
CRITICAL SUCCESS FACTORS FOR FACILITIES MANAGEMENT IMPLEMENTATION IN THE HEALTHCARE INDUSTRY

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Abstract

This paper will explore the current literature that delves into the critical success factors (CSFs) for the implementation of Facilities Management (FM) in Healthcare industry in terms of the implementation, preparation of a compilation, and identification of any gaps that might exist. The research makes reference to various journals using the key terms and only 90 articles were short-listed as the most accomplished and relevant article. Using the key term between facility management success and healthcare success, this paper identified healthcare success factors. CSF constructs were then identified using the content analysis methodology and an inductive coding technique. A subsequent analysis identified gaps that exist in the literature base. Currently, a framework found for FM healthcare encompasses maintenance management, performance management, risk management, development, ICT and supply service management. No research has been conducted to extract these six factors and validate them as CSF's in FM healthcare. A comprehensive review of FM practice in healthcare is presented in this paper. The framework of healthcare success factors in the FM developed is clear, cohesive and it can be well understood by all levels among the healthcare professionals. There is a lack of FM studies in the context of the healthcare industry, which limits the knowledge and exploration of the research scope. This study can further be explored for future research to secure FM as an added value to the healthcare sector, and therefore enhance the service quality and improve the corporate image. This research provides a comprehensive compilation of all previously identified FM implementation success factors, through a clearly structured methodological approach and gives comprehensive key factors which define the critical success factors for FM in the healthcare industry.

Keywords: *Healthcare, Hospital, Facilities management, Critical Success Factors*

1.0 INTRODUCTION

Nowadays, facilities management (FM) encompasses a large and complex sector. The demand to support the core business function is steadily increasing, even greater than ever before. Healthcare as one of the complex industries, perceives the role of FM as the support process to achieve business goals (Gelnay, 2002).

By definition, 'FM' in healthcare is similar to that in other industries. "*The integral planning, realization and management of buildings and accommodation, services and resources which contribute towards the effective, efficient and flexible attainment of organizational goals in a changing environment*", was a definition established for facilities management (FM) a decade ago according to research by Regterschot (1990). A decade later Nelson and Alexander (2002) viewed FM as "*the management of non -*

core company assets to support and increase the efficiency of the main business of the organization". After three decades, the function of FM has greatly evolved. The past definition of FM had covered services like cleaning, repairs and maintenance (Atkin and Brooks, 2000). The establishment of The European Committee for Standardization EN 15221 defines FM as the integration of processes within an organization to maintain and develop the agreed services which support and improve the effectiveness of its primary activities (CEN, 2006). Throughout these years, a detailed research by Linda and Joseph (2011) which dwelt into every definition of FM by other researchers concluded that a common keyword of 'workplace' is consistently related to the FM definition. Workplace refers to a place where people work, which further indicates that it is not specific to commercial buildings. Healthcare, for instance, is a workplace. FM definition can then be described as the integrated management of the workplace to enhance the performance of the organization (Linda and Joseph, 2011).

FM healthcare is defined as managing health facilities, and in turn, these facilities are places that provide healthcare. They include hospitals, clinics, outpatient care centers, and specialized care centers, birthing centers and psychiatric care centers- this is following the descriptions issued by the US National Library of Medicine. The mushrooming of many health facilities has put a greater degree of pressure to healthcare, since every health facility needs to make sure that their service delivery is competitive and that they are able to withstand the current market trend. Choosing quality healthcare services is important for the achievement of health equity and for increasing the quality of a healthy life which is the basic need for everyone.

All non-core activities to healthcare organizations including FM activities have been growing in time, and the same applies to its impact on the quality and effectiveness of healthcare services. FM in healthcare has been considered as one of the key elements for the successful delivery of healthcare services (Gelnay, 2002).

In the following sections, the background of the field study and selected research methodology is chosen for the preparation of the compilation,

and this will be explained later. This will be followed by a summary of the CSF categories and concepts, as well as a critical analysis of the healthcare FM CSF in literature.

2.0 BACKGROUND

In an effort to remain competitive, there has been an increasing need in the healthcare industry to ensure not only clinical service but all non-clinical services including FM to perform effectively. This thesis documents an exploratory study into the identification of CSF for FM in the healthcare industry. It was carried out from the perspectives of both the FM as support service and healthcare as the main business.

