DEVELOPING STRATEGIC SYSTEM PLANNING FRAMEWORK FOR FACILITIES MANAGEMENT (SSPfFM) IN THE HEALTH SECTOR

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ABSTRACT

Facilities Management (FM) is commonly defined as managing physical workplace and property, which have a direct link with design and construction activities in one aspect, and managing services and performance of resources in the organisation as another. Aspects of FM are inter-related and share information from project brief until the design life of the building. Information plays a major role in integrating FM stakeholders. This paper highlights the importance of strategic IT in facilitating the implementation of strategic FM in the health sector. The current uptake of IT in hospital's FM department is at operational level, while the strategic FM demands the implementation of strategic IT in FM. The gap between the current operational IT and the need for it to be considered strategically has made this research important. FM department should be ready to implement changes in managing its information systems to meet client's demand. The effective use of information for the maintenance and operation of hospitals, hospital development, benchmarking, performance measurement, managing finance and human resources, requires strategic information systems (IS). This paper introduces a Strategic System Planning framework for FM (SSPfFM) in the health sector to capture the strategic information on FM that facilitates the implementation of strategic FM. Case study research methodology was adopted in support of this research. SSPfFM is derived from a pilot study conducted in Manchester, UK. It is further validated with other three case studies. This paper identified; gain top management commitment, align information system development with FM business needs, establish technology path and policies on IT in FM, and forecast information system requirements in FM as the main components of SSPfFM that focuses on short, medium and long-term strategies of FM in the health sector.

Keywords: Facilities Management, health sector, strategic system planning framework for FM (SSPfFM), information systems (IS), information technology (IT).

Introduction

FM in healthcare is a broad topic that encompasses areas such as human resources, physical workplace, environment, engineering services, structural, maintenance and financial management. In the National Health Service (NHS) perspective, FM is defined as "A dynamic business operation embracing non-clinical business anchoring services, which is dynamic in nature for both the enhancement and creation of the best value healthcare service success using partnering philosophy. It integrates strategic knowledge and operational management issues that are environmentally sustainable, embracing the ever-changing and chaotic business environment in the healthcare service provision". (Okoroh *et al*, 2001).

Building services in NHS Trusts are designed to a relatively low-technology specifications and, like hospital buildings and support services overall, have not been required to take on board the importance of life-cycle costing and the need to deliver a

service according to contractual criteria of reliability and performance (Selman, 1998). However, a new concept of hospital and healthcare has emerged and started the transition from the traditional "provider-centred" to a "consumer-centred" healthcare system (Miller and Swensson, 2002). This concept has made the medical administrators join with construction professional right from the project onset, which was not the case in the conventional hospital construction.

Background To Strategic Fm In The Nhs Trusts

The involvement of PFI in hospital redevelopment projects has shown the UK government's commitment to promoting project life-cycle approach. A number of documents have therefore been produced by Facilities Directorate in the NHS Trust, such as Estates and Facilities Strategy and Policy document as guideline to ensure the delivery of quality service to patient and healthcare (CMMC, 2002; Trafford, 2002). Project life-cycle components include the planning of new hospital's developments, project briefing, tendering, construction, and FM activities. FM activities in NHS Trusts include hospital development, asset management, and services performed during operation and maintenance throughout the design life of the hospital building.

Comments from researchers have shown that FM departments in NHS Trust are functioning at an operational and tactical level but not at any significant strategic level (Wagstaff, 1997; Wheeldon, 2002) but commercial development of integrating non-core services into a Facilities Management service division has started to influence the thinking and structures of NHS trusts (Rees, 1997).

The key to success in implementing hospital's FM strategy lies in knowledge and ability in developing and improving the strategy (Hicks, 2004) in which the FM department must be creative in disseminating its strategic role. The strategic FM implementation must be flexible in order to manage change in support of the core functions of the hospital. The Facilities Directorate is responsible for, and must be innovative in, performing this type of services. FM services in the NHS are more than just a range of non-core activities, they are vital enabling functions that underpin the whole business activity of the Trust in all departments of the organisation (Payne and Rees, 1999). The tasks to implement strategic FM require co-ordination, integration and sharing of information among all stakeholders.

