OPERATIONAL ASSESSMENT OF THE OPERATING THEATRE COMPLEX IN A HEALTHCARE FACILITY: A CASE STUDY

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

by

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Under the Supervision and Guidance of

Dr. Susmit Jain

2025

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CERTIFICATE

This is certify that Dr. Parikshit Pathrikar in partial fulfilment of the requirements for the award of the degree of MBA Hospital and Health Management from the IIHMR University, Jaipur has successfully completed his internship at Wish2care Multispeciality Clinic During 10th March 2025 to 31st May2025.

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This is to certify that dissertation titled **Operational Assessment of the Operating Theatre Complex in a Healthcare Facility: A Case Study** is a record of the research work undertaken by **Parikshit Pathrikar** in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study possesses been sincere, scientific, and analytical.

12/06/2025

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Date: 12-06-2025

DECLARATION BY STUDENT

I hereby declare that this dissertation titled "Operational Assessment of the Operating Theatre Complex in a Healthcare Facility: A Case Study" is the bona fide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others possesses been duly acknowledged in the text.

Dr. Parikshit Pathrikar

Date 12/06/2025

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Abbreviations

OT	Operation Theatre
PPP	Public Private Partnership
COT	Cardiac Operation Theatre
BMC	Brihanmumbai Municipal Cooperation
OR	Operation Room
CSSD	Central Sterile Supply Department
TSSU	Theatre Sterile Supply Unit
DMAIC	Define, Measure, Analyze, Improve, Control
FGD	Focused Group Discussion
MJPJAY	Mahatma Jyotiba Phule Jan Arogya Yojana
GNM	General Nursing Midwifery
SOP	Standard Operating Procedure
GP	General Practitioner
AMC	Annual Maintenance Contract
CMC	Comprehensive Maintenance Contract

Abstract

Introduction:

The rising demand for healthcare services has driven organizations to strike a challenging balance between cost-cutting, service improvement, and equity of access, all while pursuing the overarching goal of improving patient value. The current case under discussion is a public-private partnership in the healthcare industry that aims to provide high-quality medical care to individuals while improving hospital revenue. Because the operation theatre (OT) complex accounts for 50 to 60% of overall revenue, it was chosen as the subject of this report's research.

Objectives:

- To study the utilization of the OT complex of the hospital
- To understand the stakeholder's concerns on the OT performance and improvement areas needed
- To recommend strategies for performance improvement and revenue enhancement

Methodology:

A mixed-method, cross-sectional study was conducted between March and May. The Define Measure Analyze Improve Control (DMAIC) tool was used in the case. Hospital and department records were used as quantitative data sources, and a focused group discussion was conducted to collect qualitative data. All the qualitative and quantitative data collected was compiled on MS Office Excel and then analyzed. Data analysis was done using an inductive approach of direct content analysis for qualitative data. A conceptual framework was designed with themes and subthemes that contribute to the challenges faced by stakeholders, and a cause-and-effect diagram was created for OT underutilization

Results and Discussion:

The operation theatres in this hospital were underutilized, and the utilization rate was found to be, on average, 32.5%, 16.2%, 15.2%, and 14% for cardiac operation theatre (COT), OT 2, OT 1, and OT 4 respectively. The focus group discussion findings highlighted that the hospital should improve its marketing and branding strategies, rationalize the surgery tariff rates, improve employee engagement and compensation, and maintain and update hospital medical equipment.

Conclusion:

The case study shed light on the underlying issues that contributed to the underutilization of the OT complex. The case study revealed two significant findings: poor marketing, branding, and pricing strategies, as well as poor employee engagement and remuneration, all of which contributed to the hospital's low patient flow, which resulted in low surgery volumes.

Keywords: Operation Theatre Utilization, Public-Private Partnership, Healthcare Management, Revenue Enhancement, DMAIC, Hospital Performance, Stakeholder Engagement,

Chapter 1- Introduction

Public-private partnerships (PPPs) in healthcare have emerged as a viable solution to address the challenges faced by healthcare systems globally, particularly in the operation theater domain. Operation theatres are critical components of healthcare facilities where surgical procedures are performed, demanding high-quality infrastructure, equipment, and skilled personnel. PPPs offer a collaborative approach between the public sector, typically represented by government entities, and private sector stakeholders, such as healthcare providers or corporations. In the context of operation theatres, PPPs can facilitate the construction, management, and maintenance of state-of-the-art surgical facilities, leveraging the expertise and resources of both sectors. Through PPPs, governments can harness private sector innovation and efficiency while ensuring equitable access to surgical services for the population.

The rising demand for healthcare services has prompted institutions to strike a challenging balance between cost-cutting, service improvement, and equity of access while pursuing the overarching goal of improving patient value. Patient flow management, a complex but vital business activity, influences hospital productivity and patient outcomes. The hospital must successfully manage the increasing needs of an unexpected and changing volume of patients with the hospital resources available while ensuring that each patient reaches each step of care as needed. As a result, boosting hospital patient flow has become a policy objective if hospitals can fulfil strategic and operational hospital goals. One strategy a hospital can implement to improve the efficiency of growth, clinical outcomes, and patient experience is the effective utilization of resources such as beds and operating rooms and the availability of professional personnel. Even the hospital, in this case, attempted to provide patient care at an affordable cost and improve performance to keep ahead of their competitors and to find potential improvement areas.

The Operation Theatre complex (OT), the heart and the most crucial revenue generator of any hospital, accounting for 50 to 60% of total revenue, is an essential and critical component of any hospital. It takes a

significant investment and a large team of experts, including surgeons, anesthetists, operating room technicians, assistants, nurses, and other specialists, making it Labouré- and money-intensive. Suitable investments are necessary for fixture and equipment installations and meeting design specifications to provide rigorous aseptic conditions.

