Title: Enhancing Operational Efficiency in a Multi-Specialty Hospital

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Case study overview

Recently been hired as a Business Analyst by HealthFirst Care, a leading multi-specialty hospital renowned for its high-quality patient care and advanced medical facilities.

The hospital has launched an initiative to enhance the overall patient experience in light of increasing patient complaints and operational challenges.

Case study overview

The management has identified key areas for improvement, including:

- Reducing wait times
- Optimizing resource allocation
- Improving communication between stakeholders

Task overview

As a Business Analyst, I have been tasked with driving this initiative. My role involves:

- Gathering stakeholder requirements
- Analyzing existing processes
- Developing data-driven solutions to improve operational efficiency
- Developing risk assessment and mitigation plan

Task 1

Business Requirement Document (BRD)

A BRD defines the business objectives, project scope, key requirements, stakeholder expectations, and deliverables for a project.

My task includes writing the following:

Problem statement

Patients face delays, double-bookings, and poor updates, while doctors, nurses, and administrative staff struggle with overbooked schedules, resource shortages, and outdated systems. Fragmented IT systems further reduce efficiency and patient satisfaction, highlighting the need for a structured solution.

Key requirements to improve operational efficiency

Patients: Easy scheduling, automated reminders, post-consultation updates
Doctors & Nurses: Conflict-free schedules, real-time diagnostics, smooth handoffs
Admin Staff: Automated scheduling, quick records, error-free billing
IT Team: Integrated cloud HIS, secure interface, analytics
Functional: Online booking/rescheduling, dashboards, integrated systems, patient feedback
Non-Functional: ≥99% uptime, secure, scalable, multi-device, fast response

Constraints

- Limited budget for IT system upgrades.
- Existing infrastructure may restrict certain enhancements.
- Staff resistance to adopting new technologies.

Acceptance criteria

Patients: Book/reschedule/cancel appointments, get automated reminders, post-consultation updates
Doctors & Nurses: Conflict-free schedules, real-time diagnostics, smooth handoffs
Admin Staff: Accurate scheduling, quick records, error-free billing
IT/Technical: Integrated HIS, ≥99% uptime, multi-device, fast response, secure & scalable
General: Real-time dashboards, patient feedback captured

Task 2

Requirement Traceability Matrix (RTM)

A Requirements Traceability Matrix maps and tracks project requirements throughout the lifecycle, ensuring that each requirement is addressed, tested, and aligned with business objectives, stakeholder needs, and project deliverables. The below are the findings of the RTM:

Categorize requirements into functional and non-functional

Functional Requirements:

- Patients can book, reschedule, or cancel appointments online.
- Real-time appointment availability to prevent double-bookings.
- Automated SMS/Email reminders for patients.
- Dashboard for monitoring staff and resource utilization.
- Patient feedback capture and reporting functionality.
- Integration of scheduling, billing, and record systems.

Non-Functional Requirements:

- System uptime ≥ 99%.
- Data security compliant with healthcare standards (HIPAA/GDPR).
- Scalable system supporting growing patient volumes.
- Multi-device accessibility (desktop, mobile, tablets).
- Response time under 2 seconds for scheduling operations.

Requirement Traceability Matrix (RTM)

Categorize requirements using MoSCoW method

Priority	Description	Examples from RTM
Must have	Essential for project success; cannot be delayed	Automate appointment scheduling, Prevent double bookings, Data security (HIPAA/GDPR), System uptime ≥ 99%
Should have	Adds significant value but not critical	Dashboard for monitoring resources, Multi-device access, Scalable system
Could have	Desirable but not essential; can be included if resources allow	Analytics for patient trends, Optional advanced reporting
Won't have	Not feasible in current scope; deferred for future	AI-based predictive scheduling (future enhancement)

Requirement Traceability Matrix (RTM)

List requirements based on priority

High Priority

- Online booking, rescheduling, and cancellation for patients
- Conflict-free schedules for doctors & nurses
- Integrated HIS (scheduling, billing, records)
- Automated SMS/Email reminders
- System uptime ≥ 99% and secure (HIPAA/GDPR)

Medium Priority

- Real-time diagnostics and equipment availability
- Quick record retrieval and error-free billing
- Dashboards for staff and resource monitoring
- Post-consultation instructions and prescriptions

Low Priority

- Patient feedback capture and reporting
- Multi-device accessibility
- Scalable system for future growth

Task 3

Stakeholder Analysis and Engagement Plan

The Stakeholder Analysis and Engagement Plan identifies key stakeholders, understands their interests and influence, and develops strategies to effectively communicate, engage, and manage their expectations throughout the project lifecycle.

