Best project awards 2017 cycle
Operational Services
Surgical Service Optimization
Improving First Case Start of Scheduled Procedures
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Main Information

Project Name.
Enhancing OR Utilization by improving First Case Start Time of Surgery

A summary of the project and its reasons (15 lines maximum)

- Mafraq Hospital performed 8,168 surgeries in 2016 in an average of 9 operating rooms.
- 3,934 surgeries were scheduled as Elective cases (48%) and 4,264 surgeries were scheduled as Emergency cases (52%). 1,724 cases were scheduled as First Elective Cases with start time of 08:15 am.
- 992 of the Scheduled cases started On-Time (58%) and 584 cases started Late (34%).
- Late Start of First Case has a direct impact on the operating room utilization. When a first case does not start on-time, the delay can propagate throughout the day and cause wasted OR minutes, overtime costs and dissatisfaction for medical providers.
- In 2016 Mafraq OR Utilization was reported to be on average of 61% (Target is 70%).
- Hospital Management is placing high emphasis on cost containment; while the operating room is the largest revenue generating department of a hospital, it is also the most costly one. The reported cost of OR Time is $10 – 30 per minute (AED 37 – 110).
- OR efficiency is multifactorial; many factors impact on the OR Utilization, the OR Management decided to improve the On Time Start as an indicator to improve OR Utilization; the aim is to identify the factors that cause delays and provide recommendations that achieve 80% FCOTS. Hence, there is urgency for operating rooms to improve efficiency metrics which will contribute to the hospital’s financial success.

Department (section):
Department of Surgery

Project Manager (Name and designation):
Nawal Ahmed Awad (Assistant Director of Nursing (ADON))

Main members of the project team (Name and role)

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Mobile</th>
<th>Email</th>
</tr>
</thead>
<tbody>
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<td>Member</td>
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</tbody>
</table>

Project Starting Date 01/04/2017

The person who can be contacted in with any issues related to the project submission

<table>
<thead>
<tr>
<th>Name</th>
<th>Telephone</th>
<th>Mobile</th>
<th>Email</th>
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<tbody>
<tr>
<td>Nawal Awad</td>
<td>02-5012106</td>
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</tr>
</tbody>
</table>
1. Identify and set goals and project document

Project justification

Mafraq Hospital is one of the largest referral treatment hospitals in the United Arab Emirates, with 451 licensed beds. Its specialist services include medicine, obstetrics, pediatrics, as well as surgical and critical care services. In addition, Mafraq Hospital is a leading trauma center and operates the largest burn unit in the UAE. With this in mind, and with the consistent resources versus the increasing demand for surgeries, the management started to think of innovative techniques to enhance the utilization of the operating rooms (OR) to serve the maximum number of patients with the lowest loss.

In 2016, Mafraq Hospital performed 8,168 surgeries in an average of 9 operating rooms. Whereby 3,934 surgeries were scheduled as Elective cases (48%) and 4,264 surgeries were scheduled as Emergency cases (52%). 992 of the scheduled cases started On-Time (58%) and 584 cases started Late (34%). Hence, an audit was conducted on December 2016 to find out why the hospital’s first surgical cases of the day were not starting On Time as scheduled Only 60% were meeting the 08:15 Wheel in Time. The audit results showed that there is a deviation from the standard 08:15 a.m Start Time of surgery. The Mean start time was 38 minutes after the standard time, with Sigma of 10, and this represents gap of 33 minutes from the Standard Start Time. We aim to reach ON TIME START with Sigma of 2.6. This will save us AED 211,000 monthly due to cost of poor quality (COPQ).

While efficient management of an operating room (OR) requires thoughtful coordination of many moving parts, costs in the OR derive from the number of healthcare providers needed to safely care for the patient and from the use of expensive equipment. Late starts at the beginning of the day can result in late finishes to cases and thereby cause over-expenditure of time and resources in the OR. In addition to the financial impact, delay in OR start time is also a source of frustration for personnel and patients. Ensuring efficiency is therefore of critical importance in any hospital.

One metric of productivity in the OR is the percentage of on-time starts that take place per given time period. This metric can be compared to others such as cost/revenue per unit time or number of cases performed in a given time period to assess correlation, and thereafter impact on overall OR efficiency.

This study elected to begin the process by addressing delays in starting the first case of the day. To achieve this, innovative time-saving measures had to be employed, which is particularly complicated in an organization where the change effort must overcome the resistance of professionals. In healthcare, physicians and staff often have deeply imbedded values and objectives that may differ from those of management. In this project, the objective was to align managerial and professional goals in order to improve the number of on-time starts in the operating room. The process was evaluated to identify the wasted time and a further root-cause analysis was done to identify the reasons behind the “Late Start of the First Case”, several responses received from the team and was mapped in the following Fishbone diagram:
As a result of this analysis, it was very clearly evident that the main reasons for the delay are related to late admission, late surgeon and incomplete preparation. Hence, this project was initiated to address these issues.

**Stakeholders**
All stakeholders were identified according to the SIPOC model, which includes five key elements:
As indicated in the above table, a multi-disciplinary staff participated in the planning and implementation of this project. They contributed in identifying the need for improvement through their experience and expertise. The project participants were classified as follows:

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Concerned parties</th>
<th>Expectation</th>
<th>Value added</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal stakeholders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership team</td>
<td>improve efficiency</td>
<td>Support and power</td>
<td>Provide the required resources</td>
</tr>
<tr>
<td></td>
<td>Improve customer satisfaction</td>
<td></td>
<td>Sponsorship of the project</td>
</tr>
<tr>
<td></td>
<td>Cost saving</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sustainability of the project</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transfer of knowledge to SSMC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR team (ADON, Nurses, physicians, registration staff)</td>
<td>Project planning and implementation</td>
<td>Project execution and compliance with the project plan and objectives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proper assessment of patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete preparation for surgery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality representative</td>
<td>Compliance with the official standards</td>
<td>Expertise in using quality tools and award criteria</td>
<td></td>
</tr>
<tr>
<td><strong>External stakeholders</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEHA</td>
<td>Meet the required corporate, HAAD and JCI standards</td>
<td>Policies and regulations</td>
<td>Performance monitoring</td>
</tr>
<tr>
<td>Patients and their families</td>
<td>Safe and complication free surgery</td>
<td>Financial return</td>
<td>Constructive feedback and perception</td>
</tr>
<tr>
<td></td>
<td>Surgery start on time as scheduled</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timely feedback from the surgeon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance companies</td>
<td>Accurate documentation and coding for the surgical procedure</td>
<td>Financial return</td>
<td></td>
</tr>
<tr>
<td>Vendors</td>
<td>Request latest supplies and equipment</td>
<td>Conduct advanced surgery using latest instruments, supplies and equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver Loan Instruments 24 hrs prior surgery</td>
<td>Provide maintenance and technical support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Receive payments with no delay</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: Stakeholders classification**

**Risk identification and mitigation**

The team identified the constraints and risks that may threat the project implementation (see criteria 4 – table 7).