Use Of It In The Nhs Trust

The NHS Trust has planned to implement an Information Strategic Programme for the Modern NHS 1998-2005 encompassing the clinical and non-clinical services including FM, that emphasises the use of IT to facilitate and improve their business (NHS Executive, 1998; NHS, 2002; CMMC NHS Trust, 2002). Government initiatives via the NHS Modernisation Plan and e-Government policy (NHS, 2001) have placed strategic FM as an agenda priority. The Facilities Directorate is required to formulate a strategy for FM and IT. Under the National IT Programme for the NHS stated in DoH (2000), DoH (2002), and NHS (2001), the NHS Trusts require information, applications and services to be delivered in new ways and through modern systems and technology, with the need for infrastructure that is robust, flexible, secure and standardised.

Facilities Directorate plays a major role in providing support services to the Trust and responsible in developing information strategy for FM activities. The future direction on how IT could strategise the dynamic business operation and the implementation of strategic FM must be clearly defined (NHSIA, 2002; CMMC, 2002). The Directorate should be ready to implement changes in managing its information systems to meet client demand.

Through NHS Plan the government has urged NHS Trust to implement IT strategically in the hospital activities. Without any referred strategic IT document plan the implementation of IT will be of an ad-hoc and operational based. Although no specific directives given to FM Directorates on how to implement strategic IT in FM, it is clear that the Directorate must take that lead. Currently there is no indication that information strategy on FM is being developed in NHS Trust despite the urgency laid by the government and authority.

Problem Statement

The strategic implementation of FM at the NHS Trusts plays a major role in persuading FM stakeholders to implement strategic IT. Despite its potential, the advantages of IT are not being fully exploited by the Facilities Directorate. Studies have acknowledged the scarcity of intellectual resources, experienced personnel, and the lack of IT knowledge and skill levels amongst managers at all level (Protti, 1999; NHSIA, 2002, The Lancet, 2002) that have delayed the implementation of strategic IT in the Trusts. Communication, integration and sharing of information among stakeholders are very important and have the potential to assist.

Based on information from the literature and the examination of the current implementation of strategic FM and IT systems in the NHS Trusts, the current uptake of IT is operational, while the implementation of strategic FM which involves short, medium and long-term activities requires information to be shared by the stakeholders that demanded the implementation of strategic IT. The unbalanced situation between the current operational IT and the need for it to be considered strategically has made this research important. In order to respond to the need for strategic FM activities, it would be important to provide the Facilities Directorate with a strategic system planning framework for FM (SSPfFM), to be associated with the strategic FM operation. The requirement for strategic IT in FM is contained in NHS Executive (1998), NHS (2001), NHS (2002) and NHSIA (2002) for the Facilities Directorate to implement. These documents does not specify the detail of the implementation plan and it is up to the Facilities Directorate own initiatives to take the matter forward. The development of SSPfFM is a step-by-step approach that will first investigate the current uptake of strategic FM by the Facilities Directorate and then identify the necessary process in strategic IS/IT to facilitate the information sharing by all stakeholders in the health sector.

Four NHS Trusts have agreed to participate as case studies to develop SSPfFM. A pilot study was used to prepare a draft proposal of SSPfFM which is then validated with other three case studies to validate SSPfFM. The final delivery of the validation process is the proposal of SSPfFM to the NHS Trusts.

Aspects Of FM In Health Sector

Aspects of FM in health sector could be grouped as design and construction related activities and as support services. Design and construction related activities for health sector include new hospital construction, redevelopment plan, renovation and refurbishment work, property management, space management, energy management, M&E services as well as engineering/building maintenance and a ground maintenance service.

Another aspect of FM is focussed as support services to the hospital and provides value for money services to the patients. Supplying catering, cleaning, and ward house keeping services, site management, waste management, portering, linen supply, residential accommodation for doctors, car parking and security are some of the typical examples of support services in the hospital.

Gelnay (2002) considers healthcare FM as one of the key elements for the successful delivery of healthcare services. These aspects of FM as business supports objectives to the organisation are shown Figure 1. This figure highlights FM activities before and after the

completion of construction. The implementation of FM requires information on design and construction related activities to be passed to the client after the completion of the construction. This information is also shared to support the business function of the organisation. Bridging the communication gaps are considered to be important solutions to allow seamless flow of information in FM activities. Information is a tool to bridge the gap between aspects of FM.