Identifying and documenting stakeholders and categorizing based on influence (high, medium, low)

Stakeholder Group	Role / Profile	Influence Level	Interest Level
Patients	• Sarah Ayvazyan • Lak Ayer	Low	High
Doctors	• Dr. Aftab Khan (Cardiology) • Dr. Robert Lee (Orthopaedics)	High	High
Nurses	• Santa Murmu (Pediatric) • Jessica Gomes (ER)	High	High
Administrative Staff	• Maria Carter (Appointment Scheduler) • Ivan Walker (Billing Administrator)	High	High
IT Teams	• Rajesh Singh (IT Manager) • Laura Simkow (Software Developer)	High	Low
Hospital Leadership	Executive Management	High	Low
Support Staff	• Maintenance • Clerical	Low	Low

Stakeholder Analysis and Engagement Plan

Listing stakeholder engagement strategies and communication plan

	High Interest	Low Interest
High Influence	Key Players • Doctors (Dr. Aftab Khan, Dr. Robert Lee) • Nurses (Santa Murmu, Jessica Gomes) • Administrative Staff (Maria Carter, Ivan Walker)	Keep Satisfied • IT Teams (Rajesh Singh, Laura Simkow) • Hospital Leadership
Low Influence	Keep Informed Patients (Sarah Ayvazyan, Lak Ayer)	Monitor Support Staff (Maintenance, Clerical)

Stakeholder Group	Method	Purpose of Engagement	Frequency
Key Players (Doctors, Nurses, Admin Staff)	Weekly meetings, detailed reports, dashboards	Gather feedback, monitor progress, ensure alignment	Weekly
Keep Satisfied (IT Teams, Leadership)	Periodic email updates, summary reports	Keep informed of progress, address concerns	Bi-weekly
Keep Informed (Patients)	Newsletters, dashboards, surveys	Provide updates, gather feedback on satisfaction	Monthly
Monitor (Support Staff)	Passive updates via reports, meeting notes	Inform about relevant changes without active participation	As needed

Task 4

Scope Management Plan

The Scope Management Plan defines how the project scope will be planned, documented, validated, and controlled to ensure that all project objectives and deliverables are met while preventing scope creep.

Categorizing scope into in-scope & out-of-scope

In-Scope Activities:

- Automating appointment scheduling
- Implementing resource tracking dashboards
- Developing real-time notification systems

Out-of-Scope Activities:

- Hospital construction projects
- Hiring additional clinical staff

Identifying assumptions and constraints

Assumptions: Stakeholder availability for reviews, accuracy of provided data.

Constraints: Budget limits, project timelines, regulatory compliance (e.g., HIPAA).

Defining phases in the Work Breakdown Structure (WBS)

- Phase-1: Requirements Gathering
- Phase-2: System Design
- Phase-3: Development and Integration
- Phase-4: Testing
- Phase-5: Deployment and Training
- Phase-6: Monitoring and Support

Note Scope Change Management

Scope Change Request Process: Defines steps for submitting, reviewing, and approving changes to project scope.
Approval Criteria: Evaluates changes based on alignment with project objectives, budget impact, and feasibility.
Stakeholder Roles: Identifies approvers, such as Project Manager and Hospital Leadership.
Scope Monitoring and Validation: Ensures that all changes are documented, communicated, and aligned with the BRD and RTM.

Task 5

Process Map Diagrams

The Process Map Diagrams visually represent the workflow of a system or process, identifying inefficiencies, redundancies, and areas for improvement to enhance operational efficiency and decision-making. The below table is filled with processes along with inefficiencies identified using the As-Is model and areas of improvements identified using the To-Be model:

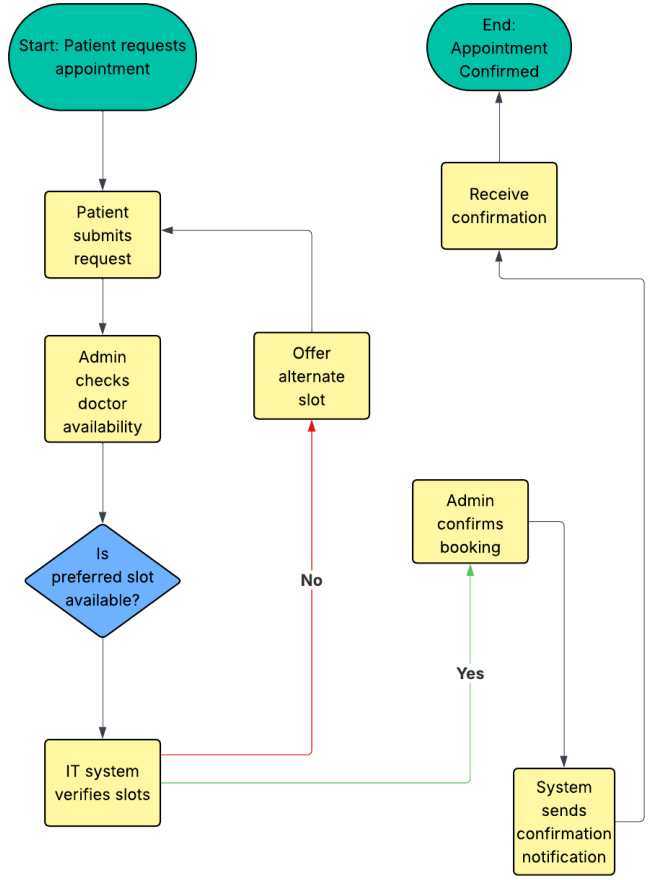
Process	As-Is model	To-Be model
Appointment Scheduling	• Manual booking processes lead to frequent **double or triple bookings**. • Lack of real-time conflict detection results in delays and patient dissatisfaction. • Notifications to patients are manual, delayed, and inconsistent.	• Introduces **real-time availability checks** to eliminate double bookings. • Provides **automated SMS/Email confirmations** for transparency. • Reduces administrative workload and improves patient satisfaction.
Patient Check-In	• Heavy reliance on **paper-based forms** causes long wait times. • Verification of patient details by staff is slow, leading to bottlenecks. • Repetition of tasks (e.g., re-filling incomplete forms) adds to inefficiency.	• Implementation of **self-service kiosks** or online pre-check-in reduces manual paperwork. • Immediate verification speeds up the process, reducing waiting times. • Enhances patient experience by providing faster, seamless entry.
Interdepartmental Communication	• Requests for resources (e.g., IT support, equipment) are handled via **emails or calls**, which are prone to miscommunication. • No centralized tracking system for issue resolution leads to delays. • Lack of accountability and visibility into the status of requests.	• A **dashboard/task management system** ensures requests are logged, tracked, and auto-notified to the right department. • Improves accountability, reduces delays, and ensures timely issue resolution. • Enhances collaboration between administrative staff and IT teams.

Task 6

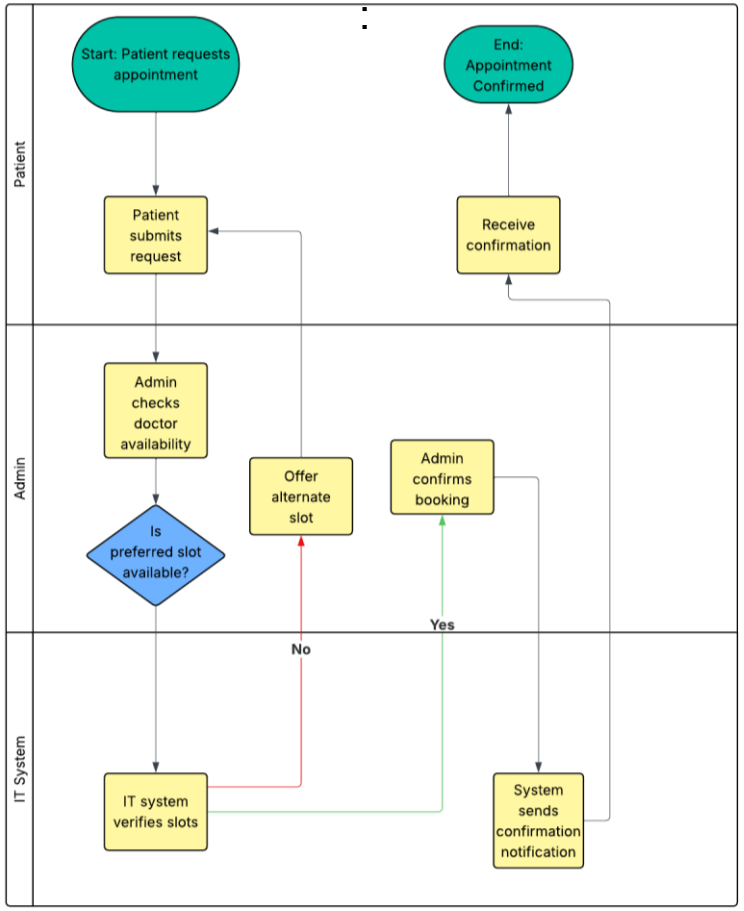
BPMN and Swimlane Diagrams

BPMN and Swimlane diagrams provide a structured visual representation of business processes, clarifying roles, responsibilities, and interactions among different stakeholders to enhance workflow efficiency and communication.

