

## Chapter 2

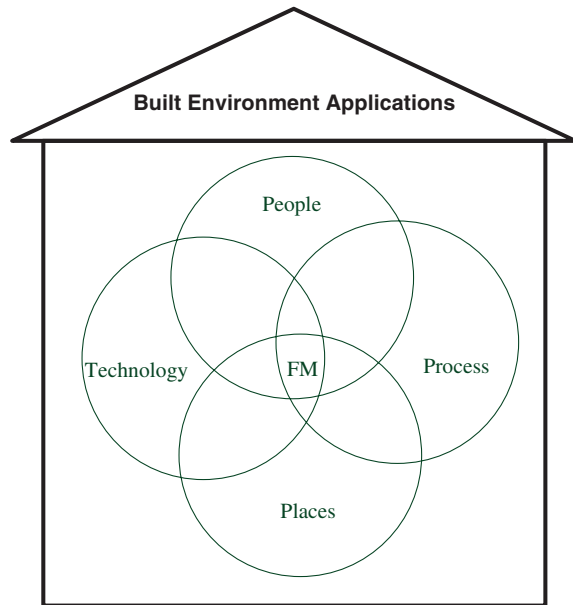
# Facilities Management and Singapore's Healthcare System

**Abstract** FM discipline's definition and development history, as well as its service coverage, especially in the healthcare domain are reviewed in this chapter. The healthcare system in Singapore is also introduced here. The literature review identifies eight aspects that are critical to successful hospital FM. However, those aspects are general in nature; it may shed light on how to improve FM service quality by combining them with other service quality tools.

### 2.1 Definition and Development of Facilities Management

Many definitions of facilities management (FM) exist and it is difficult to generate a universally accepted definition because the discipline is still evolving (Hinks and McNay 1999). Tay and Ooi (2001) provided a summary of different definitions of FM from various individuals and organisations; representative definitions are discussed below. The first and most frequently cited definition is from the International Facility Management Association (IFMA) ([www.ifma.org](http://www.ifma.org)), which defined FM as “a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, places, processes and technology”. This definition clearly shows the holistic nature of the FM discipline, indicating interdependence of various factors in successful FM (Atkin and Brooks 2009). IFMA's definition is also deemed to be a basic framework for FM (see Fig. 2.1). Another often-cited definition comes from Atkin and Brooks (2009). They looked at FM from the perspective of its functions and linked it to the organisation's core business; they defined it as “an integrated approach to operating, maintaining, improving and adapting the buildings and infrastructure of an organisation in order to create an environment that strongly supports the primary objectives of that organisation” (p. 1). Similarly, Pitt and Tucker (2008) defined FM as “the integration and alignment of the non-core services, including those relating to premises, required to operate and maintain a business to fully support the core objectives of the organisation” (p. 242). No matter what definition is adopted, the key aspect of FM is that it plays an integrating role whose purpose is to support the core business.

**Fig. 2.1** The FM basic framework



As for the development of the FM discipline, Pathirage et al. (2008) identified four generations of FM development:

- (1) FM is considered an overhead expense to be managed for minimum cost rather than optimum value.
- (2) FM is considered an integrated continuous process in relation to the organisation's individual business.
- (3) FM is looked at as resource management concentrating on managing supply chain issues associated with FM functions.
- (4) FM is regarded as an aspect of strategic management to ensure alignment between organisational structure, work processes and the enabling physical environment consistent with the organisation's strategic intent.

This trend reflects the change in focus of FM from cost cutting to a gradually stronger strategic view (Jensen et al. 2010).

