



MEDFLOW

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FALL' 25

INF311

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Preface

This project was developed to solve a real challenge many people face when trying to access healthcare. Through interviews with patients, hospital staff, and administrators, we found that booking medical services is often complicated, slow, and different from one hospital to another.

Based on these insights, we created **MedFlow** — a centralized platform designed to make healthcare access easier. It allows patients to find available services across multiple hospitals in real time, while helping hospitals organize their schedules and manage resources more efficiently.

Throughout the development of this project, we moved from early ideas and prototypes to a functional solution. This document presents the final vision, the system analysis, the models we created, and the achievements reached, along with planned future improvements.

Project Identity

Project Name: **MedFlow**

Trademark name: [Trademark MedFlow](#)



Customer Value:

MedFlow provides patients with fast, convenient, and reliable access to healthcare services by offering real-time booking across multiple hospitals in one place. Instead of spending hours searching for available appointments, patients can instantly view schedules, compare waiting times, and secure the earliest possible slot.

For hospitals, MedFlow reduces scheduling conflicts, improves resource utilization, and speeds up patient flow through an organized and automated booking system.

By saving time, reducing waiting periods, and simplifying access to care, MedFlow delivers timely value to both patients and healthcare providers.

Product/Service Scope:

MedFlow is a centralized healthcare booking and resource management system designed to simplify how patients access medical services and how hospitals manage their schedules. The platform offers the following core services:

1. Real-Time Appointment Booking

Patients can search for hospitals, specialties, and services, then instantly view available time slots. The system updates in real time to ensure accurate and conflict-free scheduling.

2. Multi-Hospital Access

Instead of visiting multiple websites or calling different facilities, patients can compare availability across several hospitals in one place and choose the earliest or most convenient option.

3. Smart Scheduling for Hospitals

Hospitals can manage doctors' schedules, equipment, rooms, and service availability through an organized dashboard. The system automatically prevents double bookings and reduces manual errors.

4. Automated Notifications

MedFlow sends instant confirmations, reminders, and updates via email or SMS to ensure patients stay informed and reduce no-shows.

5. Waitlist and Fast Rebooking

When an earlier slot becomes available, the system offers it to patients on the waitlist. This maximizes time efficiency for both patients and hospitals.

6. Data Tracking and Performance Insights

Hospitals receive insights on resource utilization, appointment patterns, and patient flow to support better decision-making.

Procedures

Patient Procedure

1. Create an account or log in.
2. Search for the required service or hospital.
3. View real-time availability.
4. Select and book a preferred time slot.
5. Receive confirmation and reminders.
6. Attend the appointment or reschedule if needed.

