

SUSTAINABLE FACILITY MANAGEMENT THROUGH THE DEVELOPMENT OF EGYPTIAN FACILITY MANAGEMENT GUIDELINE

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ABSTRACT

Facility Management (FM) emphasis a strategic focus as it adopt the United Nations sustainable development goals (SDGs) that consider Sustainable Facility Management (SFM) in business decisions. The understanding of the principles of SFM has developed over the last decade. This paper addresses the challenges of adopting SFM worldwide, and in Egypt in specific and how to overcome those challenges. A survey with FM experts was done to have a complete picture of FM in Egypt then suggest some solutions to improve the current situation of Facility Management in Egypt. One of the main strategies to overcome the challenges that was suggested in this research paper was to develop Egyptian FM guideline to ensure the adoption of SFM and to fulfill the SDGs. An overview of the development of facility management specifications, guidelines and their requirements are demonstrated, Then a Strategic Facility Management Framework for an Egyptian guideline is proposed and its outline is presented. **Motivation/Background:** The challenges of adopting Sustainable Facility Management (SFM) worldwide, and in Egypt in specific and how to overcome those challenges **Method:** A survey with FM experts and analysis **Results:** Some solutions to improve the current situation of Facility Management in Egypt **Conclusions:** Strategic Facility Management Framework for an Egyptian guideline is proposed

Keywords: Sustainable Facility Management, Facility Management Challenges, Facility Management Specifications and Guidelines, Egyptian Facility Management Guideline

1. INTRODUCTION

Facility management (FM) is a profession that includes multiple disciplines to ensure the functionality by integrating people, places, processes and technology. Facility management integrates different disciplines to be efficient. FM affects health and quality of life through the services it delivers (ISO) (2018).

FM combine various areas as planning, designing, and managing for maintaining the overall functionality by integrating the place where the building is

constructed, the customers who are using the building, the process used for construction and the technology applied for the construction [Alhammadi \(2019\)](#).

The FM emphasis adopting practices that consider social, environmental and economic benefits of business decisions. Nowadays FM realizes the 17 Sustainable Development Goals (SDGs) at different organizational levels. The adoption of SFM will reduce water, energy, and waste in the operation and maintenance of different buildings [Lok et al. \(2023\)](#), [Opoku and Lee \(2022\)](#).

Sustainable Facility Management has a significant impact on buildings' performance and their embedded systems efficiency. However, the facility management in Egypt is still under development, as most of the parties limit their role to the operation phase only [Nazmy et al. \(2020\)](#).

This study first step was to analyze the current situation of Facility Management in Egypt and address the challenges of adopting SFM worldwide and in Egypt. This was done through a survey with FM experts. Then an interviews with the experts were done to suggest some strategies to improve the current situation. One of the main strategies to overcome the challenges found was to develop Egyptian FM guideline. An outline for this Egyptian guideline is presented.

1.1. FACILITY MANAGEMENT

The functions of FM are organized into competencies as: operations and maintenance, occupancy and human factors, facility information and technology management, sustainability, communication, performance and quality, risk management, leadership and strategy, finance and business, real estate, and project management ([Zahid et al. \(2023\)](#), [IFMA \(2018\)](#))

Facility management core functions include the following as shown in [Figure 1](#), [Christiansen \(2024\)](#):

- Real estate management: Keep the building safe, updated repairs, and ensure people run it.
- Occupancy management: Balance operational costs by using data and analytics, space effective use, employee comfort, productivity, and energy saving.
- Maintenance management: Plan and carry out the maintenance for assets.
- Asset management: Includes the lifecycle of all assets.
- Financial and performance management: manage inventory, budgets and the costs incurred each month.
- Building systems: Management, condition assessments, fire and security systems maintenance, and HVAC maintenance.

