovation, health promotion and respect for human dignity, and which promotes individual responsibility and community participation towards an enhanced quality of life". The Malaysian Telehealth Application will, on completion, provide every resident of the country with an electronic Lifetime Health Record (LHR) and Lifetime Health Plan (LHP). Despite its commitment and the significance of knowledge sharing to provide value-for-money services to patients and healthcare, the Malaysian strategic IT in the health vision also does not clearly address the role of IT in FM.

# 5.5.2 Strategic Application IT in Facilities Management to the Malaysian Health Sector

The Strategic IT in FM derived from the UK National Health Service (NHS) Trusts is tested on its practicality to the Malaysian health sector. An overview of the differences between FM functions and uptake in UK and Malaysian hospitals is investigated to evaluate the current uptake of strategic FM in

the Malaysian health sector. It is also intended to gain a wider insight into the strategic FM practice at different hospitals outside the UK.

The inclusion of the Malaysian hospital is to answer the following questions:

- 1. Why is IT in FM significant to Malaysia?
- 2. What is the difference in FM activities between NHS Trusts and Malaysian Hospital?
- 3. Does Malaysian hospital have similar FM structure in the organisation?
- 4. What is the strategic FM in the context of Malaysian Hospital?
- 5. Is strategic IT in FM relevant for Malaysian Hospital?

In order to answer these questions, a series of interviews were held with the senior management staff of a Malaysian Hospital, the objectives being to:

- i. Explore Information Management and Technology strategies both at a national level and within Malaysian Hospital,
- ii. Identify challenges and opportunities in this strategic direction,
- iii. Investigate in more detail, and the FM related elements of Information Management and Technology strategy,
- iv. Explore the implementation issues of IT within FM, and
- v. Identify the strengths and weaknesses of current practices.

### 5.5.3 Relevance of Strategic Information Technology in Facilities Management

The Strategic IT in the FM proposal is made in response to the Health Ministry Directive in both the UK and Malaysia to take action on the strategic implementation of IT in the NHS Trust, and lessons learned from UK FM experience were sought to plan strategic IT in the Malaysian context.

Malaysian hospital needs to define clearly the strategic FM activities before embarking on strategic IT in FM. A task force should be set up to organise all the FM activities. This task force must be appointed by the hospital board members and explore possible ways to implement strategic FM.

A simple checklist prepared as in Figure 5.5 summarises the differences in the NHS Trusts and Malaysian hospital perspectives of strategic FM. An NHS Trust was chosen for comparison because it shared similarity as one of the leading teaching hospitals in the UK. The definition and role of FM in the Malaysian health sector need to be clearly defined. One suggestion is to rank according to priority. The ranking below was determined from high-level discussion and interviews with the hospital management. The two activities below are seen to reflect the uptake of IT in FM in Malaysia.

Revamp the current Information System/Information Technology (IS/IT) function

Align Information System development with design, build, operate and transfer consortium/ concessionaire.

|  |  | UK NHS<br>Trust | Malaysian<br>Hospital | Remarks  |
|--|--|-----------------|-----------------------|--|
| The focus areas<br>are as follows:<br>focus area | <ol> <li>Strategic FM</li> <li>Strategic IT in<br/>FM</li> </ol> | ×               | x<br>x                | Strategic FM is not an<br>agenda item at Malaysian<br>Hospital |
| Key drivers<br>to implement                      | 1. Government initiatives,                                       | $\checkmark$    | $\checkmark$          | Although there are initiatives from both the                   |
| strategic FM                                     | 2. Hospital initiatives,   | √               | $\checkmark$          | government and hospital, there is no strategic                 |
|  | 3. FM strategic<br>Plan  | 1               | x                     | planning for FM at<br>Malaysian Hospital                       |
| Definitions                                      | 1. Definition of FM.   | 1               | x                     | There is no clear definition of FM or IT in FM in the          |
|  | 2. Definition of<br>Strategic FM,                                | 1               | x                     | Malaysian health sector  |
|  | 3. Definition of<br>Strategic IT in<br>FM.                       | √               | x                     |  |

Figure 5.5: Checklists on current implementation of Strategic FM at Malaysian Hospital

### Proposed Plan for Strategic FM at Malaysian Hospital

#### **FM Definition**

 Malaysian hospital needs to define FM activities in accordance to its hospital function.

