Enhancing Operational Efficiency in a Multispecialty Hospital

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Executive Summary

Problem:

- The hospital faces multiple operational issues that affect service quality and stakeholder satisfaction

Key insights:

1. System glitches and scheduling conflicts affected operational efficiency
2. Delay appointment system and long wait time for patients affected service quality

Recommended actions:

1. Integrate record and scheduling system
2. Improvements to patient and doctor scheduling
3. Enhancement of overall operational efficiency

Introduction

Opportunity:

1. Possible area to improve the system
2. Enough resources and supporting from stakeholders

Approach:

1. Analyze the core issues (e.g., scheduling conflicts, etc.)
2. Plan the detailed solutions

Key questions/hypotheses:

1. Existing IT infrastructure is sufficient
2. Stakeholders are available for feedback and testing

Business Objectives

1. Integrate record and scheduling system
2. Enhancement of overall operational efficiency
3. Improve system and services core
4. Minimize the scheduling conflicts
5. Better appointment system
6. Better scheduling for patients and doctors


Methodology

Requirements Gathering: Business Requirement Document (BRD)

Problem statement:

- Overall appointment system and wait time for patients
- Overbooked schedules for doctors and delay
- Limited availability of nurses and essential supplies
- System glitches and scheduling conflicts
- Unintegration between current scheduling and record management systems

Key requirements to improve operational efficiency:

- Integrate record and scheduling system
- Improvements to patient and doctor scheduling
- Enhancement of overall operational efficiency

Requirements Gathering: Business Requirement Document (BRD)

Constraints:

- Limited IT staff availability during implementation
- Potential for ongoing service disruptions during transition
- Budget or time limitations

Acceptance criteria:

- Current scheduling and record management system must integrate
- Minimize the scheduling conflicts as low as possible
- Improve the overall appointment system
- Better scheduling for patients and doctors

Requirements Gathering: Requirement Traceability Matrix (RTM)

Requirement ID	Requirement description	Priority (MoSCoW)	Stakeholder(s)	Project objective	Related data file	Status
R01	Automate appointment scheduling with conflict detection	Must Have	Administrative Staff	Reduce wait times and scheduling errors	appointment_data.csv	Approved
R02	Provide real-time appointment notifications	Must Have	Patients	Keep patients informed and reduce no-shows	feedback_data.csv	Approved
R03	Improve staff communication system	Should Have	Doctor and Nurses	Reduce errors and delays due to miscommunication	feedback_data.csv	Approved
R04	Automate resource allocation system	Should Have	Nurses	Optimize resource use and reduce shortages	resource_data.csv	Approved
R05	Design a new UI for online appointments	Could Have	IT Teams	Improve system usability and reduce complaints	resource_data.csv	Approved
R06	Implement an online patient feedback system	Could Have	Patients	Gather faster insights to improve service quality	feedback_data.csv	Approved

Stakeholder Analysis and Engagement Plan

Stakeholder Name/Group	Role/Responsibility	Influence Level	Interest Level	Key Requirements	Engagement Strategy	Frequency of Interaction	Communication Method
Patients	Service Recipients	Low	High	Real-time appointment notifications, reduced wait times	Newsletters, Feedback Surveys	Monthly	Email, Surveys
Nurses	Provide healthcare for patients	Medium	High	Access to patient records	Training sessions, Direct feedback	Weekly	In-person meetings
Doctors	Diagnose and treat patients	High	High	Integrated patient info, scheduling flexibility	Regular updates, Feedback loops	Weekly	In-person meetings, Email
Administrative Staff	Manage appointments, billing, records	Medium	High	Fast data entry, validity data	Workshops, User guides	Weekly	Training, Email
Support Staff	Assist daily operations	Low	Low	Clear workflow procedures	Workshops, User guides	Monthly	Briefings, Email
IT teams	Develop and maintain system	High	Medium	System reliability, user issue tracking	Agile standups, Incident reports	Weekly	In-person /Online meeting, Email

Scope Management Plan

In-scope activities:

- Design and implementation of an integrated scheduling-record system
- Development of notification and feedback tools
- Appointment automation with conflict detection
- Resource allocation automation
- UI/UX enhancement of online booking
- Staff training and final deployment

Scope Management Plan

Out-of-scope activities:

- Hiring new medical or administrative staff
- Physical infrastructure changes
- Third-party supplier integrations

Scope Management Plan

Assumptions:

- Existing IT infrastructure is sufficient
- Stakeholders are available for feedback and testing
- No major policy or organizational disruptions will occur

Constraints:

- Limited staffing during project implementation
- Project must be completed within 19-20 weeks
- Fixed budget

Scope Management Plan

Phases in the Work Breakdown Structure (WBS):