**Determining Project outcome**

Efficiencies in surgical services are vital to the hospital’s financial viability. If the operating room (OR) performs in a less than optimal manner the hospital has a lost revenue opportunity. Hospital Management is placing an increased amount of emphasis on cost containment; while the operating room is the largest revenue generating department of a hospital, it is also the most costly one. The reported cost of OR Time is $10 – 30 per minute (AED 37 – 110). Hence, there is urgency for operating rooms to improve efficiency metrics which will contribute to the hospital’s financial success.

The expected outcomes of this project are:

- Contribute in achieving SEHA Strategic plan with a focus on the following goals and initiatives (see Fig 4):

  **Strategic Theme 1:** Provide Integrated High Quality and Patient Centered Services & improve access to healthcare services
  - Strategic initiative 1.1 Improve patient access to healthcare services
### Mafraq Hospital

- Strategic initiative 1.2 Enhance patient experience
- Strategic initiative 1.4 Meet recognized international standards in clinical quality
- Strategic initiative 1.5 Optimize clinical workforce & Clinical performance
- Strategic initiative 1.6 Implement and develop Clinical Excellence and care coordination

**Strategic Theme 2: Improve financial and operational efficiency, optimum utilization of financial resources and revenue management**

- Strategic initiative 2.1 Optimize financial and operational performance
- Strategic initiative 2.2 Optimize revenue cycle management
- Strategic initiative 2.3 Optimize market share in local market

**Strategic Theme 3: Attract and retain qualified healthcare professionals**

- Strategic initiative 3.1 Increase employee engagement, improve staff recognition

**Strategic Theme 4: Develop medical education and enhance healthcare infrastructure**

- Strategic initiative 4.4 Emergency preparedness and business continuity

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**Figure 4: Executive summary of Abu Dhabi Health Services Company (SEHA) strategic plans 2016 – 2020**

- Improve patient satisfaction
- Increase revenue generated from the elective surgeries
- Improve the OR utilization and reduce the wasted time
- Improve staff satisfaction and reduce the staff conflicts
- Improve staff commitment and punctuality

**Project objectives**

While time management is one of the most essential skills required for all medical practitioners, Mafraq Hospital allocated a special attention to improve its efficiency and value of its service through improving staff commitment towards the first case start time surgery. As indicated above, this project was given a priority because it is linked vertically to SEHA and Mafraq Hospital Strategic objectives and horizontally to Surgery Department operations, in addition to improving stakeholders’ satisfaction as well as the revenue, below is a list of the determined objectives:

- Improve First Case On-Time Start from 58% to 80%
- Reduce late start and eliminate common reasons for delay
- Improve patient preparation for surgery
- Enhance Staff Knowledge about On-Time Start
- Ensure availability of resources to reduce delays and late start
- Improve Communication among multidisciplinary Teams.
- Improve staff attendance to scheduled appointments
Mafraq Hospital

A feasibility study was completed by the multi-disciplinary project team led by the Surgical Services ADON and recommendation was raised to leadership team. The consensus of all stakeholders was taken into account and a proper communication was made through a series of workshops and brainstorming sessions. Starting from April 2017, this project was officially kicked-off as a departmental performance improvement project (see criteria five).

Pre-studies, researches and scope of the project

It is well known that running Operating Rooms is an expensive business and while Mafraq Hospital strives to be efficient, several studies and literate reviews were conducted to evaluate the current practice and identify areas for improvement. The following techniques were used by the project team:

- Analyzing OR Utilization KPI and comparing MFQ’s results with other SEHA facilities
- Analyzing patients journey in OR (see figure 7)
- Observing the pre-operative processes by conducted time studies (see table 3)
- Mapping the observed process to create a functional Flow Charts and Value Stream Map (see figure 7 and 6)
- Distributing surveys to the surgical team to assess the team spirit (see figure 9)
- Identifying the common reasons for the delay in start time (see figure 2)
- Conducting brainstorming sessions with the multi-disciplinary team members
- Literature reviews
- Obtaining feedback from patients and their families