Workflow using Advanced BPMN Model



Stakeholder responsibilities using Swimlane diagram



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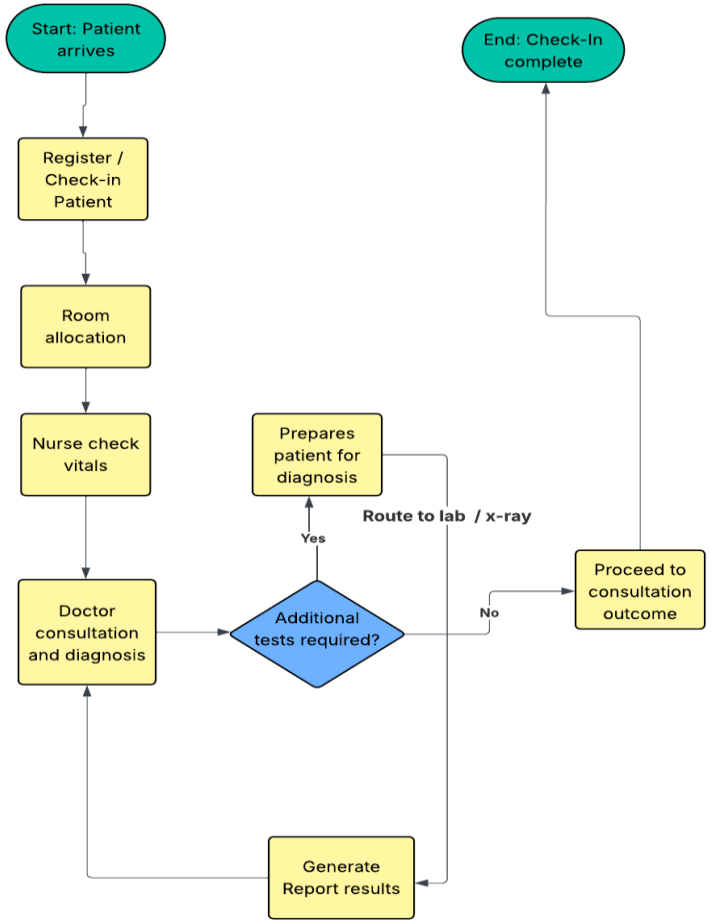

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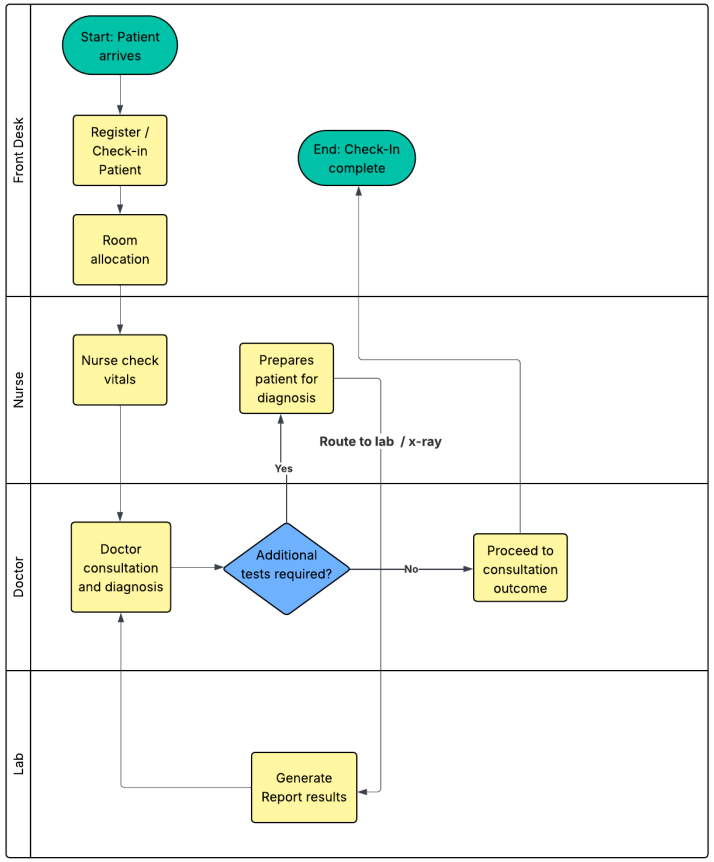