Typically, an operating room operates on an eight-hour schedule, excluding emergencies. During those eight hours, four extensive operations at maximum can be completed; however, if an ideal operation mix is adopted, this number can rise to five to six large operations every day. However, technology inefficiencies and human errors make it difficult to optimize operating rooms completely. Nevertheless, as a significant investment for any hospital budget, it is necessary to use it properly to maintain a favorable cost-benefit ratio.

The tertiary care hospital in Mumbai aims to provide quality patient care to the individuals and increase the revenue generated by the hospital. To achieve this, we studied the vital revenue-generating department -the OT complexes of the hospital. The department's performance was evaluated, and opportunities for improvement were identified as adequate management of an operation theatre is necessary to increase surgical production in any institution.

Chapter 2- Review of literature

Table 2.1 overview of reviewed paper

Author	Study Location	Sample Size	Methodology	Salient Features
A.P. Pandit et al. (2018)	India	120	Quantitative data collection and analysis of OT utilization metrics	• OT time was underutilized due to delays and poor scheduling. • Mismatch between scheduled and actual surgery times caused inefficiencies. • Long pre-operative and post-operative waiting times impacted OT flow. • Shortage of skilled staff limited OT utilization capacity. • Recommended reducing surgical days by improving daily efficiency. • Suggested hiring more staff and adopting advanced technology for better management.
Nitin RV et al. (2016)	Tertiary Care Hospital (India)	200	Empirical analysis of hospital's marketing mix	• Ambiance of the hospital plays a critical role in attracting and retaining patients. • Affordability of services is essential to cater to patients from all economic backgrounds. • Quality of care significantly influences the hospital's brand perception. • Soft skills of staff (communication, empathy) impact patient satisfaction and loyalty. • Effective marketing mix strategies are necessary to build a strong hospital brand. • Increased patient inflow directly contributes to the hospital's revenue and sustainability.
Abhinav Sarma et al. (2020)	India	50	Qualitative study of marketing strategies and challenges in healthcare	• Healthcare marketing in India faces challenges like regulatory constraints, lack of awareness, and ethical concerns. • Strategic marketing helps hospitals differentiate themselves in a competitive environment. • Patient-centric approaches and transparent communication are key to building trust and loyalty. • Digital platforms and social media offer new opportunities for hospital outreach

				and engagement. • Long-term patient relationships can be achieved through consistent service quality and strong brand reputation. • Emphasizes that planned marketing efforts are crucial for sustaining growth in the healthcare sector.
A.B. Bakker et al. (2011)	United States	100	Literature review and conceptual framework	• Work engagement is defined as a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption. • Leadership and social environment are key drivers in fostering employee engagement. • Job crafting empowers employees to shape their tasks and roles, maintaining engagement levels. • Work engagement positively impacts employee health and well-being. • Sustainable engagement requires organizational support and recognition of individual contributions. • a research agenda focused on understanding the dynamics and long-term impact of engagement.
Shanafelt TD et al. (2016)	Mayo Clinic (USA)	50	Case study approach; organizational strategy analysis	• Identified burnout as a major issue affecting physician performance and well-being. • Proposed 9 organizational strategies to promote physician engagement and reduce burnout. • Emphasized the importance of leadership involvement and accountability in implementing well-being initiatives. • Demonstrated that even low-cost interventions can yield significant improvements in engagement. • Highlighted the need for ongoing efforts and institutional commitment for sustained impact. • Shared successful examples from the Mayo Clinic to support the effectiveness of these strategies.
J. Moon et al. (2020)	United States	30	Analytical and empirical research comparing non-	• Service mix plays a critical role in determining hospital profitability. • Non-profit hospitals tend to offer premium specialty services to boost output and

			profit vs. for-profit hospitals	competitiveness. • For-profit hospitals often increase profitability by raising prices on basic routine care. • Non-profits invest more in national advertising to attract patients beyond local markets. • Competition widens the gap between the two types of hospitals in service delivery and cost structure. • non-profits carefully balance their service portfolio to sustain competitiveness and financial viability.

Chapter 3- Methodology

Study Setting

The present study is conducted for the OT Complex of a multi-specialty hospital in Mumbai.

The hospital's Operation Theatre complex

Three operating rooms were present in the institution under investigation. The hospital's third-floor operation theatre (OT) complex had four operating theatres, staff and doctor changing areas, a central sterile supply department (CSSD), a scrub area, an OT pharmacy, a control room, and a recovery room. All four ORs were modular. Two of the three OTs were major OTs, while the others were minor. One minor OT (OT 3) was under maintenance during the study period, so it is not considered in this study. There was a dedicated operating room for cardiac procedures on the seventh floor. This OT complex included a single operating room, a Cath lab, a changing area for personnel and doctors, a dirty utility room, a theatre sterile supply unit (TSSU), a scrub area, and a control room. The OT facility was open from 8 am to 5 pm. Patients having surgery between 5 pm and 8 am, Sundays and national holidays, were subject to emergency fees. There were ambulatory and inpatient procedures done here. The surgeries were given different categories based on the time and expertise required and in numerous disciplines.

Study Design

The current study is a mixed-method, cross-sectional study conducted between March and May 2025.

Study Methodology

The Define Measure Analyse Improve Control (DMAIC) tool was used in the case. The quantitative surgical volume data from March 2025 to May 2025 was studied to understand the utilization of all the operation theatres in the complex A Focused Group Discussion (FGD) was carried out in the hospital's boardroom with 10 participants and a moderator to understand the stakeholder's perspectives. A semi-structured questionnaire consisting of 7 questions based on the topic list was designed for the FGD, and the author was the moderator for the session. The discussion lasted for 120 mins. It was focused on understanding the concerns and improvement areas that could be implemented to increase the surgery numbers and improve the patient flow coming to the hospital. The notes were recorded throughout the session. Finally, after data analysis a conceptual framework-coding tree was developed, and cause and effect diagram were formulated in the analyze phase of the DMAIC methodology.