#### Strategic FM

- 1. Detail out FM strategic activities in the hospital
- 2. Document FM activities into shortmedium-long term strategic FM

### Implementation of FM activities

- 1. Design and Construction-related activities: hospital development project.
- 2. Support services to core business operation to hospitals: Operational Hotel and Estates Services which include portering, cleaning, laundering, waste disposal, maintenance, energy management, security, environment, etc.

#### Implementation of FM activities

- 1. Internal and external auditing.
  - Balance Scorebcard
  - Benchmarking
  - Reporting
  - Recommendation

Development of Strategic IT in FM at Malaysian Hospital

### Proposed Plan for Strategic FM at Malaysian Hospital

#### Planning for Strategic IT in NHS Trusts

- 1. Concern with Electronic Patient Record and Electronic Health Record.
- 2. Focus on clinical agenda.
- 3. The Trusts through Information Management & Technology manage to develop strategic IT in-house
- Current IT infrastructure is adequate to meet the strategic direction and core business in the Trusts.
- 5. The level of IT literacy for the Trusts' staff is inadequate.
- Senior managers at Trusts do not fully understand the strategic implementation of IT.

#### Establish Strategic IT in FM

### **Business Goals:**

- 1. Gain top management commitment to implement strategic IT in FM
- 2. Improve the current IS/IT function
- Align information system development with business FM needs.
- 4. Establish technology path and policies on IT in FM.

### **Competetive Advantage:**

- 1. Forecast information system requirements in FM
- 2. Revamp the current IS/IT function
- Seeking competitive advantage from IT in FM to meet Estates and Facilities strategic objectives
- Align information system development with PFI participation in the Trusts

Figure 5.6: Steps in developing Strategic IT in FM

Other activities were given very low priority. This reflects the fact that strategic IT in FM or strategic FM is the main agenda item in the Malaysian Hospital. Although FM is gaining recognition in the UK and Europe, the Malaysian sector is lagging. The lesson learned and the steps in developing the Strategic IT are proposed to Malaysian Hospital as explained in Figure 5.6. This is a guideline that will assist the hospital in planning its strategic implementation of IT in FM. Malaysian hospital needs to consolidate its strategic FM as a first step before starting to plan its strategic IT in FM.

# CHAPTER 6: ASPIRATION AND WAY FORWARD

### 6.1 INDUSTRY READINESS IN MALAYSIAN FACILITIES MANAGEMENT

Technology and innovations have fueled the evolution of Industry 4.0, the fourth industrial revolution. Industry 4.0 encourages growth and development through its efficiency capacity. The growth of the construction industry is a subset of the universal set of the gross domestic product value, thus Industry 4.0 has a spillover effect on the engineering and construction industry.

With Building Information Modelling (BIM) as the core in the cyber-physical system, the cyber-planningphysical system is able to accommodate BIM functionalities to improve construction lifecycle. This collaboration and autonomous synchronization system are able to automate the design and construction processes, and improve the ability of handling substantial amounts of heterogeneity-laden data. Industry Revolution 4.0 is expected to augment both the quality and productivity of construction and attract domestic and foreign investors. The global construction industry has been affected by the world's urban population rising by 200,000 people per day. The demand for affordable housing has never been higher, affected by a concomitant need for social, utility, and transportation infrastructure. Such challenges have ensured that the construction industry continues to review and revamp itself.

The changes that occur here impact on society as a whole as the construction costs will fall, and the environment will benefit. This is achieved by efficiently using scarce resources and ensuring that buildings are being constructed with eco-efficiency in mind. This positively impacts the economy by ensuring that the global infrastructure gap is narrowed, and economic development is boosted overall. During the last couple of decades, most industries have undergone an evolution and have instilled product and process innovations into the core of their operations.

