Developing a healthcare knowledge-based framework to enhance the productivity of the operations of private hospitals

A. Iglesia, M. Al-Qassimi, S. Abouali, N. Alqarni, B. Mazouni, A. Waboi, Z. Araci and A. Al-Ashaab

***Abstract*—** Recently, private hospitals, especially in the UAE, are expected to offer a comfort equivalent to a 5-star-hotel for their patients. Running such a hospital effectively and sustaining it in the competitive market become a struggle. In order to achieve patient satisfaction, private healthcare organisations should improve their service offering by enhancing the quality of their main managerial operations. This could be possible with a knowledge-based framework that represents the good practices of successful organisations' main managerial operations. The aim of this paper is to present the development of such a framework, and its validation by an expert judgement in a private hospital in the UAE. Data for this research was collected with a semi-structured questionnaire from 13 hospitals across Europe and Saudi Arabia. Results were analysed and evaluated in order to develop the knowledge-based framework. Findings showed that having a knowledge-based framework helps organisations with identifying the gaps in their current operations management and addressing these gaps by applying the proposed framework.

***Keywords*—** private healthcare, knowledge management, operations, patient journey, process mapping.

I. Introduction

THE PRIVATE healthcare sector is quickly evolving and hospitals must be constantly shifting into better practices. The productivity and service offering of managerial operations should be enhanced as a tool for maintaining market share. However, currently there is no systematic approach that represents standardised processes and operations in order to run the organisation successfully within a competitive market. In addition, the loss of knowledge, which is neither captured nor preserved, impedes productivity and service improvements in these organisations. Loss of knowledge refers to that which already exists in the organization but, due to several challenges, cannot be captured, stored, and reused within it. These challenges might be caused by the staff (e.g. retirement or leaving the organisation).

The aim of this paper is to present the work of developing a Healthcare Knowledge-Based Framework focused on the operations of private healthcare organisations. This is a representation of the good practices, so private hospitals can compare their current processes and identify their inefficiencies and gaps in their operations effectiveness. This paper is presenting with some detail the ideal Patient Journey and its support by Quality Management operations.

II. Research Methodology

The adopted research methodology consists of four main phases, represented in Figure 1. First, the related literature was reviewed and the gaps were identified, as presented in section III. The second phase was to collect primary data by performing interviews with senior managers and employees of private hospitals located in Europe and Saudi Arabia, which is explained in section IV. After that, findings from the literature and the field study helped the authors with developing a healthcare knowledge-based framework, as presented in section V. Finally, this framework was evaluated by expert judgement from a private hospital in the United Arab Emirates.

A. Iglesia is a MSc student of Knowledge Management for Innovation in Cranfield University, UK (e-mail: aleiglesia6@gmail.com).

M. Al-Qassimi is a PHD student of Cranfield University, UK.

S. Abouali is a MSc student of Management and information systems in Cranfield University, UK. (e-mail: s.abouali-sanchez@cranfield.ac.uk).

N. Alqarni is a MSc student of Knowledge Management for Innovation in Cranfield University, UK (e-mail: nouf.alqarni@cranfield.ac.uk).

B. Mazouni is a MSc student of Management and information systems in Cranfield University, UK. (e-mail: b.mazouni@cranfield.ac.uk).

A. Waboi is a MSc student of Management and information systems in Cranfield University, UK. (e-mail: a.w.waboi@cranfield.ac.uk).

Z. Araci is with the school of aerospace, transport and manufacturing of Cranfield University, UK (e-mail: zhrcnn@hotmail.com).

A. Al-Ashaab is with the school of aerospace, transport and manufacturing of Cranfield University, UK (e-mail: a.al-ashaab@cranfield.ac.uk).