Normally, FM departments are responsible for providing support functions to meet the core objectives of hospitals and deliver a valuable service to patients. Also, the integration between the two aspects of FM is critical as the activities are inter-related and share information. This relationship makes the project life-cycle approach important to FM professionals as it provides a link between construction and the operation of hospital facilities.
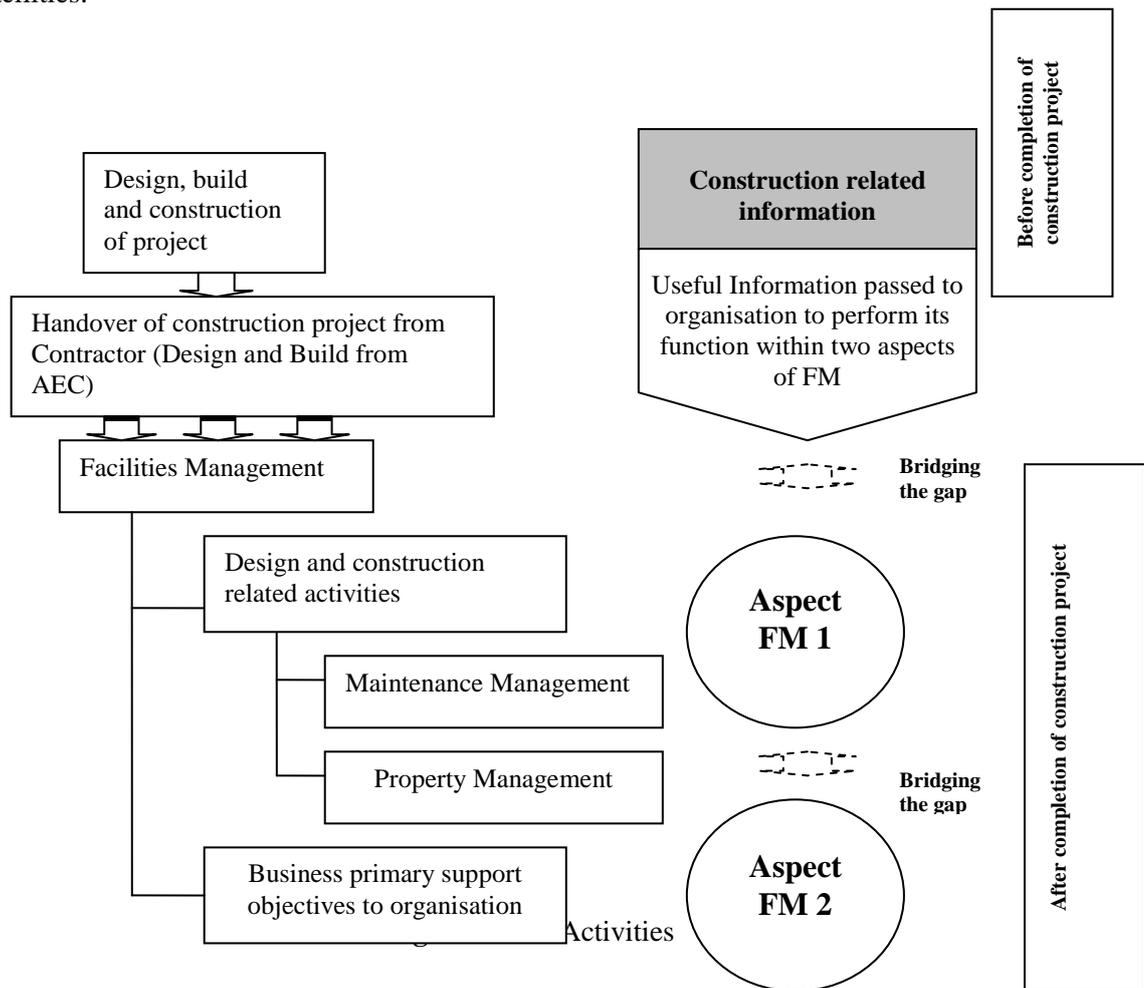
The Project Life-Cycle Approach