FM has been much discussed in the healthcare services and academic world but, academically the concept is only discussed at elementary level. Many researchers focus on single or desired factors involved in FM healthcare rather than producing a set of key factors contributing towards successful implementation of FM in healthcare. Gelnay (2002), Rees (1997; 1998) and Gallagher (1998) studied about the growth of the profession and the role of facility manager in healthcare. Okoroh *et al.* (2002) and Holt *et al.* (2000) studied how risk management affected FM implementation in healthcare.

There was a research done reviewing the main areas in which effective healthcare FM has been implemented in the National Health Service (NHS). NHS, in the UK is a well-known healthcare provider globally. The main areas focused are strategic planning, customer care, market testing, bench marking, environmental management and staff development (Gallagher, 1998). Some points extracted from the articles were considered as success factors for FM implementation in the healthcare industry. In fact, there are many researches studying the implementation of FM in healthcare that have touched modestly on several success factors. The problem of this disjointed 'success factors' for FM implementation in the healthcare industry has resulted in the confusion among healthcare professionals especially Facility Managers and stakeholders in choosing the most appropriate

factors for the implementation to ensure success in their FM healthcare organization. Therefore, it is fundamental to gather all the key factors that influence the successful implementation of FM in healthcare. In other words, the suggested CSF used in the healthcare industry has a direct effect on the outcome of FM implementation by minimizing the problems and achieving success as mentioned in the previous section.

It can be seen that all of these sources reinforce the understanding that the effectiveness of healthcare services will increase with the growth and development of the FM profession. This in turn will lead to a change in the position of FM in the healthcare organization and FM will become a central part of the organization – one that will help shape its decisions and processes. Chanter and Swallow (2007) agreed that effective facility management is vital to the success of an organization by contributing to the achievement of its strategic and operational objectives.

The healthcare industry is ranked second after the nuclear industry in terms of standards and regulation or operational risk of failure. The rank triggered an alert and it is critical to implement a successful FM in healthcare (Price, 2004). This is supported by the research done by Ifryn (2004) that healthcare facilities are classified under high risk category and that they are complex to manage. The failure in such complex facilities can have catastrophic impacts.

A study by Paul (2000) suggested that FM function in healthcare was an unsuccessful obligation to FM function that could lead to the deterioration of facilities, function or worse leading to the failure within the organization. (Cable and Davis, 2004) warned that poor facility management could result in inadequate facilities to support the functioning, excess facilities not contributing to the organization's mission, cost inefficiencies, inadequacy and unavailability of facilities for future needs. The main problem facing FM is the low service quality (Ruslan, 2007). It is vital to get the right factors that can contribute to FM's high performance service delivery. On the other hand, FM's successful implementation can support the organization's mission, the realization of future facility requirements, greater cost efficiency, and the ability to anticipate results of current management decisions (Sarel Lavy, 2010). Ada

Scupola (2012) concluded that innovation perceived by FM companies encourages competitiveness.

These pieces of evidence support that CSF in FM should be identified to help FM professionals implement FM in the healthcare industry systematically. Eventually the finding will reduce the operational risk failure and increase the overall performance of FM in the healthcare industry. Most of the research on CSF irrespective of the type of industry also focused on identifying the CSF, finding the indicators for each CSF and discovering the relationship between the CSF and the performance of the organizational or project involved (Naim, 2012; Ahmad *et al.*, 2007; Baidoun, 2004; Singh, 2011; Kim *et al.*, 2011; Love *et al.*, 2004)

Therefore, this study was conducted to gather CSF that is important to the successful implementation of FM in healthcare. The research demonstrates the visualization of CSF that enables FM professionals in healthcare industry to understand the CSF explicitly. Throughout the research, many key factors crucial to FM healthcare are developed in order to provide the means to capture the CSF.

By having the best practice and the solid CSF, FM is given the opportunity to play a leading-edge role in critical organization change and development efforts (Franklin, 1990). Thus, getting a list of CSF in healthcare FM is important to ensure that these facilities are working perfectly all the time and support the success in delivering the best healthcare service.

3.0 METHODOLOGY

3.1 CSF compilation

This comprehensive literature review utilizes a conceptual analysis approach which has involved extensive note-taking that has highlighted a lot of references with regard to the FM healthcare success factor. All articles containing references on the success factor of the healthcare FM were then analyzed further for the purpose of coding the identified constructs. Miles and Huberman (1994) viewed this part of analysis as involving the phases of differentiating and combining the data collected.