In the practical world, about 40 years ago, we could find only fleeting mentions of FM; it functioned largely for maintenance and cleaning (Atkin and Brooks 2009). Starting in innovation organisations such as fast-growing banking and telecommunications firms, FM development was driven by organisations' attempts to manage their buildings effectively under the pressure of becoming more competitive (Rondeau et al. 1995). When services outsourcing came into people's sight, FM became the main cost-cutting initiative (Noor and Pitt 2009). This outsourcing trend assisted the development of FM as a profession "in its own right" (Loosemore and Hsin 2001); the need for a united concept and common standards for FM gradually drew people's attention. At the same time, professional

associations began to appear; they organised different professionals with diverse backgrounds into one discipline, spreading the FM concept and providing a platform for “professionalisation and knowledge exchange” (Drion et al. 2012). The Association of Facilities Engineering and the Association of Higher Education Facilities Officers were the pioneers in FM (Cotts et al. 2010). Now, FM has emerged as “a new professional discipline with its own codes, standards and technical vocabulary” (Atkin and Brooks 2009, p. 2). However, FM is still a relatively new profession (Tay and Ooi 2001) and in its early stage.

In the academic world, early FM researchers conducted empirical research in the field (Ventovuori et al. 2007). Therefore, early developments in FM are deemed to be based on practical works (Alexander 1994). To promote this discipline, practice and research should be linked (Nutt 1999). Thus, theoretical and empirical research investigating both the physical and the non-physical areas of FM was called for (Cairns and Beech 1999). Entering the 2000s, FM as a scientific discipline was maturing gradually with extended research areas including not only technical issues, the workplace, procurement and general trends, but also performance measurement and sustainability (Ventovuori et al. 2007). In addition, research papers and conferences in this field are becoming more numerous (Jensen et al. 2012; Meng and Minogue 2011; Shaw and Haynes 2004). However, no theory of FM has been clearly articulated and the lack of a comprehensive theoretical framework is considered a weakness of the field (Mudrak et al. 2005). To establish the theoretical framework, some studies have emphasised facilities’ influence on the behaviour, health and well-being of people using them (Fleming 2004; Leung and Fung 2005; Smith et al. 2011). Other studies have focused on FM’s effects on the success of the organisation to produce evidence that demonstrates FM’s contribution to the core business (Akhlaghi and Mahony 1997; Duyar 2010; Haynes 2007; Price 2004). However, a theoretical framework for FM should integrate both views. Moreover, this inadequate knowledge base has led to a lack of “secure methods and techniques” for enhancing FM performance, thus indicating a good opportunity for research in the specific field of FM performance (Kulatunga et al. 2010).

Furthermore, over the past 20 years, studies on the topic of “performance measurement and management” have become abundant (Amaratunga and Baldry 2003; Walters 1999; Wauters 2005). Traditionally, FM performance measurement has used cost as the only indicator (Tranfield and Akhlaghi 1995). This cost-only approach can lead to FM becoming a “commodity service” purchased at the lowest price from non-differentiated suppliers (Loch 2000). Against this backdrop, researchers have applied various new models to measure FM performance using different indicators under the three main components: physical (e.g. building fabric, structural integrity, heating, lighting), functional (e.g. space, layout, ergonomics, health and safety) and financial (e.g. capital and life-cycle expenditures, depreciation) (Loosemore and Hsin 2001; Williams 1996). Among these models, key performance indicators, the balanced scorecard and the business excellence model are the most widely used and most effective tools (Meng and Minogue 2011). Although these models largely resolve the problem of cost-only

indicators, they are more introspective and put more weight on technical aspects, more or less neglecting the needs of customers (Loosemore and Hsin 2001; Massheder and Finch 1998). Researchers have argued that FM services should be more customer focused and provide higher quality (Hui et al. 2013; Tucker and Pitt 2009). However, as Tucker and Pitt (2009) pointed out, the level of FM performance measurement research that has focused on customer satisfaction is quite limited. Therefore, FM studies should develop models that are more sensitive to customers' needs, that is, more customer oriented (Shaw and Haynes 2004). Caruana and Pitt (1997) pointed out that performance measurement in service quality should be based on asking customers about their perceptions and their expectations regarding the service they receive. Against this backdrop, this study emphasises the involvement of customers in FM performance measurement and takes the measurement approach from the customer's point of view. Thus, a new method should be considered for this purpose instead of the conventional quantitative specification compliance methods. Evaluating performance from the customer's perspective requires a more "behavioral, holistic, systemic and subject approach" (Spencer and Hinks 2007). Service quality theory has shed light on this problem and is reviewed and discussed in the next chapter.