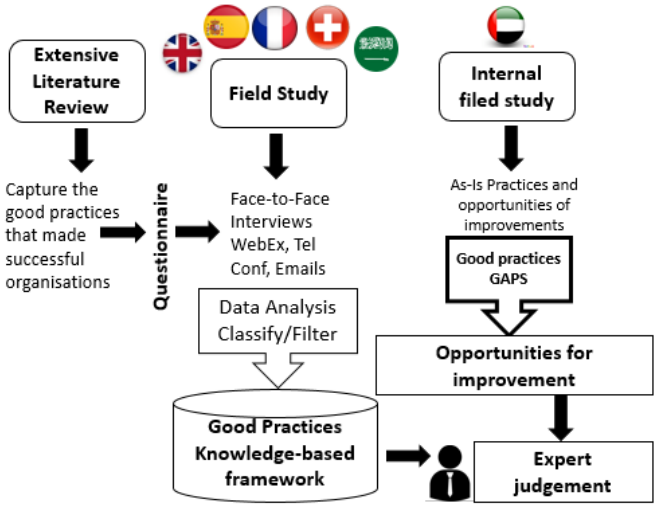

Figure 1. Representation of the followed research methodology.

III. Review of the Operations in a Private Healthcare Organisation

A literature review was executed in order to identify the main operations that play an essential role in running a private hospital successfully. Recently, scholars, academics and practitioners frequently state the importance of implementing well-established systems/approaches in private healthcare sectors. For example, knowledge management is a way to improve the main perspectives of a private hospital such as service quality, financial performance and productivity [3], [21], [14], [20]. Lean in healthcare is also becoming widespread with most healthcare lean projects having occurred in the USA (57%), with the UK growing at a fast pace (29%), followed by Australia at 4% [4]. Due to the continuous cost increase, lean has been proposed as one of the process improvement methodologies to address the reported inefficiencies in healthcare delivery [13].

Figure 2 illustrates the main initiatives that healthcare should consider in order to continuously enhance its operations. These are represented in the points: 2. "Businesss model in private healthcare", 3. "Knowledge management in healthcare", 4. "Lean in healthcare" and 5. "Problem-solving in healthcare". All these initiatives are to provide the right service to the patient throughout his/her journey. The figure is also showing the different sub-topics of these initiatives. The focus of this paper is the point 1. "Main operation processes in a private hospital", where the reviewed literature is related to the quality management and the patient journey.

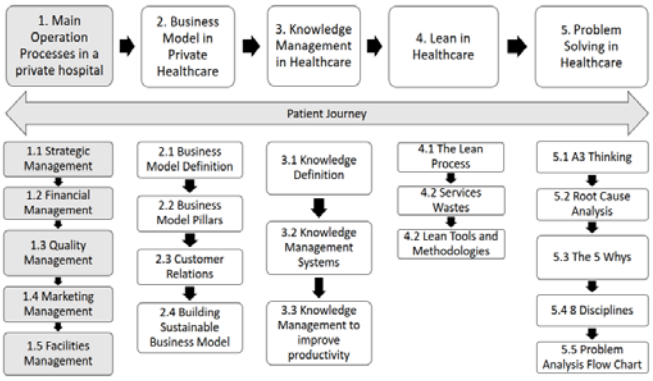

Figure 2. Private healthcare environment for supporting the patient journey operations.

The patient journey refers to all the steps, activities or procedures that one patient has to go through in order for the hospital to provide effective care to him/her. Having a well-defined journey from the time the patients enter the hospital until they leave, enable the improval of the service offering and the identification of possible bottlenecks [9], [10]. There are five essential managerial operations that support the patient journey, listed as follows and highlighted in Figure 2 [7], [11], [23].