QUESTIONS	
1.	Please briefly describe the demographic and socio-economic status of the patients visiting this hospital.
2.	What, according to you, are the influencing factors for the patients to visit this hospital?
3.	How are the infrastructure of this hospital and the OT complex?
4.	Do you find the existing SOPs used in the OT complex comprehensive?
5.	What are the driving factors for rendering your services to this hospital?
6.	What are the challenges or concerns you face while rendering the services in the OT complex?
7.	What improvement areas can be of focus to improve the hospital's patient flow?

Table 3.1: Pre-structured questionnaire for Focused Group Discussion

Study Participants

The focused group discussion consisted of 6 surgical consultants, 2 OT nurses, a biomedical engineer and an OT manager.

Selection criteria: The workforce involved in the overall functioning of the OT complex was considered for the Focused Group Discussion (FGD). The participants who verbally consented to participate in the study were approached for FGD. Based on the time availability of the participants, these 10 participants finally took part in the focused group discussion.

Sampling technique: Convenience sampling technique was used for participant selection for FGD.

Data Sources

Secondary data in the form of hospital department records for quantitative analysis.

Primary data through focus group discussion for qualitative analysis.

Data Collection and Analysis

The responses recorded during the FGD were transcribed on MS office Excel by the moderator using the written notes. Transcripts and results were not returned to the participants for review and feedback.

Data analysis consisted of an inductive approach of direct content analysis to identify the subthemes of challenges and concerns causing hinderance for the department and a framework was developed. The responses of first and second consultant were openly coded, and the first draft of framework was developed.

While coding the other interviews new subthemes were added to the framework till it reached thematic saturation. The Coding of the collected data was done by the author using MS office Excel.

Chapter 4- Result

Defining Phase

In the Defining Phase, the problem was defined as the hospital's management wanting to increase the hospital's surgical volume to increase income. The study's goal was to identify the challenges and concerns limiting the utilization of the OT complex. A project charter was developed (Figure 1).

The project charter included the start and end date of the project which was 10th March 2025 and 31st May 2025 respectively. The purpose of the project was mentioned as the management of the hospital wanting to increase the OT utilization being the major revenue generating department. So, the goal was to identify the challenges and concerns limiting the utilization of the OT. It also mentioned on the project sponsor, manager, stakeholders involved in the project and scope of the project. The scope of the project was to provide the list of causes leading to the inadequate utilization of the OT complex and to recommend strategies to improve the surgical volume of the OT complex.

The critical to quality was set to have a good functional OT service which would be able to provide quality care to the patients and help to increase the OT utilization to at least 60%.

PROJECT CHARTER			
Name	**Operational Assessment of the Operating Theatre Complex in a Healthcare Facility: A Case Study**		
Date	March 10,2025	**Project Sponsor**	Study Hospital
End date	May 31,2025	**Project manager**	parikshit pathrikar
Project propose		**Stakeholders**	
The management of the hospital wants to increase the OT utilization as it is the major revenue generating department challenges, So the goal is to identify the challenges and concerns limiting the utilization of the OT complex		Surgical consultants OT muses Biomedical Engineer OT Manager Hospital Managemient Hospital management consultar	
Scope			
Deliverables: List of causes leading to inadequate utilization of the OT complex		Deliverables: Strategies to improve the surgical volume of the OT complex of the hospital	

Figure 4.1: Project Charter

Measure Phase

In this phase, the quantitative data collected from the OT complex was analysed to find the actual utilization of each of the OT theatres. The total numbers of operations performed from Jan 2025 to May 2025

were cases. June and July is forecasting.

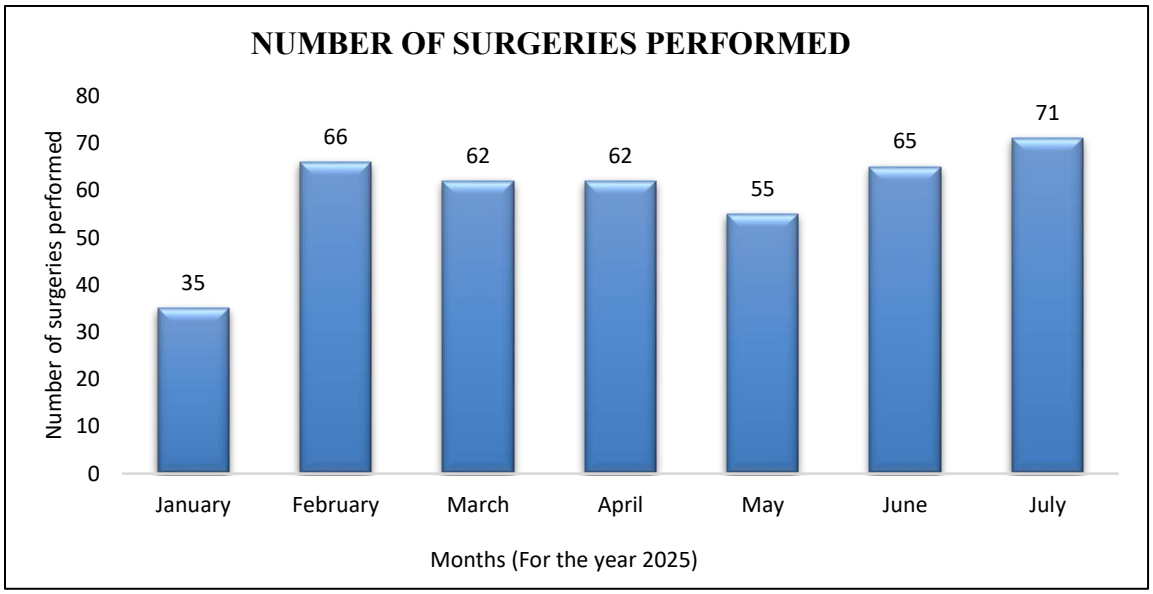

Figure 4.2: Number of surgeries performed in five operating theatres from Jan 2025 to May 2025

Number of emergency surgeries done was 12(2.88%) and elective were 404(97.1%). Of the surgeries performed, 53 percent belonged to the major category and only 10 per cent to the minor (Figure 3).