Figure 1

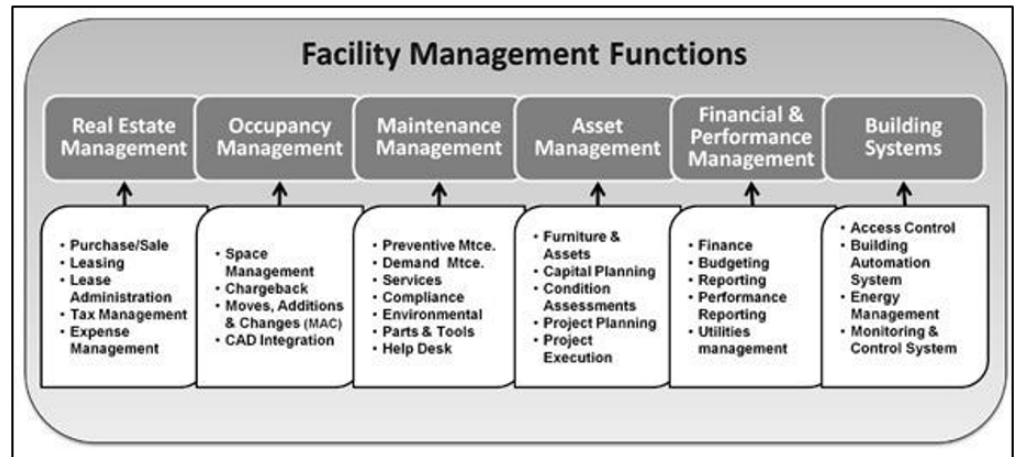


Figure 1 Facility Management Functions

Source Christiansen (2024)

Hard Facilities Management (Hard FM) and Soft Facilities Management (Soft FM) is another way to look at facility management roles as shown in [Figure 2](#), [Christiansen \(2024\)](#)

Figure 2

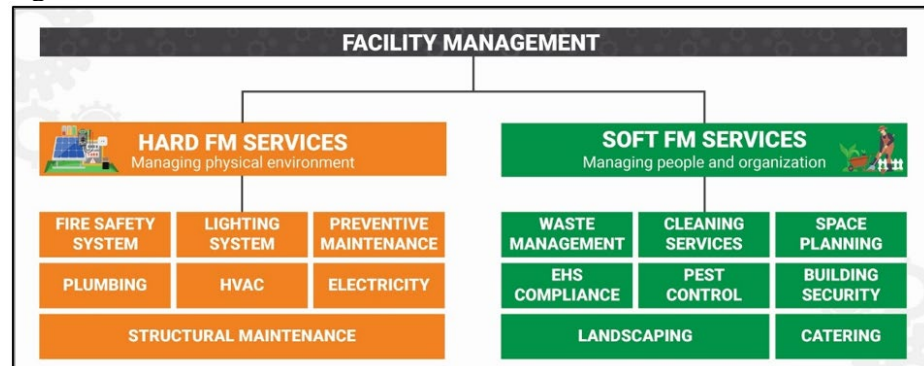


Figure 2 Facility Management Roles

Source Christiansen (2024)

1.2. SUSTAINABLE FACILITY MANAGEMENT

The concept of Sustainable Facility Management (SFM) include FM and sustainable development, It adopt technology and innovative business practices that balances the impact of economic, social, and environmental business decisions [Opoku and Lee \(2022\)](#).

SFM contributes to economic, social, and environmental sustainability through the management, implementation and delivery of organization's core and non-core business services [Tucker \(2013\)](#).

SFM implements sustainable practices that address customer experience, climate change, and competition (the 3Cs of FM) which minimizes the negative impact of business decisions on the environment [Lok et al. \(2023\)](#).

The integration of social, environmental and economic targets within the business strategy is Facility Management main task. Sustainable Facility Management basic structure – SFM-Model is presented in Figure 3, Junghans (2011)

Figure 3

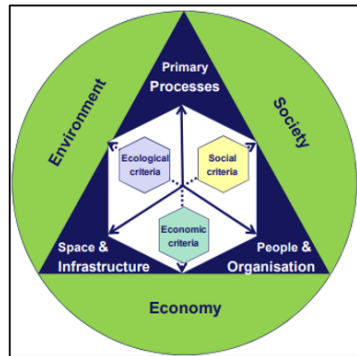


Figure 3 Basic Structure of Sustainable Facility Management – SFM-Model

Source Junghans (2011)