1. Strategy management: Strategy is the high-level plan to ensure the objectives of the organisation are met. In terms of benefits, this is an enabler to maximise profits. Additionally, the goal is to create a distinctive set of capabilities that allow private healthcare organisations to serve their customers in an optimised way, providing a service that exceeds their expectations, thus attracting more customers, retaining existing ones and increasing the market share over the competitors. The importance of well-defining the strategy to be followed, and to communicate it to all the stakeholders is emphasised throughout the literature [2], [8].
2. Finance management: Internationally, healthcare costs are increasing, due to, among others, advances in medical and technological treatments, an ageing population, changing public expectations and evolving patterns of diseases. Therefore, the management of the organization resources and the cost-controlling becomes a major factor for adapting to the rapidly shifting healthcare industry [1], [6].
3. Quality management: Quality management in the healthcare industry is a structured organizational process that involves all care givers in planning and implementing continuous improvement [22], [18].
4. Marketing management: One of the main issues for private hospitals is how to attract new customers into the organisation. Brochures, flyers, meetings, TV spots, offering discounts, sponsorships, social networks, advertising, out-reach programmes, etc. are currently being used by private hospitals as a tool for improving the customer awareness of their hospital

brand. These marketing techniques offer a wide range of possibilities. However, the importance of having a well-developed webpage and the use of video-marketing within it, as well as the implementation of internal marketing techniques and methods becomes a major factor when it comes to the private healthcare context [16], [12], [15].

5. Facilities management: Facilities management is defined as the use of multi-disciplinary management techniques for controlling and ensuring the high-quality service provision inside the hospital. It contributes to the delivery of strategic and operational objectives, on a day-to day level, providing a safe and efficient working environment [3], [19].

Quality management is related to all the activities which ensure or improve the service and medical offering. Figure 3 represents the process of quality management and continuous improvement in the private healthcare context. The hospital seeks to find customer requirements and expectations, and several key performance indicators are set up, typically with monthly or yearly goals [5]. Additionally, customer satisfaction tools are developed in relevant departments, such as customer satisfaction feedback forms. From this set of tools and methods, hospitals acquire a wide range of results and data, which after being analysed serve as a basis for the management and staff to implement an action plan, with different measures or initiatives to achieve the quality and service-offering goal.

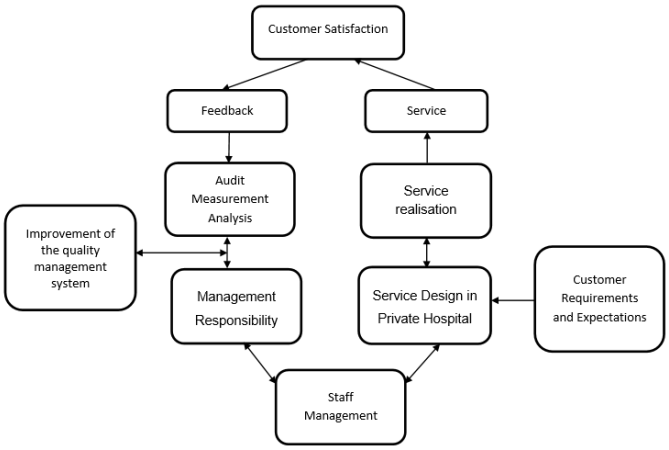

Figure 3. Quality management process in private hospitals.

Practitioners in private healthcare think that specialization of the operations is an essential aspect of achieving a good quality service offering. Specialization, in this paper, refers to the area/operations/processes/services that the organization focuses on. Figure 4 illustrates how specialization of a private hospital interacts with the patient journey and experience.

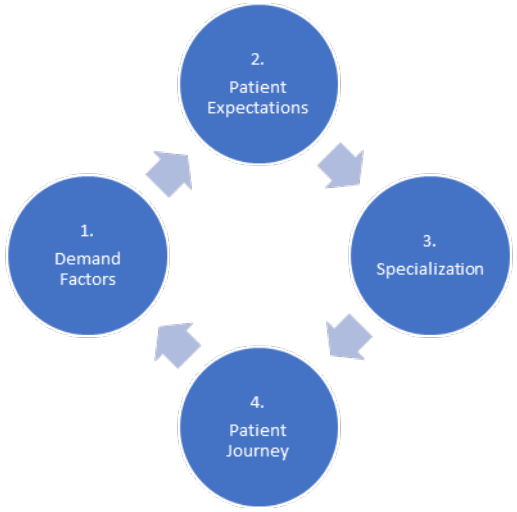

Figure 4. Continuous improvement cycle of a private hospital.