<table>
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<th>2017</th>
<th>Average Delay (min)</th>
<th>Indicator</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Total</th>
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<td>January</td>
<td>37</td>
<td>Number of surgeries performed</td>
<td>624</td>
<td>658</td>
<td>694</td>
<td>687</td>
<td>695</td>
<td>632</td>
<td>589</td>
<td>767</td>
<td>645</td>
<td>788</td>
<td>767</td>
<td>7546</td>
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<td>February</td>
<td>45</td>
<td>Number of First Elective cases scheduled</td>
<td>133</td>
<td>147</td>
<td>156</td>
<td>137</td>
<td>130</td>
<td>160</td>
<td>106</td>
<td>167</td>
<td>123</td>
<td>161</td>
<td>171</td>
<td>1591</td>
</tr>
<tr>
<td>March</td>
<td>39</td>
<td>Number of surgeries started ON TIME</td>
<td>107</td>
<td>108</td>
<td>96</td>
<td>93</td>
<td>83</td>
<td>120</td>
<td>73</td>
<td>106</td>
<td>76</td>
<td>95</td>
<td>89</td>
<td>1046</td>
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<tr>
<td>April</td>
<td>10</td>
<td>Number of surgeries Started Late</td>
<td>26</td>
<td>39</td>
<td>60</td>
<td>44</td>
<td>47</td>
<td>40</td>
<td>33</td>
<td>61</td>
<td>47</td>
<td>66</td>
<td>82</td>
<td>545</td>
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<td>May</td>
<td>37</td>
<td>Total First Case Delay Minutes</td>
<td>960</td>
<td>1759</td>
<td>2004</td>
<td>2415</td>
<td>1736</td>
<td>1490</td>
<td>1087</td>
<td>2643</td>
<td>1606</td>
<td>1997</td>
<td>3023</td>
<td>20720</td>
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<tr>
<td>June</td>
<td>36</td>
<td>Average First Case Delay Minutes</td>
<td>37</td>
<td>45</td>
<td>29</td>
<td>10</td>
<td>37</td>
<td>36</td>
<td>35</td>
<td>51</td>
<td>39</td>
<td>39</td>
<td>40</td>
<td>398</td>
</tr>
<tr>
<td>July</td>
<td>35</td>
<td>% On Time Start of Surgery</td>
<td>74%</td>
<td>61%</td>
<td>62%</td>
<td>68%</td>
<td>64%</td>
<td>69%</td>
<td>75%</td>
<td>63%</td>
<td>62%</td>
<td>59%</td>
<td>52%</td>
<td>64%</td>
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<td>August</td>
<td>51</td>
<td>% Late Start of First Case</td>
<td>26%</td>
<td>39%</td>
<td>38%</td>
<td>32%</td>
<td>36%</td>
<td>31%</td>
<td>25%</td>
<td>37%</td>
<td>38%</td>
<td>41%</td>
<td>48%</td>
<td>36%</td>
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<td>45</td>
<td>% Late Start of First Case</td>
<td></td>
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<td>November</td>
<td>40</td>
<td>% Late Start of First Case</td>
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<td>% Late Start of First Case</td>
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<tr>
<td>STDEV</td>
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<td>% Late Start of First Case</td>
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Table 2: Historical Data on Delay First Case Start

The scope of this project is limited to Mafraq Hospital OR department including 9 Operation Theaters.

Project success factors

In the first quarter of 2016, the Surgery department team identified success factors to support the project proposal taking into account the international best practices in the field of OR service efficiency as well as taking into account the results of feedback from internal and external stakeholders. This work resulted in a set of success factors for this project, including the following.

- Leadership support and commitment toward efficacy, patient safety and happiness
- Clear vision and mission cascaded top-to-down from the corporate to an organizational level
- The project is in line with the strategic objectives of SEHA and the Emirate of Abu Dhabi
- The availability of expertise, skills and competencies in the various disciplines involved in the project
- The harmonized integration and buy-in between the team members
- The availability of logistical support at Mafraq Hospital (IT, Registration, Support Service...etc.)
- Availability of the required space (9 Operating Rooms, recovery area, meeting rooms...etc.)
- Ease of access to literature reviews and best practices in the field of OR management at SEHA e-Library
- The prior planning for each step before implementation and ensure that corrective actions are identified during the project implementation period
- Availability of modern technology to document the operational data and patients tracking information
- Availability of risks management tools at Mafraq Hospital that was used in the planning phase
- Availability of an integrated performance measurement system based on a set of performance indicators that is monitored by the corporate and shared transparently with all BEs.
2. Project Plan and Execution

Project phases

As mentioned above, the project was initiated in April 2017 as part of the surgery department annual performance improvement projects initiative.

The team referred to a comprehensive FOCUS PDCA framework as a scientific technique to continuously improve the project, below is a list of the phases:

- **Phase 1**: Find a process to improve
- **Phase 2**: Organize team to work on improvement
- **Phase 3**: Clarify current knowledge of the process
- **Phase 4**: Understand process variation and capability
- **Phase 5**: Select a strategy for continued improvement
- **Phase 6**: Plan the activities and mark all the needed resources
- **Phase 7**: Do and implement the planned changes gradually
- **Phase 8**: Check the results through before-and-after data comparison.
- **Phase 9**: Act and take the necessary actions to improve the process

As this is a continuance cycle, there are always a chance to going back to the planning phase, which is from the quality prospective, is a very healthy approach to help organizations improve its efficiency (see figure 6):
Operational objectives of each phase

As indicated above, the project is based on a very clear rational, where each and every step has a start and end time. However, due to the deadline to submit this project, the team is still in the process and a full closer of the project is not yet announced. The operational objectives per phase are:

**Phase 1: Find a process to improve**

In Q1 2017, the OR team realized that their department performance indicator needs to be improved; they started by auditing their internal processes to find out why the First Scheduled Cases of the day were not starting On Time. The audit results showed that there is a deviation from the standard 0815 Start Time of surgery. The Mean start time was 0850 with an average of 40 minutes delayed from the standard time with Sigma of 10. The total unutilized minutes were 22,173 minutes. The estimated cost of poor quality (COPQ) due to late start minutes is AED 1,653,530 in 2016. The aim is to improve Start Time of First Case from 58% to 80% by Q4 2017. The objective of this phase was to decide on the process that needs to be improved, and based on the evaluation results, it was clearly indicated that the most common reasons for delay was related to the surgeons and anesthesiologists’ unavailability and lack of patients’ preparedness and this was the focus of the project.

**Phase 2: Organize team to work on improvement**

The objective of the phase was to form the team, the OR committee assigned multidisciplinary members consists of Surgeons, Anesthetists, Assistant Directors of Nursing, Nurse Managers OR, Nurse Manager PAC/DSU, Nurse Manager Surgical Inpatient Unit, Clinical Resource Nurse and a quality representative. They were all informed about their roles and responsibilities at this project and their buy-in was established.