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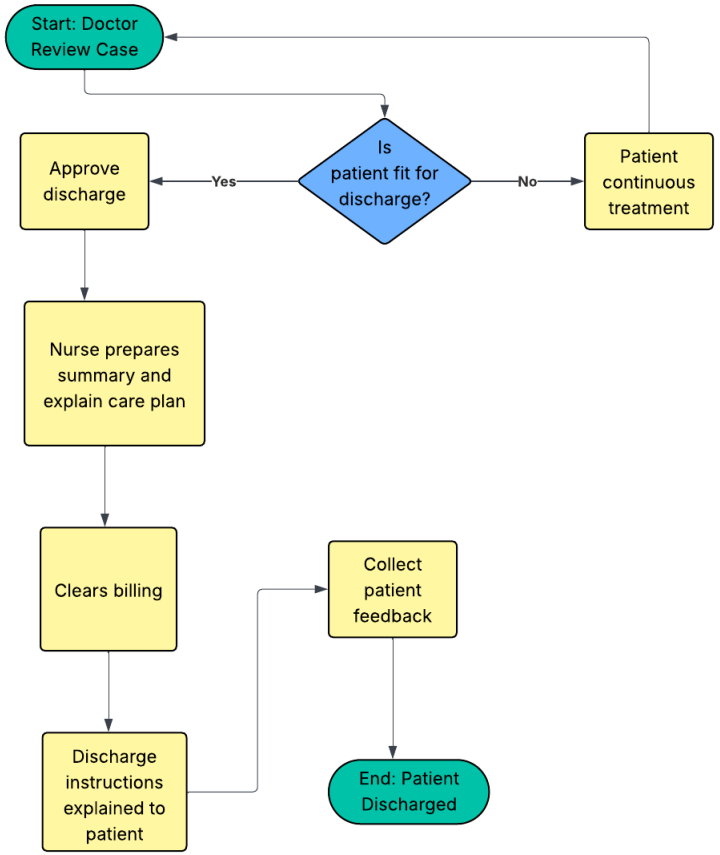
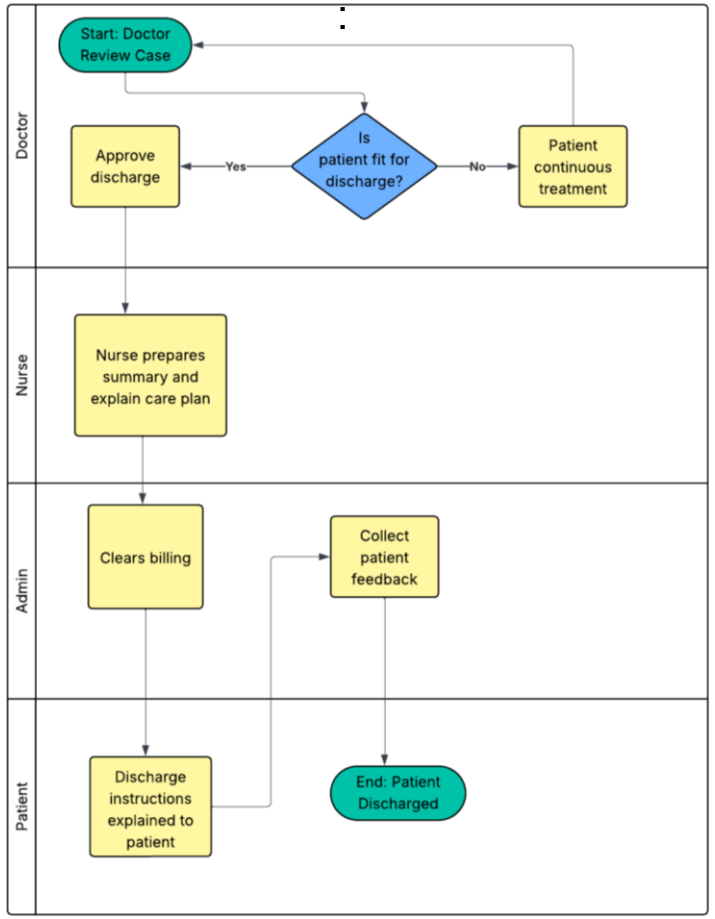


Stakeholder responsibilities using Swimlane diagram



Task 7

Data Analysis Document

The Data Analysis Document summarizes the key findings, trends, and insights derived from patient and resource data, providing evidence-based recommendations to enhance hospital operations and patient satisfaction.