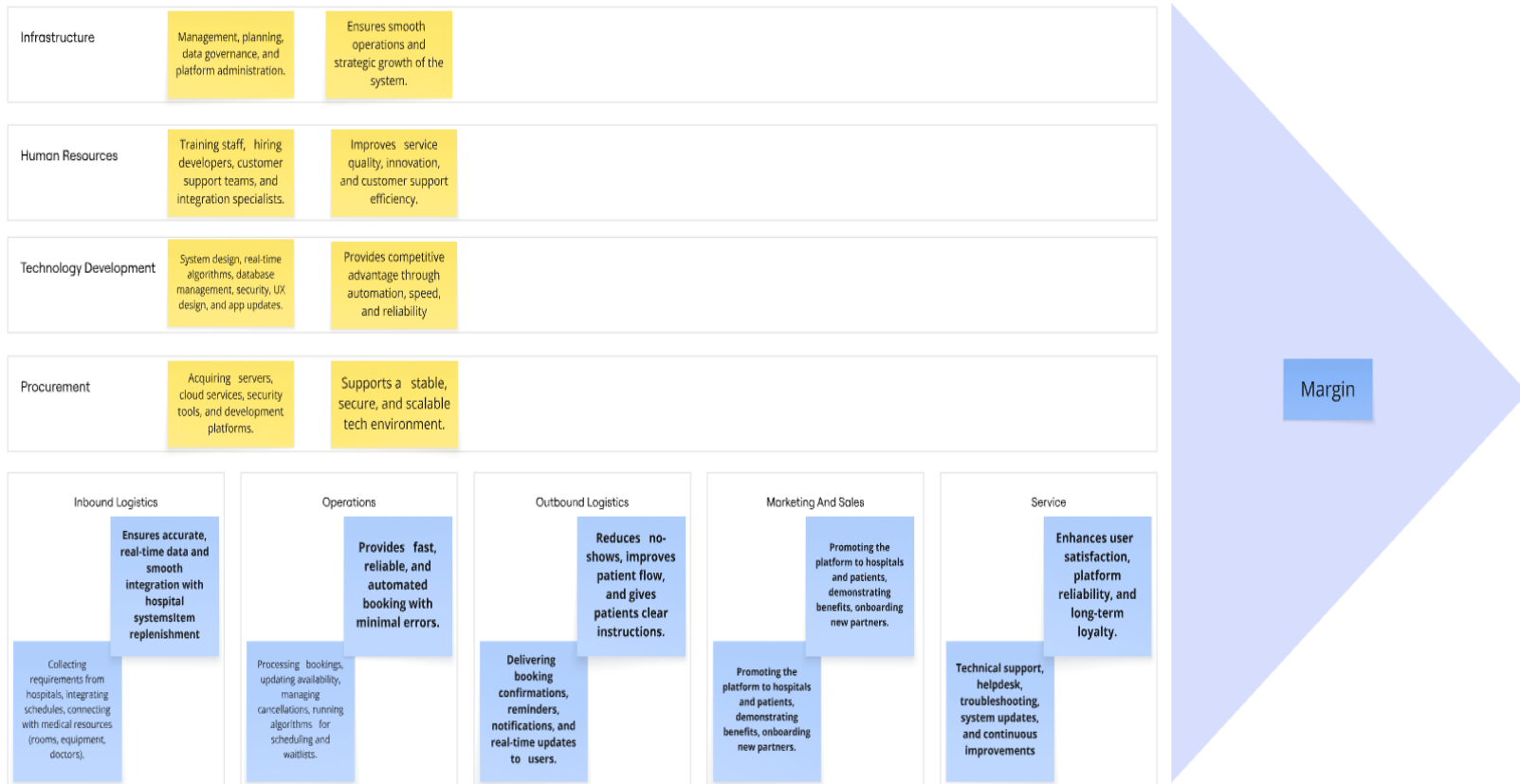
Hospital Procedure

1. Register and verify the hospital profile.
2. Add services, doctors, rooms, and equipment.
3. Set working hours and availability.
4. View and manage bookings in real time.
5. Receive system-generated insights to improve operations.
6. Update schedules and resources as needed.