**Phase 3: Clarify the Current Process**

In order to clarify the current process, the team used different strategies; they observed pre-operative processes and conducted time studies. Then they mapped the observed process and created functional Flow Charts and Value Stream Map (see figure 7 and 8) in addition to analyzing historical data (see figure 9). They also reviewed the current measurement data and obtained feedback from different stakeholders through a Team Spirit Survey (see figure 10).
Results of Team Spirit Questionnaire

Total number of 62 questionnaires received from Surgeons, Anesthetist and OR Staff with the following results:

<table>
<thead>
<tr>
<th>Results of Team Spirit Questionnaire</th>
<th>Total</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Are you proud to be a member of the Operating Room team?</td>
<td>61</td>
<td>98%</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>2 Does your team inspire you to perform your best?</td>
<td>55</td>
<td>89%</td>
<td>7</td>
<td>11%</td>
</tr>
<tr>
<td>3 Does your team help you to complete your work?</td>
<td>60</td>
<td>97%</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>4 Do you have the appropriate amount of information to make correct decisions about your work?</td>
<td>58</td>
<td>94%</td>
<td>4</td>
<td>6%</td>
</tr>
</tbody>
</table>

Feedback
3 Unit Manager, Charge Nurses and Staff are very cooperative in every new project implemented
2 Need more education support
3 More training and seminars
1 Some staff are resistant to change
1 Some staff are not supportive
1 No inspiration sharing between team members
1 Instruments need replacement. Improve OR Consumables and Implants workflow
1 Request for a coffee machine inside the Operating Room (Pantry Area)
1 Staffs motivates their colleagues
1 Unacceptable behavior of other staff
1 bonus increment for the staff
2 Have team building
1 Best team in OT 5 (recognized one staff)

Phase 4: Understand the Root Causes
As indicated in the first criteria (figure 2), the root cause analysis technique was used by the team to identify the possible causes for the problem, such as Fishbone diagrams, data analysis...etc. (see the below figures). As per the analysis, reasons for delay were categorized into 7 main groups:
1. Incomplete Preparation (22%)
2. Late Surgeon (22%)
3. Late Admission (36%)
4. Late Anesthetists (1%)
Mafraq Hospital

5. Institutional Limitation (9%)
6. Clinical Decision (2%)
7. Others (3%)

Further analysis was made using the OR internal measurements to further drill down into the reasons:

Figure 11: Late Start of First Case from Patient Location Areas

Figure 12: Incomplete Preparation per Specialty

Figure 13: Reasons for Incomplete Preparation

Figure 14: Late Surgeon per Specialty (Total of 146 Late Surgeons)
Phase 5: Select a part of the process to improve
From the above data, the analysis of poor OR utilization was due to the following reasons and the objective of this phase was to select the process that needs to be improved:
1. Late Start of First Case
2. Increased % Cancellation Rate
3. Increased % Turnaround Time

Phase 6: Plan the activities and mark all the needed resources
The plan was to focus on the following aspects:
- Improve the First Case On-Time Start from 58% to 80%
- Reduce late start and eliminate common reasons for delay
- Improve patient preparation for surgery
- Enhance Staff Knowledge about the importance of the On-Time Start
- Ensure availability of resources to reduce delays and late start
- Improve Communication among multidisciplinary Teams.
- Improve staff attendance

Phase 7: Do and implement the planned changes gradually
The objective of this phase was to start the improvement and a comprehensive action plan was communicated to all stakeholders indicating their roles and responsibilities (see figure 16). The action plan was made to address the following concerns: surgical team is unaware about the need to improve and change, incomplete preparation, premedication orders, anesthesia clearance for inpatients, late Surgeons and anesthetists, late admissions, lack of governance and other institutional limitation.

Phase 8: Check the results through before-and-after data comparison.
After five months of implementation, the team was able to assess the effectiveness of the new enhancements made by the team. They conducted formal assessments on the OR indicators to identify the trends (see criteria 6).
### Table 3: Analysis of the common reasons for late start surgeries (Jan to Sep 2017)

<table>
<thead>
<tr>
<th>Reasons for late start</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late Surgeon /Anesthetist</td>
<td>17</td>
<td>18</td>
<td>21</td>
<td>28</td>
<td>33</td>
<td>34</td>
<td>20</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Late Admission</td>
<td>24</td>
<td>20</td>
<td>16</td>
<td>19</td>
<td>23</td>
<td>17</td>
<td>18</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Institutional Limitation</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Incomplete Preparation</td>
<td>14</td>
<td>10</td>
<td>26</td>
<td>27</td>
<td>40</td>
<td>21</td>
<td>29</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>11</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>58</td>
<td>73</td>
<td>83</td>
<td>116</td>
<td>81</td>
<td>76</td>
<td>65</td>
<td></td>
</tr>
</tbody>
</table>

### Phase 9: Act and take the necessary actions to improve the process

Based on previous analysis, the team observed an inconsistent improvement in the rate of First Case Start Time, it was obvious that an action must be taken to improve the results. The team leader decided to head back to phase four of the project to re-map the new plan and use the knowledge gained from the project. Below is a list of the concerns:

- Improving First Case Start Time, Reducing Turn around Time between surgeries have direct impact on improving OR Utilization.
- Improving OR Utilization is a multidisciplinary team effort between surgeons, anesthetists and nurses.
- The team should collaborate to improve OR Utilization.

### Tools, techniques and technical specifications

As mentioned above, the project was executed using the FOCUS-PDCA model and several quality tools were used to analyze the data such as root-cause analysis, trend analysis, questionnaire, brainstorming sessions, Gantt Charts (see figure 17), value stream mapping ...etc.

### Communication

The project team held a series of periodic meetings to discuss the stages of the project and progress of the action plans. They used MS. OUTLOOK Calendar system to schedule the recurring meetings every two weeks, they also used the electronic communication tools such as e-mails and shared folders to exchange information and files. The status of the project was presented to the QPS committee and the OR committee on monthly basis and all relevant information were archived on the official document management system “PolicyManager” for staff to access.

![Figure 17: Resources saved at the Shared folder/ PolicyManager](image)

### Ensuring team members’ understanding of strategic and interim objectives

Keeping in mind the limited scope of project, it was easy to communicate with the concerned stakeholders and the project team members on timely manner. The project outcomes, objectives, inputs and outputs were clarified during the regular meetings. The project leader ensured delivering a comprehensive and detailed presentation about the project objectives and progress in the high level meetings with leadership to ensure a comprehensive awareness of all stakeholders.

### Team work mechanism

The project team ensured keeping the key stakeholders aware of the project progress through regular verbal and written communication and the periodic meetings. The Chief of Surgery and the ADON ensured cascading top-to-down communication to all staff.
Identify project activities
The initial steps were designed and agreed by the multidisciplinary team members using their expertise and suggestions. The team has identified the project resources and activities as well as all tools and techniques needed by the medical, nursing and administration staff to implement the project.

Implementation schedule
The team maintained a project action plan which was developed based on the project studies and included clear assignments. This action plan was discussed in every team meeting to ensure the timely implementation of the project.