The engineering and construction sector has not kept pace in terms of technological opportunities that can help improve production and productivity, resulting in a stagnation of labor productivity as well. Several internal and external challenges are responsible for this situation, including the industry dealing with consistent fragmentation, trouble recruiting a workforce with the right talent, insufficient links to contractors and suppliers, and inadequate transfer of knowledge from one project to another. Despite the industry's vast potential, increasing efficacy and productivity can only result from digitalization, new techniques for construction, and innovations. Tools such as three-dimensional (3D) scanning, Building Information Modelling (BIM), drones, and augmented reality have all reached market maturity. By incorporating these innovations, firms can exploit them to increase productivity level, safety, and quality, and improve project management. To use this potential, a strategy must be devised for concerted and committed efforts across many different areas, including operations, technology, personnel, regulation, and more. Government and industry readiness in Malaysia are summarised in Table 6.1 below:

### PEOPLE

|    | Government                               |    | Industry                              |
|----|--|----|---------------------------------------|
| 1) | Increasing number of professionals with  | 1) | Cooperation with IPTAs                |
|    | Master of Science (MSc) and Doctor of    | 2) | Built Faculty in IPTAs                |
|    | Philosophy (PhD) in Asset and Facilities | 3) | Training in FM for contractors        |
|    | Management                               | 4) | Active promotions of Asset Facilities |
| 4) | Government maintenance professional at   |    | management via seminars               |
|    | state and district levels                |    |                                       |
| 5) | Road shows to all Government Agencies    |    |                                       |
| 6) | Asset Facilities Management seminars     |    |                                       |

### **SYSTEM & PROCESS**

|    | Government                                 |    | Industry                               |
|----|--|----|--|
| 1) | Establish policy & best practices in Asset | 1) | Improve its FM capabilities            |
|    | Facilities Management                      | 2) | Increase competitive edge              |
| 2) | Asset Management procedures                | 3) | Utilisation of guidelines developed by |
| 3) | Certificate of Competency (COC) for        |    | Government                             |
|    | Government FM Contract                     |    |  |
| 4) | Realistic yearly budget plan estimation    |    |  |
| 5) | Asset condition and performance rating     |    |  |
|    | guidelines                                 |    |  |

### **TECHNOLOGY: APPLICATION SYSTEM**

| Government                                       | Industry                                  |
|--|---|
| 1) mySPATA – Registration Module                 | 1) Improved its FM capabilities           |
| 3) Decisions based on facts                      | 2) Increased competitive edge             |
| 4) 25,000 premises have been registered          | 3) Utilisation of guidelines developed by |
| 5) Agencies has started to register assets up to | government                                |
| component level                                  |   |
| 6) Technical capacity of agencies is being       |   |
| strengthened                                     |   |

### GOVERNANCE

| Government                                  | Industry                                  |
|---|---|
| 1) Setting up of Asset Management Unit      | 1) Improve its FM capabilities            |
| 2) Asset Management Practices Audit         | 2) Increase competitive edge              |
| 3) CIDB classification of contractors in FM | 3) Utilisation of guidelines developed by |
|   | Government                                |

Table 6.1: Government and industry readiness in Malaysia

### 6.2 FACILITIES MANAGEMENT GROWTH

The BIFM (2007) has suggested a number of factors that could stimulate the FM growth. Global competition is one of them, where there is a need to maintain a healthy competition in delivering quality services to the public. Another factor is the high cost of space, which is caused by the rising cost of occupying, servicing and maintaining space. This has also resulted in limitations and cost constraints in FM services. The rising expectations from clients and building occupiers are also the driving force behind FM in prioritising the service elements. FM also seeks to use the rapid development in information technology in a variety of ways, e.g., to delegate service tasks and to communicate with users. Most important of all, the relationship between the clients, the users and the FM team is crucial in supporting the growth and development of FM.

The role of FM in supporting the core business objectives of the organisation must be demonstrated, including how FM addresses the demand and supply relationship and the various levels of possible interaction that FM can offer. A number of models have been developed to facilitate the process and concept of added values. The FM Value Map for example, aims to demonstrate the various different ways that FM can offer the added values to the practitioners. It proposes how the resources can benefit the stakeholders-society, customers, staff and owners through the impacts or outcomes from both processes and provisions. The development of various models in the value creation aspect signifies an

impressive initiative in creating innovative and advance tools for the practitioners. This way, the clients will be able to comprehend the values that FM service can offer.