## 2.2 FM Service Coverage

As a relatively new discipline, FM has emerged out of practice, integrating three main streams of activities: property management, property operations and maintenance and office administration (Kincaid 1994). FM was regarded as merely a support service in the past, but its position within organisations has changed considerably and now it is often viewed as part of the strategic business function (Kulatunga et al. 2010). Therefore, FM now encompasses a myriad of services. There is no standard services coverage in FM; thus, the exact scope of FM should be determined empirically on a case-by-case basis to fulfil the requirements of its home organisation (Chotipanich 2004).

Generally speaking, FM covers a variety of services, including real estate management, financial management, change management, human resources management, health and safety and contract management, in addition to building maintenance, domestic services and utilities supplies (Atkin and Brooks 2009). Cotts et al. (2010) provided a detailed description of FM functions and sub-functions. The main functions include management of the organisation, facility planning and forecasting, lease administration, space/workplace planning, allocation and management, architectural/engineering planning and design, operations, maintenance and repair and general administrative services, among others. Barrett and Baldry (2009) also provided a range of services that are usually covered in FM (see Table 2.1).

Tucker and Pitt (2009) viewed the FM service coverage issue from a more customer-oriented perspective and provided 11 general FM services: maintenance of the building fabric, mechanical and electrical (M&E) engineering, waste

**Table 2.1** Typical FM services

<b>Facility planning</b> Strategic space planning Corporate planning standards and guidelines User needs Furniture layouts Monitoring of use of space Selection and control of use of furniture Definition of performance measures Computer-aided facilities management (CAFM)	<b>Building operations and maintenance</b> Operation and maintenance of the plant Maintenance of building fabric Management and adaptation Energy management Security Voice and data communication Control of operating budget Monitoring of performance Supervision of cleaning and decoration Waste management and recycling
<b>Real estate and building construction</b> New building design and construction management Acquisition and disposal of sites and buildings Negotiation and management of leases Advice on property investments Control of capital budgets	<b>General/office services</b> Provision of management support services Office purchasing (stationery and equipment) Non-building contract services (e.g. catering, travel) Reprographics services Housekeeping standards Relocation Health and safety

Source Barrett and Baldry (2009)

**Table 2.2** Classification of FM services

	Description	Examples
Hard FM	Management and maintenance of property and other physical assets	Estate and property, indoor air, structure and fabric, water supply, electricity, telecommunication systems
Soft FM	Management of support services	Catering, cleaning, waste management, security, laundry

Source Adapted from Kulatunga et al. (2010)

management, maintenance of grounds and gardens/internal plantings, cleaning, catering, mailroom, security, health and safety, reception (including switchboard) and helpdesk. Similarly, Hui et al. (2013) also took the customer's stand in identifying FM services. They included property management, security, cleaning, management of common areas, management and maintenance of communal facilities, washrooms and promotion (e.g. festive decorations, promotion of events) in FM service coverage for shopping malls. Thus, one can conclude that FM service coverage varies from organisation to organisation. FM service coverage is likely to differ in a small office building and a large complex manufacturing site. The provision of specific FM services depends on the nature of the organisation and the needs of the core business.

FM services can be divided into two categories: hard FM and soft FM (Kulatunga et al. 2010). This hard–soft classification is also called premises and business support services (Mudrak et al. 2005). Table 2.2 illustrates these classifications and provides examples.

## 2.3 Singapore's Healthcare System

The Republic of Singapore is a tropical island and city-state with an area of just over 700 km<sup>2</sup> (Pwee 2009) that is densely populated, with a total population of 5.31 million (Singapore Department of Statistics 2012). Singapore is known as one of the world's cleanest and most efficiently run countries (Edlin 2009). Its healthcare system is also internationally recognised and was ranked top in Asia and 6th among 191 countries in the World Health Report on health systems (World Health Organisation 2000). Singapore's healthcare system comprises public and private sectors. The government's Ministry of Health manages the public sector and regulates the private sector.