An emphasis is laid on the meaning of the words and not just on the words themselves. This technique is called inductive coding technique (Strauss and Corbin, 1990) which is defined as *‘open coding is the part of analysis that pertains specifically to the naming and categorizing of phenomena through close examination of data. During open coding, the data are broken down into discrete parts, closely examined, compared for similarities and differences and questions are asked about phenomena as reflected in the data’*.

Part of this methodology involves the technique tested by Konstantinos (2013); this technique is an interpretive qualitative research approach. He adopted the technique to test the proposed model of the service-oriented architecture implementation CSF in healthcare. Strauss and Corbin (1990b) suggested the same technique and called it the preparation of qualitative data category cards. Miles (2009) concluded that healthcare can be characterized by unique issues, such as: the interactive nature of practitioner/patient relationships and patient’s subjective experiences of illness. Owing to complex healthcare characterization, effective clinical process is driven to several different kinds of knowledge, rather than to a single knowledge. This principle is useful to be applied to the research methodology to enable healthcare setting research (Fossey, 2002). In addition, the qualitative research method is used in the evaluation of computer and IT systems both within and outside the field of healthcare (Kaplan and Maxwell, 2005).

This compilation review is set to gain a deeper understanding of various CSF in implementing FM in healthcare, as already identified by other researchers. Another approach used is the content analysis. Making inferences by systematically and objectively recognizing the characteristic of messages (Holsti, 1968), content analysis has been a well-established approach for analyzing text (Silverman, 2000). An advantage of using content analysis is that researchers are able to examine data during individual years as well as during the span of all years under study (Mc Broom, 1992).

According to Silverman (2000), a good coding scheme would echo a search for ‘uncategorized activities’ so that they could be considered, in a manner similar to searching for

different cases. Hence, the analysis has also searched for references for ‘success’ factors that may not have such a meaning. Throughout the research, the articles searched may not include ‘success’ or ‘success factor’, but for the search only covered the FM or healthcare although it must be stated that the data gathered was relevant.

3.2 Data collection procedure

In the stage of the data collection, it is important to realize that not only the choices, or the selection of data being made because of potential methodological bias but also because choices necessitate semantic and cultural interpretation of data (Cicoural and Carley, 1990). The procedure in sorting out the data analysis for FM implementation in healthcare adopted the 8 coding steps as follows (Carley, 1992).

Step 1: Making decision of the level of analysis.

The first level used is to decide whether or not single word or phrases are to be used. Single words like success, healthcare or facilities would be deemed useful if the research focus rests on a specific text but in this case, phrases are widely used as the research aim is to capture broad based concepts or terms of art in a particular community. Berg (2004) stated that the first step of the content analysis is to determine the level of the sample that will be chosen and the units of analysis that will be used.

The key words searched are recommended by previous authors in many articles found in the early stage of literature review. Since healthcare is unique, Longest (2000) asserted that ‘the health system is an incorporation of many different agendas’. Selecting the actual articles to be included in the compilation was dependent on the researcher’s decision after reading the articles’ titles and abstracts. If they were recognized as having contained information that would be suggestive of healthcare FM success factors, then the article was selected for further review.

This research involves an extensive analysis of a number of journal articles. The source of journals is listed in Table 1. Many databases such as Emerald, Web of Science, Google Scholar, Frost and Sullivan and Scopus were also searched. These databases have been the home to thousands of journals that are categorized under

facilities and healthcare field. Articles were then selected using search terms and phrases as can be referred to in Table 2.

Table 1: Source of Journals

No	Journal
1	International Journal of Operations & Production Management
2	The TQM Magazine
3	International Journal of Health Care
4	Journal of Enterprise Information
5	Facilities
6	Journal of Facilities Management
7	Managing Service Quality
8	Journal of Enterprise Information
9	Journal of Health Organization and Management
10	International Journal of Health Care Quality Assurance
11	Management Research Review
12	Health Manpower Management
13	International Journal of Productivity and Performance Management
14	Benchmarking: An International Journal
15	Built Environment Project and Asset Management

Step 2: Making decision of how many steps to code for.

When coding a text, one should either use a pre-determined set of concepts or develop a list of concepts incrementally. This stage permits total inclusion of all identified CSFs. It includes the categorization of critical success factors as has been mentioned in the literature.