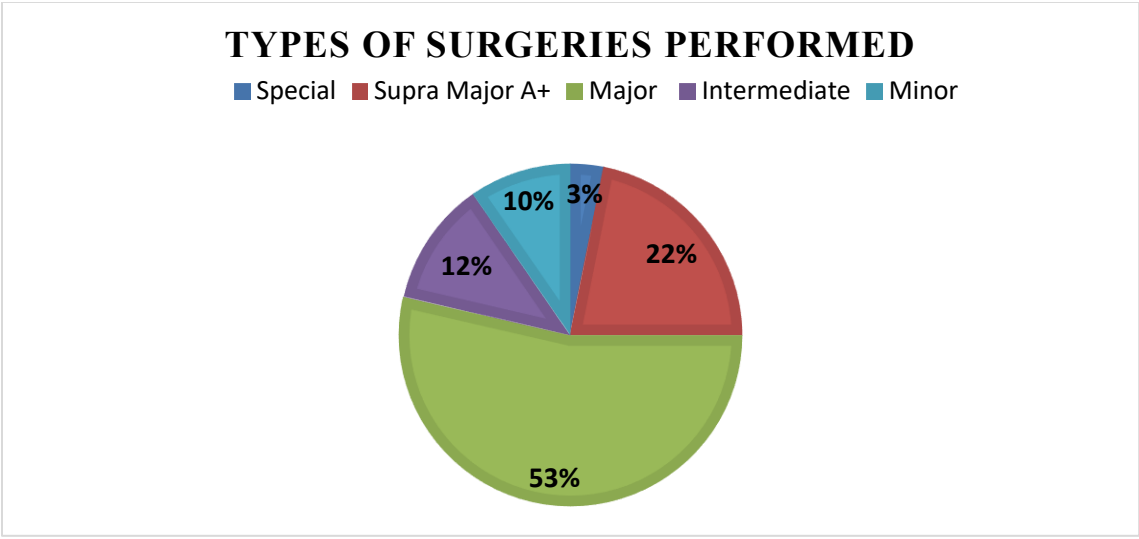

Figure 4.3: Number of surgeries performed based on types from Jan 2025 to May 2025

General surgery contributed to the maximum number of cases (37.01%), followed by orthopedics (15.86%) and cardiac procedures (15.14%).

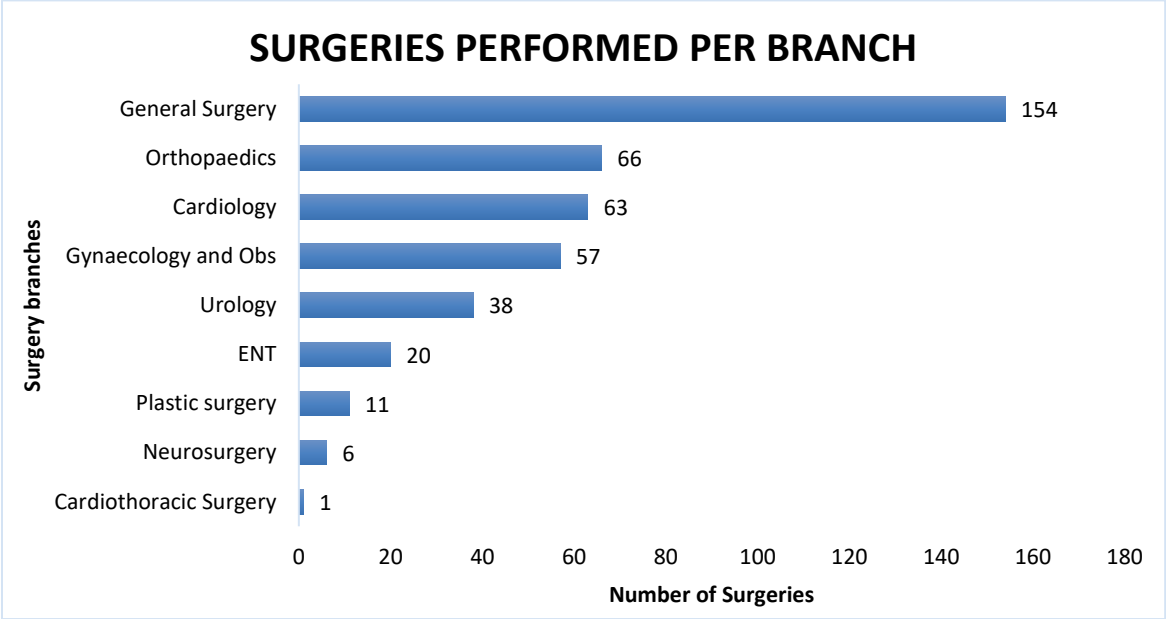

Figure 4.4: Number of surgeries performed by each branch from Jan 2025 to May 2025

This hospital provided free surgery only for cardiac procedures under the Mahatma Jyoti Rao Pule Jan Arogya Yojana (MJPJAY) scheme. Of the cardiac procedures conducted during the study period (63), 60.31% were done under the MJPJAY scheme.

It was found that the average OT utilization from Jan 2025 to May 2025 was highest for cardiac operation theatre (32.5%) .