1.3. SUSTAINABLE FACILITY MANAGEMENT BENEFITS AND CHALLENGES/BARRIERS

Sustainable FM concept has developed in the UK at the same time with sustainable development theory and climate change growing appreciation Shah (2007). In UK, the legislation formulation is sustainable FM main driver Elmualim et al. (2012)

In developing countries, Malaysia for example, FM development started in the second half of the 1990s. However, SFM is still new, low awareness and there isn't enough literature on it Adewunmi et al. (2012). Sustainable Facilities Management have many benefits; some are summarized in Figure 4, Adewunmi et al. (2012), Abigo et al. (2012), Baaki et al. (2016), (IFMEC) (2018), (IOS) (2018).

Figure 4

Perspectives	Benefits of Sustainable Facilities Management
Social	<ul style="list-style-type: none"> - Add value to their organisations and customers through efficient management of sustainability issues and practices; - A long-range focus in organisations and has continuity responsibilities; - Incorporate the SDG's from a corporate level into a broad scope of enabling practices; - A leadership network working to advance gender parity in executive management. - Determining profitability, productivity, energy management, waste management, employee wellbeing and public perception of an organization; - Home-work balance by providing good and flexible work conditions
Environmental	<ul style="list-style-type: none"> - Ensure proper functioning of the market, protect people's health and safety and preserve the environment; - Reduction in energy consumption, Waste reduction Increase productivity, Elimination of oil and air pollution, Sustainable urbanization, Reduction of deforestation and Reduction of carbon dioxide emissions - Technology advances beyond our wildest imaginings; resources becoming more scarce; higher efficiency of operations demanded by customers; - Preserving the environment, incorporating sustainable practices in the management of buildings comes with the benefit of reduced cost;
Economic	<ul style="list-style-type: none"> - Reduces the running/operational cost of the organisation and carbon emissions of buildings; - Lifecycle cost reduction, financial gain, investment drive, Life cycle cost reduction, profitability, to remain competitive and Market expansion - A wide recognition of the benefits and importance of incorporating sustainability into FM practice; Pressure from legislation, fierce market competition and constantly changing business environments warranting the need to seek competitive edge;

Figure 4 Benefits of SFM

Source Adewunmi et al. (2012), Abigo et al. (2012), Baaki et al. (2016), (IFMEC) (2018), (IOS) (2018)

A comparison on Sustainable FM situation in UK and Nigeria was done and revealed that the lack of regulations, sustainable policies and awareness are the main barriers to sustainable practice in Nigeria [Abigo et al. \(2012\)](#).

Another study in Nigeria assured that sustainable FM practices main barriers are lack of relevant laws and regulation, lack of knowledge, awareness and training [Oluseyi et al. \(2014\)](#)

Egypt's facility management market has grown over the past few years. In 2004, The first mega project to apply comprehensive FM in Egypt was the Nile City Towers Project. The country's infrastructure development initiatives, such as the New Administrative Capital and the Golden Triangle projects, have also created significant opportunities for the facility management industry. However, the facility management industry in Egypt faces several challenges, such as inadequate regulatory frameworks, low awareness of the importance of FM and lack of skilled labors, as a result there is a reluctance by some organizations to invest in facility management services [Elzanoun \(2023\)](#)

Some solutions were suggested which can improve FM services delivery in Egypt, thus compete with its rivals in the world and leads to improvement and sustainability. The use of BIM through all the life cycle phases of the building, The shift to outsourcing, and to provide specified education program are some of the solutions suggested [Nazmy et al. \(2020\)](#).

2. MATERIALS AND METHODS

In order to understand and analyze the current situation of Facility Management in Egypt, First, a literature review of FM, SFM, SFM benefits and challenges, development of FM standards, codes and contracts, and the status of FM in Egypt was expedited. Second, a survey with 30 FM experts was done during the period of July and August 2024. The survey addressed 2 main topics: The FM different job description and their level of application in Egypt, and the different challenges for applying FM and the degree of importance of each. After the analysis of the survey, interviews were done with those experts to discuss how to overcome the challenges found. One of the main strategies discussed in the interviews was to have an Egyptian FM guideline that lead to sustainability, the benefits of having it and their degree of importance were also discussed. In the last step, a Strategic Facility Management Framework for an Egyptian guideline is proposed and its outline is presented.