Step 3: Making decision either to code for existence or frequency of a concept.

The researcher can decide to code for the frequency of a concept. Hence, further understanding of the relative importance of the concept can be developed.

Table 2: Searched: citation, title, abstract

Individual journal searches	Database searches
FM critical success factor	Facility management 'AND' critical success factor
FM healthcare success factor	Facility management 'AND' healthcare
Healthcare success factor	Facility 'AND' critical success factor
Healthcare management success factor	Healthcare 'AND' success factor
Facility healthcare	Healthcare management 'AND' success factor
Facility hospital	Hospital 'AND' facility
FM hospital	Hospital 'AND' facility management
CSF hospital	Hospital 'AND' success factor
FM	CSF 'AND' FM
CSF	CSF 'AND' FM 'AND' healthcare

Step 4: Making decision on choosing the level of generalization.

This stage will entail the decision to perform coding exactly as how the texts appeared or do some alteration or collapsed form. In this research, any words or phrases that give the same meaning were grouped under the same construct. As an example, 'healthcare management' and 'healthcare organization' share similar meanings therefore, they were placed under the same group or category.

Step 5: Creating translation rules

This step is where rules for coding text were developed to ensure consistency throughout the coding process. These are the translation rules that were created and used;

- All articles were read for the first time and it was important to note on every possible reference in light of the success factors. The important concepts were then recorded in the bibliographic program. At this stage, it is advised not to jump to any categorization.

- Then, all the notes taken on the success factor were re-read to determine the similarity before they were placed in the same category.
- The category established shall be reviewed to determine whether it is possible to collapse or subdivide and develop any new category.
- After finalizing all the categories, the concepts were then reviewed in an effort to determine construct terms. This could be coming from a single coded terms or a total new construct term.

Step 6: Making decision on irrelevant information.

At this stage, the researcher should decide on irrelevant decision- either to delete, skip over or use, to dynamically reassess and alter the coding scheme. Since there is a lack of standard to define information as irrelevant, the decision made here was to only delete the texts not regarded as important to the research questions and articles. Since this collation focuses on all concepts considered to be the success factors in FM healthcare, the content analysis may not dismiss anything. However, it only coded the text that was clearly highlighted as possible success factors.

Step 7: Code the texts.

The coding process was conducted manually by following the translation rules created at Step 5.

Step 8: Analyzing result

The final stage in the data collection is to analyses all the findings and review all the construct terms of frequency and the critical evaluation of the CSF approach. In the next segment, the results will be reviewed.

3.3 CSF literature compilation

3.3.1 Determine the categories

The number of articles reviewed was 90 and 42 were considered as having mentioned about FM healthcare but only 18 contained success factor pertinent to the area of research. Firstly, the level of analysis involves concepts which were grouped into similar categories. Success factors determined as similar categories were grouped

together. Next, 26 possible success factors categories were identified and there was a total of 14 CSF in categories.

3.3.2 Naming the categories

The identifying process and naming categories were done considering that the reader can determine its reference. The name selection prioritized the terminology commonly used in the literature.

Many researchers group the CSFs into five primary success factors according to Rockart and Bullen (1981) namely the industry, competitive strategy and industry position, environmental factors, temporal factors and managerial position. However, in this collation, it is decided that the CSF is to be determined, specifically to accomplish the various strategic elements that lead to achieving the goal (Pearce, 2004).

3.3.3 Understanding the CSF categories and their concepts

Details of CSF will be described in terms of the concepts it presents.

i) Teamwork effectiveness

This CSF is considered to be one of the powerful tools for achieving success in any area, sector or activity (Carmen Jaca, 2013). Cooney and Sahal (2004) characterized teamwork as the most important elements in continuous improvement systems, as it facilitates the information sharing, problem solving and the development of employee responsibility. Hence, this concept is integral in FM healthcare industry. Healthcare team is an extensive team because they require a high degree of interdependence and coordination among members (Tesluk, 1997). Teamwork factors are the characteristics that contribute to better team's effectiveness. Team members in healthcare have clear roles, among which is to focus foremost on meeting patients' needs. They have a personal desire to learn and they value meeting the needs of their patients (Mickan and Rodger, 2000).