Roles and Responsibilities
As indicated earlier, the project team was formed in the first phase of the project, where clear roles and responsibilities were identified and assigned based on the job function and expertise. Please see criteria 2.

Project resources

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Knowledge Resources</th>
<th>Financial Resources</th>
<th>Technical Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Leadership team</td>
<td>• Data analysis skills</td>
<td>• Cost associated with relocation of staff (e.g. registration staff, Pre-op nurse)</td>
<td></td>
</tr>
<tr>
<td>• Surgeons</td>
<td>• Project management skills</td>
<td>• Cost associated with wasted OR Minutes</td>
<td></td>
</tr>
<tr>
<td>• OR nurses</td>
<td>• Quality tools (FOCUS PDCA)</td>
<td>• Cost associated with cancelled surgery due to late start</td>
<td></td>
</tr>
<tr>
<td>• Anesthetists</td>
<td>• Communication skills</td>
<td></td>
<td>• Availability of Functional Medical Equipment and Instruments to conduct surgery.</td>
</tr>
<tr>
<td>• Registration staff</td>
<td>• International literacy</td>
<td></td>
<td>• Access to data reporting systems.</td>
</tr>
<tr>
<td>• Quality team</td>
<td>• Performance management skills</td>
<td></td>
<td>• Availability of consumables required to conduct safe, effective surgical procedures.</td>
</tr>
</tbody>
</table>

Outcome indicators
As mentioned earlier, the team skills and expertise were used to design clear objective and outcome indicators for each phase of the project. The indicators were decided during the brainstorming sessions and regular meetings.

3. Develop an organized and comprehensive plan for internal and external communication

Internal and external communication objectives
Taking into account the limited scope of the project, this improvement process was made within the OR department which consist of 300 employees (medical, nursing, allied health and administration staff). Hence, there was a huge need for a proper internal communication; however the external communication with the external stakeholders was made during the quarterly review of the hospital performance. The following are the objectives of the internal communication plan:

<table>
<thead>
<tr>
<th>Objectives of internal communication</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Ensure an effective communication among team members | • Achieving the project objectives  
• Increase the level of awareness of the big picture and their role in  
• Monitor the progress of the action plan  
• Remove the barriers between the leaders and the team  
• Increase the team productivity |
| Support the culture of creativity and excellence | • Facilitate the discussion and exchange of ideas  
• Utilize the existing knowledge and expertise  
• Use different methods of communication  
• Create a constructive workplace |
| Enhancing team spirit | • Build trust and credibility  
• Ensure the participation of all members  
• The team members feel valued and appreciated  
• Motivate the team to improve the process  
• Retain the staff and improve their engagement |

Table 4: Internal communication objectives
Dissemination and transfer of knowledge and promotion of communication and openness

A full report following FOCUS PDCA framework is published on the hospital intranet “Mafraqi” as part of the annual performance improvement projects. All staff have access to view and learn from the project and team are willing to provide the support. The progress is also shared with the Quality & Patient Safety committee on monthly basis.

Communication stakeholders

Those involved in the communication were identified by the project team, the role of the leadership team including Chiefs and Chairs and C-suite members in communicating information to their departmental staff was also emphasized, as the support of the leadership team had the greatest impact on achieving the objectives of the project.

External/Internal communication channels and mechanisms

External communication about improving OR efficiency and Utilization was communicated on quarterly basis with the Management Oversight Committee (MOC). High attention to clear communication was made by the team leader to the OR surgical team to ensure the success of this project.

Disseminate the project plan and obtain feedback to develop the plan.

The project plan was circulated to all stakeholders prior to the implementation due to the importance of their role in execution and success of the project. Their constructive feedback was taken into consideration especially from the Surgeons and Anesthetists who had the major contribution on the progress of the project.

4. Develop a quality assurance plan

Identify expected outputs and quality assurance points

Mafraq Hospital strongly believe that patients’ safety and satisfaction depends on several elements including the speed of access to the quality of services provided, the administrative and medical service, the environment, effective communication and others. Hence, short term and long term outputs have been defined by the project team:

**Short-term outputs:**
- Ensure Nurses awareness of the surgery requirements (instruments, time, pre-preparations...etc.)
- Reduce the wasted OR time
- Improve OR Utilization
- Increase the number of elective surgeries

**Long-term outputs:**
- Improve Mafraq Hospital reputation in the community
- Improve the financial gain
- Improve the market share
- Comply with top-management strategic goals
- Improve the quality of internal work structures
- Enhancing customer satisfaction
- Improving the medical team satisfaction with their performance and reducing their resistance to change

As indicated earlier, the team followed a scientific approach to manage this project through the adoption of the FOCUS PDCA framework. The team ultimate aim was to enhance the efficiency and ensure patients safety and satisfaction. Therefore, specific criteria and standards were decided to ensure appositive returns, eliminate waste and reduce processes variations.

**Figure 19: Quality Assurance Plan**

Develop Evaluating Criteria

The project team indicated a set of performance indicators that are required to be monitored and presented to the management on timely manner, for example: the OR utilization rate. In addition a short questionnaire was developed and shared with the team members to gauge their satisfaction with the team and the progress of the project and the experience gained through the work (see criteria 6).
Document quality assurance procedures and take corrective action.

All performance indicators are documented on a daily basis and the reports are being shared with SEHA Corporate office on monthly basis. The results are discussed every two weeks at the c-suite meeting, monthly at the OR committee and on a quarterly basis at the Management Oversight Committee Meeting (MOC). These forums are usually results on a list of recommendations and feedback from the team and the top management which helps in improving the project.

Define the roles and responsibilities of quality assurance

The task of monitoring the project performance indicators was assigned to the project team leader Assistant Director of Nursing who was leading the project. The nursing team ensured documenting the OR time in the system on timely manner and the Chair of Surgery was responsible for monitoring the project progress and ensuring surgeons and anesthetists commitment. Both were accountable to take the necessary actions in dealing with any challenge and escalation to the management when required.

Periodic quality assurance procedures

OR Performance indicators are extracted and analyzed on the daily basis; all performance indicators are measured and presented to senior management at the hospital as well as to SEHA corporate office periodically to ensure proper business continuity.