2.1. DEVELOPMENT OF FM STANDARDS AND CODES

The European FM standardization started in 2002, and the first standards were published as EN 15221-1 and EN 15221-2 in 2006. Then EN 15221-3, -4, -5 and -6 were published in 2011 and 7 was published in 2012 ([Jensen et al. \(2023\)](#)- [CEN \(2006\)](#), [CEN \(2006\)](#), [CEN \(2011\)](#), [CEN \(2011\)](#), [CEN \(2011\)](#), [CEN \(2011\)](#), [CEN \(2012\)](#)).

Since 2017, ISO (International Organization for Standardization) published ISO 41001:2018 "Facility management – Management systems – Requirements with guidance for use" as the main FM standard. Then several ISO standards were published and others are under development as shown in Appendix 1 ([Jensen \(2010\)](#), [Facilities Management Standard 001, 2022](#)).

FM organization and the demand organization must work together to define needs to meet the core business strategy and develop FM policies and practices. This is done through the process approach methodology known as “Plan-Do-Check-Act” (PDCA) as shown in [Figure 5](#)

Figure 5

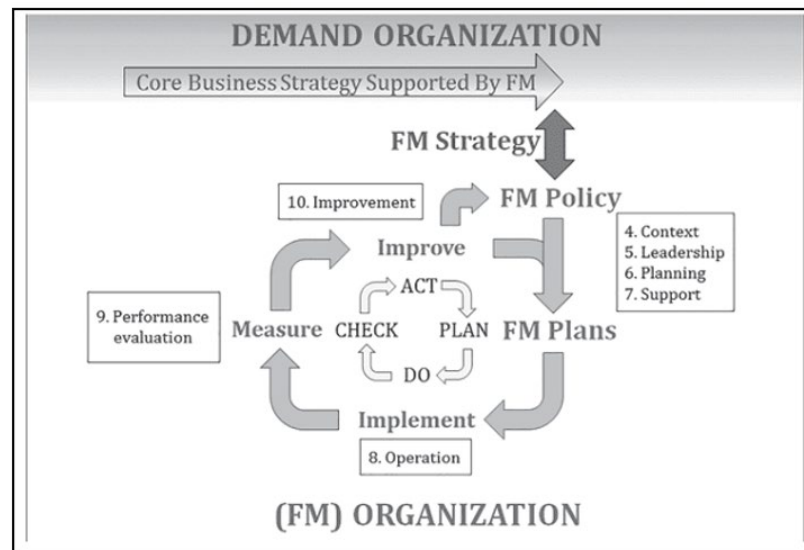


Figure 5 Facility Management

Source (ISO standard 41001:2018)

Facility Management Association of Australia (FMA Australia) with Project Reference Group that included different organizations developed a series of Facilities Management Good Practice Guides. One of these guides presents an overview of facility management in multi-unit residential buildings, that focus on common areas and shared services [FMA \(2012\)](#).

Queensland Australia Building Management Accreditation (ABMA) Code of Practice was developed by Accreditation Agency Limited (“ABMA”). It is a practical guide that help to develop and implement “Facilities Management Plan” (“FMP”) for the community titles scheme, aged care facility or commercial property [\(ABMA \(2020\)\)](#),

Procurement of Facility Management Code of Practice is published by the Royal Institution of Chartered Surveyors (RICS). It covers planning, procurement and post-procurement phases and provides the different factors, activities and key decisions during these phases [\(RICS\) \(2020\)](#).