FM is also developing in giving more efforts to the community. FM is perceived in a different perspective within the context of an urbanised FM. This perspective looks into FM approach outside its traditional practical and theoretical dominion focusing on business imperative, organizational context, workplace setting and service delivery. The concept of urban FM towards the future of FM alignment is particularly looking at the opportunities between FM and the management of public infrastructure and the related services. The opportunity for FM to develop is also demonstrated that the dominance of the business imperative and shareholder value would be balanced in the future by the realignment of FM with the public interest. The focus of urban FM in managing the community facilities within the context of FM, where urban FM is seen as a platform for the future innovations in delivering benefits and values to the community. The introduction of an urban FM approach also has changed the traditional focus of FM towards the long-term presence of built assets in a community.

The FM field is highly developed and widely practiced by property developers and companies in the West. There is a stark contrast in FM practice between Western countries and Asian countries. However, some countries like Japan, Australia, New Zealand, Hong Kong and Singapore have shown a positive growth in the FM field. FM is recognised in these countries as an activity that can achieve more effective management of the buildings, services and associated workforce, in support of the strategic objectives of an organisation. There is a significant difference between FM development in Asian countries like Japan, Hong Kong, Taiwan, South Korea, Singapore and Malaysia. Japan first embarked on introducing an integrated FM system by using the automated mechanization: Nippon Telegraph and Telephone Corporation. Japan sees FM as an important area in business and the techniques of FM are increasingly used. Hong Kong started implementing FM in 1994 and, to-date, the industry has gone from strength to strength, gaining more professional members and organising successful annual conferences.

The whole area of FM is quite well-developed, with the growth in the professional FM sector being matched and complemented by research and education. The growth is encouraged by the fact that Hong Kong has been a place where East meets West and has a multi-cultural background. On the other hand, Taiwan shows smaller growth than Japan and Hong Kong but is slowly improving, based on the increasing number of IFMA memberships. FM in South Korea is developing at a slower pace than some of its competitors in the region. This was indicated in a survey in 2007 by the Ministry of Industry and Trade, which showed that only 2.7% of the respondents were familiar with the concepts of FM. Despite this low number, multi-national companies like Samsung, Hewlett Packard and IBM Korea have used international FM consultants in their business organisations in South Korea. From an education perspective, the well-attended Asian FM conferences signify a growing interest in FM among the Asian countries.

The development of FM in Asian countries like Hong Kong, Malaysia and Singapore is based on three areas, namely practice, research and education. Survey of these countries shows clear signs of progress in Hong Kong and Singapore and mixed signals in Malaysia, concluded by the little evidence of real tangible and visible progress in the field. It is also anticipated that the lack of attention given to environmental issues in South-East Asia impedes organisations practising FM from achieving efficiency. Whilst Malaysia is making progress in the development of FM, there is an overall mixed signal. General lack of understanding and progress are key drivers that hinder the development of FM in Malaysia. One of the drivers is that when there is no recognition of the FM profession this leads to a lack of participation from the whole organisation. As a result, the FM sector does not demonstrate the added value that FM can contribute to the overall benefit of the organisation.

Malaysia is still lagging behind in software development specific to FM. Assets in Malaysia require good maintenance performance to extend their life capacity. In this respect, the application of technology to asset management leads to effective and efficient management of government assets and facilities. Adoption of integrated FM requires high initial cost, unless the computerised programs can be developed locally in the market or funding support is provided. The adoption of an integrated FM requires space allocation in order to store the automation mechanism required to operate the integrated service system. This may not be a problem for new developments but, as earlier mentioned there are lots of aging buildings and densely populated buildings where space allocation might be an issue.

### 6.3 THE ROLES OF STAKEHOLDERS

Currently in Malaysia, FM is still at the beginning stage even though it has been practiced by the organisation many years ago, but then people do not realise the important of FM. The evolution can be traced back to the mid of 1990s when the Government decided to privatise Hospital Support Services (HSS) to three concessionaires. The basic understanding of this approach is that, medical personnel should only concentrate on its primary function. Since then, the government has decided to privatise the maintenance to the public building under the purview of federal government.