"Demand factors" are identified by the strategy management department considering the "patient expectations". As result, the "specialization" of the hospital is identified and the "patient journey" is monitored regularly for a continuous improvement. The cycle could become repeatable only if there is a knowledge-based framework for the practitioners to follow and execute necessary actions. However, there is a gap in the literature about how to develop such a framework that is applicable in private healthcare organizations. Additionally, real-life practices of knowledge management techniques in private hospitals is not explored thoroughly. Therefore, in section V, this paper presents a healthcare operations knowledge-based framework which is derived from the best practices of the hospitals' knowledge management and lean applications.

IV. Best Practices of Private Hospitals in Europe and Saudi Arabia

A semi-structured questionnaire was developed to capture the best practices in successfully running private hospitals. Interviewees were selected from the top-management of successful and popular hospitals across Europe and Saudi Arabia. In this paper, the authors are presenting a small part of the field study data, related only to the patient journey and quality management. The overall profile of the participants private healthcare organisations is as follows:

1. Years since establishment: 27-113 years.
2. Number of beds: 0-470 beds.
3. Number of staff: 6-1300 staff.
4. Patients seen per year: 17,000-260,000 patients.
5. Specializations: up to 33 specializations.

Participants were asked how important it was to provide the services listed in Figure 5. As it is shown in this figure, four processes in the patient journey are very important from the perspective of the interviewees. These processes are:

"investigate and test"; "prepare for the operation"; "perform operation/surgery procedure" and "provide post-operation care". However, all the elements listed in the figure are important apart from providing "Entertainment during waiting times", which is not perceived as a priority of service offering. All these important elements could be englobed under one premise: providing patients with an excellent quality and effective care.

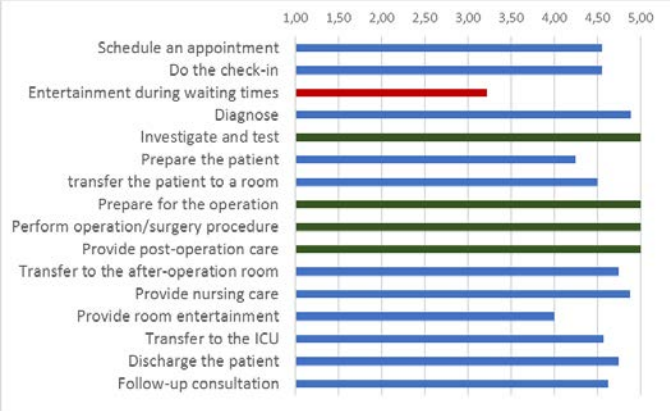

Figure 5. Importance of the potential patient journey services offered by private hospitals.

As it has been indicated in the literature review, in section III, the patient journey is affected by the quality management activities of private hospitals. In order to capture the opinions of practitioners, participants were asked about the importance of quality management elements listed in Figure 6.

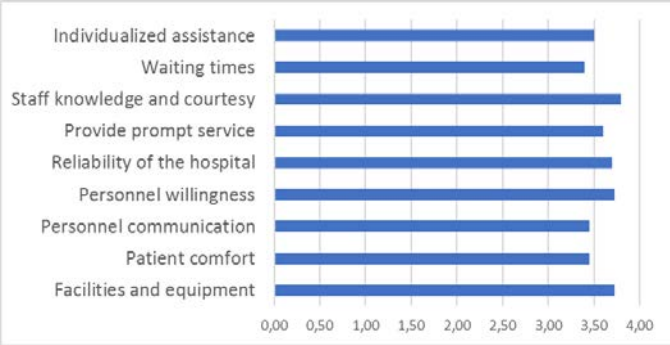

Figure 6. Importance of the quality management elements in enhancing the service offering of patient journey.

Interviewees stated that all quality management elements have an essential role in increasing the quality of the patient journey of a private hospital. Thus, in order to enhance the performance of the patient journey, improving quality management activities should be the focus area of the organization.