IFMA-RICS collaborated in development of Strategic Facility Management Framework Guide that provide consistent, world-leading professional standards and guidance. It covers the actions to deliver facilities services that achieve optimum value and maximize FM contribution to the organization. [\(RICS\) and \(IFMA\) \(2018\)](#)

IFMA’s Facility Management Professional (FMP) credential is globally recognized as a standard for distinguishing the achievements of facility management. IFMA is the world's largest international association for facility management professionals, It supports 24,000 members in 105 countries. It identifies activities that are the core for ‘body of knowledge’ which comprises the IFMA suite of credentials – Facility Management Professional, Sustainability Facility Professional and Certified Facility Manager [\(IFMA\) \(2022\)](#). IFMA has identified 11 core competences for a senior facility manager as shown in [Figure 6](#).

Figure 6**Figure 6** Foundational Competencies of the FM Body of Knowledge

Source (IFMA) (2022)

2.2. FM CONTRACTS

FM Contracts are the legal agreements between a facility management service provider and a client for a period of time to manage and provide any type of FM services that does not require sophisticated management techniques, comprises straightforward services and imposes low risk. Services scope, schedule, service level agreements, pricing, and other terms and conditions are the main outlines of FM contract. [Datta \(2023\)](#).

FM Contract Types

- **NEC4 FM Contract** (New Engineering Contract by Institution of Civil Engineers) In June 2017, NEC contracts (NEC4) was released, which describes the client's service requirements as well as how the supplier is to supply the services.
- **CIOB FM Contract** (Chartered Institute of Building): The 3rd Edition is designed by CIOB in 2008 to be a benchmark for facilities management contracting, it is fair, intelligible, usable, and brief. It reflects legislative and commercial changes (up to 2008) affecting the FM business.
- **FIDIC DBO Contract** (International Federation of Consulting Engineers): FIDIC released Design-Build and Operate Contract (DBO Gold Book) in 2008

2.3. A STATUS QUE FOR FACILITY MANAGEMENT IN EGYPT

Egypt has been adopting sustainable development strategies for the last 10 years. This takes place strongly in Urban development and Construction industry, where more than 10 new cities have been built including all the facilities that need to be managed, operated and maintained to fulfill the sustainability goals. Some achievements in Facility management industry have been there already where, an

Egyptian Facility Management Association (EGYFMA) is established in 2019. It is a non-profit organization to serve the Facility Management industry in Egypt through many activities. Its purpose is to define and advance the industry of management, operation & maintenance of cities and facilities, in response to the growing directions of urban development. EGYFMA plays a vital role in advocating for the importance of facility management and provides training programs to improve the skills of the workforce. It also works to establish regulatory frameworks and standards to enhance the quality of services provided in the market. (<http://egyfma.org/>)

However, the road for the right and complete implementation of SFM still needs to be paved where there is no institutional standards, Cods or Guidelines for Egypt so far.

This paper discusses FM current practices in Egypt and the challenges facing application of SFM. It presents the need for a sort of Egyptian regulation for FM. Therefore the paper discusses and demonstrates the development of Egyptian FM guideline as a strategy to improve FM current situation and overcome the challenges.

3. RESULTS AND DISCUSSION

To analyze the current practices of Facility Management in Egypt, a survey with conducted with 30 FM experts. 77 % of the experts have experience more than 10 years while only 3 % have less 5 years. Their organizational role varies between consultant, contractor, service provider, real estate and others as shown in Figure 7 The majority are consultant and contractor.