WBS ID	Task name	Task description	Owner	Milestone/Deliverable	Estimated Duration
1.0	Project initiation	Kick-off and planning	PM	Project Charter	1 week
1.1	Requirements Gathering	Collect requirements	BA / PM	BRD Completion	1 week
1.1.1	Stakeholder Interviews	Interview patients, doctors, nurses, and admin	BA	Interview Summary	1 week
1.1.2	Analyse Appointment Data	Identify scheduling inefficiencies	BA / DA	Data Analysis Report	1 week
1.2	System Design	Architecture and UI/UX planning	IT teams	Design Document	2 weeks
1.3	System Development	Build system & services	IT teams	Working Modules	6 weeks
1.4	Testing	Testing modules	IT teams	Test Report	3 weeks
1.4.1	User Acceptance Testing	Internal check for each module	IT teams	Pass Reports	1 week
1.5	Deployment	Final rollout to production	IT teams	Live Date	1 week
1.6	Training & Handover	End-user training and documentation	PM	Training Completion	1 week
1.7	Project Closure	Lessons learned and closeout docs	PM	Final Report	1 week

Scope Management Plan

Scope change management:

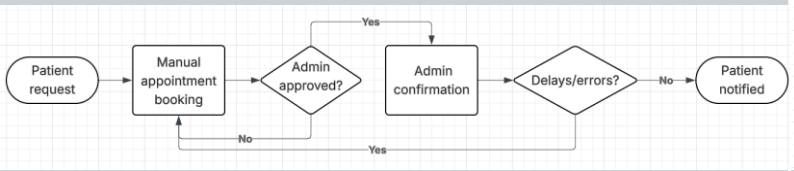
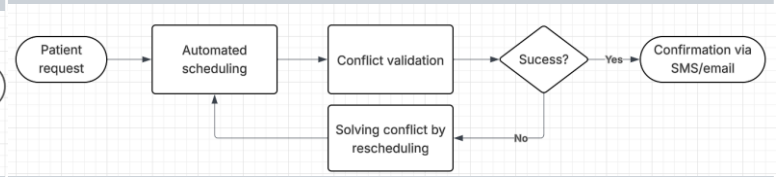
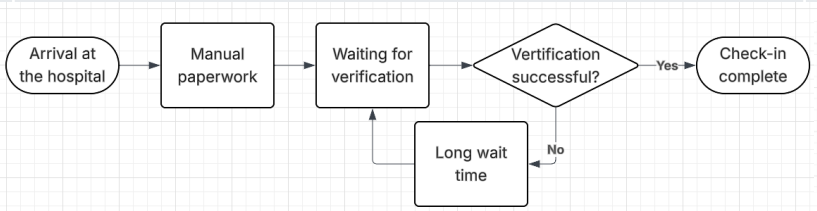
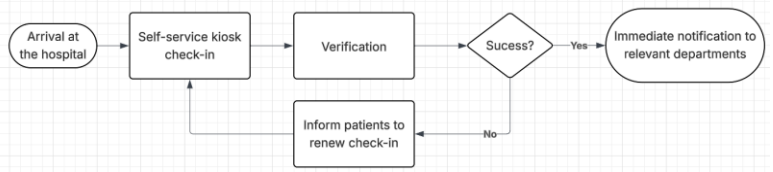
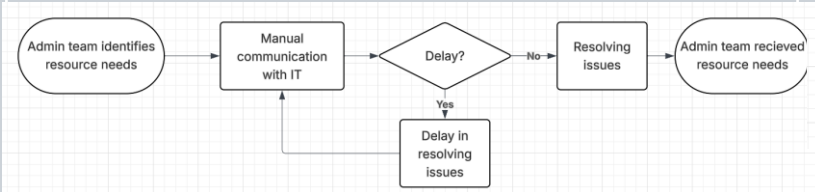
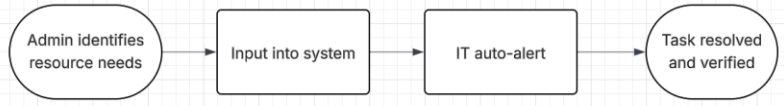
Approval

- High-impact changes require owner/sponsor approval
- Low/medium changes could be approved by PM

Implementation

- Approved changes are added to the WBS and timeline
- All stakeholders are notified of updates

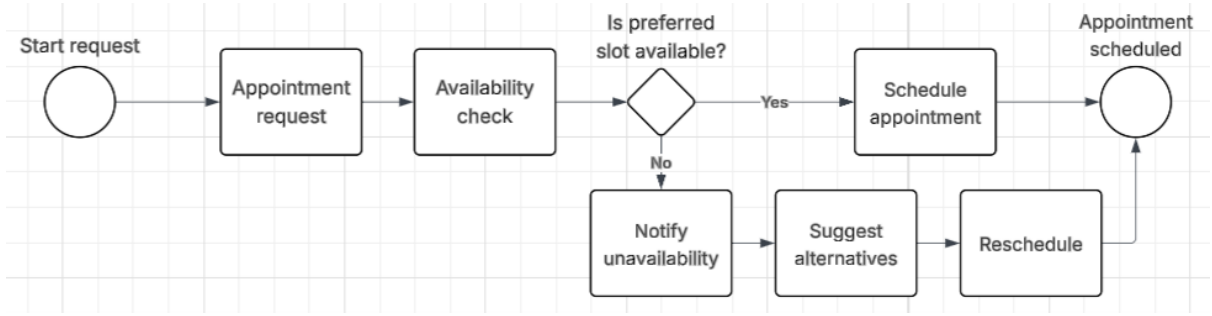
Process Mapping

Process	As-Is Model	To-Be Model
Appointment scheduling process		
Patient check-in process		
Interdepartmental communication		