The purpose of quality management in private hospitals is to establish a system that measures and manages patient care in a way that provides the optimal medical service for all patients. The constant improvement in the quality of care, equipment and medical staff will enable the patients to feel safe, to trust completely and thus to be loyal. The more efficient the hospital, the greater the number of patients; that is why private hospitals must set up superior quality improvement systems in order to always be on top of their sector [17].

V. Healthcare Organisations Knowledge-Based Framework

The information obtained from the literature review and the field study has been analysed and filtered to identify the most important elements for running a private hospital successfully. These elements are represented in the form of a mind-map, which's top-level is shown in Figure 7. These are: "lean in healthcare", "problem-solving", "knowledge management", "processes", which are divided in "operational" and "medical", and "resources". Therefore, the top-level of the knowledge-based framework is similar to the key initiatives in private hospitals shown in Figure 2. This framework is divided into several levels until showing different pieces of knowledge from each of the sub-elements. This knowledge is captured from good practices in the literature review, industrial applications and data collected from the field study. This paper is presenting with some detail the patient journey and the quality management elements of the framework.

Figure 7. Healthcare knowledge-based framework top level for private hospitals.

The framework should be applicable to private hospitals of any size providing both inpatient and outpatient services. However, the practical application of the elements proposed in the framework may differ from hospital to hospital based on managements' preference, hospital size and need for customization to be suitable for the hospital's strategic vision and management style.

Figure 8 shows more detail for the operational processes, including the patient journey and the quality management highlighted with numbers one and two.

Figure 8. Healthcare knowledge-based framework. Operational processes level.

From the understanding of the literature review, two common patient journeys were developed depending on the patient illness and if they are following the normal or the emergency procedure. Later, in collaboration with the interviewees, these have been verified and detailed, even though they can present some variations depending on the organisation characteristics. The purpose is to have a reference framework where the management of private hospitals could refer to enhance the patient journey experience. Figures 9 and 10 are showing the two commonly agreed patient journeys: Programmed and emergency.

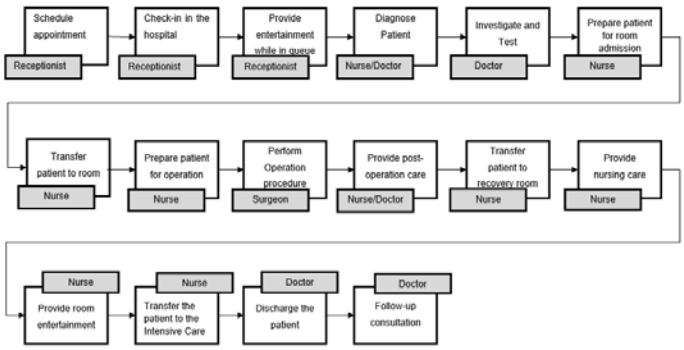

Figure 9. Private hospitals common programmed patient journey.

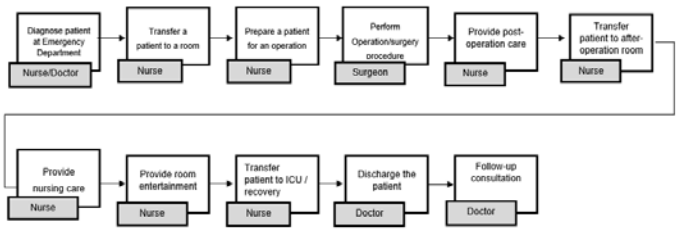

Figure 10. Private hospitals emergency patient journey.

Figure 11 presents the quality management elements of the framework. It consists of the common processes and standards that hospitals are seeking to achieve. These processes are: "determine patient requirements and expectations", "service quality design", "service quality planning", "service quality realization", "quality audit and measurement" and "quality continuous improvement". The minimum recognition that hospitals must obtain are their national standards and the European regulations; the most pursued international quality standard representing service-excellence is the Joint Comission International accreditation.

Figure 11. Healthcare knowledge-based framework. Quality management process.

