SUSTAINABLE INITIATIVES FOR FACILITIES MANAGEMENT IN PUBLIC PRIVATE PARTNERSHIP (PPP) PROJECTS

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Abstract

Facilities management is a discipline that supports an organisation in delivering its core business efficiently. The rapid development of infrastructure has opened up a venue for facilities management to be delivered through public private partnership (PPP) scheme. One of the scopes of service within this scheme is sustainability. This element can actually give a positive impact on the success of PPP projects; however, the implementation of sustainability within PPP arrangement has been overlooked, therefore requires a lot of improvements. Based on extensive literature review, this paper investigates and proposes sustainable initiatives for facilities management within PPP project life cycle perspective.

Keywords: *Sustainable initiative; facilities management, public private partnership*

1.0 INTRODUCTION

Facilities management (FM) is a profession that provides various services to support the core business of an organisation. It is responsible for coordinating the services needed for buildings, system, equipment or furniture that can benefitted the organisations to compete in a rapidly changing world (Becker, 1990). Thus, it can be stated that FM is essential for an effective and efficient functioning of an organisation.

With specific roles and functions, FM was involved in the implementation of PPP, which has been widely adopted by governments across the globe. Through PPP, various private sectors with different background and skills including FM have been invited to offer better facilities and services to the community. In a PPP project, it is important for the public and private sectors to combine their respective expertise. Usually, private sectors are the ones having the advantage in terms of resources, management skills and technology, while the public sectors are more inclined to regulatory actions and protection of public interest (UNECE, 2008).

The increase in implementation of PPP has directly affected the development of FM profession. According to Wiggins (2010), PPP is one of the factors driving the development of FM. Active involvement of FM in developing and managing PPP projects has highlighted the real function of FM, which supports the core business of an organisation.

As previously mentioned, sustainability is one of the scopes of service delivered through FM in PPP project. According to Elmualim *et al.* (2008), FM profession, which is at the forefront in grasping the agenda of changing organisation and individual working behaviour within the facilities, plays an active role in the sustainable agenda especially when FM business is closely working with three pillars of sustainability namely social, economic, and environmental.

FM can be viewed as a good mechanism to deliver sustainability in PPP projects due to its active involvement in both development and operational phases of project. As a main private

party responsible for the operational phase of PPP projects, FM is expected to plan and incorporate sustainable practice in their services. However, there are yet several issues regarding this implementation. For instance, Elmualim *et al.* (2009) have mentioned that efficient implementation of sustainable practice depends on the asymmetry of information and key issues between design and operational phases of a project. Meanwhile, Wang *et al.* (2013) postulated that the enforcement of sustainability across the whole life of PPP project seemed to be overlooked. Furthermore, Zhou *et al.* (2006) pointed out that the lack of recognised framework is among the problems in integrating sustainable objectives in PPP scheme.

These issues indicate that there is inadequate focus of sustainable practice from the PPP project life cycle perspectives since there is no clear continuity of practice found at the beginning until the end of projects. Although the concept of life-cycle analysis happens to be one of the basis of FM that can provide a sustainable competitive advantage (Cotts *et al.*, 2009), it has been discovered that the establishment of model or guideline such implementation is still limited. Capturing the above-mentioned issues and gaps in literature, this paper aims to investigate sustainable initiatives that can be incorporated by FM throughout the life cycle of PPP projects. According to Hodges (2005) as well as Lee and Kang (2013), it is crucial to explore this agenda through the long-term view of FM as sustainability is well known for its long-term wait to produce full benefits.

2.0 THE ROLE OF FACILITIES MANAGEMENT

The development in FM professionalism has widened managerial responsibilities within the FM division. The International Facility Management Association (IFMA) has defined FM as a profession that comprises multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology. It has been also stated by Nelson and Alexander (2002) that FM is a support service provided by the management of non-core company's assets to support and increase the efficiency of the main business in an organisation.

Generally, FM is responsible to offer services related to facility planning, real estate and building construction, building operations and maintenance as well as support. In these activities, specific FM processes such as formulating FM strategy, analysing requirements, developing solutions, implementing solutions and monitoring service provisions are conducted (Atkin & Björk, 2007). These processes are conducted through three levels of management known as strategic, tactical and operational. Each level contains specific roles and goals. The strategic roles of FM include dealing with high level of decision making such as formulating facilities strategy, negotiating service level agreement, identifying business needs and user requirements (Alexander, 2003; Noor & Pitt, 2009). At tactical level, tactical plans are developed according to strategic demands (Robathan, 1996). Meanwhile, operational level of FM involves day to day activities in supporting the core business. Wiggins (2010) has listed several key roles of FM for all three levels of management as shown in Table 1.