Trends identified using Pivot Table

department	Average of Feedback Score
Cardiology	7.03
General Medicine	5.48
Neurology	6.36
Oncology	6.51
Orthopedics	5.93
Pediatric	6.24
Grand Total	6.31

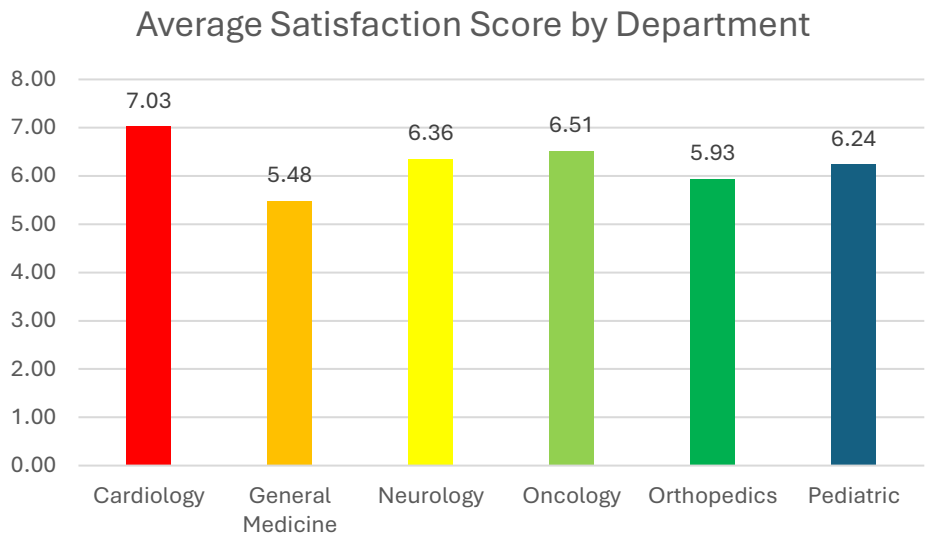
Department	Average resource utilization
Cardiology	4.57
General Medicine	4.51
Neurology	4.29
Oncology	3.76
Orthopaedics	4.62
Pediatric	4.80
Grand Total	4.42

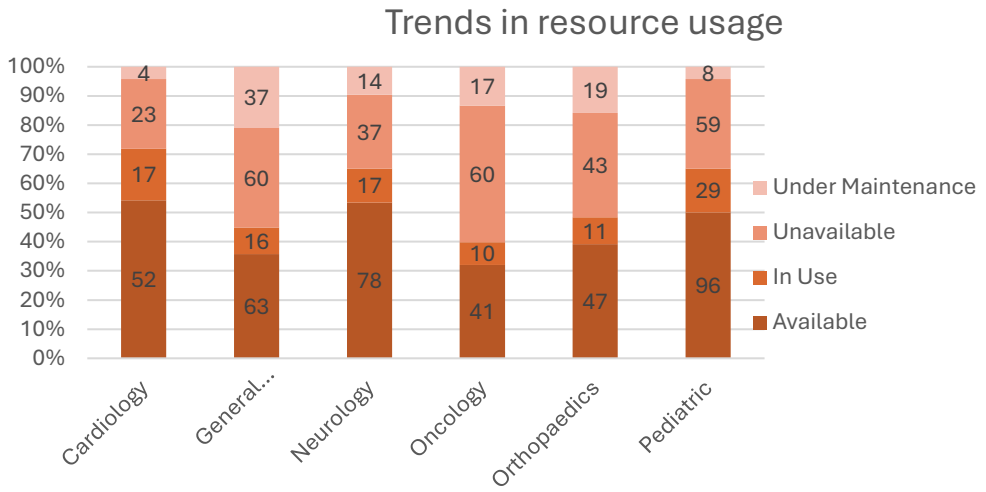
Sum of Usage Hours	Column Labels				
Row Labels	Available	In Use	Unavailable	Under Maintenance	Grand Total
Cardiology	52	17	23	4	96
General Medicine	63	16	60	37	176
Neurology	78	17	37	14	146
Oncology	41	10	60	17	128
Orthopaedics	47	11	43	19	120
Pediatric	96	29	59	8	192
Grand Total	377	100	282	99	858