VRIO Analysis

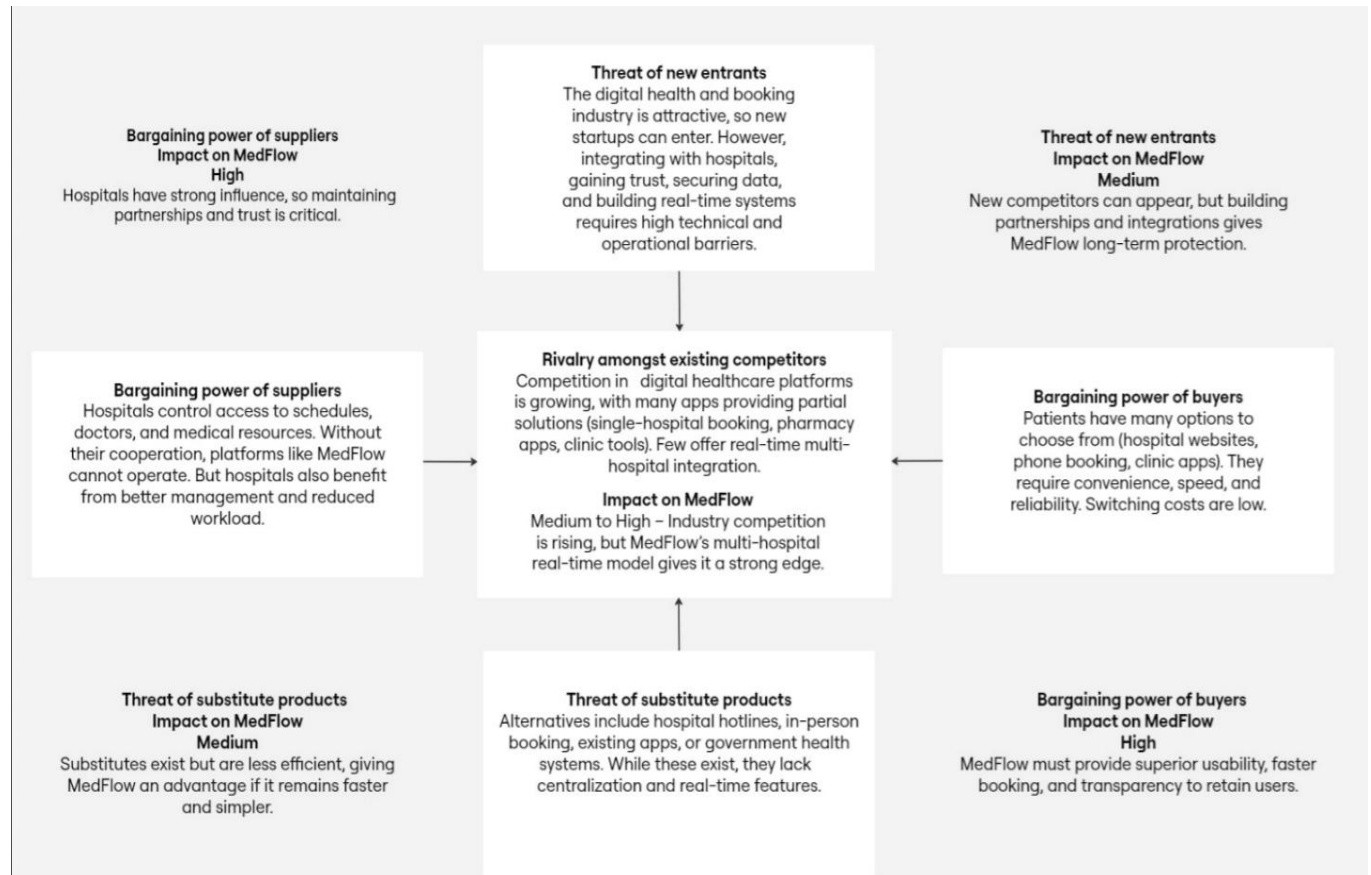
Resource	Valuable?	Rare?	Imitable?	Organized?	Competitive Advantage
Centralized multi-hospital booking system	Yes, Reduces patient waiting time by showing available slots across multiple hospitals.	Yes, Most hospitals use separate, isolated booking systems.	Moderately, Needs large datasets, integration with legacy hospital systems, and trust agreements.	Yes, Hospitals have IT infrastructure, trained staff, and management support.	Sustained Competitive Advantage
Real-time availability of doctors, rooms and equipment	Yes, Prevents double booking and scheduling conflicts.	Yes, Fully integrated real-time tracking across multiple hospitals is uncommon.	Yes, Website functionality can be replicated by competitors	Yes, Platform and hospital processes support effective use.	Sustained Competitive Advantage
Smart scheduling and automation(waitlists, reminders, conflict-prevention)	Yes, Reduces errors, prevents scheduling conflicts, and improves patient satisfaction.	Yes, Fully automated scheduling with conflict-prevention and reminders is uncommon in multi-hospital systems.	Moderately, competitors can develop similar software with effort.	Yes, Platform and hospital workflows support automated scheduling effectively.	Temporary Long-Term Advantage
User-friendly interface and booking experience	Yes, enhances patient satisfaction and increases system adoption.	No, user-friendly interfaces are common	No, Competitors can replicate the interface with effort.	Yes, Platform design and hospital processes support smooth user interaction.	Competitive Parity
Analytics and performance insights for hospitals	Yes, Ensures efficient workflow and better patient experience.	Yes, Integrated design with aligned processes is uncommon.	Yes, Hard to replicate the full integration and workflow.	Yes, Platform and processes are structured to use it fully.	Sustained Competitive Advantage

Value Chain Analysis



Activate Windows

Industry Structure (Porter's 5 Forces)



PESTEL

Political

Government policies supporting digital transformation can encourage the adoption of Supply Chain 4.0 technologies

Regulations on data sharing and cross-border digital communication impact how companies use cloud systems and connected platforms.

Trade regulations and international agreements affect the movement of goods and influence how digital tracking systems are used

Political stability ensures smooth global supply chain operations, reducing disruptions.

Economic

Economic growth increases demand for efficient and automated supply chains, making Supply Chain 4.0 more valuable

Exchange rate fluctuations affect global sourcing decisions and may require advanced forecasting tools.

High inflation or rising costs push companies to adopt automation and analytics to reduce waste and improve efficiency.

Investment in new technologies (IoT, AI, robotics) may require strong financial stability and long-term planning.

Social

Customers expect fast delivery, transparency, and reliable service—pressuring companies to modernize supply chains

Changing consumer behaviour (online shopping, customization) increases the need for digital tracking and real-time inventory visibility.