Evidence of corrective actions

As shown in the Figure 20, the nursing team created a very practical and comprehensive request form that is used by the surgeons prior to surgery appointment, to ensure completing all the necessary preparation prior to the date of surgery. This helped in proactively indicating the resources needed and length of the surgery from the subject matter expert prospective. Hence, last minute errors were reduced and targets were achieved.

The Second Criteria: Project Team

Manage and Lead Project Team

Project team formation and the suitability of the expertise, qualifications and skills to work in the project:

The project team members were selected according to their role, expertise, skills and competencies. The contributions made by them were also identified in the first phase of project planning – see the following table for more details:

<table>
<thead>
<tr>
<th>Team members</th>
<th>Reason for selection</th>
<th>Qualification</th>
<th>Role in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair of Surgery department</td>
<td>Expert in the field of surgery</td>
<td>Subject Matter Expert with clinical and managerial focus</td>
<td>Project Owner</td>
</tr>
<tr>
<td>Assistant Director of Nursing</td>
<td>Expert in nursing and OR management</td>
<td>Executive Master in Health Care Administration</td>
<td>Project Lead</td>
</tr>
<tr>
<td>Chair of Anesthesia Department</td>
<td>Expert in the field of anesthesia</td>
<td>Subject Matter Expert in Clinical Practice</td>
<td>Team member</td>
</tr>
<tr>
<td>Chief of OMF Surgery</td>
<td>Expert in the field of surgery</td>
<td>Subject Matter Expert in Clinical Practice</td>
<td>Team member</td>
</tr>
<tr>
<td>Operating Room (OR) Nurse Manager</td>
<td>Expert in nursing and OR management</td>
<td>Subject Matter Expert in Clinical Practice and management</td>
<td>Team member</td>
</tr>
<tr>
<td>Operating Room Nurse Educator</td>
<td>Resource Person for Surgery and Anesthesia</td>
<td>Subject Matter Expert in Clinical Practice</td>
<td>Team member</td>
</tr>
<tr>
<td>Preadmission Unit Nurse Manager</td>
<td>Expert in the field of nursing and preadmission testing</td>
<td>Subject Matter Expert in Clinical Practice and management</td>
<td>Team member</td>
</tr>
</tbody>
</table>
Forming the team and defining the tasks assigned to each of them and determining the detailed requirements of different tasks

With reference to the above table, during the first phase of the project (Organize team to work on improvement), the team was formed to develop and implement measures to reduce/eliminate delays of First Case Start of Scheduled Procedures at Mafraq Hospital, evaluate progress and monitor compliance. A clear roles and responsibilities assigned to each member of the team, including the team leader as per the Project Charter (can be provided upon request).

Actions taken by the leadership to spread the spirit of the team

The team consists of members from different functions and expertise; the team leader ensured an effective collage and harmony between the members. This was achieved by the regular interactions and communication as well as managing the healthy discussions around the action plans.

The project owner and the project lead provided support to team members and created an environment of communication and openness to encourage and embrace the culture of team work. The team was assigned different roles and responsibilities based on their level of expertise. The surgeons worked to identify and resolve issues related to surgeons; the anesthesia team identified areas for improvement in regards to anesthesia and the nursing teams collaborated to ensure the patient’s journey from the clinic to the completion of surgery is safe, effective and efficient.

Apply, review and document the work of the team and its achievements through a follow-up system

The assigned tasks were documented, reviewed and followed up on a tracker and evaluated periodically by the project team.

Evaluation of working methods and measuring the results of the work of the team

A survey was conducted to measure the team member’s satisfaction and to obtain their feedback during the project. And in line with the timing of submission of the award document, another survey was conducted using an internal survey process (see figure 10 and criteria 6).

The Third Criteria: Resource Management and Control

Manage financial resources related to the project

This costless project was mainly around improving two basic aspects: (a) the internal process and (b) staff commitment. Hence, there was no major financial resources required neither a dedicated budget. However, as a result of the literature review, the team was able to do a financial feasibility study to calculate the cost of OR Time per minute, as per the international benchmark,
it cost between $10 – 30 per minute which is equivalent to AED 37 – AED 110. Accordingly, the reported cost of OR Time is $10 – 30 per minute (AED 37 – 110). So the total cost of lost OR minutes in 2016 is 1,653,530 AED and in 2017 Jan – August is 1,781,530 AED.

<table>
<thead>
<tr>
<th>Late Start Minutes</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total Lost Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>960</td>
<td>1759</td>
<td>2004</td>
<td>2415</td>
<td>1736</td>
<td>1490</td>
<td>1087</td>
<td>2643</td>
<td>1606</td>
<td>1997</td>
<td>3023</td>
<td>1625</td>
<td>22,345</td>
</tr>
<tr>
<td>2017</td>
<td>1916</td>
<td>1582</td>
<td>2659</td>
<td>2807</td>
<td>4170</td>
<td>2374</td>
<td>2097</td>
<td>2234</td>
<td>1679</td>
<td>2560</td>
<td>24,078</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost of Wasted Minutes (AED)</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total Cost Lost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>71040</td>
<td>130166</td>
<td>148296</td>
<td>178710</td>
<td>128464</td>
<td>110260</td>
<td>80438</td>
<td>195582</td>
<td>118844</td>
<td>147778</td>
<td>223702</td>
<td>120250</td>
<td>1,653,530</td>
</tr>
<tr>
<td>2017</td>
<td>141784</td>
<td>117068</td>
<td>196766</td>
<td>207718</td>
<td>308580</td>
<td>175676</td>
<td>155178</td>
<td>165316</td>
<td>124246</td>
<td>189440</td>
<td>0</td>
<td>0</td>
<td>1,781,772</td>
</tr>
</tbody>
</table>

Table 6: Estimated Cost of Wasted OR Minutes

Manage knowledge resources

Identification of the knowledge and information

As indicated in the first criteria (see figure 17), the required resources of knowledge resources were identified such as expertise in OR management, data analysis skills, project management skills, Quality tools (FOCUS PDCA), communication skills, performance management skills, leadership skills as well as knowledge in research and recite international literacy. Every member of the team was a subject matter expert in his/ her field, the valuable knowledge shared between the team enhance the team members awareness and experiences as reflected in the team spirit questionnaire (see figure 9), where 94% of the members confirmed the availability of appropriate amount of information to make correct decisions about their work.