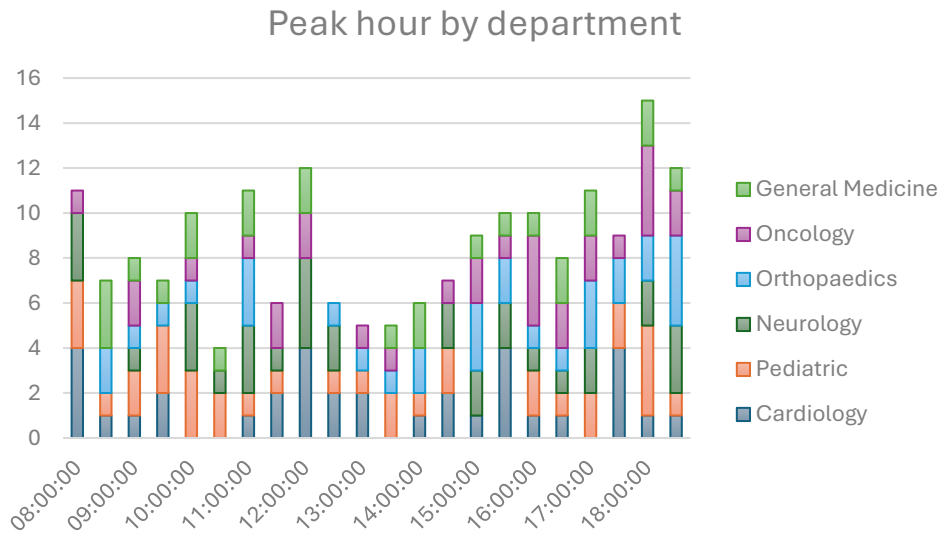
Count of Feedback Score	Satisfaction Score		
Hour of Time	High	Low	Grand Total
8	15	3	18
9	12	1	13
10	13	1	14
11	15	2	17
12	16	1	17
13	8	2	10
14	10	2	12
15	16	2	18
16	13	4	17
17	16	2	18
18	20	6	26
Grand Total	154	26	180

Data Analysis Document

Analyzed trends







Data Analysis Document

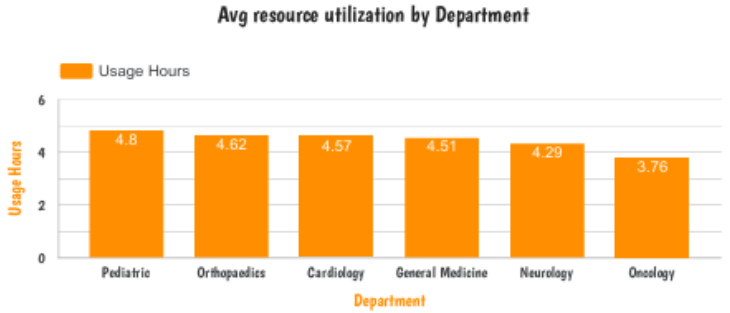
Key insights

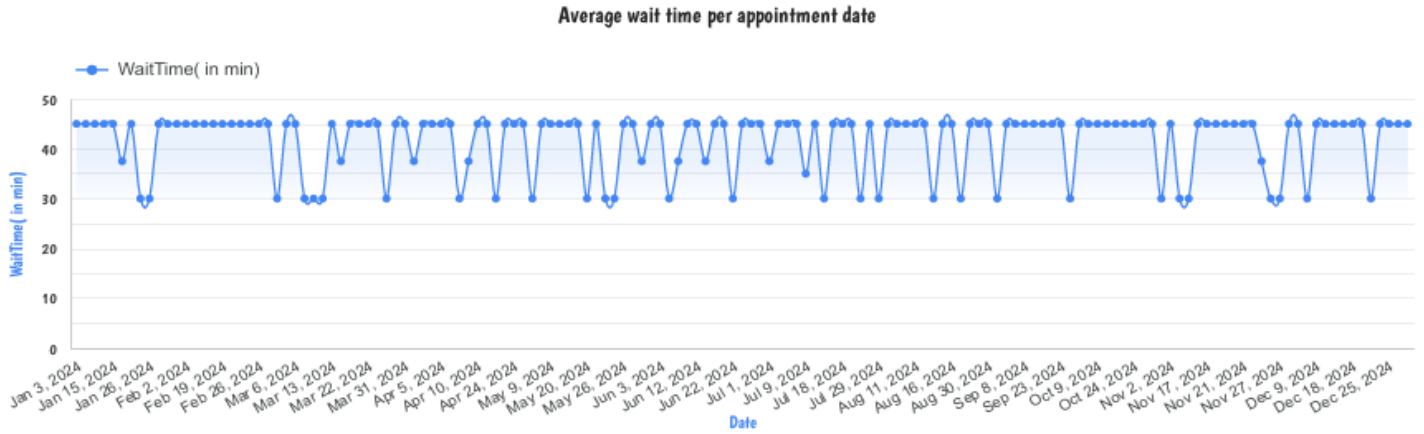
- General Medicine & Orthopaedics underperform in feedback, strongly linked to resource unavailability.
- Oncology resources are underutilized, suggesting mismatched scheduling.
- Appointments are clustered in evening slots (5–6:30 PM), causing patient dissatisfaction during peak hours.
- Thursdays have the lowest patient load and can be optimized to balance demand.
- Patient satisfaction overall is positive (85%+ high feedback), but key stress points (4 PM & 6 PM) require targeted interventions.