Employees may need new digital skills to work with advanced technologies; training becomes essential.

Growing social concern for sustainability pushes companies to use data analytics to reduce waste and carbon footprint.

Technological

Rapid technological innovation (AI, IoT, automation, robotics, blockchain) directly supports the shift to Supply Chain 4.0.

Cloud platforms enhance communication and coordination across suppliers, warehouses, and distribution points

Real-time data tracking improves decision-making, forecasting, and responsiveness.

Cybersecurity becomes critical to protect sensitive supply chain information from digital threats.

Legal

Data protection laws (GDPR, privacy regulations) control how supply chain data is collected, stored, and shared.

Compliance with import/export laws must be integrated into digital systems for traceability.

Health and safety regulations influence warehouse automation and robotics usage.

Intellectual property protection is essential when deploying new technologies and software solutions.

Environmental

Climate change and environmental risks require supply chains to become more resilient and adaptive.

Governments encourage eco-friendly operations, making sustainability a competitive advantage

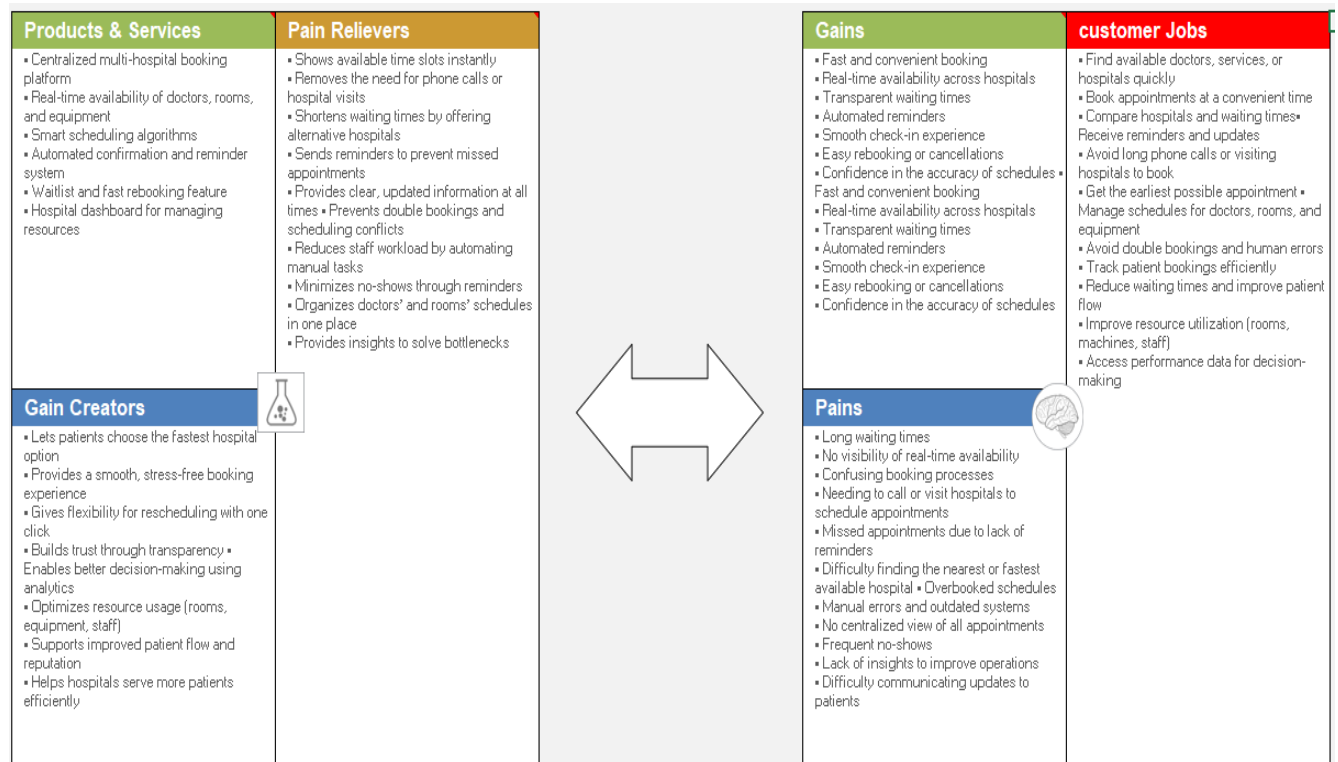
Supply Chain 4.0 tools help reduce waste, optimize routes, and lower carbon emissions

Natural disasters or environmental disruptions highlight the need for predictive analytics and real-time monitoring.