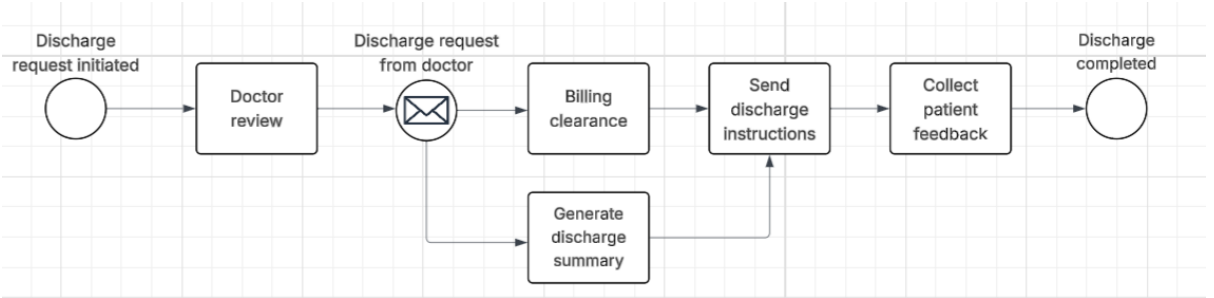
Advanced Process Mapping

Detailed workflow using the advanced BPMN model:

Patient appointment scheduling workflow



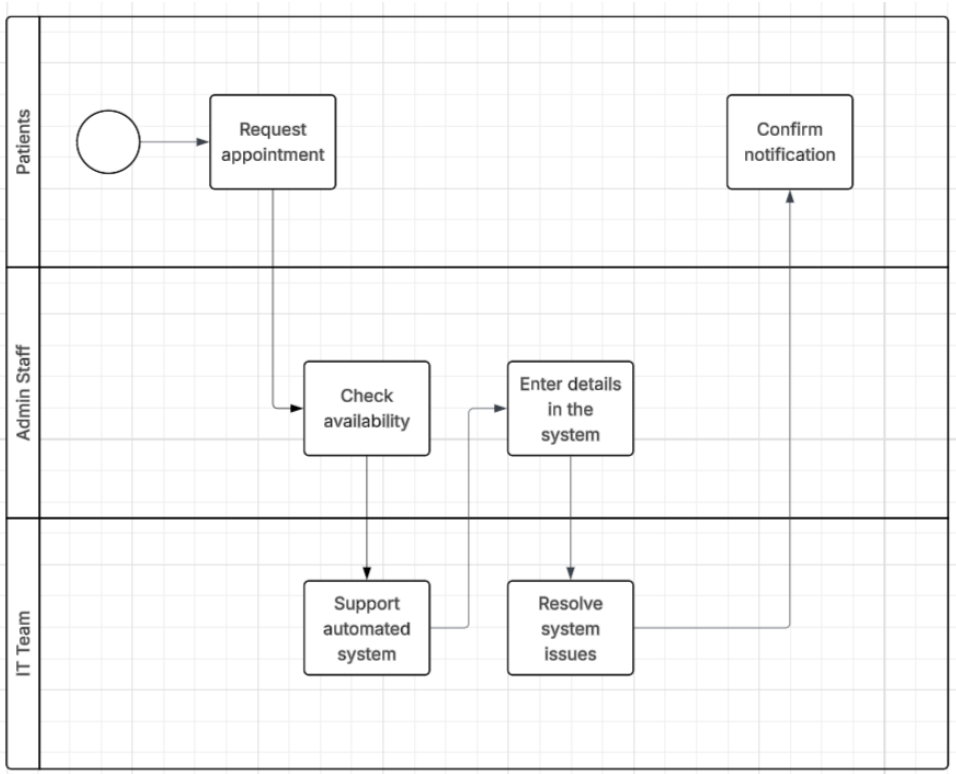
Discharge process workflow



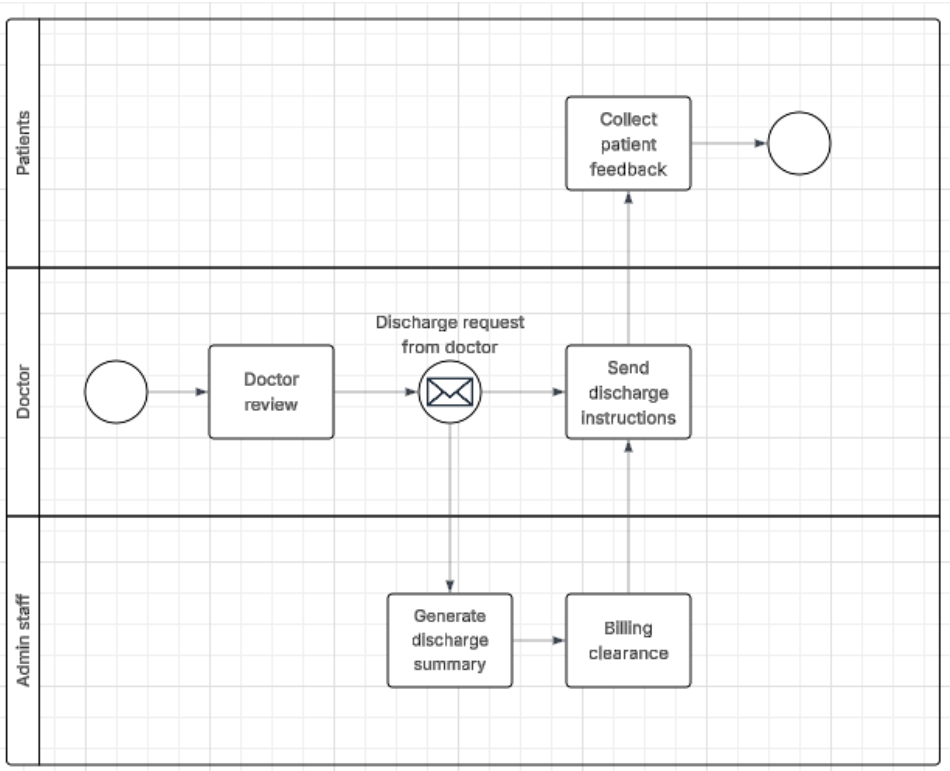
Advanced Process Mapping

Stakeholder responsibility using the Swimlane diagram:

Patient appointment scheduling workflow



Discharge process workflow



Data Analysis

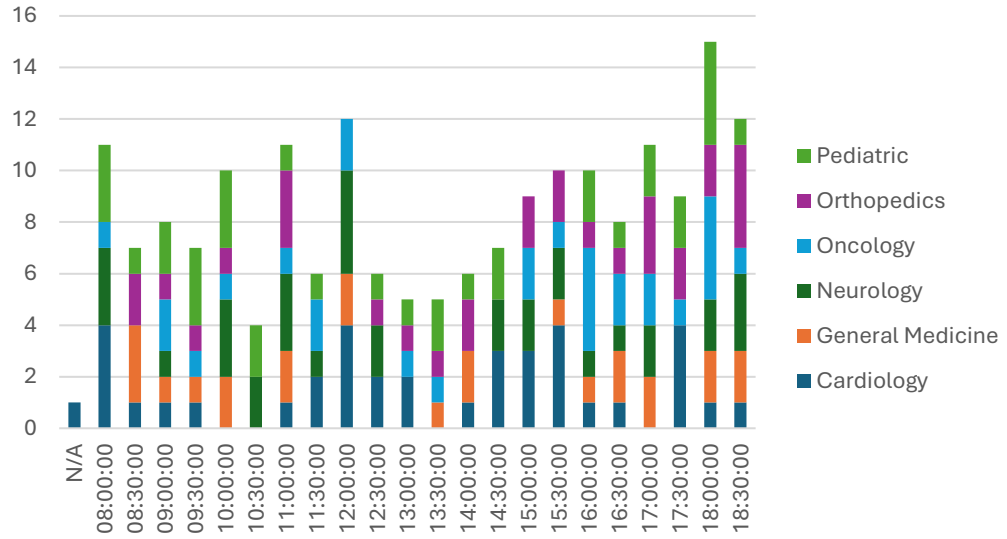
Trends using a Pivot Table:

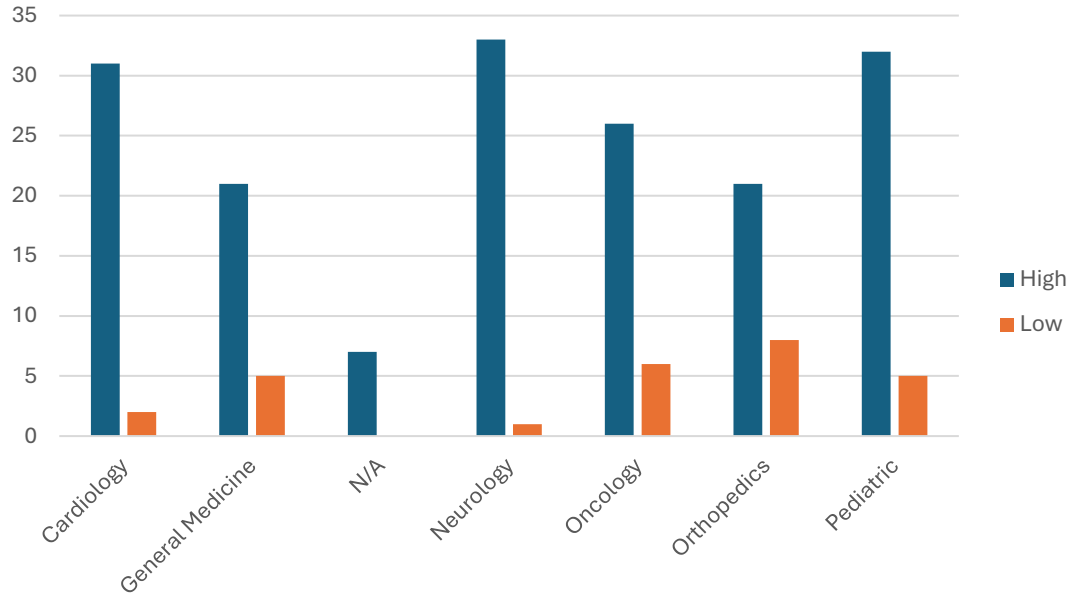
Count of AppointmentID	Column Labels						
Row Labels	Cardiology	General Medicine	Neurology	Oncology	Orthopedics	Pediatric	Grand Total
N/A	1						1
08:00:00	4		3	1		3	11
08:30:00	1	3			2	1	7
09:00:00	1	1	1	2	1	2	8
09:30:00	1	1		1	1	3	7
10:00:00		2	3	1	1	3	10
10:30:00			2			2	4
11:00:00	1	2	3	1	3	1	11
11:30:00	2		1	2		1	6
12:00:00	4	2	4	2			12
12:30:00	2		2		1	1	6
13:00:00	2			1	1	1	5
13:30:00		1		1	1	2	5
14:00:00	1	2			2	1	6
14:30:00	3		2			2	7
15:00:00	3		2	2	2		9
15:30:00	4	1	2	1	2		10
16:00:00	1	1	1	4	1	2	10
16:30:00	1	2	1	2	1	1	8
17:00:00		2	2	2	3	2	11
17:30:00	4			1	2	2	9
18:00:00	1	2	2	4	2	4	15
18:30:00	1	2	3	1	4	1	12
Grand Total	**38**	**24**	**34**	**29**	**30**	**35**	**190**