Project life-cycle approach is crucial in FM. Major functions in FM like maintenance and operation have often been ignored in the project life-cycle cost resulting in buildings that are costly to maintain. Horvath (1999), Sarshar *et al.*, (2000), Underwood and Alshawi (2000) proposed project infrastructure should properly be viewed from a life-cycle perspective. Lack of information and cooperation among the parties, especially the contractor and the designer, at the design stage, is the major contributor to problem of maintenance (Underwood, Alshawi, 2000). In many cases, operation, maintenance and end-of-life environmental costs of facilities have contributed to 85 % in cost occurring after construction by outweighing all initial costs (Scarponcini, 1996). A study by Teicholz (2004) also suggested that design and construction of buildings often represents less than 15% of the total lifecycle cost of building.
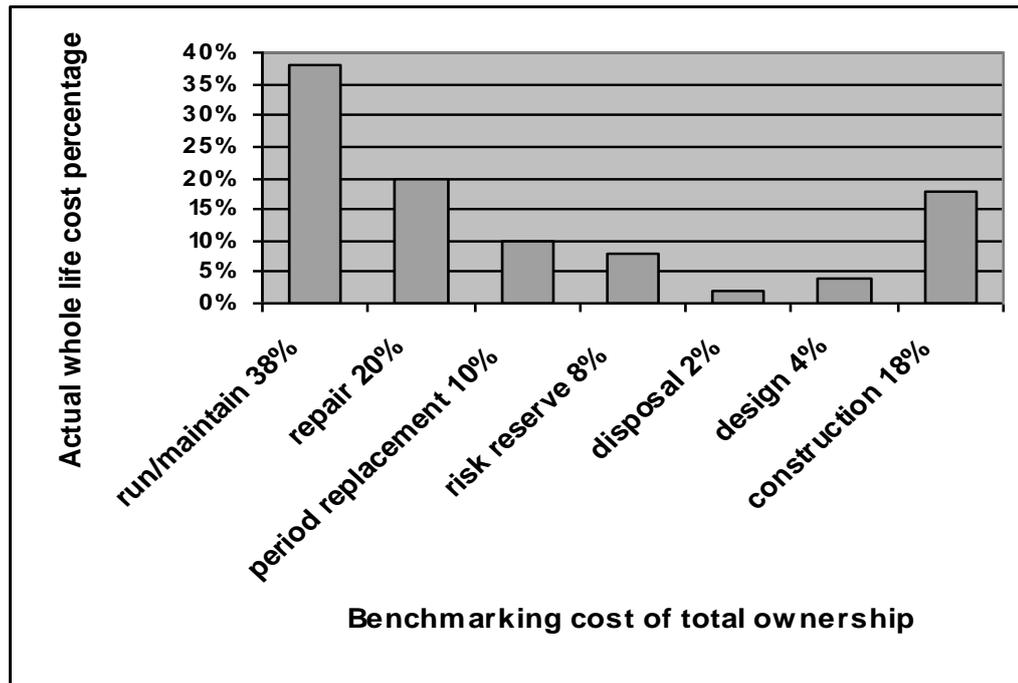
Figure 2: Benchmarking cost of total ownership - Boussabaine et al. (2004)

Another study by Boussabaine *et al*. (2004) gave a slightly higher percentage of design and construction life-cycle cost at 22% as shown in Figure 2 to which whole life cycle cost (WLC) can be compared and controlled.

The project life-cycle approach for hospital emphasises the importance of Architecture, Engineering and Construction (AEC) and FM professionals working together with policy makers. This allows dissemination of information and knowledge sharing to be integrated throughout the project life-cycle right from the project inception. Likewise, integrated FM for hospital demanded facilities managers, stakeholders of FM and AEC to be on board right from the planning stage. Figure 3 shows the project life-cycle for hospital.
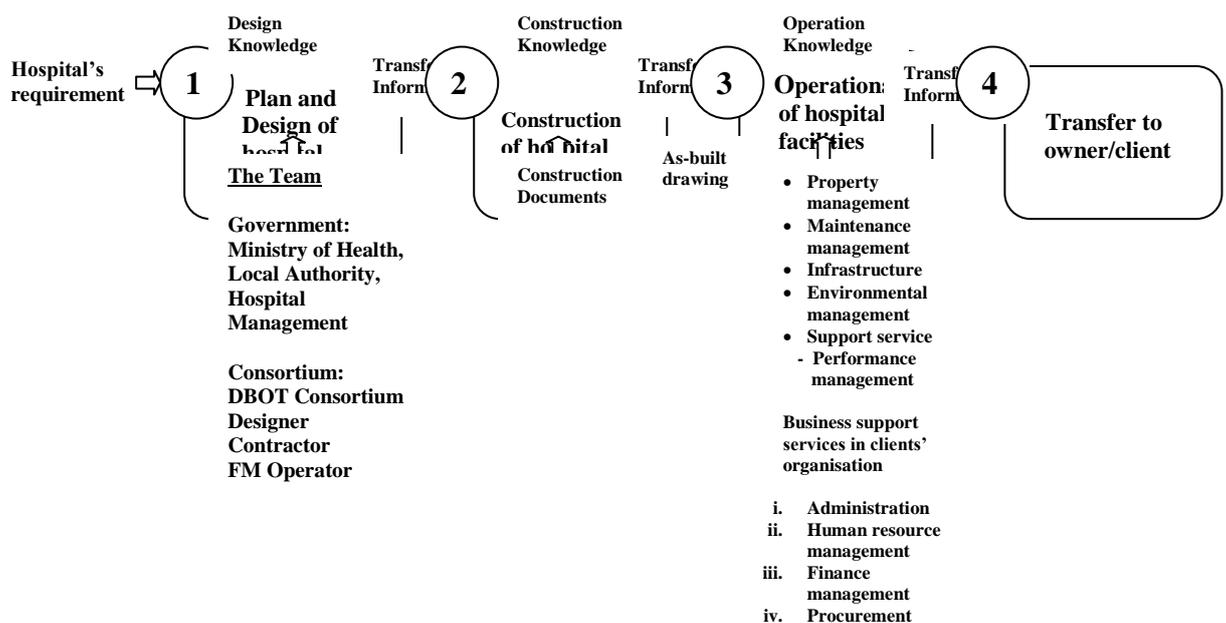