So far, it is still at the early stage to identify the person who are championing in this areas. Even though the country has many experts in FM but their expertise and knowledge are still scattered around. CIDB Malaysia has taken a step forward to collaborate with government and industry in its initiatives. Under Strategic Thrust 2 of Construction Industry Master Plan (CIMP 2010-2015) that has been outlined by CIDB Malaysia to make quality as the hallmark of the construction industry. One of the programmes introduced by CIDB Malaysia is to register those contractors involved in FM services. Table 6.2 therefore demonstrates the main roles, task areas and responsibilities for each FM stakeholder involved.

| Stakeholders                    | Key functions  | Area of Roles & Responsibilities  |  |
|---------------------------------|--|---|--|
| Asset Owner/Investor            | Ownership  | Initiate projects or works defining the needs.  |  |
| Authorities (Federal/<br>state) | Governing bodies & approvals   | Compliance to Act & regulations standards etc.  |  |
| Developer                       | Undertake the development activities                                     | Planning, implementation Compliance with statutory and by laws.   |  |
| Consultant                      | Design (Conceptual & detail)   | Advisory, supervision, submission,<br>Cortication   |  |
| Bankers                         | Financial facilities and service   | Housing Loan, Bridging Finance, Bonds,<br>Guarantee, and credit facility.                                   |  |
| Insurance Company               | Insurance policy and service   | Provide insurance coverage  |  |
| Contractors                     | Build and construct operate & maintain                                   | Undertake physical activities within time, cost and quality as per contract.                                |  |
| Asset/Property<br>Manager       | Provide input during design stage manage built asset                     | Ensure proper running operation and functioning of asset.   |  |
| Facility Manager                | Manage and maintain facilities   | Provide input during design and construction stage.   |  |
| Service Provider                | Solutions & services   | Provide secondary utility services.   |  |
| End User                        | Users of common facilities   | Formal education, competency training.  |  |
| Public                          | Users of common facilities   | Proper usage of assets.   |  |
| Academia                        | Capacity building  | Formal education, competency training.  |  |
| Institution/Association         | Provider interaction platform<br>for the development of FM<br>practices. | Strengthen the FM industry through<br>knowledge sharing and best practices<br>amongst Malaysian FM players. |  |

Table 6.2: Stakeholders involved in FM (Source: CIDB, 2011)

### 6.4 THE WAY FORWARD OF FACILITIES MANAGEMENT IN MALAYSIAN CONSTRUCTION INDUSTRY

Facilities management has played significant roles in the era of pandemic of COVID-2019. In 2021 onwards, FM fraternity will be guided with strategic document related construction industry. National Construction Policy (NCP 2030) by Ministry of Works has outlined strengthening FM as one of its strategic thrust in policy. The government aims to improve project quality management system to ensure consistent high quality project deliverables. There is need to establish central centre of excellence to progress FM as a catalyst to cultivate the culture of FM in industry. FM needs to have local FM standard and new regulations.

Form industry point of view, CIDB Strategic Plan (CSP) 2021-2025 aspires to improve current services including green field services by benchmarking with world class, some adoption technologies would be considered. One of the areas spotted in the strategic plan is FM. This strategic plan is being supported with the advent of IR4.0 towards digital technology as transpired in Construction 4.0 Strategic Plan 2021-2025. It is timely for nation to be transformed by empowering smart in construction for society. Smart construction is building design, construction, and operation that collaborative partnerships with full digitalise technology and industrialised manufacturing techniques. It will improve productivity, minimise whole life cost, improve sustainability and maximise user benefits. It is in tandem with aspiration of FM to complement with life cycle in construction value chain.

In the era of 2021 onwards, construction industry should be ready with transformation in digital eras. Industry fraternity should look into roles and goals how the organisation must change from maintenance into global FM to better serve the nation. There are urgent needs for FM practitioners, associations and government agencies and academia / FM scientist to move forward as a team to bring FM to greater height in 2021 eras. Collaboration in FM is paramount and will benefit stakeholders in adopting 12 emerging technologies and moving ahead towards the next construction industry revolution in FM. Practical roadmap and strategic plan is high time to be established with quadruple helix collaborations by all parties involved in FM fraternity. The elusive FM industry-academia partnership will take steps to turn into full-fledged FM business to boost economy and nation-building.