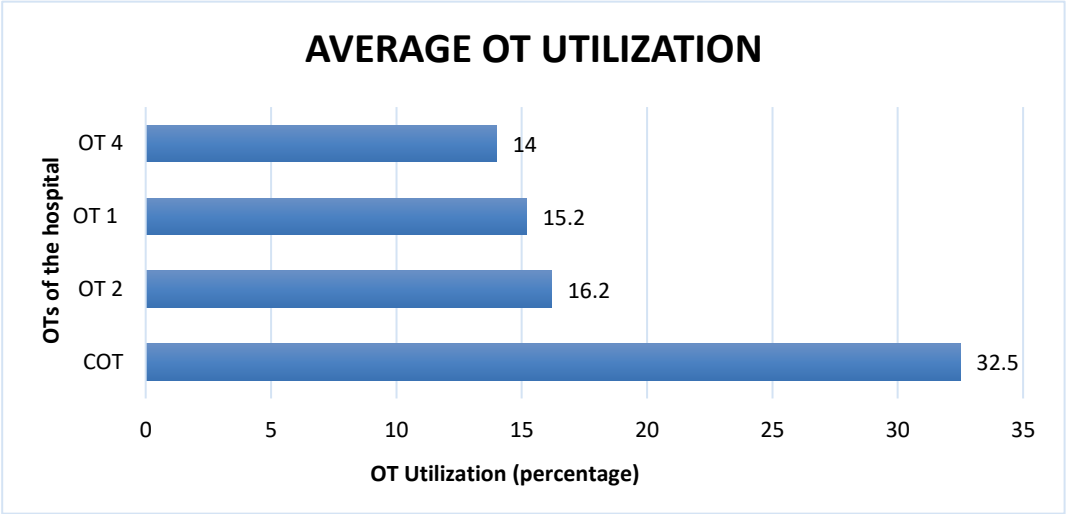

Figure 4.5: Average OT utilization of each OT in the hospital from Jan 2025 to May 2025

Analyzing Phase

In the Analyzing Phase, detailed data analysis is performed to discover the causes of low usage of the OTs. A focused group discussion is conducted with Operating Room staff and other stakeholders. The focused group discussion included ten participants: six surgical consultants from various surgical branches, two OT nurses, a biomedical engineer, and an OT manager. (Table 2). The primary focus of this discussion was to understand their concerns and challenges faced in the OT complex and then get their suggestions on improvements that could be implemented. The discussion lasted for 120 mins. The pre-structured questionnaire consisting of 7 questions was used to drive the discussion and gain insights from the group.

Descriptive details of the FGD participants			
Sr. no.	Role in hospital	Qualification	Employment duration with this organization
1	Visiting Consultant-Ophthalmologist and eye surgeon	MBBS, DNB-Ophthalmology	6 months
2	Visiting Consultant- ENT Surgeon	MBBS, DNB-ENT	12 months
3	Visiting Consultant-General Surgeon	MBBS, MS-gen. surgery	6+ years
4	Visiting Consultant-Urologist and Urosurgeon	MBBS, MS- gen. surgery, MCh-urology and kidney transplant	6+ years
5	Visiting Consultant-Obstetrician and Gynecologist	MBBS, MD, FCPS, DGO, DFP	6+ years
6	Visiting Consultant-Cardiothoracic and vascular surgeon	MBBS, DNB	5 years

7	OT Nurse	GNM	4 years
8	OT Nurse	GNM	5 years
9	Biomedical Engineer	BE- biomedical engineering	7 months
10	OT Manager	BSc, MHA	6 months

Table 4.1: Descriptive details of the focused group discussion participants

Conceptual framework

The topic list of semi-structured questionnaire questions served as the foundation for our conceptual framework. The key themes of our conceptual framework were the following: perceived hospital reputation, employee motivation, and improvement areas. The themes were made up of 11 subthemes that emerged from the data.

The conceptual framework is depicted as a coding tree in Figure 7. Findings and quotes are used in this result section to discuss the most important subthemes for each main theme.