Figure 3: Project life-cycle for hospital

The project life-cycle for hospital is divided into four operations as follows:
  i.   Plan and design of hospital,
  ii.   Construction of hospital,
  iii. Operational of hospital,
  iv.   Transfer hospital back to owner.

Research Objectives

The objectives of this research are summarised below:

  i.   Explore the strategies and the implementation issues of Facilities Directorate in NHS Trusts involved in the case studies,
  ii.   Investigate the strengths and weaknesses of current practices of IT for FM in NHS Trusts,
  iii. To capture and formulate Strategic System Planning framework for FM (SSPfFM) relevant to the hospital's strategic FM based from literature review and case studies,
  iv.   To validate the SSPfFM framework developed from the pilot study against the other three case studies,
  v.   Propose a Strategic System Planning framework for FM (SSPfFM) to the health sector.

Case Study As A Research Strategy

The design of the pilot study is established first and targeted to NHS Trust A. This hospital has planned to develop its strategic systems planning for FM and has collaborated in this research. Data was obtained via interviews, questionnaire feedbacks and document checks on NHS circulars. Senior managers of the Facilities Directorate have collaborated in this exercise. Three other NHS Trusts B and C and D have taken part in the multiple case studies to validate the SSPfFM developed from the pilot study.

The case studies looked into the current use of IT in FM and examined how the health sector perceived IT as a tool to improve the implementation of strategic FM. The case studies looked into current events happening in the health sector. This includes government's policy, organisational and department's strategic direction and objectives, and the interaction between the hospital management and the patients.

Case Studies Analysis Criteria

In order to meet the research objectives, the analysis of the case studies are mainly focused from the following criteria:

  i.   The alignment of information systems (IS) strategies and strategic FM in the NHS Trusts,
  ii.   Examine the current IS/IT capabilities in Facilities Directorate of all the NHS Trusts involved, and
  iii. The implementation of strategic IS/IT in FM for NHS Trusts.

Research Framework

The research framework from the pilot study to the multiple case studies is illustrated in Figure 5. The pilot case represents a most complicated one, compared to the other three cases, so that nearly all relevant data collection issues will be encountered in this initial trial. Each individual case study consists of a "whole" study, in which convergent evidence is sought regarding the facts and conclusions for each case; each case's conclusions are then