In 2012, there were more than 10,000 hospital beds in the 25 hospitals and specialty centres in Singapore (Ministry of Health 2012a). In the public sector, eight public hospitals comprise six general hospitals (AH, CGH, KTPH, SGH, NUH, TTSH), a women's and children's hospital (KKH) and a psychiatric hospital (IMH) (Ministry of Health 2012b), as well as a specialty centre (NHC). Table 2.3 shows each hospital's name and size; information was gathered from each hospital's website and annual report.

The private sector has seven general hospitals, five rehabilitation/community hospitals and four special hospitals/medical centres (Ministry of Health 2012b). Table 2.4 provides a general introduction to these facilities; information was gathered from each hospital's website.

In Singapore, primary healthcare services are provided mainly by the private sector, taking up 80 % of the services, while the public sector provides the

**Table 2.3** Singapore's public hospitals

Name	Member of	Number of beds (as of August 2012)
Alexandra Hospital (AH)	Jurong Health Services	400 beds
Changi General Hospital (CGH)	Eastern Health Alliance	788 beds
Khoo Teck Puat Hospital (KTPH)	Alexandra Health	550 beds
National University Hospital (NUH)	National University Health System	1032 beds
Singapore General Hospital (SGH)	Singapore Health Services	1590 beds
Tan Tock Seng Hospital (TTSH)	National Healthcare Group	1481 beds
KK Women's and Children's Hospital (KKH)	Singapore Health Services	832 beds
National Heart Centre (NHC)	Singapore Health Services	185 beds
Institute of Mental Health (IMH)	National Healthcare Group	2000 beds

*Source* Retrieved from hospital's websites and annual reports

**Table 2.4** Singapore's private hospitals

Name	Member of	Number of beds (as of August 2012)
Gleneagles Hospital	Parkway Pantai Limited	272 beds
Mount Elizabeth Hospital	Parkway Pantai Limited	345 beds
Mount Elizabeth Novena Hospital	Parkway Pantai Limited	333 beds
Parkway East Hospital	Parkway Pantai Limited	113 beds
Raffles Hospital	Raffles Medical Group	380 beds
Mount Alvernia Hospital	NA*	303 beds
West Point Hospital	China Healthcare Group	NA*

Source Retrieved from hospital's websites

NA\* Not available

remaining 20 %. However, considering the more costly hospitalisation care, the situation is opposite, where 80 % is provided by the public sector and 20 % by the private sector (Ministry of Health 2012a). For this reason and reasons of data availability, this study mainly focused on the public general hospitals.

## 2.4 Hospital FM

As a critical element in the successful delivery of medical care (Gelnay 2002), development of the FM profession will raise the effectiveness of healthcare service delivery (Lavy and Fernández-Solis 2010). FM should achieve zero defects to ensure the 24-hour operation of the hospital. In addition, Baldwin and Shaw (2005) stated that when it comes to patients' choice of hospitals, technical health-related issues may affect the hospital's reputation, but patients tend to base their choice on subjective assessments of patient-encountered FM services, such as the hospital environment, ease of parking, facilities for visitors and perceived cleanliness.

Hospital FM always integrates various non-core services under its umbrella and thus it is difficult to demarcate its boundary. The National Healthcare Services Trust of the UK includes the following services under the domain of FM: domestic/linen/accommodation, portering/transport/receipt/dispatch, medical electronics and maintenance, operational estates, printing services, security, catering services, car parking, patient services (hairdressing, chaplaincy), reprographic services and receipt and distribution (Barrett and Baldry 2009). Note that this service coverage is likely to vary across the world and organisations (Payne and Rees 1999). Table 2.5 provides a comprehensive list of general services coverage (Okoroh et al. 2001).

Following the FM services' classification mentioned above, soft FM services that are generally provided in hospitals are shown in Fig. 2.2 (adapted from May and Pinder 2008).