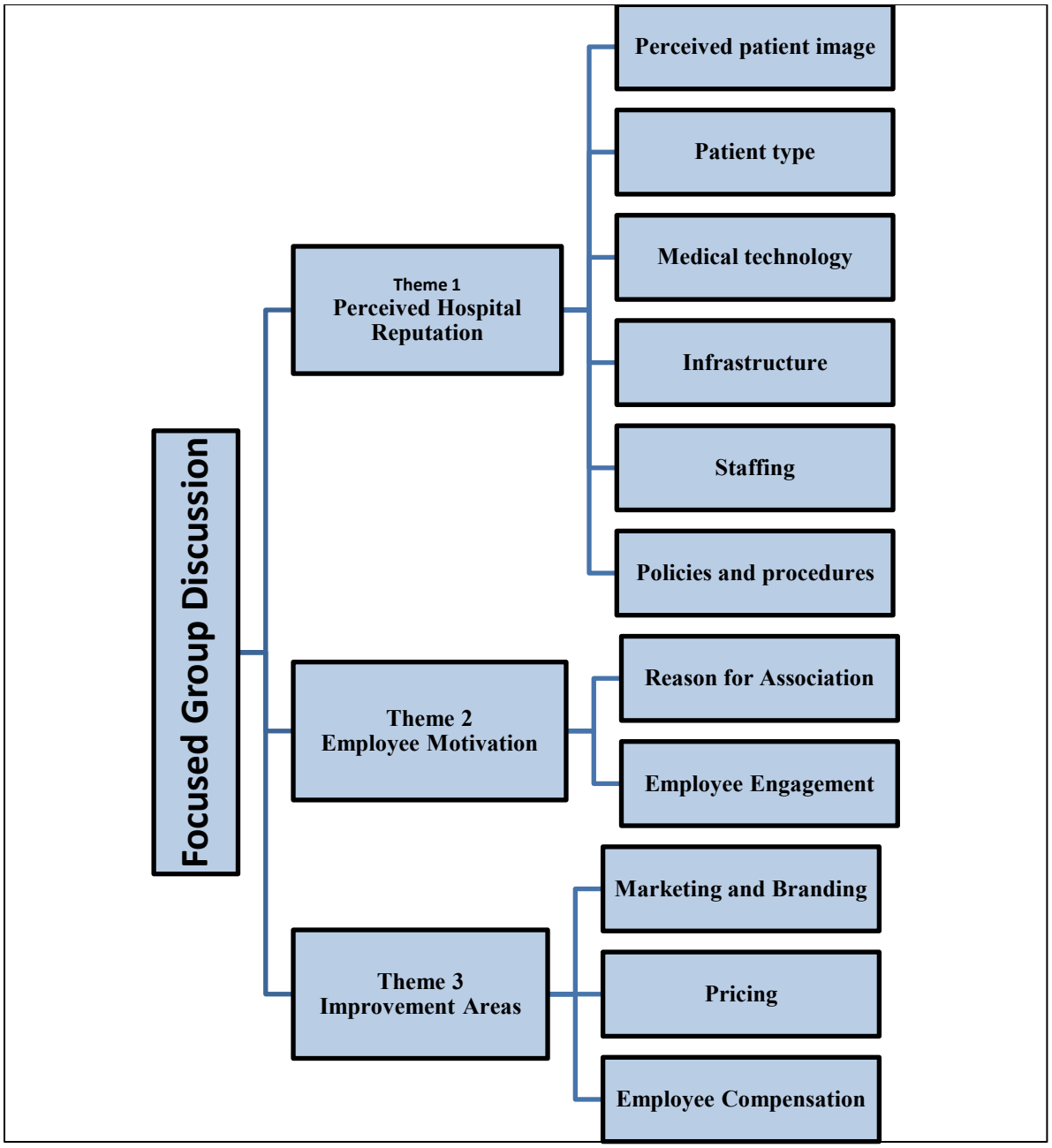

Figure 4.6: Conceptual Framework: The Coding Tree

Perceived Hospital Reputation

This theme includes multiple subthemes, of which perceived patient image and medical technology were particularly significant.

As per the participants, the patient perceived the study hospital as a "typical government hospital" and a "dedicated Covid hospital with minimal facilities available". A second subtheme was medical technology available in the operation theatre complex. Most of them felt that the OT lacked some medical equipment needed during surgery and needed upgradation, which is illustrated by the following quotes: "the laser in the OT is not functional, so I need to carry my laser to perform the surgical procedure." (Consultant 4); "most of the medical equipment have reached the end-of-life stage and they need to be replaced by purchasing new equipment in buyback" (Biomedical Engineer)

Employee Motivation

The reason for the association with hospital and employee engagement were the subthemes under this main theme. Sixty percent of participants have been associated with the hospital for five years, which is why their reason for association was related to that. "I have been associated with this hospital since its inception, starting as a full-time consultant, and now, I continue here as a visiting consultant and surgeon and give back to it." (Consultant 3)

Employee engagement was essential for the proper functioning of the department and also to motivate employees. A positive experience shared during the discussion: "I continue to perform my surgeries in this hospital because the staff is very efficient, friendly and supportive, which helps me be at peace while I perform surgery." (Consultant 6) However, there were negative experiences shared during the discussion as well: "Having associated with the hospital for more than six years now, I do not feel the management acknowledges and promotes the services I render here." (Consultant 5) "the staff in the OT is good, but we do not feel there is someone to listen and discuss our problems here." (OT Nurse 1)

Improvement Areas

For improvement areas, the main subthemes were marketing and branding, pricing and employee compensation. Most of the participants pointed out that the customers were misperceiving the hospital, so a good marketing strategy was needed to attract more patients, whom the following quote could illustrate: "Many patients are not aware that the hospital has resumed their normal services, a few days back a patient called me to ask if it was safe to come to the hospital as it was dedicated covid hospital" (Consultant 1) Some also suggested different marketing and branding strategies like conducting school camps, awareness camps and individual marketing would also help bring in more patients.

The participants felt the pricing of packages needs to be more competitive. "The relatives ask why the surgery package costs too much, why would they pay Rs.45000 as a deposit when they are caseless patients, and because of this, I do not see some enquiries getting converted to surgeries performed here" (OT manager). The surgeons were unhappy with the affiliation fee percentage ratio being practiced in this hospital.

Because of this, a Cause-and-Effect diagram was created. Causes of underutilization were identified using the Cause-and-Effect diagram. The key causes were manpower, machine, methods, and marketing and branding. All the concerns connected to staffing were grouped under manpower. Similarly, medical equipment-related difficulties under machines and methods included policies and administrative challenges. Within the marketing and branding header, marketing and branding difficulties were highlighted; these causes were then categorized as controllable and non-controllable. All of the causes were found to be controllable in this case.