Table 1: FM roles according to management levels

Level of management	FM Roles
Strategic	- Defining FM strategy - Policy making and setting guideline - Input and response at corporate level - Conducting risk analysis - Initiating and monitoring KPIs - Managing the impact of facilities - Maintaining relations
Tactical	- Implementing and monitoring guideline - Developing budget plans - Translating business objectives to operational level - Defining and interpreting KPSs (performance, quality, risk and value) - Monitoring compliance with laws and regulations - Managing project, processes and

	agreements - Managing FM teams - Optimising the use of resources - Interpreting, adapting and reporting changes - Communicating with internal or external service providers on a tactical level
Operational	- Delivering services - Monitoring and checking service delivery processes - Monitoring service providers - Receiving requests for service via help desk or crevices centre - Collecting data for performance evaluations, feedbacks and demands from end – users - Reporting to tactical level - Communicating with internal or external service providers at operational level

Source : (Wiggins, 2010)

2.1 Public private partnership (PPP)

The implementation of PPP has started to gain attention since 1980s. Ever since, it has become a solution to overcome public budget constrain by allowing the use of private sector expertise and knowhow to deliver and manage public services (Cruz & Marques, 2013). The characteristics underpinning this arrangement are; (1) public services provided by private sector; (2) integrated package of design, build and finance; (3) long term contract (usually 25-30 years) and; (4) New concept introduced during the tendering process (value for money and whole life costing) (Wang, 2010).

Value for money, risk transfer, whole life cycle commitment, facilitation of 'core' public services delivery and payment for services based on performance are among key principals of PPP scheme (Robinson *et al.*, 2009). These elements are prioritised by both parties to ensure the success of PPP projects. Certain elements such as whole life cycle approach, the support on public core business delivery and payment mechanism require high commitment from FM parties. This is in line with the long term involvement and active role played by FM in PPP projects.

2.2 FM roles in PPP projects

FM completed the formation of consortium purposely developed for the PPP projects, which is known as Special Purpose Vehicle (SPV). As a part of SPV, FM delivers its services throughout PPP project life cycle that comprises four phases namely design, construction, operational and hand over. The duration for this life cycle is usually between 25-30 years. During this period, both private and public sectors have to play their roles according to the long – term contractual agreement. In investigating the effectiveness of FM in PPP projects, Brewer *et al.* (2013) found that FM contractors are able to deliver long term value to both clients and service providers.

FM input in the design and construction stages of PPP projects is very crucial. There is a strong relationship between what have been decided in design stage and the results on the operational phase. According to Baldwin (2003), the injection of FM input in the early stage of PPP project will give a positive impact on operational performance. Due to long term partnership, facilities manager is highly needed in preparing the whole life cost analysis, projecting facility plans and reviewing project proposals in the context of operation and core business requirements (El-Haram & Agapiou, 2002). Lack of FM involvement in feasibility and design phase will leave a negative impact on the value maximisation especially during the operational phase of PPP project (Brewer *et al.*, 2012).

FM is a wide and complex area that covers the asset management, building operations and maintenance as well as business support services (Kadefors, 2008). There are two indicators used in measuring the performance of FM service, which are availability and service failure (Wang, 2010). Therefore, the payment mechanism for FM service delivery in operational stage of PPP project is closely linked with output specification and performance monitoring system (Robinson & Scott, 2009). This system was developed to ensure whether or not the services provided by FM have met the required level and expectation.

In the process of assessing the value for money (VFM) for PPP bids, Takim *et al.* (2011)

viewed FM as a fundamental element in the construction and completion stages of a project. Their findings demonstrated a very strong influence gave by FM involvement in both stages of PPP project. This is in agreement with one of the key principles of PPP - whole-life approach where the private sector is responsible in delivering and maintaining the project until the end of concession period (Oyedele, 2013). The role of FM specifically in design and operational stages of PPP were highlighted by El-Haram and Agapiou (2002) as displayed in Table 2.

Table 2: FM roles over the life cycle of PPP project

Phase	FM role
Bid development and design	- Developing and estimating the cost breakdown structure - Reviewing and assessing the design from FM perspectives - Selecting cost-effective design option that could optimise the whole life costing - Developing maintenance strategies - Selecting optimum operating scenario - Liaison with other stakeholders in SPV
Operational	- Managing and controlling O&M strategies and cost - Collecting and analysing FM data - Monitoring the quality and availability of services - Ensuring the availability of required facilities

Source: (El-Haram & Agapiou, 2002)

3.0 SUSTAINABLE INITIATIVES FOR FACILITIES MANAGEMENT IN PPP PROJECTS

According to Baldwin (2003), there are several opportunities for FM that exist in partnership project as illustrated in Figure 3. The capacities of FM in offering its product, process and performance have made it a powerful medium to incorporate sustainability into a PPP project. Within the process, the consideration of sustainability may include sustainable policies, procedures, implementations, monitoring and reporting progress (Elmualim *et al.*, 2012). Concurrent with other facilities functions, Cotts *et al.* (2009) suggested a few ways to merge sustainability into the FM business. This includes site selection decision in minimising environmental impacts, recycling programme management, indoor air quality management, project management in compliance with environmental regulation, sustainable maintenance and operations practices.