SWOT Analysis

Strengths	Weaknesses
Real-time visibility using IoT and tracking systems	High initial cost to implement new technologies
Higher efficiency through automation and AI	Employees may lack digital/technical skills
Better forecasting through big data analytics	Difficult integration with old systems
Improved customer satisfaction	Increased cybersecurity risks
Stronger coordination across the supply chain	High dependence on technology
Opportunities	Threats
Increasing demand for fast, reliable delivery	Rapid technological changes require constant upgrades
New advancements in AI, robotics, blockchain	Cyberattacks and data breaches
Government support for digital transformation	Economic instability affecting budgets
Sustainability demands encourage optimization	Strict data protection regulations
Ability to gain strong competitive advantage	Global supply chain disruptions

Value Proposition Canvas



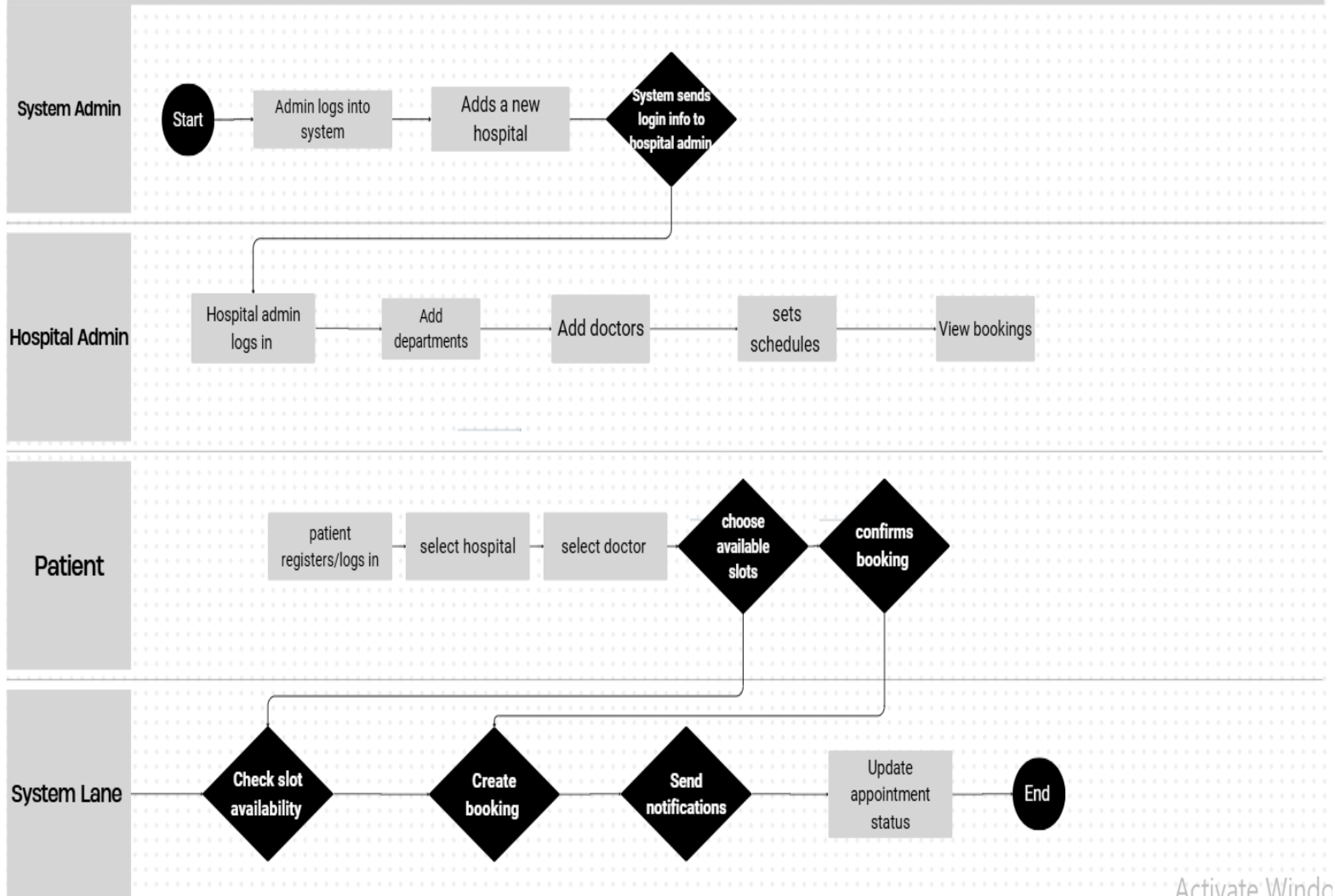
Business Model Canvas

Digital Business Model Canvas

Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
<ul style="list-style-type: none"> Hospitals Clinics & Medical centers Technology providers(SMS/ email services) Payment gateway provider 	<ul style="list-style-type: none"> Managing hospital onboarding Providing customer support for hospitals and patients Updating doctor schedules & availability Secure handling of patient data 	<p>For patients:</p> <ul style="list-style-type: none"> Easy online appointments booking Access to