VI. Field Study in a Hospital in Dubai

Mapping the internal processes of a healthcare organisation is the first step for identifying opportunity of improvements to enhance the quality of service offering. This will lead to improving the experience of the patient journey in that hospital. In this research, a private hospital in Dubai has been used as a case study with this purpose. This section is presenting specifically the mapping of the patient journey and the quality management process. In addition, it is highlighting different opportunities of improvement as well as proposing certain actions to enhance the processes.

The hospital possesses state-of-the-art facilities and offers patients with a broad range of individual health services. Additionally, personalized service is provided with the focus on clinical outcome through the evidence-based medicine approach, and constantly seeks the operational excellence.

The authors prepared a semi-structured questionnaire and arranged face-to-face interviews with personnel from the organisation, including management and operational levels. In addition, the research team went on a walk-through of all the steps of the patient journey, to actually live the experience and observe it. The team mapped the processes on an ad-hoc basis.

Three patient journeys were identified in the hospital: The programmed journeys, in-patient and out-patient, and the emergency patient journey. However, only the emergency procedure and the opportunities of improvement raised from it are explained in this paper, and shown in Figure 12.

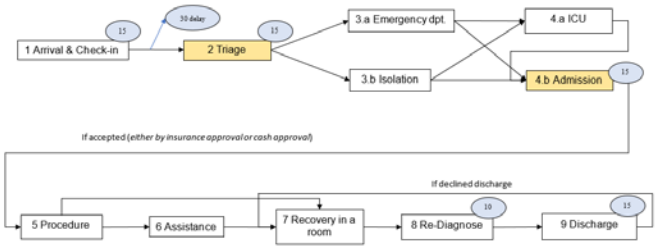

Figure 12. Representation of the emergency patient journey in a private hospital in Dubai.

Process mapping helped the authors with identifying the delays throughout the process flow. First, the patient arrives to the hospital, either by car, ambulance or by walking and he/she goes straight to the check-in in case they are capable to. If not, one of their relatives will perform this activity as soon as they arrive to the hospital. Once the check-in is done, patients go to the step 2. "triage room", which takes in average 15 minutes, and where the doctor and the nurse will classify them on a 1 to 5 level on regard of the urgency of their illness or issue according to international standards. These levels of classification are:

1. Resuscitation: When the patient vital constants are stopped, and requires immediate action.
2. Emergent: The patient is able to wait for 15 minutes until the physician assessment. E.g. anaphylaxis, gastroesophageal reflux, drug withdrawal, etc.
3. Urgent: The patient can wait around 30 minutes for the nurse or physician assessment. E.g. bronchiolitis, pneumonia, spontaneous abortion, etc.
4. Less urgent: The average time for either nurse or physician assessment is 60 minutes. E.g. appendicitis, cholecystitis, gastroesophageal reflux, etc.
5. Non-urgent: It is the least urgent from all of the triage levels and the patient is able to wait for 120 minutes. Examples of illnesses allocated in this level are gastroenteritis, vomiting, disorders of menstruation, etc.

There is however a 30 minutes' waiting time after triage until the physician can assess the patients. After investigating the reasons behind this delay, it was found that doctors and nurses had to process a lot of paperwork, as well as ocasionally contacting the insurance companies. Problem-solving approaches should be applied in order to eliminate this waiting time.

After the patient has been classified in the triage activity, the journey could differ depending on the level of classification, and the patient could go either to the step 3.b. "isolation room" in case of a contagious illness or to the step 3.a. "emergency department". If the illness is really demanding, the patient will be transferred to the activity 4.a. "Intensive Care Unit" where the ICU doctor and nurses will take care of him. The hospital has 12 intensive care rooms, but 2 empty rooms are always tried to be kept in case an internal emergency happens. At the end of the journey, the hospital will perform the procedure, provide the assistance and the environment for an effective recovery, and discharge the patient according to his/her needs.

The main area of improvement was the implementation of the Electronic Medical Records, an information-management software which reduces the timing in every step of the activity as well as increases the perceived quality and the satisfaction of the patient.