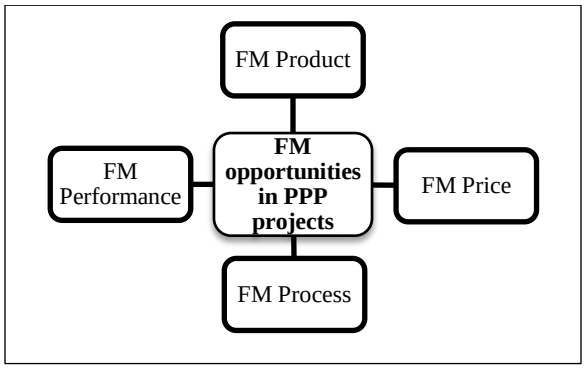

Figure 1: Sustainable initiatives for FM opportunities in PPP
Sources: (Baldwin, 2003)

For an efficient implementation, it is better for FM to view sustainable initiatives based on the project phases of PPP. This is due to the prioritisation of PPP towards the whole life approach. Cotts et al. (2009) revealed that the rational of FM as a natural indicator in leading the effort for sustainability is due to its nature of using life cycle assessment for decision making. Therefore, the injection of sustainability in PPP project phases is all within the purview of a facility manager. Shah (2008) anticipated that the implementation of sustainability within each phase of project will reduce operating cost, provide maximum return and supply more sustainable facilities. These arguments are recognized as significant in the development of sustainable initiatives for FM throughout the lifecycle of PPP project.

Phase 1: Feasibility and Briefing

Decisions made regarding the sustainability during the early phase of a project have been proved to be helpful for the overall implementation. According to Patel and Fortune (2006), the feasibility and briefing phase is very important based on to two reasons: (1) it sets up a framework for the whole project and the assessment for its sustainability; (2) it establishes a set of benchmark with different criteria for the assessment.

Phase 2: Design

Design is a key phase in implementing sustainability in a project. It is a process of producing a building that can successfully perform its functions, benefitted to the company, socially acceptable, and use minimum energy and material without producing hazardous waste (Chiu & Chu, 2012). The elements of design are assessed against energy efficiency, water efficiency, indoor environment, site location, material usage and atmospheric considerations (Bunz *et al.*, 2006).

Phase 3: Construction

The use of resources and waste generated from the construction of building has given a major impact towards the environment (Rwelamila *et al.*, 2000). Therefore, sustainable aspect needs to be incorporated into the activities as well as material used in the construction. In addition, Chong *et al.* (2009) stressed that many efforts are needed to bring sustainability into construction including the involvement of professionals.

Phase 4: Operational

Consideration towards the life cycle of a building is mainly based on time and resources invested during the operational phase *(Cotts et al.*, 2009). Sustainable initiatives taken in this phase are based on day to day basis where the outcome will reflect the overall success of sustainability implementation.

Considering the important roles played by each project phase, there is a need for a guideline that can be referred to FM. Therefore, the proposed sustainable initiatives that can be conducted by FM in PPP projects are illustrated in Figure 4.

Feasibility and briefing

- Incorporate sustainable strategy with business needs, budget resource and life cycle capital funding
- Put consideration into reduction facility operating costs within the decision making process
- Set capital cost provision for sustainability based on agreed payback mechanism
- Choose property locations that can reduce liability related to climate change impacts affecting asset value

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Design

- Orientate building to maximise or minimise the sun's energy absorption
- Design, select, integrate and commission a building automation system such as energy management, piping and ventilation
- Prioritise occupancy requirements within design criteria
- Procure building materials with recycled content

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Construction

- Use environmental friendly construction products
- Minimise the use of resources from central and local government, clients and building users
- Comply with related standard or rating tools
- Produce high efficiency windows and specialised building cladding
- Recycle waste materials
- Use new technologies including building information modelling (BIM)

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Operational

- Recycle the programme for office products
- Reduce the energy and other resources usage
- Record the procurement process
- Illuminate retrofits
- Reduce the use of water through the installation of aerators for sinks and showers, rainwater collection programmes and run-off for irrigation system.

Figure 4: Sustainable initiatives for facilities management
Source: (Cotts et al., 2009; Shah, 2008; Wiggins, 2010)

4.0 CONCLUSION

This paper proposed a set of sustainable initiatives from the perspective of project life cycle. Sustainable initiatives available from the literature have been integrated into PPP project phase, which consist of feasibility and briefing, design, construction and operational. The consideration towards project life cycle is essential as sustainability needs a long term view for an efficient implementation. Thus, the focus of its implementation in PPP project should be aligned from the start until the end of the project. Therefore, FM as the main party involved in the long period of PPP projects plays an important role for this task.

The proposed sustainable initiates presented in this paper provides a useful step by step approach for implementing sustainability practice when a division particularly FM has a long term involvement in a project. Although the proposed initiatives are formulated in the context of PPP projects, their application can be also extended in other types of project or separately conducted.

Nevertheless, there are several limitations in this study that are yet to be discovered. As this paper proposed a set of sustainable initiatives from PPP life cycle perspectives, there is also a need to examine its applicability. Besides, more studies are needed to see the interaction between sustainability and other scopes of service provided by the FM as it involves a wide scope of managerial responsibilities in the PPP projects. Furthermore, the impact of sustainability conducted by FM on the performance of PPP project especially in terms of cost and quality of services should be investigated in the future.

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