**Table 2.5** FM operations in healthcare sector

Facilities management		
Estate management support services	Environmental management support services	Hotel support services
Grounds Gardening Energy Utilities Property management Property maintenance Design Building services	Health and safety Pollution control Fire precautions Incineration Waste management	Catering Reception Residences Housekeeping
Site support services	Business support services	Space management support services
Portering Security Car parking Telecom Accommodations Cleaning Hygiene	Leisure Recreation Strategic maintenance Transportation Occupational health Reprographic Procurement Information technology Purchasing Marketing Complaints management	Space utilisation Space allocation Space audit

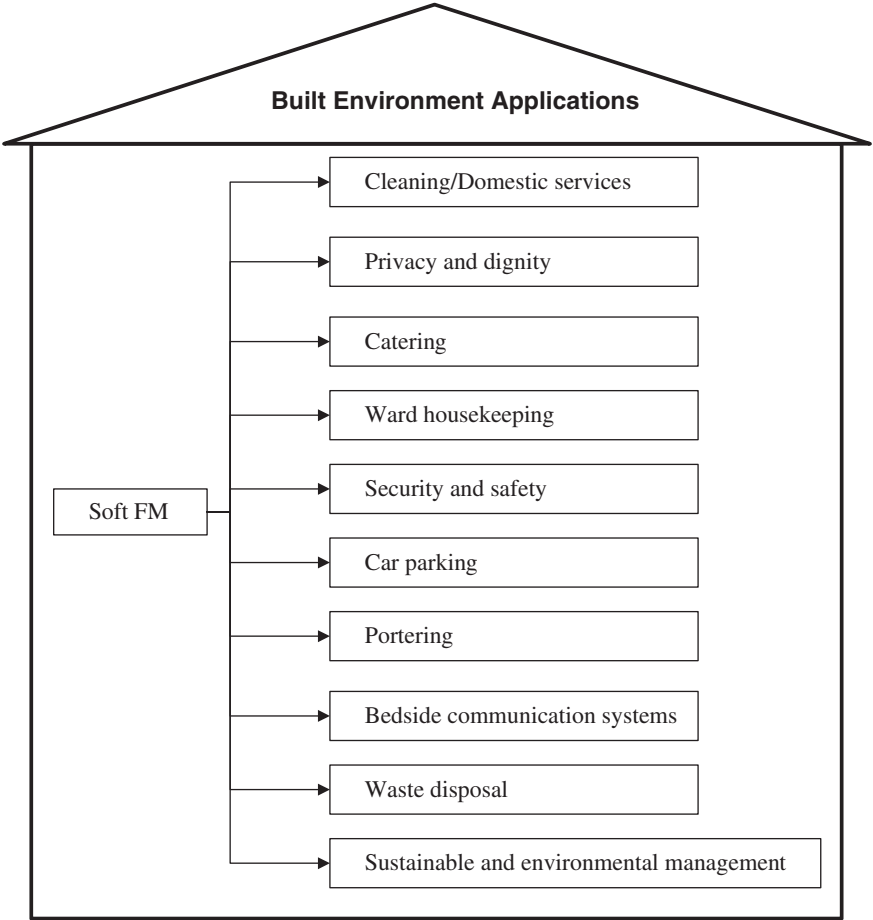
Source Adapted from Okoroh et al. (2001)

Although FM service coverage is complex and varies from hospital to hospital, four common and vital services can be identified from a customer-oriented perspective: catering, estates, domestic and portering (Sarshar 2006). In Cole's (2004) study, of the 10 top priorities patients and the public identified for hospital services, 3 were FM related: cleanliness, hospital food and a safe and comfortable environment. Similarly, Miller and May (2006) suggested that the most important facilities factors to people were cleanliness, hospital food, comfortable environment and privacy and dignity.

This study aims to identify the service gaps and evaluate the service quality of FM from the patients' perspective, so both the soft and the hard side of FM services are covered with a focus on patient-encountered service attributes. Thus, the soft side services take up a larger portion because they are accessible to patients.

To some extent, hospital FM differs from normal types of FM, such as FM for office buildings. Hospital facilities managers tend to view the systems and components of their facilities from a long-term life-cycle perspective because hospitals usually own their facilities. In addition, the unique nature of hospitals, that they are places where a mistake can cost the life of a human being, and the fact that FM is a critical component of hospital management contribute to the need for more research in this area.