Table 3: The CSFs

Critical Success Factor
Teamwork effectiveness - Carmen Jaca,(2013), Cooney and Sahal (2004), Tesluk (1997), Mickan and Rodger (2000)
Contract management - Trevor (1999), Clark and Smith (1998), Clark (1999)
Knowledge and competencies - Yasin (2010), Varcoe (1993), Alexander (1994), Carder (1995), Mc Lenna (2000), Puddy (2001), Sapri and Pitt (2005), Pathirage (2008), Wahid and Fernie (2009), Nutt (1999), Youssef and Zairi (1995), Ali (2013)
Strategic decision making - Okoroh (2006), Igal (2004), Irizarry (2014), Gupta (2000), Shanks and Par (2000), Chen (2001), Carmen Jaca (2013)
Resource and training - Wong (2005), Amidon (1997), Louis (1990)
Top management commitment and support - Procter and Brown (1997), Jaehn (2000)
Equipment and facility upgrading - Igal (2004), Selman and Adeli (2000), Stephen (1996), Lindholm and Suomala (2004), Woodward (1997), Hyvonen (2003), Lukka and Granlund (1996)
Strategic planning - Sarshar (2006), Letza (1996), Thomas (2011), Barret (1995)
Information and communication ICT - Shohet and Lavy(2004), Nat (2006), Yu <i>et al.</i> (1997), Waring and Wainwright (2002), Ada Scapulo (2012)
Risk management - Okoroh (2002), Alexander (1992), Wagstaff (1997)
Customer focus - Loosemore (2001), Lima and Tang (2000), Ulrich and Zimring (2004), Daryl (2008), Andaleeb, 1998)
Work environment - Amaratunga (2002), Gallagher (1998), Gagendran (2000)
Performance measurement - Maimunah Sapri (2005), Amaratunga and Baldry (2002), McDougall and Hinks (2000), Shankar (2007)
Continuous improvement - Chovil(2010), Hyrkas and Lehti (2003), Le Brasseur, Whissell & Ojha (2002)

ii) Contract management

This CSF concept is repeatedly mentioned throughout the literature whereby it is important to apply solid, core implementation of the contract management (Trevor, 1999). Healthcare facilities management is provided by an organization which is the product of the combined in-house and contract service

providers. To the customers and people who use facilities services there must be no perceived gap which highlights the interface point where in-house service provision stops and contract provision starts. In other words, it is very important that facilities services are delivered within the context of a unified service provision. The process of outsourcing is well established and credit is due on the initiative of developing the multi-cultural approach which involves both directly employed labor and external contractor providers. In healthcare, the combination of in-house knowledge and commercial outlook of specialist contractors in the various disciplines such as doing plan preventive maintenance for medical equipment, catering, to name but a few can provide a very efficient and productive output if the service is accurately specified, adequately resourced and effectively monitored and frequently reviewed. In fact, specification is the key to successful facilities delivery process. Clark and Smith (1998) and Clark (1999) researched the introduction and implementation of Service Level Agreements (SLAs) and found that healthcare management considered that critical aspects that need to be straightened out when introducing SLAs were ‘agreeing realistic standards and procedures’ and ‘details of the specification’.

iii) Knowledge and competencies

In specific, many researchers have come to acknowledge the importance of knowledge and competencies, because it is a fact that in many industries the CSF does not specifically address FM (Yassin, 2010). Many have maintained that knowledge is vital in the FM industry encompassing aspects like profession progression, strategic approach, innovation, business opportunity and to prepare for future challenge (Varcoe, 1993; Alexander, 1994; Carder, 1995; Mc Lenna, 2000; Puddy, 2001; Sapri and Pitt, 2005; Pathirage, 2008; Wahid and Fernie, 2009). Nutt (1999) mentioned that FM knowledge is very important and it makes a proactive contribution to business, where FM still tends to be technically oriented and reactive. As healthcare organizations are growing in number and complexity, there is also a growing need for professional managers including FM

professionals. The National Health Service UK (NHS) survey has ranked education as their CSF (Youssef and Zairi, 1995). Healthcare organizations can be managed better by having knowledgeable and skilled players. Ali (2013) in his research, mentioned managerial knowledge and skills as the two key success factors which ensure effective management of healthcare organizations.