Figure 7

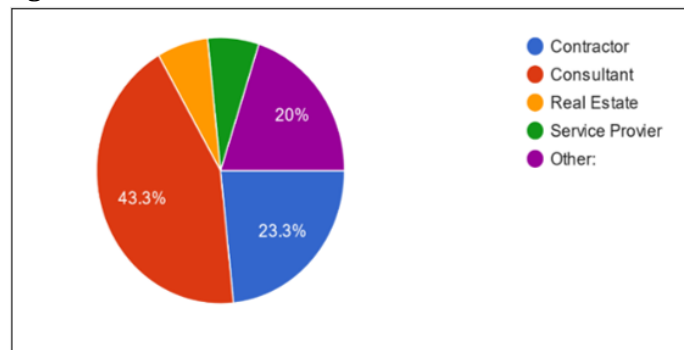


Figure 7 Organizational Role Distribution

3.1. FACILITY MANAGEMENT JOB DESCRIPTION

Facility management job description varies between operation and maintenance, administrative services, architectural and engineering services, real state, space management, health and safety, financial and strategic planning. The experts were asked about their opinion for the level of application of each job description in Egypt. The level of application was divided in the survey into 4 groups : From > 25 % , 25-50 % and 51-75 % , and < 75 % . During the analysis > 25 % is considered as weak level of application, the 25-50 % as fair level of application, 51-75 % as medium level of application, and < 75 % as High level of application. As shown in Figure 8, the majority of respondents chose that only operation and maintenance concept is applied at medium to high while the rest are applied at fair to medium level except strategic planning which is applied weak to fair level of

application . These results stress the main problem in Egypt which is that FM is mostly known as operation and maintenance only.

Figure 8

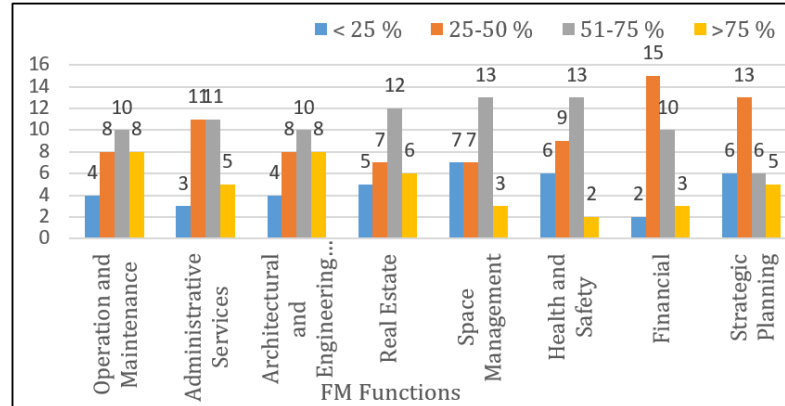


Figure 8 Level of Application of Different FM Job Description

3.2. CHALLENGES AND BARRIERS

The survey also addresses the challenges and barriers in Egypt regarding applying SFM, 12 challenges were chosen and the degree of importance of each is asked about. The degree of importance was divided in the survey into 4 groups: From > 25 % , 25-50 % , 51-75 % and < 75%. During the analysis, the > 25 % is considered as weak degree of importance, 25-50 % as fair degree of importance, 51-75 % as medium degree of importance and < 75% as High degree of importance. As shown in [Figure 9](#), the majority chose that Lack of Government policies / legislation & initiatives has medium to high degree of importance while the rest have fair to medium degree of importance

Figure 9

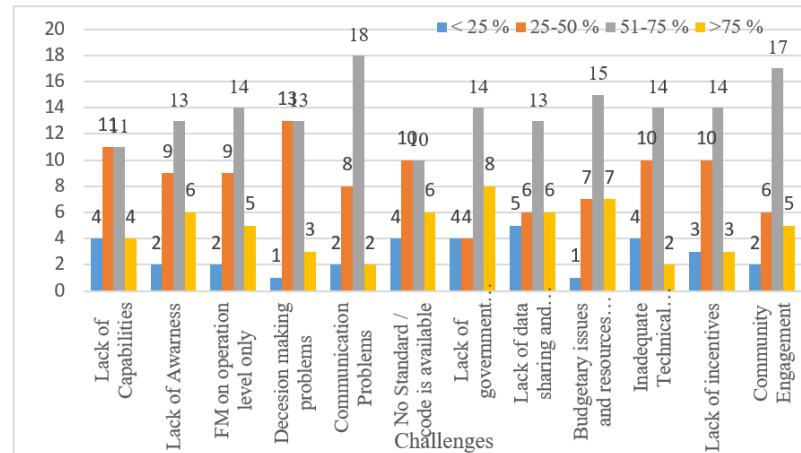


Figure 9 Degree of Importance of Different Challenges

3.3. HAVING AN EGYPTIAN FM GUIDELINE AND ITS BENEFITS

After the analysis of the survey, interviews were done with the experts to discuss how to overcome the challenges found. One of the main strategies discussed in the interviews to help in applying SFM and overcome the challenges is to have an

Egyptian FM guideline that lead to sustainability, the benefits of having it and their degree of importance is also discussed.