Count of Satisfaction Level	Column Labels		
Row Labels	High	Low	Grand Total
Cardiology	31	2	33
General Medicine	21	5	26
N/A	7		7
Neurology	33	1	34
Oncology	26	6	32
Orthopedics	21	8	29
Pediatric	32	5	37
Grand Total	**171**	**27**	**198**

Data Analysis

Trends analyzed from the Pivot Table:





Data Analysis

Key insights:

Peak appointment hours (appointment_data.csv)

- Peak Hours: 18:00 PM
- Most department’s appointment: Cardiology

Satisfaction level (feedback_data.csv)

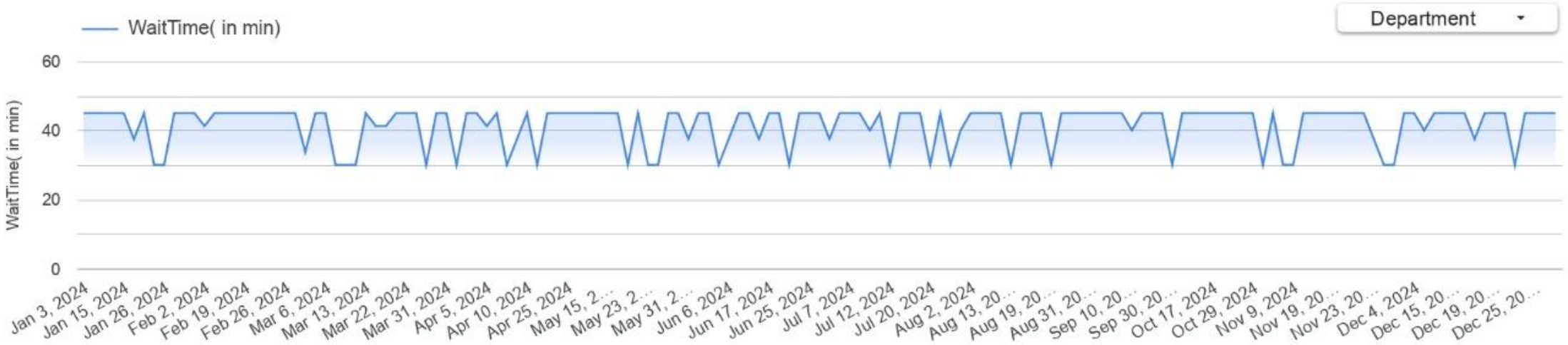
- High (More than or equal to 5): 171
- Low (Less than 5): 27

Resource bottlenecks (resource_data.csv)