considered to be the information needing replication by other individual cases. For each individual case, the report indicates how and why a particular proposition was demonstrated or otherwise.
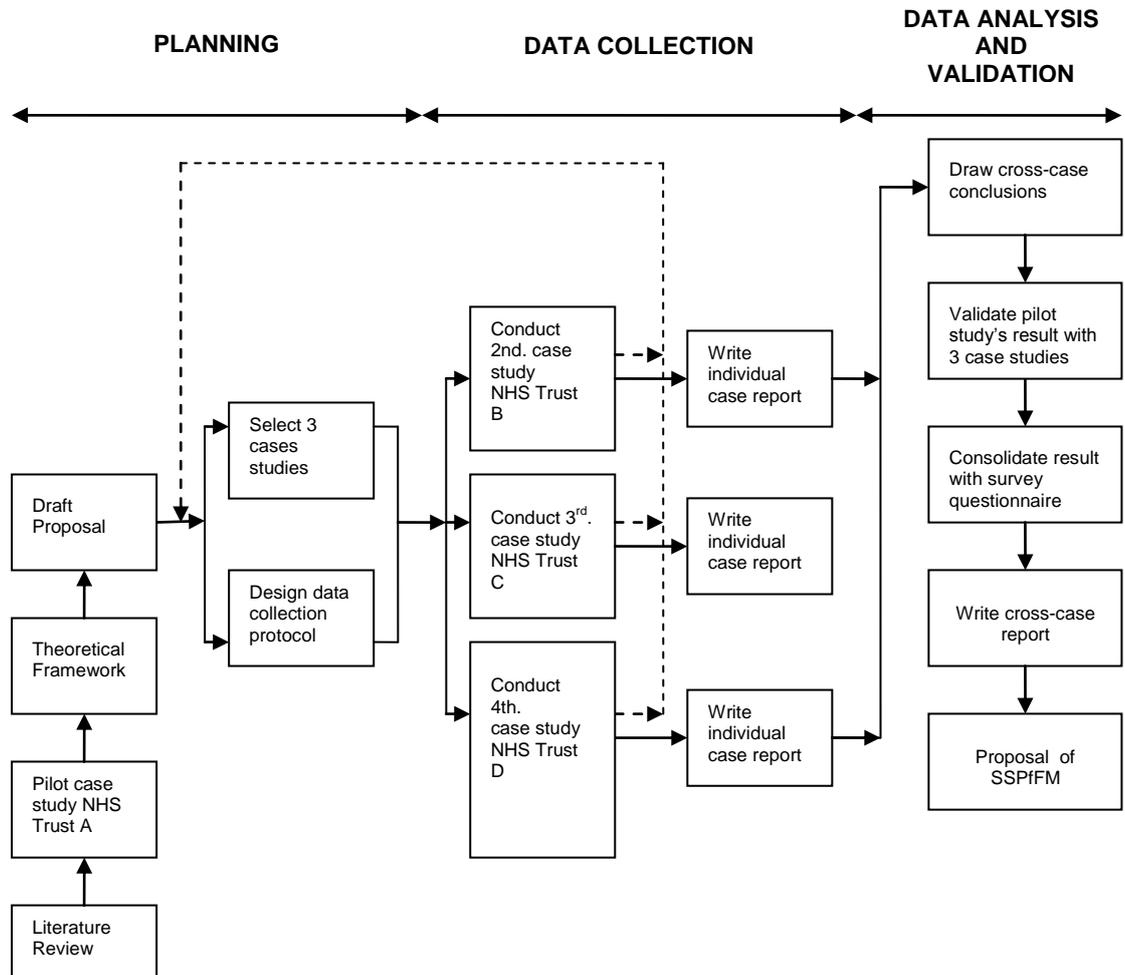

Figure 4: Case Study Research Framework

An important part of Figure 4 is the dotted line feedback loop, which represents the situation in which important discovery occurs during the conduct of one of the individual case studies – for example, if one of the cases did not in fact suit the original design. A second feedback could represent the situation in which the discovery led to reconsidering one or more of the study's original theoretical propositions. Under either circumstance, "redesign" should take place before proceeding further. Once this has been established, the research follows the path recommended before analysing, and drawing conclusions from the case studies.

Analysis Of Case Studies

The background detail of the hospitals involved in the case studies is shown in Table 1.

Closely examining the alignment of the NHS Trusts IS/IT strategies to FM strategic objectives as shown in Table 2 have suggested the followings:

    i.   Only the pilot study has started the strategic IS/IT planning. Although there is directive from the government (DoH, 2002) to implement strategic IT in the hospitals but the uptake from the Facilities Directorate is still at its early stage,

ii. There is no integration between information systems in FM and the hospital's core business needs dealing with patient's record such as Electronic Patient Record (EPR) and Electronic Health Record (EHR),

iii. The involvement of PFI consortium in the hospital's development project shows the relevance and importance of strategic IS/IT,

iv. It is important to gain top management commitment to implement strategic IS/IT for FM.

Table 1: Size of hospital

Case Study	Category	Size
Pilot case study Case Study 1	Large	**NHS Trust A** This Trust is a major teaching Trust with six hospitals on four sites. Hospital staff : 7500
Case Study 2	Medium	**NHS Trust B** Hospital staffs: 2500
Case Study 3	Medium	**NHS Trust C** Hospital staffs: 2500
Case Study 4	Medium	**NHS Trust D** Hospital staff : 4000

Table 2: Aligning IS/IT strategies to FM strategic objectives

Aligning IS/IT strategies to FM strategic objectives	Pilot Study NHS Trust A	Case Study 2 NHS Trust B	Case Study 3 NHS Trust C	Case Study 4 NHS Trust D
Aligning IS in FM with hospital business needs	No	No	No	No
Aligning IS with FM strategic needs	Planning stage	No	No	No
Seek competitive advantage from IT	Through PFI	No	No	Through PFI
Gain top management commitment/support	√	No	No	√
Forecast IS resource requirements	Planning stage	No	No	Planning stage
Establish technology path and policies	Planning stage	No	No	No

The current implementation of IS/IT capabilities in Facilities Directorate for all the case studies is detailed in Table 3. The analysis is focused into three areas: strategic FM, strategic IT and organisation's initiatives towards formulating strategic IS/IT in FM.