iv) Strategic decision making

Facilities managers must be involved in the decision-making processes and this is essential in healthcare facilities (Igal, 2004). They work in a healthcare complex environment in which they have to keep abreast with a large amount of information provided by various domains. They face a lot of information on a daily or even hourly basis and critical decisions are often required (Irizarry, 2014). Delivering quality service in healthcare and keeping up with effective timing in line with implementation (Gupta, 2000) demonstrate the need of the team who can make necessary decisions (Shanks and Parr, 2000; Chen, 2001). This concept is important, as healthcare is characterized by clear definition of roles, which is an advantage for decision-making (Carmen Jaca, 2013). Professional judgment, based on sound information is an essential element in interpreting the data for effective FM healthcare delivery (Okoroh, 2006).

v) Resource and training

This CSF concept refers to the importance of the training as a critical aspect of an implementation. In the 1980's and early 1990 many of the Facilities Management institutions were founded throughout the world such as International FM Association (IFMA) in the United States, the Institute of British FM (BIFM) in the United Kingdom, Europe FM (Euro FM) in Europe, FM Association (FMAA) in Australia, Japan Facilities Management Association (JFMA) in Japan. They are all seeking to support FM growth in the market. These organizations offered various training and resources of the current FM trend. Skyrme and Amidon (1997) identified seven key success factors, two of which are a strong link to a business success and continuous learning.

Training is always important in health care facilities, but never more so than in new facilities or in newly expanded facilities where some would see changes as having to be understood (Louis, 1990).

vi) Top management commitment and support

This CSF is the most popular aspect mentioned in various literature reviews regardless of industry and location. The USA (manufacturing, private sector, public sector), the UK (specific study in healthcare, NHS), the Middle East (manufacturing, private sector, public sector), Malaysia and Singapore (manufacturing, private sector, public sector) have ranked management commitment at the top of the list of importance (Youssef and Zairi, 1995). This concept stresses on having committed leadership at the top management level. Low management commitment and involvement can lead to failure in as many as 80 percent of the organizations (Jaehn, 2000).

vii) Equipment and facility upgrading

Under FM, there are more than thousands of equipment to be managed in performing the best operation. Equipment in healthcare industry can be grouped into facility equipment, imaging and radiotherapy equipment, diagnosis and monitoring equipment and life support and treatment equipment. In order to achieve the greatest return and benefits from the assets, a systematic process of operating, maintaining, upgrading of assets is tremendously important and it helps to deliver a good management system (Selman and Adeli, 2002). It enables an organization to monitor and maintains things that are considered to be of value to an entity/ group. A lot of scholarly works have focused on Life Cycle Cost (LCC) when involving the equipment and facility within the hospital vicinity (Stephen, 1996; Lindholm and Suomala, 2004; Woodward, 1997; Hyvönen, 2003; Lukka and Granlund, 1996).

viii) Strategic planning

This CSF is vital since healthcare, being a complex organization, lays its primary focus on

translating the organization's strategy into measurable goals (Letza, 1996). Facility management activities are part of the value chain and are associated with CSF of the core business. This perspective on the return on investment from its fixed assets, ensures that buildings are constructed or leased to further organizational goals and they strive to provide an optimal environment within which the highest productivity is delivered (Thomas, 2011). Barrett (1995) emphasized that FM tends to have a technical and reactive, rather than proactive orientation. He then recommended a generic model based on the integration of various FM domains to obtain a network of interaction on the operational and strategic levels of FM.

ix) Information and communication (ICT)

ICT applications carry great potential for averting errors and improving quality in healthcare (Nat, 2006). The complexities involved in the different facilities management themes, and their interrelations, can be addressed and better understood if ICT is executed (Yu *et al.*, 1997; Waring and Wainwright, 2002). ICT in FM is advantageous as a tool to observe critical applications such as energy expenditure, abnormal building usage, critical system breakdowns, and loss of perishable goods or damage due to either the floods or leaks. ICT also important in term of practice for example help desk system, online service request system and other system that can be implemented for improvement and innovation in FM (Ada, 2012).

ix) Risk management

Okoroh (2002) probed into the concept of risk in healthcare facilities management operations and identified the critical business success factors that call for proper management when delivering best value services in the NHS. There are four stages of systematic approach to risk management in FM namely risk identification, risk analysis, risk control, financing of risk (Alexander, 1992). Wagstaff (1997), in his study on IT support in FM healthcare made a claim that in healthcare business, the planning term, risk, quality, cost and quantity are very closely associated. Risk management has slowly become one of the core

themes confronted by healthcare facility managers. In hospitals, the different building systems and components, such as medical gases, fire protection systems, and electricity, must demonstrate high performance levels, since any minor breakdown could be the precursor to both casualties and financial losses (Okoroh, 2002).