- Most used: Room
- Least used: Nurses

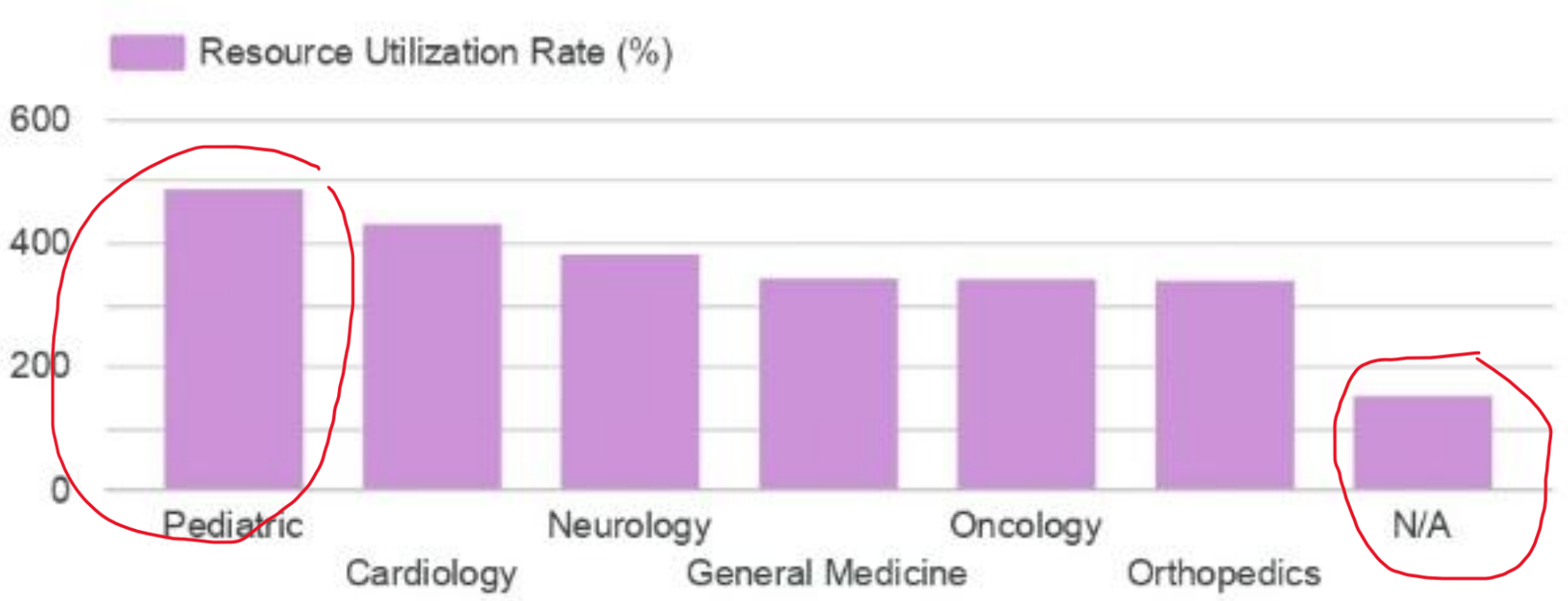
Data Visualization

Average patient wait time using a line chart:



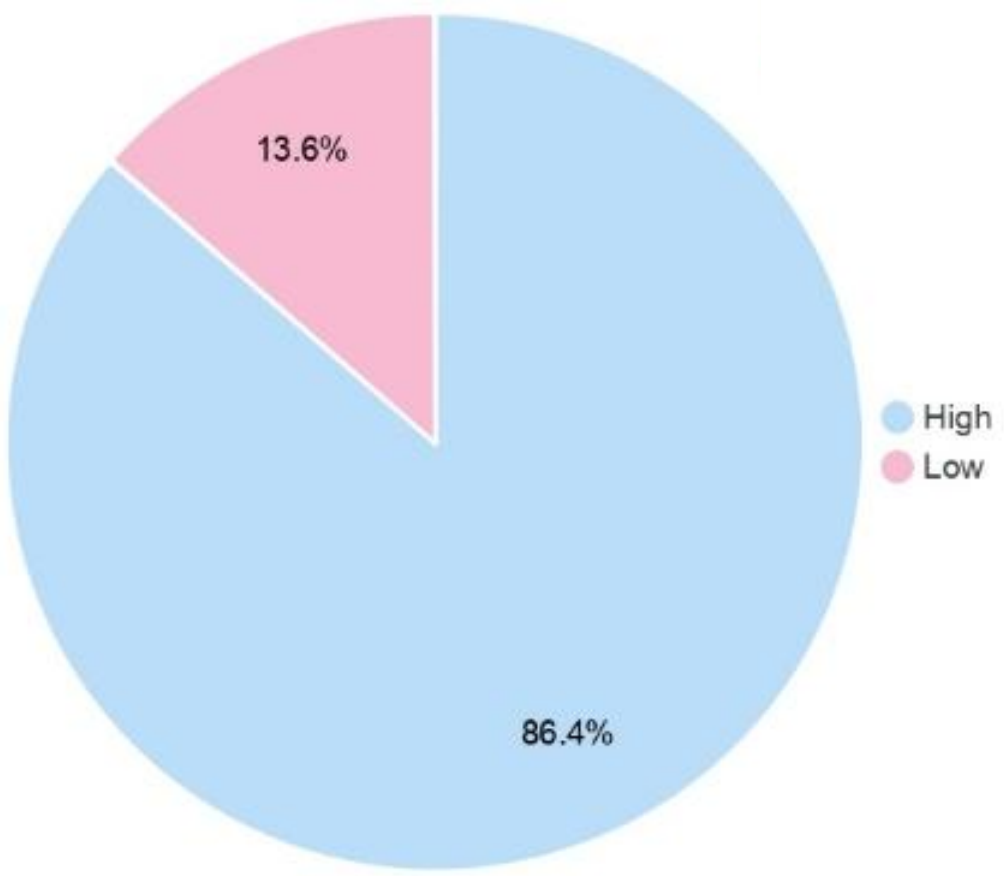
Data Visualization

Bar chart highlighting overused and underutilized resources:



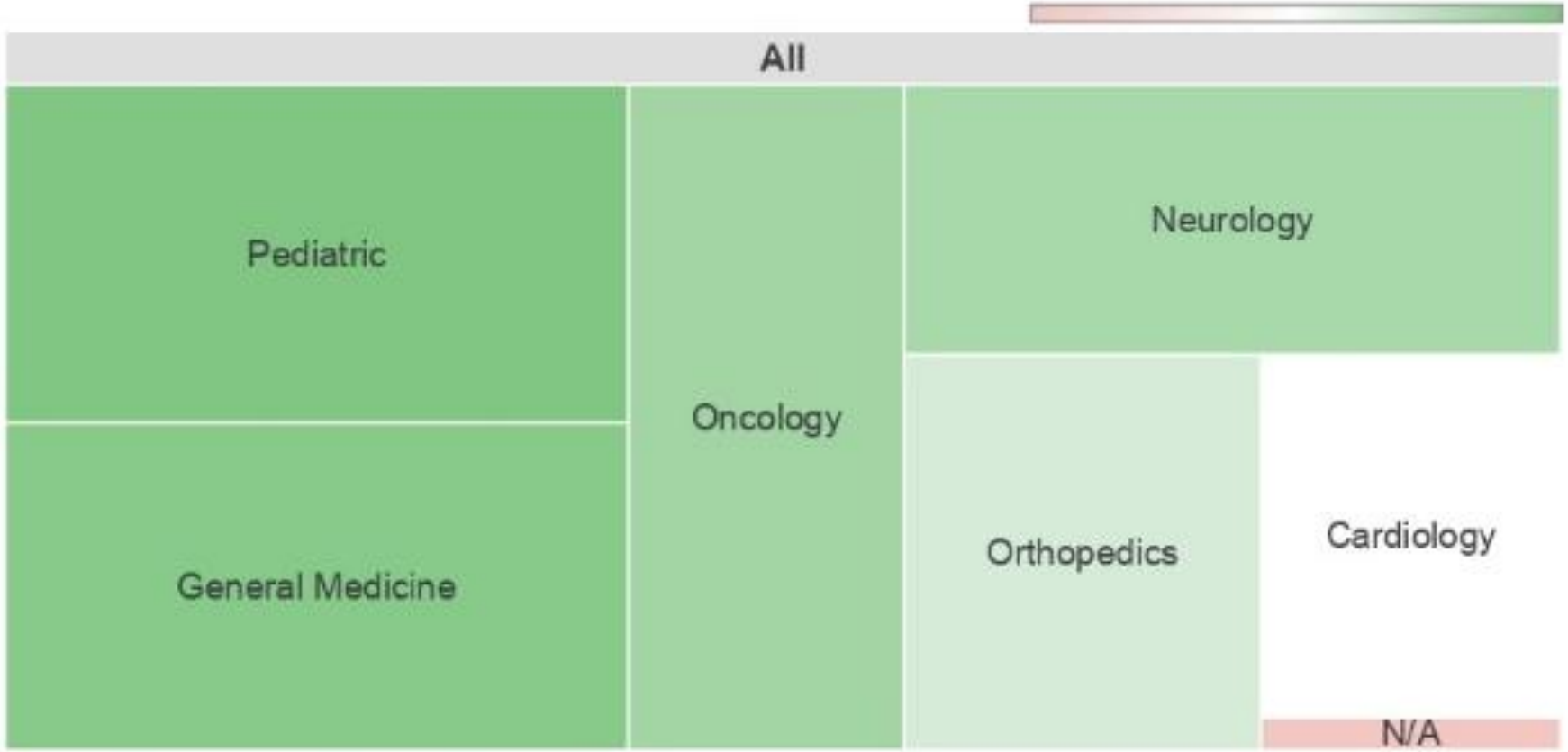
Data Visualization

Patient feedback visualized using a Pie Chart:



Data Visualization

Heat Map showing the efficiency of departments:



Risk Management Plan

Risks identified in the risk register:

Risk ID	Risk Description	Risk Category	Likelihood	Impact	Severity
R01	Scheduling conflicts from incomplete system integration	Technical	High	High	High
R02	System glitches that cause appointment delays/errors	Technical	Medium	High	High
R03	Limited staff availability	Operational	Medium	Medium	Medium
R04	Overbooked doctor schedules that cause patient dissatisfaction	Operational	High	High	High
R05	Patients experience longer wait times during system transfer	Stakeholder	Medium	High	High
R06	Staff resistance to new scheduling system	Stakeholder	Medium	Medium	Medium
R07	Data breaches due to system integration	Technical	Low	High	Medium
R08	Budget and time constraints limit project scope	Operational	Medium	Medium	Medium
R09	Miscommunication between staff	Operational	Medium	Medium	Medium

Risk Management Plan

Risks categorized based on the Risk Assessment Matrix:

	Low Impact	Medium Impact	High Impact
High Likelihood	Green	Yellow	Red (R01,R04)
Medium Likelihood	Green	Yellow (R06,R08,R09)	Red (R02,R05)
Low Likelihood	Green	Green	Yellow (R07)

Risk Management Plan

Elements identified in the SWOT analysis:

Strengths

- Strong stakeholder involvement
- Well-planned project scope and objectives
- Access to supporting data sets and stakeholder

Weaknesses

- Limited staff availability
- Potential service disruptions during transition
- Manual workflows and data silos

Opportunities

- System and services integration to improve scheduling
- Automation potential to reduce wait times
- Staff training during transition