The analysis from Table 3 has paved the way for the formulation of strategic IS/IT in FM for the health sector. Strategic IS/IT in FM is influenced by the following factors:

i. The vision for strategic IS/IT for the hospital firstly has to be established,

ii. The strategic FM document is prerequisite before planning for strategic IS/IT in FM,

iii. Obtaining top management commitment will expedite the planning process,

Table 3: Current strategic IS/IT capabilities in Facilities Directorate

Current development of strategic IS/IT in Facilities Directorate, NHS Trust	Pilot Study NHS Trust A	Case 2 NHS Trust B	Case 3 NHS Trust C	Case 4 NHS Trust D
Strategic FM				
Defining FM strategic planning objectives	√	√	In progress	√
FM Strategic Plan for hospital	√	√	In Progress	√
Determining FM key planning issues	√	In progress	In progress	√
Prioritize FM business operation	√	In progress	In progress	√
Strategic IT				
Strategic ICT Vision for Hospital	√	√	√	√
Strategic ICT Vision for FM	Planning stage	No	No	No
Identifying strategic IS/ IT in FM objectives	No	No	No	No
Analyzing the current IS environment for hospital	National level (Dept. of Health)	National level (Dept. of Health)	National level (Dept. of Health)	National level (Dept. of Health)
Analysing the current IS in FM business system	No	No	No	No
Analysing the current IS organizational system	√	No	No	√
Analysing the current FM information systems	√	No	No	√
Current external business environment	Not required	Not required	Not required	Not required
Current external IT environment	Not required	Not required	Not required	Not required
Identifying opportunities for improvement for IT in FM	No	No	No	No
Evaluating opportunities for improvement in IT	No	No	No	No
Identifying high level IT strategies	No	No	No	No
Identifying new IT architecture	No	No	No	No
Organization's initiatives towards formulating strategic IS/IT in FM				
Organization's initiatives towards formulating strategic IS/IT in FM				
Organizing the planning team looking on strategic FM	√ strategic	√ operation	√ operation	√ strategic
Establish Strategic team to formulate strategic IS/IT in FM	Planning stage	No	No	Planning stage
Obtaining top management commitment to implement strategic IS for FM	√	No	No	√
Identifying new business processes	No	No	No	No
Identifying priorities for new development projects	√	√	Not documented	√
Defining change management approach to implement strategic IT	Not required	Not required	Not required	Not required
Has defining IS action plan previously	No	No	No	No
Has evaluating IS action plan previously	No	No	No	No

    iv.   The development of strategic IS/IT in FM requires a teamwork that comprise of FM stakeholders in the hospitals,

    v.   The Facilities Directorates requires directive from top management to plan for strategic IS/IT in FM for the hospital.

SSPFFM In Health Sector As The Way Forward

After analysing the pilot study and the validation process via three case studies, the SSPfFM are represented in Figures 5 and 6 respectively. The priority of the process flow was determined by the senior management through priority ranking established during the interview sessions.

Discussions with senior management at the Facilities Directorate of the three case study Trusts suggested that additional factors and modifications on SSPfFM are needed other than those identified by the pilot study. The adjustment to the previous SSPfFM is shown in Figure 6 and detailed modifications are as follows:

    i.   Directive from the top management that drives the planning of strategic IS/IT in FM for the health sector, is crucial,

    ii.   A strategic team is required to determine the business vision and strategic FM for Case 2, 3 and 4. For Case study 3, there was no strategic FM being planned and documented when the interviews were conducted,

    iii.   The strategic team must comprise members from Facilities Directorate, IM&T Directorate and the NHS Trust stakeholders to ensure all aspects and issues in strategic FM are discussed,

    iv.   A second loop is introduced to complete the strategic IS/IT in FM. The strategic team engaged here may consist of the same members that established the strategic FM earlier, or a new team may be appointed by the management. However, to maintain the continuity, the author proposes the same strategic team be engaged,

    v.   The SSPfFM stresses the importance of NHS Board member, and FM stakeholder approval, to ensure that detailed strategic FM information pertaining to the health sector is captured.