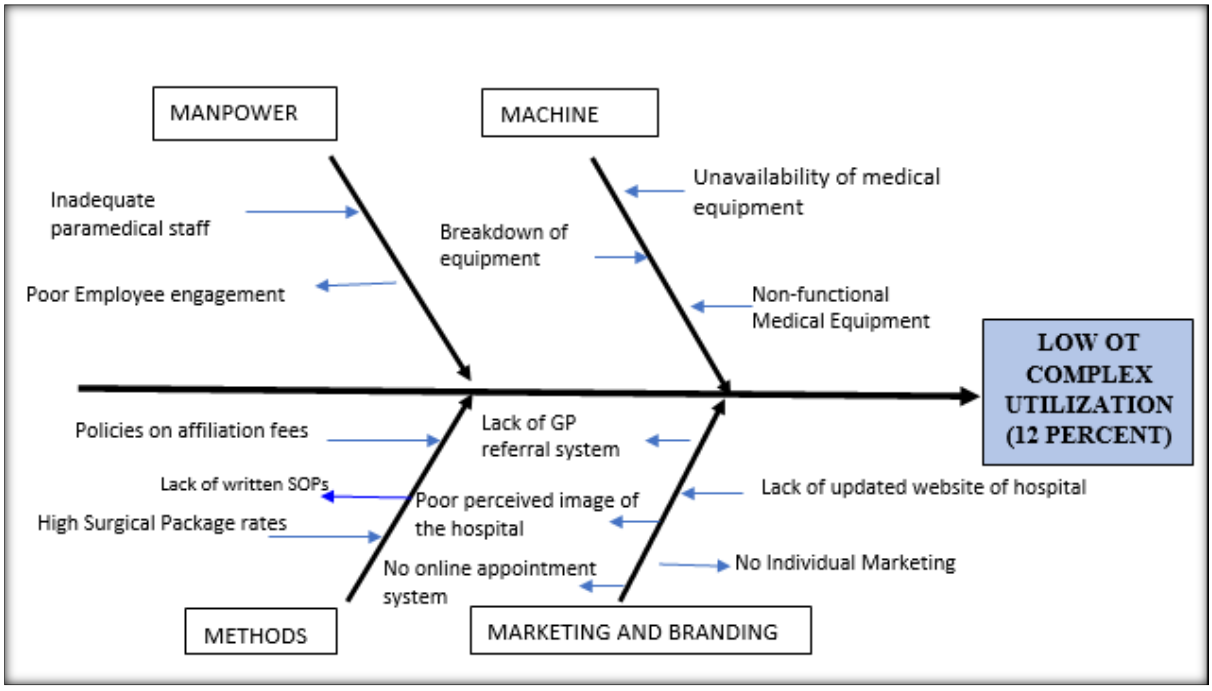

Figure 4.7: Ishikawa Diagram (Cause and Effect Diagram)

Improving Phase

During this phase, a brainstorming session was held with management and a hospital management expert to examine potential solutions to the difficulties encountered. Table 3 highlights the brainstorming session's potential options.

Issues	Priority	Potential solutions
Issue 1 Marketing and branding strategies	High	**<u>To change the perceived image of the hospital</u>** • Website Updation of the hospital and promote the services provided by the hospital • Online appointment feature on the website • Advertise the hospital through pamphlet's in newspaper • Make use of patient and doctor testimonials • Design an E-marketing strategies • The hospital should try for entry-level accreditation • Design a suitable service mix to be differentiated in the market **<u>To increase the patient flow of the hospital</u>** • General practitioner referral system • Medical camps • Awareness sessions and seminars • Employee marketing strategies • Coupons or discount strategies could be looked up
Issue 2 Employee Engagement	High	• Interdisciplinary team meets where the employees could interact and also discuss learnings, concerns, best practices • CMEs • Achievement board could be set up where the best-performing employees are recognized and acknowledged for their hard work • Having more focus group discussions to address concerns of the surgeons, nurses
Issue 3 Employee compensation	High	• One-on-one conversation with the top performing surgeons, consultants, and try to understand their perspective on the affiliation fees and come to a middle path where it is beneficial both to the hospital and the employees
Issue 4 Policies and SOPs	Moderate	• Design the written SOPs to be followed in the department. • Training sessions to explain each stakeholder's role • Compliance check

Issue 5 Tariff Rates	Moderate	• Tariff rationalization
Issue 6 Medical equipment	High	• All the AMC/CMC records must be maintained in a file for easy access • The equipment that has a buyback offer must be considered a priority and replaced • There should be a defibrillator in each major OT, so the purchase should be made for the same • Equipment refurbishment, replacement, and decommissioning policies should be clearly defined. • Medical equipment calibration must be performed regularly
Issue 7 Manpower	High to moderate	• The hospital must plan to onboard full-time surgeons and consultants • A few BSc nurses should be hired • Hire new staff

Table 4.2: Outcome of the brainstorming session where potential solutions were discussed.

Control Phase

During this phase, it was suggested that task assignments be clarified and given to quality personnel, ward, and operation theatre staff with sufficient authority to ensure strict adherence to the policy and enable constant monitoring.

Chapter 5- Discussion

The study's key finding was that operation theatres were underutilized, and the average utilization of each OT was 32.5%, 16.2%, 15.2%, and 14% for COT, OT 2, OT 1, and OT 3, respectively. The utilization of OT is lower than the global standard of 80% · This study emphasized the concerns and obstacles that contributed to the low usage of the operation theatre complex in this hospital, which impacted the hospital's revenue. Focusing on these challenges may result in increased OT utilization and, as a result, increased hospital revenue. The most glaring constraints we observed were the lack of marketing and branding initiatives to promote patient flow, the policies and surgical package pricing, employee engagement and medical technology deployed in the facility. The findings were consistent with those reported by Dwiki Yessi Farantika et al., who noted that the type of employment, product mix, pricing mix, and promotion combination all had significant associations with patients' decision-making when selecting outpatient health services.

In our study, most participants agreed that the hospital needed a strong marketing and branding strategy to boost patient flow. Due to increased competition, the operation of the healthcare sector now heavily relies on service marketing and is transitioning from the dominance of service providers to the preference of service seekers. As a result, the hospital must not completely rely entirely 'word-of-mouth' promotion to recruit patients. Hospital administration must work more than ever to establish and promote the hospital as a brand. Vijay Bhangale et al. conducted a study that highlighted the importance of marketing and branding in hospitals and reviewed various techniques used by hospitals in Mumbai.

The strategies discussed in the article are listed in the table below.

Hiranandani Fortis Hospital	Health camps, seminars, and leaflets, as well as local cable television, hoardings, and billboards.
Kokilaben Dhirubhai Ambani Hospital	Billboards, doctor meetings, business meetings, media, celebrations of major days (No Tobacco Day, World Health Day), patient educational programmes (cancer awareness program, menstrual hygiene program)
Wockhardt Hospital	Coupons for health check-ups, health talks at general practitioners' clinics, corporate partnerships, Twitter, Facebook communities, YouTube, even live cardiac surgery that other patients can see.