## **BIBLIOGRAPHY**

- 1. Atkin, B. and Brooks, A. (2009), Total Facilities Management, Wiley-Blackwell, London.
- 2. Ayers, J. B. (2006). Handbook of Supply Chain Management. Boca Raton, FL: Auerbach Publications.
- 3. BIFM (2010) Homepage of British Institute of Facilities Management.
- 4. Boyatzis, R. E. (1982). The competent manager: A model for effective performance. John Wiley & Sons.
- 5. British Institute of Facilities Management (BIFM) (2007), Workbook 3: FM and FM Strategy, BPP Learning Media, West Midlands.
- CIDB (2009) Asset and facility management (AFM) programme workshop No 2&3, 8&9 July 2009, Seri Pacific KL, Kuala Lumpur, Construction Industry Development Board (CIDB) Malaysia.
- CIDB (2015) Construction Industry Transformation Programme 2016-2020, Ministry of Works, Kuala Lumpur.
- CIDB (2016) Balanced scorecard: policy and guidelines, Planning and Coordination division CIDB Malaysia, Kuala Lumpur.
- 9. CIPD (2009), Meeting the UK's people management skills deficit, Download, CIPD, 11 June.
- 10. Construction Industrial Development Board (CIDB) (2010), Newsletter [on-line], Malaysia, Published by CIDB, available
- 11. Flanagan, R. (2014). Whole-life thinking and engineering the future, Frontiers of Engineering Management, Engineering Management Theories and Methodologies
- 12. IFMA (2010) Homepage of the international facilities management association.
- 13. IFMA. (2011). What is the international facility management association. Retrieved 7th May 2012, from http://www.ifma.org/
- 14. Indicators, O. E. C. D. (2015). Health at a Glance 2011. OECD Indicators, OECD Publishing, Paris DOI: https://doi org/101787/health\_glance-2015-en Accessed February, 15, 2016.
- 15. ISO 41001: 2018. (2018) International Standard Organisation for Facility Management-
- Jensen, P. A. (2011). Organisation of facilities management in relation to core business. Journal of Facilities Management. 9, pp. 78–95.
- 17. KPMG. (2010). Strategic performance management: driving value from strategy. KPMG International Cooperative, New Zealand.
- Lambert, D. M. (2004). Supply Chain Management: Processes, Partnerships, Performance (3rd ed.). SCMI: Sarasota.
- Noor, M. & Pitt, M. (2009) A Critical Review On Innovation In Facilities Management Service Delivery. Facilities, 27, 211-228.
- 20. OECD (2011), Health at a Glance 2011: OECD Indicators, OECD Publishing. http://dx.doi. org/10.1787/health\_glance-2011-en
- 21. Organisation Internationale de Normalisation (ISO), 2016. New ISO standard in development to facilitate facilities management.

- 22. Pillay, M.S. (2002), "Privatisation of hospital support services", IFMBE Proceedings, of the Conference on Medical and Biomedical Engineering and Computing, Springer, Berlin.
- 23. Pitt, M., & Tucker, M. (2008). Performance measurement in facilities management: driving innovation?. Property management.
- 24. Public Works Department Annual Report (2009), Public Works Department Annual Report, Malaysia, Published by PWD, available at: www.jkr.gov.my/jkr4/index.php?r\_page/view&id\_1 61
- 25. Tang, C. S. (2006). Perspectives in supply chain risk management. International journal of production economics, 103(2), 451-488.
- 26. Tang, O., & Musa, S. N. (2011). Identifying risk issues and research advancements in supply chain risk management. International journal of production economics, 133(1), 25-34.
- 27. Tranfield, D. & Akhlaghi, F. (1995). Performance measures: relating facilities to business indicators, Journal of Facilities, Volume 13, Issue 3, pp 6-14.
- 28. Williams, B. (1996). Cost-effective facilities management: A practical approach. Journal of Facilities, Volume 14, Issue 5, pp 26-38.