ix) Customer focus

In the healthcare industry, patients today are more aware of alternatives being offered and the higher demand for better standards of service. This automatically increases their expectation (Lima and Tang, 2000). A report entitled 'The Role of the Physical Environment in the Hospital of the 21st Century: A Once in a lifetime Opportunity' summarized that there is a growing evidence based on the relationship between hospital design and health outcome (Ulrich and Zimring, 2004). This evidence is an eye-opener for FM healthcare to upkeep the hospital facility at their best operational level, even the analysis of the impact of FM on patient outcomes does not show any evidence of correlation (Daryl, 2008). Hospitals that fail to understand the importance of delivering customer satisfaction may be inviting probable extinction (Andaleeb, 1998).

xii) Work environment

Gallagher (1998), for instance, defined the following six issues as encouraging the successful implementation of healthcare FM and he further stressed that environmental management is included in the list. On a daily basis, effective facilities management provides a safe and efficient working environment, necessary to the performance of any business irrespective of its size and scope. The environment created for the occupants is manifested in a facility which influences the performance of the activities carried out in that facility (Gagendran, 2000). Hence, organizations in general would appreciate facilities that are comfortable to occupy, cost-effective and efficient to administer, and those facilities shall remain as added value assets (Douglas, 1996). It is interesting when Amaratunga (2002) listed work environment as CSF in FM and associated it with safety and health performance.

xiii) Performance measurement

Facilities management can contribute to the performance of organizations in multiple ways, which include strategy, culture, control of resources, service delivery, supply chain management and change management (Amaratunga and Baldry, 2002). Benchmarking has been brought into the facilities management context as a form of performance measurement rather than a distinct process which dependency on the performance criteria irrefutable (McDougall and Hinks, 2000). One of the more efficient strategies for the maintenance of facilities and complex infrastructures as healthcare is the performance-based maintenance, which is based on measures for the diagnoses of the physical-functional, economic, organizational and managerial states of the asset's maintenance. In a facilities management context, performance measurement offers a great contribution to organizational success in terms of its effectiveness, efficiency and added value (Sapri, 2005). Later, a framework for performance measurement concept that intertwines efficiency, effectiveness and flexibility in healthcare processes has been established (Shankar, 2007).

xiv) Continuous improvement

The continuous improvement in the facilities management process, guarantees that organizations are consistently positioned to adhere to the standard worldwide, but the process has to be locally appropriate, and the market practice and service delivery should be aligned with the current business process within the country in which they are operating. The concept of continuous improvement has gradually been incorporated into healthcare models (Chovil, 2010; Hyrkäs and Lehti, 2003; LeBrasseur *et al.*, 2002). Its adoption by a healthcare unit enables it to be proactive rather than reactive as the reliance is on an ongoing evaluation of processes and outcomes (Chovil, 2010).

4.0 RESULTS AND DISCUSSIONS

4.2 Analysis of FM in healthcare literature

The next compilation is a challenge where the frequency of citation for each CSF described above is recorded because there is not even a paper that has yet to cover a topic of CSF for FM healthcare. The citation, the extraction of CSF in this area of research is analyzed according to the steps described before. Hence, throughout the compilation it is discovered that there are gaps in the literature to date.

The CSF cited, lacks deeper elaboration and empirical data. Many researchers cited training as important in FM healthcare but none of them had seemingly made the effort to elaborate on them. The limitation of the training exploration in FM healthcare excludes how important the training can be included in new healthcare building systems and equipment. Training includes dry runs, drills and exercises on both clinical and utility systems issues, system-specific failure contingencies and other emergency management issues. User acceptance testing can adopt the approach of seeing how robust the new systems are by performing negative testing designed to 'break the system' before the first patients are seen within the new project area. In FM healthcare according to Mr David, 2010 in HFM magazine, training includes the readiness for security incidents; facility-related issues, clinical matters and issues concerning other equipment and systems; all hazardous materials and waste-related requirements; the use of personal protective equipment (PPE) in the new environment; and a more proper look into the fire response procedures. None of these were discussed under the training category explored in the literature.