Conclusion

The implementation of strategic FM engaged many stakeholders in the NHS Trusts. The need to share information between aspects of FM as discussed earlier emphasise the importance of strategic IT in FM. The SSPfFM is proposed to fill the IT implementation gap created when the Trusts starts to implement strategic FM. Without the SSPfFM in place the authors foresee the operation of strategic FM will face layers of "information difficulties" in its implementation. One example is the involvement of the PFI consortium which clearly demands a strong need for sharing of information. Information sharing is currently not taking place as IT systems in hospital development departments, and hotel and estates operational services departments are stand alone, although both departments are in the Facilities Directorate. The SSPfFM requires staff to be knowledgeable in the management of IT, and this research revealed that the level of IT knowledge among staff at the Facilities Directorate is still to be improved.

This research revealed, obtaining top management commitment and the need to establish a strategic team to align strategic IT to FM business objectives are prime concerns. The strength and the success of the SSPfFM rely on the ability of this team to streamline IT with strategic FM objectives. This is only achievable through good knowledge in IT.
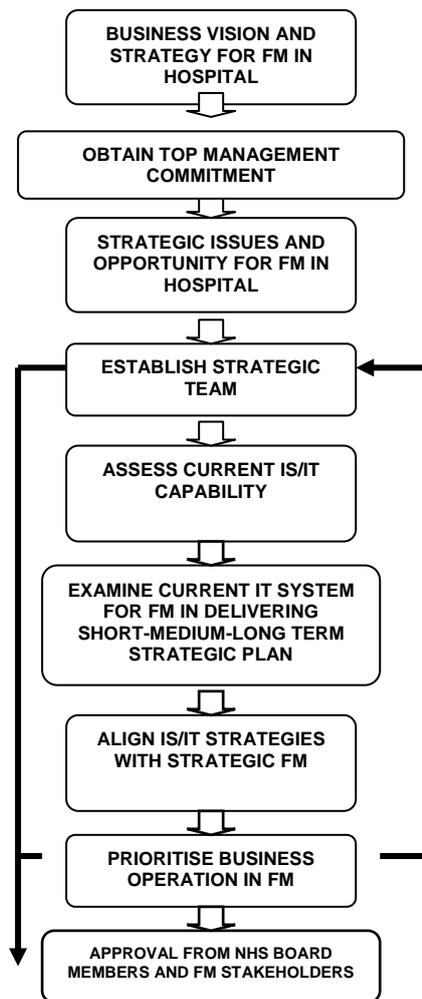
Figure 5: Strategic System Planning Framework for FM (SSfFM) in the Health Sector from Pilot Study
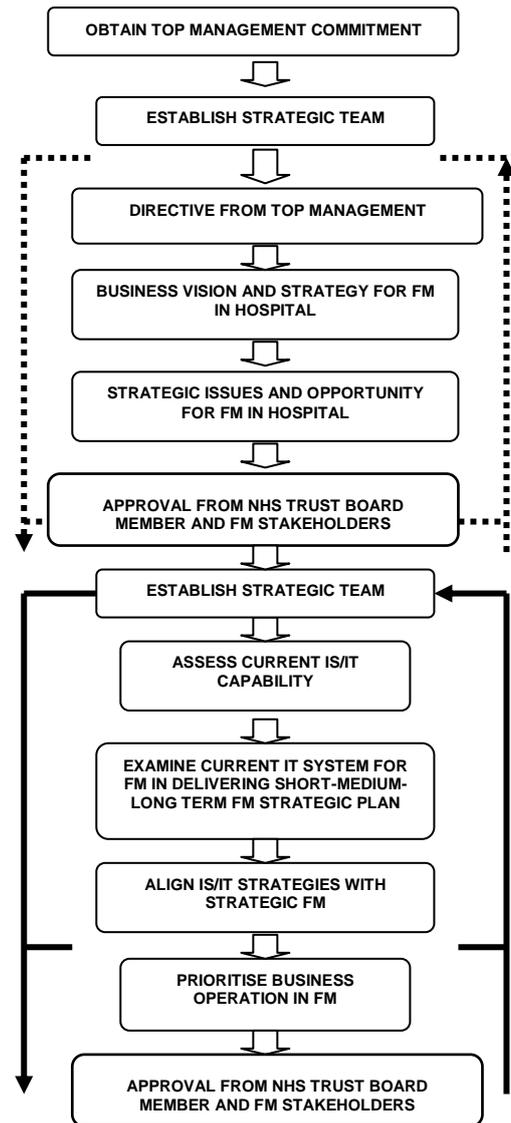
Figure 6: Strategic System Planning Framework for FM (SSfFM) in the Health Sector after Validation from Case Study 2, 3 and 4

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