## Index

### A

Asset and Facility Management · iv, v, 13, 19 Assets · vii, 11, 22, 23, 29, 31, 57, 107 awareness · 4, 13, 17, 21, 24, 25, 82, 86

### В

building · iii, 1, 7, 8, 17, 19, 20, 22, 28, 33, 39, 41, 42, 44, 45, 46, 55, 61, 62, 63, 64, 67, 71, 73, 80, 81, 82, 84, 85, 88, 92, 94, 104, 106, 108, 109, 110 business · iii, 1, 4, 19, 21, 33, 36, 38, 41, 47, 48, 49, 51, 52, 53, 55, 56, 58, 62, 64, 66, 67, 71, 73, 74, 75, 76, 77, 80, 83, 87, 89, 94, 95, 99, 106, 107, 110

### С

capabilities  $\cdot$  41, 42, 43, 53, 62, 66, 75, 85, 105 capacities  $\cdot$  41 challenges  $\cdot$  ii, 21, 23, 24, 26, 40, 41, 52, 56, 67, 75, 101, 104 cleaning  $\cdot$  1, 17, 82, 94, 99 collaboration  $\cdot$  2, 24, 26, 33, 36, 48, 52, 67, 77, 83, 86, 104 Collaboration  $\cdot$  viii, 67, 110 competitive  $\cdot$  43, 62, 64, 75, 76, 105 construction  $\cdot$  ii, iii, 1, 17, 19, 21, 23, 24, 28, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 50, 73, 83, 88, 90, 91, 92, 95, 104, 108, 109 construction industry  $\cdot$  iii, 19, 24, 33, 36, 41, 42, 104, 110 Construction Industry  $\cdot$  iii, iv, 1, 14, 20, 33, 34, 36, 41, 42, 45, 83, 108 contractors  $\cdot$  30, 33, 38, 40, 45, 76, 83, 92, 104, 105, 108

### D

development · ii, 5, 10, 12, 17, 19, 20, 21, 24, 26, 28, 29, 31, 33, 34, 39, 41, 42, 44, 45, 48, 53, 56, 61, 62, 63, 64, 68, 73, 77, 86, 88, 92, 99, 102, 104, 106, 107, 108, 109

### Е

Effectiveness · 98 efficiency · 17, 39, 41, 57, 58, 59, 64, 66, 70, 71, 72, 75, 76, 80, 88, 90, 93, 95, 96, 97, 98, 104, 107 Efficiency · 98 engineering · 26, 27, 40, 45, 46, 47, 66, 82, 84, 88, 89, 92, 95, 96, 104

### F

Facilities Management · ii, iv, v, vii, viii, ix, 1, 2, 3, 4, 6, 14, 20, 21, 22, 28, 37, 38, 39, 40, 43, 44, 47, 57, 58, 62, 70, 74, 80, 82, 84, 85, 89, 99, 101, 102, 105

Facilities Manager · iv, 21, 44, 47 Financial · 24, 25, 59, 71, 79, 81, 97, 108

### G

government · ii, 4, 7, 8, 9, 10, 11, 12, 13, 14, 17, 19, 20, 22, 24, 27, 28, 31, 32, 33, 34, 45, 47, 57, 61, 64, 83, 102, 105, 108, 109 growth · 17, 18, 36, 41, 42, 49, 58, 63, 64, 71, 79, 92, 98, 104, 106, 107

### Н

health care · 17, 87 hospital · 58, 88, 89, 90, 92, 93, 94, 98, 99, 101, 102, 103 human capital · 18, 26, 39, 48, 63

### L

Industry · iii, viii, 33, 45, 48, 104, 105, 107, 109 industry players · iii, 83, 88 Information Technology · ix, 100, 102 issues · 21, 22, 23, 24, 25, 26, 30, 36, 37, 41, 57, 65, 73, 81, 83, 87, 88, 96, 101, 107

### Κ

knowledge · iii, 1, 18, 21, 24, 26, 28, 42, 43, 44, 59, 61, 62, 63, 65, 66, 70, 71, 75, 104, 108, 109