Methods of organizing, storing and archiving information

The team complies with Mafraq Hospital policies pertain to documents and data management, those are:

- Access Control Policy
- General Confidentiality Policy
- Release of information, patient request and third parties
- Secure Filing and Access to Medical Records
- Confidentiality of Medical Records

Channels for knowledge exchange and dissemination

With reference to the first criteria, the team utilized the available resources to share and disseminate knowledge and information, such as using MS Outlook to exchange files and information, creating a shared folder to archive all relevant reports and analysis, holding periodic meetings to exchange ideas and discuss the action plans.

Establish procedures to ensure the protection and integrity of information, including, but not limited to, defining the powers of use and change, the powers of authentication, review and approval of information by more than one person before saving them.

Identify ways of transferring knowledge

One of the most significant skills gained by the project team throughout this project is project planning and innovative thinking skills. As the aim of this project is to enhance efficiency by reducing the wasted time and start the first case surgery on time, the team has identified several methods of communication such as the systematic meetings, checklist templates, email communication, reporting and statistical analysis, risk assessment, data management and archiving…etc. The team’s main interest was focused on efficiency which is a strategic requirement and they believe that their contribution by exchanging knowledge will benefit all stakeholders.

Disseminate the lessons learned

In the course of submitting this project to SEHA Excellence Award, the team is willing to share its success story with sister facilities as well as the committee, through presenting in the Innovation Dome and other relevant forums. Whereby lessons learned, challenges and innovative ideas will be shared.

Manage and direct suppliers – Not applicable
Predicted Risk Management

With reference to the First Criteria, identifying factors that are expected to have a negative impact on the project is one of the most important elements of Project Management. This approach is used to anticipate technical or human errors or any regulatory obstacles that may affect the work progress. The team used Mafraq Hospital Risk Matrix to list the potential risks that are expected to occur, determine its effects and consequences, assess their probability, calculate the costs and determine the required management intervention – see table 6.

<table>
<thead>
<tr>
<th>Risk classification</th>
<th>Description</th>
<th>Impact</th>
<th>Consequences</th>
<th>Likelihood</th>
<th>Cost</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>People related Risk</td>
<td>1. Resistance to change</td>
<td>High</td>
<td>Wasted OR time and delayed surgeries</td>
<td>High</td>
<td>High</td>
<td>Team members</td>
</tr>
<tr>
<td></td>
<td>Surgeons late arrival to the operating room or late requesting tests and instruments</td>
<td></td>
<td>Lack of awareness</td>
<td>Medium</td>
<td>High</td>
<td>Team members</td>
</tr>
<tr>
<td></td>
<td>2. Communication gap</td>
<td>High</td>
<td></td>
<td>Medium</td>
<td>High</td>
<td>Team members</td>
</tr>
<tr>
<td></td>
<td>Project members not cascading down information to their staff</td>
<td></td>
<td></td>
<td>Medium</td>
<td>High</td>
<td>Team members</td>
</tr>
<tr>
<td></td>
<td>3. Patients commitment</td>
<td>High</td>
<td>Wasted OR time and delayed surgeries</td>
<td>High</td>
<td>High</td>
<td>COO</td>
</tr>
<tr>
<td></td>
<td>Not arriving on time or changing the appointment without prior notification</td>
<td></td>
<td></td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Finance related risks</td>
<td>1. Budget constraints</td>
<td>Medium</td>
<td>Delayed surgeries</td>
<td>High</td>
<td>High</td>
<td>CFO/ COO</td>
</tr>
<tr>
<td></td>
<td>Unavailability of budget to buy/repair equipment and instruments</td>
<td></td>
<td></td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Staff shortage</td>
<td>High</td>
<td>Delayed patient registration</td>
<td>High</td>
<td>High</td>
<td>HR/ COO</td>
</tr>
<tr>
<td>Logistics related risks</td>
<td>1. System malfunctioning</td>
<td>High</td>
<td>Delayed surgeries</td>
<td>Medium</td>
<td>High</td>
<td>CIO</td>
</tr>
<tr>
<td></td>
<td>Unplanned Malffi downtime</td>
<td></td>
<td></td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unplanned power shutdown</td>
<td></td>
<td></td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discrepancy in data reported between Mafraq and SEHA BI</td>
<td></td>
<td></td>
<td>High</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

Table 7: Risk Assessment Matrix

Risk Identification

As indicated in the above matrix, several risks existed and could potentially hinder the project progress and affect the desired goals, such as:

- Staff shows resistance to change and continue their old practices of late arrival to the operating room and late requesting tests and instruments which delay the first case start time.
- Lack of registration staff and their late arrival could lead to late patient registration
- Communication gap could occur when project members do not cascade down information to their staff so the new processes are not shared with all OR team (approx. 300 employee)
- Patients also could contribute to the delay in start time if they arrived late on the day of surgery
- Unavailability of budget to repair instruments could lead Mafraq Hospital to borrow from other BEs
- Unplanned Malffi downtime as well as the unplanned power shutdown

Project sustainability

The team discussed all the risk related issues during their team meetings and several immediate actions were taken to prevent risks from happening as well as ensuring the patient safety and project sustainability.

<table>
<thead>
<tr>
<th>Related Risk</th>
<th>Description</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance to change</td>
<td>Surgeons late arrival to the operating room or late requesting tests and instruments</td>
<td>Conduct a multidisciplinary 1-day retreat to build a general commitment for change</td>
</tr>
<tr>
<td>Communication gap</td>
<td>Project members not cascading down information to their staff</td>
<td>Ensure continuous communication process with all members of the surgical teams. Conduct</td>
</tr>
</tbody>
</table>
interdepartmental meeting.

<table>
<thead>
<tr>
<th>Patients commitment</th>
<th>Not arriving on time or changing the appointment without prior notification</th>
<th>Develop structured preadmission process to strengthen the follow up process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budget constraints</td>
<td>Unavailability of budget to buy/repair equipment and instruments</td>
<td>Review capital equipment and work flows to ensure availability of functional medical equipment and instruments</td>
</tr>
<tr>
<td>Staff shortage</td>
<td>Lack of registration staff to register patients on time. Shortage of surgeons, anesthesia and nursing staff</td>
<td>Conduct manpower capacity analysis to ensure availability of resources to meet the service demand.</td>
</tr>
<tr>
<td>System malfunctioning</td>
<td>Unplanned Malffi downtime Unplanned power shutdown Discrepancy in data reported between Mafraq and SEHA BI</td>
<td>Develop processes and workflows for down time procedures to ensure business continuity. Coordinate with SEHA BI to ensure accuracy of reported data.</td>
</tr>
</tbody>
</table>

### Fifth Criteria: Project Execution

**Develop a system for Managing Records and project activities**

Due the nature of the OR team job routine which requires them to be on the filed most of the time, the project team leader and the nursing representative hold the responsibility of documenting the meetings outcome as well as assuring data management to support the plan execution.