Threats

- Data security risks from integration
- Resistance to adapt from staff
- Budget/time constraints

Risk Management Plan

Key insights from the Risk Management Plan:

- There are no GREEN risks
- Most of risks are defined as yellow and red
- There are no risks that unsolvable

Risk Mitigation Plan

Strategies to mitigate risks:

Risk ID	Risk Description	Risk Category	Likelihood	Impact	Severity	Mitigation Strategy
R01	Scheduling conflicts from incomplete system integration	Technical	High	High	High	Rollout system integration as quickly as possible
R02	System glitches that cause appointment delays/errors	Technical	Medium	High	High	Monitoring and quick fixes
R03	Limited staff availability	Operational	Medium	Medium	Medium	Plan human & resource allocation
R04	Overbooked doctor schedules that cause patient dissatisfaction	Operational	High	High	High	Improve scheduling and reduce overbooked
R05	Patients experience longer wait times during system transfer	Stakeholder	Medium	High	High	Schedule upgrades during low patient time
R06	Staff resistance to new scheduling system	Stakeholder	Medium	Medium	Medium	Provide intensive training and a guidebook
R07	Data breaches due to system integration	Technical	Low	High	Medium	Apply strong cybersecurity measures
R08	Budget and time constraints limit project scope	Operational	Medium	Medium	Medium	Prioritize critical features and regular progress reviews
R09	Miscommunication between staff	Operational	Medium	Medium	Medium	Create clear communication channels

Risk Mitigation Plan

Factors included in the Contingency Plan:

Risk ID	Contingency Plan
R01	If scheduling conflicts happen, deploy a temporary manual override process for scheduling while developing urgent fixes and communicate delays directly to patients and staff.
R02	In case of system glitches, backup appointment systems (manual or alternative digital). And IT work on emergency patches and restore normal operations as soon as possible.
R03	If staff shortage delays tasks, reassign duties to available personnel or hire outsource contractors. Communicate adjusted timelines to stakeholders carefully.
R04	For overbooked schedules causing dissatisfaction, implement temporary appointment caps and additional patient communication. Review schedules and adjust dynamically daily.
R05	If patient wait times increase during system upgrades, deploy additional patient support staff to manage flow, provide timely updates to patients, and consider extending working hours temporarily.
R06	In case of staff resistance persist, engage to encourage adoption. Offer one-on-one training sessions and address concerns through forums or surveys.
R07	In case of a data breach, immediately isolate affected systems, notify IT teams and follow incident response protocols.
R08	If budget/time constraints impact progress, initiate project scope review and seek additional funding or resources if possible.
R09	If miscommunication leads to errors, set up daily/weekly briefings and feedback loops and utilize centralized communication tools (e.g. Slack, MS Team) for clarity.

Risk Mitigation Plan

Risks prioritized based on the Visual Risk Matrix:

Priority Level	Risk ID & Description	Rationale	Action Urgency
High	R01 – Scheduling conflicts from incomplete system integration	High likelihood and high impact; directly disrupts hospital operations and appointments.	Immediate action
High	R02 – System glitches causing appointment errors/delays	High impact on patient satisfaction and care delivery; may recur if not fixed.	Immediate action
High	R04 – Overbooked doctor schedules	Leads to poor service experience; directly impacts doctors and patients.	Immediate action
High	R05 – Longer patient wait times during system transfer	Affects patients during critical upgrade periods; can damage hospital reputation.	Immediate action
Medium	R03 – Limited staff availability	Medium severity; affects implementation pace but can be managed with planning.	Monitor closely
Medium	R06 – Staff resistance to new scheduling system	Moderate risk; affects adoption and efficiency if left unaddressed.	Act within 2 weeks
Medium	R07 – Data breaches due to integration	Low likelihood but high impact; needs prevention measures, but not an active issue yet.	Prepare proactively
Medium	R08 – Budget and time constraints	Realistic project pressure; may affect scope or deadlines.	Track regularly
Medium	R09 – Miscommunication between staff	Can cause inefficiencies; not critical but accumulates negative impact over time.	Resolve promptly

Risk Mitigation Plan

Key insights from the Risk Mitigation Plan:

- High-Priority Risks Require Immediate Action
- Technical and Operational Risks Are the Most Critical
- Contingency Planning Strengthens Project Resilience
- Staff Engagement and Communication Are Crucial
- Proactive Security Measures Are Necessary

Conclusion

1. The project focused on improving operational efficiency in a multi-specialty hospital by integrating scheduling and record management systems.
2. Key issues addressed include long patient wait times, overbooked doctor schedules, system glitches, and lack of system integration.
3. Each risk was assigned specific **mitigation strategies** and **contingency plans** to minimize disruption and ensure business continuity.
4. **Staff engagement, clear communication**, and **technical preparedness** were emphasized to support successful adoption of new systems.
5. The **Risk Assessment Matrix** helped prioritize risks by severity, enabling efficient allocation of attention and resources.
6. Overall, the project enables a **more efficient and resilient hospital operation**, aligning with long-term goals of service excellence and quality care delivery.


APPENDIX

Appendix

Note: Use this section to include supplementary materials, such as charts, graphs, data tables, and other supporting documents, for this Business Analysis (BA) report.