Hinduja Hospital	Health camps, print and electronic media, e-marketing, an obesity workshop, a hip replacement promotional campaign, a sleep apnea workshop, and health programs
S.L. Raheja Hospital	Health check-up clinics, workshops, and public awareness events
Asian Heart Hospital	CMEs, medical camps, e-marketing, collaboration with the Mumbai Marathon, 'Brave Heart' Awards, enlisting a brand ambassador as the face of Helpline '126-126,' talk show on news channels, corporate tie-ups, employee and service marketing
Nanavati Hospital	Workshops, seminars, book series, patient education, health examinations, and so on.
Fortis Healthcare	Advertisements for Fortis Healthcare in the media (newspapers)

Table 5.1

It also noted that marketing hospitals to general practitioners (GP) (creating a referral network) is critical because a reference from a "family physician" is essential in patients' decision-making. A study by Arun Sarma et al. indicated that healthcare marketing plays a crucial role in helping healthcare workers create, communicate, and bring benefits to the target market. Through their high-quality services and reputation, hospitals with a well-planned marketing strategy can stay ahead of their competition and develop long-term relationships with their patients.

Outcome measurement in an Indian study article published in international conference proceedings revealed an increase of 11% in OT used by internal marketing strategy. To ensure enough patient flow to the hospital, it is critical that the study hospital researches marketing and branding trends and prepares a strategic strategy based on practicality and budget availability.

Based on the results of our study, we also recommend that the hospital can work on the package pricing strategy. Studies have shown that the pricing in healthcare organizations should be rational, following expenditures and services acquired rather than utilizing patient consumer ignorance to boost healthcare organizations' profits. Regardless of the type of hospital, the hospital management must practice tariff rationalization through a solid costing system. An efficient costing system guarantees affordable patient care, fostering patient loyalty to the hospital and preserving a healthy top and bottom line. Costing should be done by carefully examining historical data, comparative data from other hospitals, research on capacity usage, and actual asset utilization.

The findings of our study showed that employee engagement and compensation are the motivating factors for the employees to work in the hospital. The result here is similar to a study done by Wallace et al., where motivation and team familiarity were identified as the significant factors behind efficiently running operating theatres, supporting the use of regular operating teams and maintenance of a highly motivated workforce. A study by Tait D. Shanafelt et al. stated that having an engaged physician workforce in healthcare organizations is critical to meet institutional objectives and achieve their mission as it has strong linkage with quality of care, patient safety, and patient satisfaction. Having engaged workforce also helps organizations to reduce physician burnout and promote physician engagement. Many healthcare organizations have linked physicians' financial compensation to productivity. So, the hospital management should engage and communicate with their employees to know their problems and struggles and also communicate the organizational goals and objectives.

The other issue identified in our study was the breakdown or lack of medical equipment leading to underutilization of OT. This outcome is analogous to one found in a study where there were delays and cancellations in the OT room due to a lack of necessary equipment on time. Another study also indicated that proper functioning of OT requires good hospital management, provision of different medical and surgical services such as equipment, medications, time utilization, sterilization, and control of infections.

The substantial aspect of the current case study is that it tried to identify the causes for the underutilization of services in hospitals, particularly that of an OT complex with a mixed method approach which provided us with the opportunity to identify issues without detail, complexity, and context.

This is in contrast with most of the studies done on OT, which usually consider the turnover time of the different OT activities or perform time-motion studies. Another advantage was we conducted the focused group discussion by including all the stakeholders involved in OT activities, potentially resulting in more productive interviews. Using this study's findings, the hospital should focus on testing multiple potential interventions to determine which (combination of) interventions work best for this hospital.

Despite the study's strengths, there were some limitations, which are discussed in the coming chapter.

Chapter 6- Conclusion

- In the current case, the hospital's management wanted to improve the surgery volume to increase revenue; thus, we applied the mixed method technique.
- The case study revealed two significant findings: poor marketing, branding, and pricing strategies, as well as poor employee engagement and remuneration, all of which contributed to the hospital's low patient flow, which resulted in low surgery volumes.
- The mixed method approach sheds light on these difficulties from the stakeholder's perspective. It helped to identify solutions that could contribute to increased patient flow and surgical volume in this hospital's operating room shortly.
- We recommend that the hospital organize more such meetings with stakeholders to identify the problems fundamental cause and then implement mitigation technique.

Recommendations

After the identifying the issues leading to low surgical volume, we brainstormed on multiple solutions that could be implemented. Finally, the best suitable solutions that the hospital could use to improve the surgical volume and in turn generate more revenue were suggested. The solutions were provided with regard to the causes of each component of the cause-and-effect diagram..

Marketing and Branding	• Hiring a digital marketing assistant under the Marketing Manager could be wise • The frequency of website updates should be modified from annually to monthly • The website should incorporate an add-on function for an online appointment system • The e-marketing plan should be created within a six-month time frame and include awareness seminars, patient and consultant testimonials, and awareness-based posts • In collaboration with the NGOs, medical camps could be organised • General practitioners within a 2 to 5 km radius should be contacted to enhance patient flow in the hospital. A referral system could be built by deciding on the cut % for referrals • To build a brand the hospital should try for entry-level accreditation
Medical Equipment	• Before purchasing new medical equipment, check for buyback offers • AMC/CMC records should be kept in a file for proper storage • Instrument preventive maintenance and calibrations should be conducted regularly
Policies and Standard operating Procedures	• OT Manager must develop a SOP to be followed by the staff and check for compliance

Employee Compensation	• As in this case some of the top performing employees are not satified with the remuneration, the management could talk one-on-one with those employees to understand the issue and then decide on the retention strategy by providing some rewards and incentives
Surgical Package rates	• A market research should be carried out to assess the package rates of the hospitals within the catchment area (5km radius) to know the trends • Tariff rationalization should be carried out by taking help of the finance department
Manpower	• Once there is increase in surgical volume, the staffing must be increased to ensure efficiency in the delivery of services
Employee Engagement	• The HR manager must ensure that all the employees in the organization are feeling motivated to perform the job • HR manager can conduct interdisciplinary team meetings once a month so the doctors culd share their best practices • Grivience addressal system for all the employees must be in place

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