**Procedures for saving files and tracking records**

The team identified a clear procedure for tracking all related documents throughout the project; this is to save the useful Implicit and explicit knowledge gained from the project and to comply with the hospital policy (see criteria 3). All documents and records were classified according to their type and level of confidentiality, the archiving location is determined and controlled by the project team leader and the nursing representatives as per the below table:

<table>
<thead>
<tr>
<th>Record type</th>
<th>Specification</th>
<th>Confidentiality</th>
<th>Archiving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Action Plans</td>
<td>Electronic – word format</td>
<td>Not confidential</td>
<td>OR Share folder</td>
</tr>
<tr>
<td>Patient history analysis reports</td>
<td>Electronic – excel sheets</td>
<td>Confidential</td>
<td>OR shared folder</td>
</tr>
<tr>
<td>OR policies</td>
<td>Word and PDF format</td>
<td>Not confidential</td>
<td>Polity manager</td>
</tr>
<tr>
<td>Department Dashboard</td>
<td>Electronic – excel sheets</td>
<td>Not confidential</td>
<td>OR Share folder</td>
</tr>
</tbody>
</table>

**Review the stages of the project and its outputs**

The team leader was accountable to follow up on the progress of the project action plan, a periodic communication was done to ensure that timely adaptive actions are taken, analyze the actual performance against the plan and make the needful adjustments whenever needed. The team leader also ensured keeping the concerned stakeholders informed of progress by reporting to the Quality & Patient Safety Committee and Medical Executive Committee as well as other related forums.

**Develop procedures to ensure the validity of the documents.**

Data reports have been assigned to one person who has received extensive training in building OR reports. The reports are validated by the project lead following the hospital approved data validation process. The reports are analyzed and reviewed by the project team and results are shared with all end users.

**Follow a comprehensive systematic mechanism or methodology that ensures that best practice is recorded in a manner that includes all project stakeholders at all levels**

Department dashboard was developed where the operating room performance indicators are recorded and reported to all stakeholders on monthly basis.

**Measuring and monitoring the completion of project stages according to the project plan**

The project progress is monitored against the Gantt chart. So far the project is executed as per the agreed timelines.

**Project closing**

The project is on-going until the date of publishing this report.
The Sixth Criteria: Results

During less than one year of project implementation, more than 6,902 patients have completed successful surgeries in OR. The project resulted in several tangible and intangible achievements:

- Positive trend in the rate of On Time Start of First Case Surgery
- On Time Start of First Case Surgery increased from 35% in May 2017 to 59% in August 2017
- Late Start of First Case Surgery reduced from 65% in May 2017 to 41% in August 2017
- Strengthened the cross-functional team harmony
- Enhanced management for the first scheduled case where the subsequent events flow smoothly
- Enhance the dialogue between Nursing and Medical team
- Improving the same-day admission process
- Improved OR efficiency and revenue
- Reduced patients complaints
- Dissemination of project findings among SEHA facilities as a knowledge sharing initiative
- Appreciate staff efforts and leadership commitments

Project KPIs and results

Project completion time

With reference to the Project Gantt chart (figure 5), the project started in April 2017 and is ongoing as per the plan, taking into account that OR in a trauma center facility requires full readiness around the clock.

The extent to which the project results achieved

As the project is still in progress; the team is still working to reinforce the action plan, monitor compliance and progress. The results captured demonstrate that the project has achieved its ultimate objectives, as evidenced by the following monthly KPIs:

![Figure 22: OR Utilization January 2016 – October 2017](image)

Although OR Utilization had positive trend rate in May and June 2017, however it further decreased from 64% in May 2017 to 56% in August 2017 due to several issues mainly surgeons and anesthetists availability.

![Figure 23: % of First Case on Time Start - 2017](image)
Measuring the quality of project outputs

*The following criteria are not applicable to this project*: Extent of commitment to the project’s estimated budget, Number of errors, Costs of errors, Number of hours / days of delay

Number of change orders

The OR department in a trauma facility is characterized by its constant change to accommodate the patients various needs. The fact that 52% of the surgical procedures performed at Mafraq Hospital is emergency procedures may limit the access to elective theatres; however, no major changes were made to the project plan but small improvements were made upon the discussion with the stakeholders for instance, the team ensured the availability of sufficient operating rooms to run on emergency basis and assign other operating rooms for elective procedures. Moreover block schedules for elective procedures were closely monitored to ensure optimal utilization.

Performance indicators and results of the Working Group

The efficiency of the project manager

As indicated in Figure 9, the Team Spirit Questionnaire was conducted internally among the multidisciplinary team and the results are as follows:
Mafraq Hospital

Indicators of measuring the impact of the project
During the last two quarters of 2017, the project achieved its objectives despite all the difficulties and obstacles faced by the team during the implementation of the Action Plan. In Q3 2017 (when the award document was delivered), some of the achievements that the project contributed to can be summed up:

• Reduce same day cancelation of scheduled surgeries from 9% in May 2017 to 5% in October 2017.
• Applying the best international practices in the field of performing safe surgery in terms of eliminating wrong site/side surgery by improving patient and site verification process. The number of surgical cases with identifiable risks for wrong-site surgery reported between 2015 and 2016 reduced by 58% (12 cases in 2015, 5 cases in 2016 and 1 case in 2017).
• Reduce Turnaround Time from 40 minutes in April 2017 to 30 minutes in October 2017.
• Keeping pace with market share and improve our competitive value.

Impact of the project:

Figure 29: % Elective surgeries in 2017

Figure 30: Monthly Volume of surgical Procedures in 2017

Figure 31: Turnaround Time (min) - 2017

Figure 32: % On Time Start in 2017

-The End-