**Fig. 2.2** Hospital soft FM services coverage

Research on hospital FM has mainly focused on issues of performance measurement and benchmarking (Lavy and Shohet 2009; Lennerts et al. 2005; Shohet 2006). As stated above, those considering the performance measurement of hospital FM have tended to take an internal view from the FM departmental and organisational perspective and have mainly concentrated on one specific area, such as cleaning, catering, maintenance or waste management (Akter and Tränkler 2003; Cesarotti and Di Silvio 2006; Hwang et al. 1999; Liyanage and Egbu 2008; Suess 1992). Indeed, these approaches have positive effects on FM performance, but they only provide information about the performance of one specific area and that performance is evaluated against indicators determined by the hospital, not the patients. Taking a patient-oriented approach to a set of more generalised FM services is more effective in identifying the service gaps and satisfying patients.

**Table 2.6** Key aspects contributing to successful FM

	Factors	Sources
1	Management of information and knowledge	Atkin and Brooks (2009); Pathirage et al. (2008); Nutt (1999)
2	Fitting FM function and role to the environment of practice	Atkin and Brooks (2009); Chotipanich (2004); Nutt (2002)
3	Sufficient budget and cost effectiveness	Rondeau et al. (1995); Shohet and Lavy (2004)
4	Selecting and dealing with the outsourcer	Bull (1996)
5	Leadership and experience of facilities manager	Rogers (2003); Rondeau et al. (1995); Bandy (2002)
6	Facilities managers' involvement in hospital level decision-making	Cotts et al. (2010); Barrett and Baldry (2009); Shohet and Lavy (2004)
7	Staff development and training: soft and hard skills	Srinivasan (2008); Rondeau et al. (1995); Bandy (2002)
8	Service tasks standardisation and benchmarking	Wauters (2005); Massheder and Finch (1998); Alexander (2003); Bandy (2002)

## 2.5 Key Aspects Contributing to Successful FM/Hospital FM

The success of FM depends on visionary commitment from multiple parties in multiple disciplines to meet customer demands (Kam-Shim 1999). Various studies have proposed key factors that can contribute to the success of FM and, in the hospital context, hospital FM. Generally these factors fall into eight aspects. Table 2.6 summarises the literature review findings relating to this topic.

### (1) Management of information and knowledge

Based on the purpose of this study and the nature of hospital FM, “management of information” here mainly includes the information generated from FM work processes, such as operations information from inter- and intra-departments, instructions from management and feedback from patients and staff. Knowledge includes the FM staff's intellectual skills and those valuable things learned from everyday operations. Managers must ensure and facilitate the flow of information. Since information flow is a two-way process, we emphasise the exchange or sharing of related information with different parties, such as managers and staff, patients and contact personnel. Information must be understood and used effectively. Good management of information and knowledge can make the most of past experiences and smooth the process of complex hospital FM, ensuring that all work is done effectively and correctly.

### (2) Fitting FM function and role to the environment of practice

Being fully aware of the environment in which one is working is important. From the big picture of the country's economy and climate to the specific location and cultural context of the hospital, facilities managers should be

sensitive to their surrounding environment. Singapore is a city-state with a tropical climate. It is also a diverse country with different races, cultures and religions. All of these characteristics can have implications for hospital FM, from influencing the hospital's grounding to influencing staff's behaviour or food provision. Facilities managers must learn to pay attention to the big picture. Even within the same sector, different hospitals share different goals and plans; understanding the hospital's needs is crucial. Alignment of FM work should reflect the hospital's long- and short-term objectives. Hospital FM is complex and it has no universal rules. The most appropriate approach is to fit the FM function and role to the environment in which the hospital operates.

(3) Sufficient budget and cost effectiveness

FM service coverage varies among hospitals, but the services are all broad and require considerable monetary resources. For example, a lot of challenging issues exist in handling maintenance in healthcare facilities, so the FM department must have a budget adequate to pay for the work to be done. Therefore, by demonstrating its key role in ensuring the normal operation of the hospital and the value it adds to the hospital, the FM department should be proactive in the hospital's financial arrangements. On the other hand, the FM department should use its money wisely and its own budget plan should not hinder the hospital's financial performance. Thus, the facilities managers must justify their budgets and use the money wisely.