Task 8

Dashboard

Dashboards visualize key operational metrics, such as patient wait times, resource utilization, and staff productivity, enabling data-driven decision-making for improved hospital efficiency and patient experience.





Resource usage count across departments

	Department	ResourceID
1.	Pediatric	40
2.	General Medicine	39
3.	Oncology	34
4.	Neurology	34
5.	Orthopaedics	26
6.	Cardiology	21

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Task 9

Risk Management Plan

The Risk Management Plan identifies, assesses, and mitigates potential risks—such as data privacy concerns, system integration challenges, and operational inefficiencies—to ensure smooth project execution and improved patient care.

Risks identified in the risk register

Risk ID	Risk Description
R1	Staff resistance to new system
R2	System downtime during peak hours
R3	Data breach risk
R4	Poor adoption by clinicians
R5	Misaligned expectations with leadership

Categorized risks based on the Risk Assessment Matrix

	Low Impact	Medium Impact	High Impact
High Likelihood		R1	
Medium Likelihood		R4	R2
Low Likelihood			R3, R5

Risk Management Plan

Elements identified in the SWOT Analysis

STRENGTH	WEAKNESS
• Strong leadership support • Reliable, cleaned operational data • Clear stakeholder requirements	• Manual workflows still exist • Departmental data silos • Limited staff technical training
OPPORTUNITY	THREAT
• Process automation through digital tools • Staff training & skill development • Improved patient satisfaction via reduced wait times	• Data breaches or compliance issues • Staff/stakeholder resistance to adoption • System downtime impacting service delivery

Key insights

Strengths can accelerate adoption

- Strong leadership backing and clear requirements reduce resistance.
- Reliable operational data supports better analytics and decision-making.

Weaknesses highlight change needs

- Manual workflows and siloed data slow efficiency.
- Limited staff training risks poor adoption of new systems.

Opportunities align well with weaknesses

- Process automation directly addresses manual workflows.
- Staff training programs can overcome skill gaps and resistance.
- Improved efficiency links to better patient satisfaction.

Threats require proactive mitigation

- Data breaches demand stronger security and compliance.
- Staff resistance requires change management and stakeholder engagement.
- System downtime must be addressed with reliable IT infrastructure and backup systems.

Overall Insight:

If leadership leverages existing strengths (support + data) while investing in automation and training, the hospital can overcome weaknesses and seize opportunities. However, ignoring staff readiness, security, and IT resilience could turn threats into major project risks.

Task 10

Risk Mitigation Plan

The Risk Mitigation Plan identifies potential risks, assesses their impact, and implements strategies to minimize disruptions, ensuring smooth hospital operations and improved patient care.

Strategies to mitigate risks	Factors included in your Contingency Plan	Prioritized risks based on Visual Risk Matrix	Key insights from Risk Mitigation Plan
Provide training & change management workshops	Change Management & Training	Staff resistance to new system	• High risks: Staff resistance & system downtime • Medium risks: Data breaches, clinician adoption, leadership alignment • Risks span operational, technical, and stakeholder areas • Adoption & stakeholder engagement are as critical as IT stability
Implement backup servers & maintenance schedules	IT Reliability & Backup	System downtime during peak hours	
Enhance security protocols, regular audits	Data Security & Compliance	Data breach risk	
Involve clinicians early, gather feedback	Stakeholder Engagement &	Poor adoption by clinicians	
Regular status updates & stakeholder reviews	Communication	Misaligned expectations with leadership	

Thank You