The results revealed that all benefits are of high degree of importance and the most important is that the guideline will help to differentiate levels of management responsibilities as shown in [Table 1](#). These results focus on an important issue as in facility management, there are a lot of stakeholders so it is very important to differentiate and clarify roles and responsibilities and the guideline should address this subject.

Table 1

Table 1 Level of Importance of Different Benefits of Having FM Guideline				
Subject	Level of Importance			
	<25% (Weak)	25-50 % (Fair)	51-75 % (Medium)	75%> (High)
Increase the awareness and Recognizes the value it delivers	1	3	12	14
Ensure consistency		5	12	13
Engage stakeholders		3	14	13
Differentiate different levels of management responsibility and roles		4	10	16
Deliver effective operations		5	11	14
minimize unnecessary cost	1	6	10	13
Contractual issues	2	4	12	12
KPIs	1	3	14	12

3.4. PROPOSED FACILITY MANAGEMENT GUIDELINE

The results from both survey and interviews show that there is an urgent need to emphasize on the importance and increase the awareness about the benefits of implementing facility Management in the construction industry in Egypt. A guideline is needed to increase the awareness and application of facility management.

Different standards / specifications, codes and guidelines in the field of facility management are reviewed to overview the contents of these codes and guidelines. Hence, building the base for the proposed Egyptian FM guideline. The summary is shown in [Table 2](#).

The study proposed some outline by merging ISO standards with professionals guidelines to identify facility management requirements and how to apply it. The proposed outline is shown in [Figure 10](#).

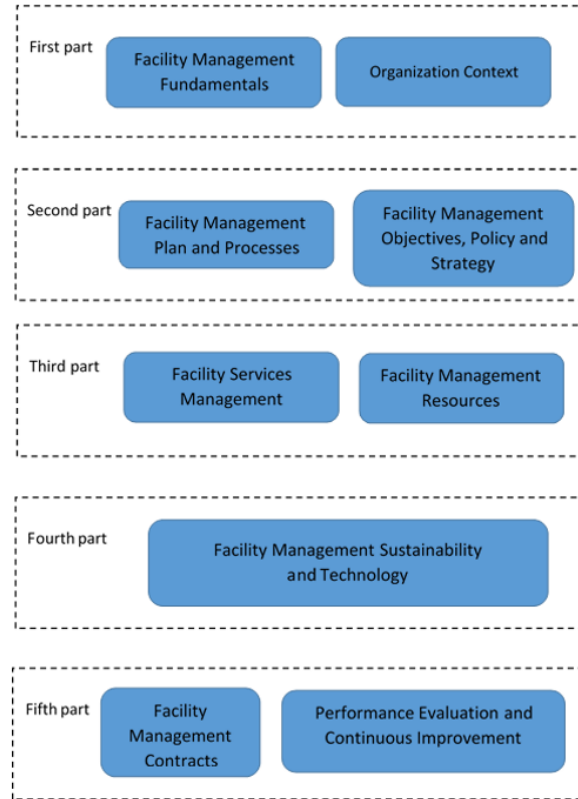
It is proposed that the guideline should be divided into five main parts. First part should be about understanding and defining facility management fundamentals, and organizational context. Second part should address facility management objectives, policy and strategy. It also should address facility management planning, functions and evaluation. The third part should address facility services management focusing on facility management resources. The fourth part should cover facility management sustainability and technology. The last part should address facility management contracts, Service Level Agreements (SLA), Key Performance Indicators (KPI) and continuous improvement.