### L

legislation · 4, 7, 14 lifecycle · 13, 17, 22, 23, 104

### Μ

maintenance · ii, iii, 1, 9, 10, 11, 13, 17, 19, 20, 25, 26, 27, 29, 31, 44, 45, 46, 47, 48, 49, 57, 70, 72, 74, 80, 81, 82, 84, 85, 88, 89, 92, 93, 94, 96, 99, 105, 107, 108, 109
Malaysia · ii, iii, iv, v, vi, viii, ix, 1, 7, 9, 13, 14, 17, 18, 19, 20, 21, 24, 27, 30, 33, 36, 38, 39, 40, 42, 45, 47, 50, 68, 69, 70, 82, 83, 84, 88, 93, 100, 101, 102, 104, 105, 107, 108
management · ii, iii, 1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 38, 39, 43, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 69, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85,86, 87, 88, 89, 92, 93, 94, 95, 98, 99, 101, 102, 104, 105, 106, 107, 109
maturity · 37, 104

### 0

organisation · 1, 2, 17, 23, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 72, 73, 76, 77, 80, 88, 93, 94, 96, 99, 101, 107, 108, 109 organisation. · 2, 17, 49, 50, 52, 53, 54, 56, 57, 58, 59, 60, 61

### Ρ

people · 1, 2, 8, 10, 19, 26, 35, 41, 42, 48, 49, 52, 53, 54, 58, 60, 62, 66, 80, 83, 85, 86, 93, 95, 104, 108 performance · ii, 11, 17, 18, 23, 27, 29, 31, 32, 33, 41, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 68, 69, 70, 75, 77, 87, 89, 90, 93, 94, 95, 96, 98, 100, 105, 107 Performance Appraisal · 52 performance measurement · 27, 58, 98 personnel · iii, 17, 26, 43, 48, 83, 86, 104, 108 place · 1, 19, 22, 33, 63, 69, 83, 88, 92, 100, 107 planning · 9, 11, 13, 20, 21, 27, 29, 30, 31, 33, 35, 48, 54, 58, 60, 62, 63, 65, 71, 72, 74, 79, 83, 85, 89, 92, 93, 98, 100, 102, 103, 104 Policy · iv, v, vii, viii, 8, 9, 20, 31, 34, 35, 62, 82, 83, 105, 109 procedures · 2, 6, 8, 11, 29, 43, 45, 48, 54, 64, 70, 86, 105 process · 1, 13, 19, 22, 23, 25, 29, 31, 32, 39, 48, 49, 51, 52, 53, 54, 55, 57, 58, 59, 60, 63, 64, 65, 66, 70, 72, 76, 82, 85, 87, 89, 90, 92, 96, 98, 100, 104, 106 procurement · ii, 18, 29, 39, 73, 74, 76, 96 productivity · 2, 10, 22, 36, 39, 40, 41, 55, 59, 72, 88, 104, 109 professional body · 27, 57 programmes · 24, 108

### Q

quality service · 59

### R

registration · 4, 8, 11, 29, 33, 38, 40, 43, 44, 45 regulation · 39, 104 research · ii, 12, 24, 27, 39, 40, 42, 46, 56, 62, 77, 87, 107 Resolution · 20, 28, 29, 30, 31 revolution · 21, 104, 110 roles · 3, 17, 24, 25, 28, 41, 60, 82, 108, 109

### S

shareholder · 106 standards · 4, 30, 32, 37, 38, 43, 44, 45, 48, 90, 94, 98, 108 strategic plan · 109, 110 strategy · ii, 4, 7, 8, 11, 13, 33, 41, 42, 50, 51, 52, 53, 54, 56, 58, 61, 62, 63, 64, 68, 69, 74, 76, 80, 83, 101, 104 Sustainability · 29, 39

### Т

technologies · iii, 2, 18, 23, 39, 40, 53, 66, 109, 110 technology · ii, iii, 1, 12, 29, 30, 37, 43, 48, 49, 62, 72, 86, 87, 90, 92, 104, 106, 109 training · 20, 24, 26, 37, 39, 40, 44, 45, 48, 57, 62, 66, 67, 68, 69, 75, 83, 86, 98, 109 transformation · 36, 109

U Utilisation · viii, 85, 105

W

workplace · 17, 66, 87, 89, 106