(4) Selecting and dealing with the outsourcer

Outsourcing in Singapore's hospitals is quite common. Some literature has recommended long-term partnerships with outsourcers so that both parties can take advantage of the good relationship. Other studies have argued that competitive tendering can better serve the organisation. Either way, outsourcing is an important factor that will affect FM performance. For the purpose of this study, we concentrate on the selection of outsourcing contractors and their management; their competence and service culture are two critical aspects to examine. In addition, effective control over contractors and subcontractors helps to ensure that they clearly understand the hospital's needs and meet a satisfactory service level. The hospital should obtain the best possible contractual and financial arrangements for outsourcing.

(5) Leadership and experience of facilities manager

Both leadership ability and experience are vital for facilities managers to achieve success. Hospital FM is a broad and complex concept. Thus, facilities managers must be able to lead and strategically plan FM services to ensure that everything is geared to achieving zero defects in hospital operations, meeting various goals and satisfying customers, whether internal or external, by providing clear guidelines instead of high aspirations. On the other hand, FM is a labour-intensive business, whether outsourced or maintained in-house. Facilities managers need the people skills to manage people, foster a team spirit and inspire their staff, ensuring that employees feel appreciated for their contributions. In addition, health facilities always undergo rigorous inspections; facilities managers need to interact successfully with various

regulatory agencies. All these responsibilities require that facilities managers have a balance of technical and managerial skills. By continuing professional development and the accumulation of experience, facilities managers can develop these skills.

(6) Facilities managers' involvement in hospital level decision-making

Facilities managers' involvement in hospital level decision-making can help smooth the arrangement of FM work and prepare them for future development of the hospitals. Facilities managers can demonstrate their commitment to quality service during the hospital level decision-making process. Facilities managers are familiar with their hospital's facilities and thus can give their own opinions and suggestions so as to achieve a better decision when any changes are anticipated. The FM department's requirements and operation information can also be reflected in the hospital's development strategy and external communications, which can contribute to the FM department's success.

(7) Staff development and training: soft and hard skills

Hospitals are filled with people. The professional behaviour of medical staff will impress patients, so will the behaviour of non-medical staff. Customer service skills are important for FM staff when they have direct contact with patients. A neat appearance, kind words and a sense of respect will make patients feel better and more satisfied with the services they receive. Some FM staff work behind the scenes and seldom have direct contact with patients; for them, the hard skills are of crucial importance. The staff's intellectual resources form the valuable knowledge base of the FM department and the hospital. Training is an effective way to equip the staff with the continuous renewal skills they need to meet the demands of their job responsibilities and handle general enquiries and complaints; such training will also influence their attitude towards work.

(8) Service tasks standardisation and benchmarking

Hospitals are places where an error can cost the life of a person. Thus, FM service tasks standardisation is essential to ensure that everything runs smoothly. Especially when it comes to healthcare equipment, the price of dysfunction is too huge to pay. Standardisation is also beneficial for outsourcing, clarifying the service level agreement. Without clear-cut standards, the quality of FM services performed cannot be assured. Benchmarking provides an opportunity to learn from best practice hospitals and to guide the direction for improvement, as well as stimulate competition and innovation. Good benchmarking requires formal processes for measuring performance and goal setting. In addition, service goals in benchmarking should be based on customer standards rather than hospital standards.

The eight aspects discussed above can help in achieving successful hospital FM performance. However, these factors alone do not necessarily contribute to improved service quality. They are described at a general level in the literature and not at the practical or operational level. More importantly, the understanding of how they can improve service quality is ambiguous. Thus, more detailed service quality-related sub-factors should be studied to justify their effectiveness in improving FM service quality. This is discussed in Chap. 4.

## 2.6 Summary of Chapter

This chapter has reviewed the FM discipline's definition and development history and its service coverage, especially in the healthcare domain, as well as the healthcare system in Singapore. The literature review also identified eight aspects that are critical to successful hospital FM. However, those aspects are general in nature; combining them with other service quality tools will shed light on how to improve FM service quality.

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