Last but not least, among the most cited CSF, performance measurement appeared to have many types of interpretation and implementation towards success. Little research talks about the CSF in detail. For instance, Sapri and Pitt (2005) focused on benchmarking, Igal(2004) shed light on KPI, Kaplan and Norton (1992) focused on the balance score card. In simple words, CSFs are

the *cause* behind the organizational success, whereas KPI/Benchmarking/Balance Score Card are the effects of organizational actions. Table 4 summarized the frequency analysis of CSFs found in literatures.

Table 4: Frequency Analysis of CSFs in literature

CSF Category	Number of Citation in Literature
Top management commitment and support (Procter and Brown, 1997)	30
Strategic planning (Sarshar, 2006)	25
Performance measurement (Sapri, 2005)	20
Customer focus (Loosemore, 2001)	17
Knowledge and competencies (Yasin, 2010)	16
Information and communication ICT (Shohet and Lavy, 2004)	15
Teamwork effectiveness (Carmen Jaca, 2013)	11
Contract management (Trevor, 1999)	7
Strategic decision making (Okoroh, 2006)	7
Resource and training (Wong, 2005)	5
Continuous improvement (Chovil, 2010)	6
Equipment and facility upgrading (Igal, 2004)	5
Risk management (Okoroh, 2002)	5
Work environment (Amaratunga, 2002)	3

Clearly, there is a paucity of research that attempted to explore an expansive collection of CSF in FM healthcare. Trimmer (2002) offered a list of generic CSFs based on a literature review,

expanded the list which caters to the healthcare in general, but not FM healthcare in particular.

The top rank CSF cited in the vast literature is top management and commitment support but in healthcare business, FM involves multifarious services. The interaction between top management level has not been discussed thoroughly. In the healthcare sector, FM is categorized as support service and clinical as core business service. Thus, the relationship between top management from clinical and non-clinical domains should be detailed to see the real commitment from all healthcare professionals. Typically, a study that was conducted in many hospitals (Gelnay, 2002) mentioned that the facilities manager was not involved in the briefing, designing and cost analyzing stages. According to Neely (1999), the main motives for the implementation of FM performance include changes in the organizational role which leads to the involvement of the top management. As the largest healthcare sector in the world, NHS has ranked management commitment as the number 1 success factor.

Many CSFs cited in other industries have not been cited anywhere in the FM healthcare literature. Sherry Finney (2007) listed 25 CSFs in the ERP implementation but only six CSFs had been found compatible. The paper anticipates that future researchers to explore into the stakeholders' perspectives. Christian (2013) agreed with Sherry Finney (2007) that there is a demand perspective on internal stakeholders in terms of building users, or in a broader scope, users of the facilities that serve as part of the responsibility of FM. A fascinating study by Yousse and Zairi (1995) listed 22 CSFs in the healthcare industry but it did not shed light on FM healthcare.

Peter Kimmel, an IFMA fellow in his seminal speech during IFMA's World Workplace 2013 described three key elements that related the FM to critical success factors;

1. FM Function: Maintenance management, energy management, space management, etc.
2. FM Process: Organization of the FM group, workflow, decision-making process, etc.
3. FM Costs and Budget

None of the literature reviewed has mentioned about cost management as CSF in FM. Presently, a framework found for FM healthcare was established by Shahet and Lavy (2004) and it consists of six domains; maintenance management, performance management, risk management, development, ICT and supply service management. The observation found that no research had been conducted to extract these six domains and validate them as CSFs in FM healthcare. The risk management, performance management and ICT were listed as CSFs in the compilation but they are not cross-referenced specifically to the research.

5.0 CONCLUSION

Further research and a better probe into FM healthcare can lead to some invaluable findings toward enhancing chances of implementation success. The review of CSFs for FM healthcare reveals that CSFs are presented based on the success factors reviewed. It should be mentioned however, that researcher tends to focus on specific CSF therefore the list of the rank of importance cannot be established.

This review opens up an opportunity for future research to establish a sound CSF framework for FM healthcare. The CSFs listed in this collation can be validated by doing some data collections, questionnaire and interviews. Data gathered from healthcare professionals are deemed necessary to validate the listed CSFs at the current practice.

By having the best practices, solid CSFs can give FM the opportunity to play a leading-edge role in critical organizational change and

development efforts (Franklin, 1990). In this healthcare industry, the findings are critical to support healthcare professionals in managing the main business. Finally, all the CSFs listed need to be more carefully researched to overcome the limitations of the literature reviewed. On the same token, the gap in this aspect of the previous findings needs to be bridged and explored in further detail.

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