Table 2

Table 2 Summary of Standards/ Specifications, Codes and Guidelines in Facility Management			
Standards/ Specifications	Codes	Guidelines	Body of Knowledge
European FM Standardization EN with the main standard: EN 15221-1 :2006 "Facility Management – Part 1: Terms and definitions, (replaced by ISO 41011, 2017 and ISO 41013/TR, 2017).	Australia Building Management Accreditation (ABMA) - Facilities Management Plan Code of Practice: development of Facilities Management Plan and life cycle of property infrastructure	Facilities Management Good Practice Guide in Australia: Provide good practice requirements between different stakeholders in all stages of multi-unit residential buildings	IFMA Credentials Body of Knowledge : Identifies the key activities for facility managers.
International Organization for Standardization (ISO) with the main standard: (ISO) 41001:2018 "Facility management – Management systems – Requirements with guidance for use.	Procurement of Facility Management Code of Practice: Help to choose procurement route that consider different factors in procurement process which results in a successful contract that provides benefits for all parties.	Strategic Facility Management Framework Guide Provide good practice in strategic planning of FM.	

In general, having Egyptian facility management guideline will lead to:

- Emphasize on the importance and increase the awareness of what good facility management means.
- Develop and implement effective facilities management at different sectors
- Help viewing facility management as a profession and recognizes the value it adds
- Guidance and examples of good practice
- Ensure consistency
- Reduce duplication of effort, deliver effective operations, minimize unnecessary cost
- Reference to solve any FM contractual problems
- Contribute in the various aspects of the 17 Sustainable Development Goals (SDGs) at different organizational levels.
- Ensure SFM contribute to economic, social, and environmental sustainability through management, implementation and delivery of organization's core and non-core business services.
- Help facility managers measure progress, improve performance, and align facility operations with organizational objectives by selecting relevant KPIs.

Figure 10**Figure 10** The Proposed Outlines for Egyptian FM Guideline

4. CONCLUSIONS AND RECOMMENDATIONS

- 1) There is an urgent need for a guideline for facility management in Egypt to emphasize on the importance and increase the awareness about the benefits of implementing facility Management in the construction industry community.
- 2) In Egypt, In spite that the concept of Sustainable facility Management (SFM) is new, It is important to start applying it as it has become crucial
- 3) Operation and maintenance is the most applied FM functions in Egypt with high degree of application (< 50%) and the least applied functions are strategic planning
- 4) The Lack of Government policies / legislation & initiatives, is the main challenge in Egypt and the rest of the challenges shows medium degree of importance.
- 5) Having an Egyptian FM guideline have many benefits, all are of high degree of importance and the most important is that it will help to differentiate levels of management responsibilities.
- 6) For the Egyptian FM guideline, the study presented outlines that merge ISO standards and professional guidelines to identify facility management requirements and how to apply it.
- 7) Future Research should focus on the competencies for integrating sustainability into FM at the strategic, tactical and operational levels to plan and communicate with different stakeholders

5. APPENDIX A - FM ISO STANDARDS

ISO Standards Published

ISO 41001:2018 - Facility Management — Management Systems — Requirements with Guidance for Use
ISO 41001:2018/Amd 1:2024 - Facility Management — Management Systems — Requirements with Guidance for Use — Amendment 1: Climate Action Changes
ISO 41011:2024, ISO 41011:2017 - Facility Management — Vocabulary
ISO 41017:2024 - Facility management - Guidance on Emergency Preparedness and Management of an Epidemic
ISO 41012:2017 - Facility Management — Guidance on Strategic Sourcing and the Development of Agreements
ISO 41015:2023 - Facility Management — Influencing Organizational Behaviors for Improved Facility Outcomes
ISO 41018:2022 - Facility Management — Development of a Facility Management Policy
ISO 41014:2020 - Facility Management — Development of a Facility Management Strategy
ISO/TR 41013:2017 - Facility Management — Scope, key Concepts and Benefits
ISO/IEC TS 17021-11:2018 - Conformity assessment- Requirements for bodies providing audit and certification of management systems- Part 11: Competence requirements for auditing and certification of facility management (FM) management system

Under Development

ISO/TR 41016- Facility management — Overview of available technologies
ISO/DTR 41019- Facility management's role in sustainability, resilience and adaptability
ISO/DTR 41030 - Facility management — Existing performance management in facility management organizations — State of the industry

CONFLICT OF INTERESTS

None.

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None.

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