Regarding the quality management in hospitals, its purpose is to establish a system that measures and manages patient care in a way that provides the optimal medical service for all patients, doing this by planning and implementing continous improvement. In the specific context of the Dubai private hospital, four main quality management processes with which the hospitals has to deal were identified and mapped: JCI accreditation, data management, risk management and compliance management. These processes are represented in Figure 13.

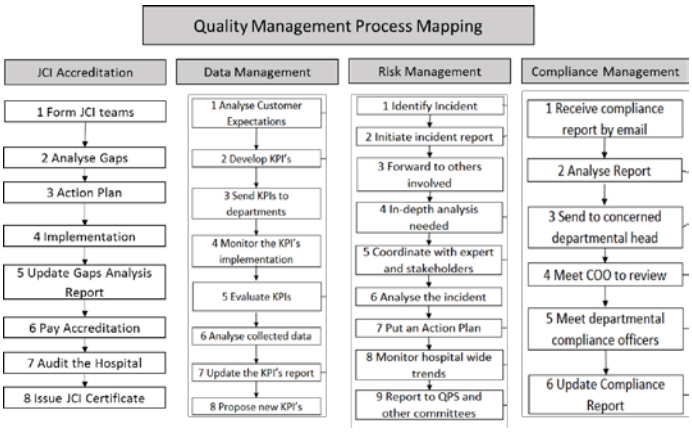

Figure 13. Quality management operations in the private hospital in Dubai.

Due to its importance in this specific hospital, this paper is presenting with some detail the process for obtaining the JCI accreditation, showed in Figure 14.

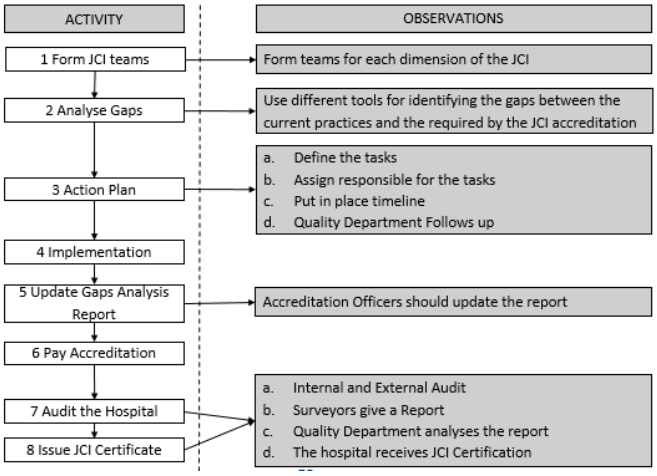

Figure 14. JCI accreditation obtaining process.

The first step of the process is to form the team responsible for the obtention of the accreditation. It is observed that the

creation of different teams, and assigning each of them to different perspectives or tasks of the service-offering could be useful for the organisation. Afterwards, these teams analyse the gaps between their current practices and the standard required by the JCI accreditation, and develop an action plan to address these gaps. The process is designed for updating the gaps analysis. However, the frequency of the update could be an improvement to the process, being more accurate about how far the current practices are from the standards. Finally, the hospital pays the fees to the JCI organisation, who after one month sends an audit. If passed, the hospital receives the accreditation from the responsible entity.

VII. Conclusions

This paper has explained the initial work of the process of developing a knowledge-based framework based on good practices of private hospitals operations. This framework will serve as a foundation for the future work. The current structure of the framework need to be kept, but the detail of it and the examples need to be populated with more depth, with sources from the literature, industry examples and a field study carried out through more healthcare organisations and countries.

Afterwards, the mapping of the hospital processes which are to be compared against the framework must be done. When internal processes of a private healthcare organization are analysed, the following must be found out: Which good practices must be endorsed, which must be enhanced and which of them are missing and must be introduced.

The work reported in this paper will lead to developing a generic operational excellence framework that eventually could be used as a model for other businesses in the health sector. This framework could be adapted for other emerging innovative sectors in order to ensure the strategical successful development and sustainability of their businesses.

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