multiple hospitals in one place Real-time doctor availability Reduced waiting time Appointment reminders 	<ul style="list-style-type: none"> Automated notifications (SMS/ email) 24/7 availability platform Feedback systems for improvements 	<p>Primary:</p> <ul style="list-style-type: none"> Patient seeking medical appointments Hospital management teams clinics & private doctors
	<p>Key Resources</p> <ul style="list-style-type: none"> web & mobile applications Database with hospitals, doctors, and appointments Technical development team Customer support team Booking engine 	<p>For Hospitals:</p> <ul style="list-style-type: none"> Centralized doctor schedule management Fewer phone calls & manual errors Increased patient satisfaction Digital record of appointments 	<p>Channels</p> <ul style="list-style-type: none"> Websites Mobile app Social media ads Email marketing 	<p>Secondary:</p> <ul style="list-style-type: none"> insurance companies Telemedicine providers (future expansion)
Cost Structure			Revenue Streams	
<ul style="list-style-type: none"> App development & maintenance Marketing & promotion Customer support team Staff salaries Cybersecurity measures 			<ul style="list-style-type: none"> Subscription fees from hospitals Advertisements for healthcare services Integration fees (insurance, telemedicine platforms) Pay-per-booking fee 	

Business Process Model

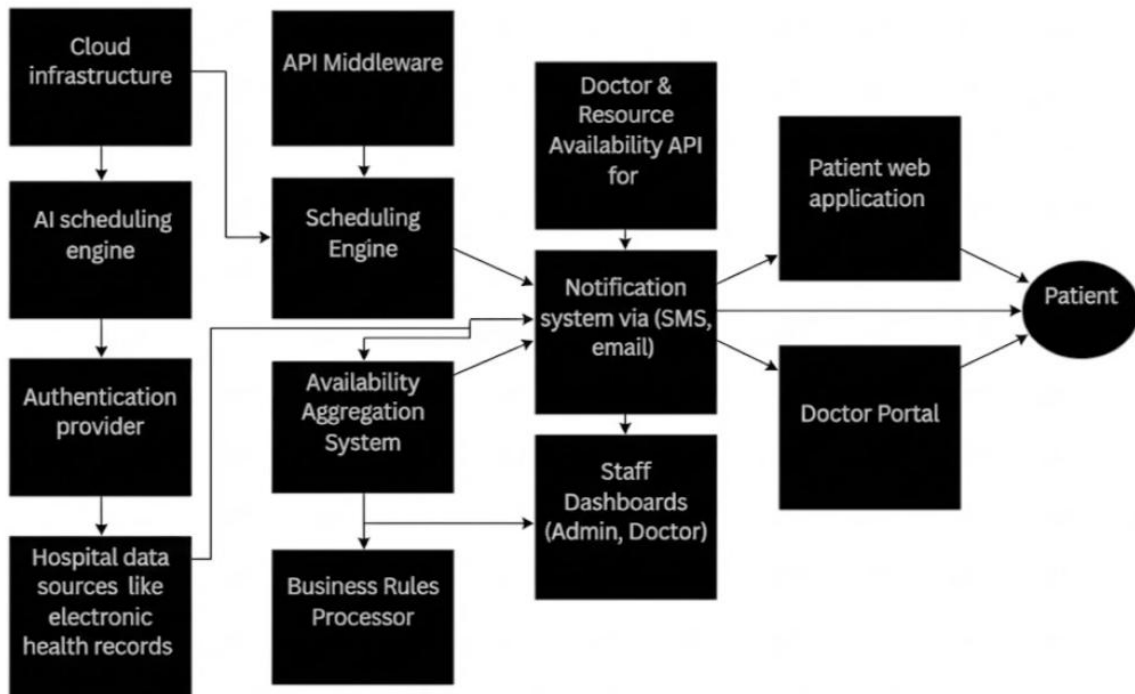
Business Process Model



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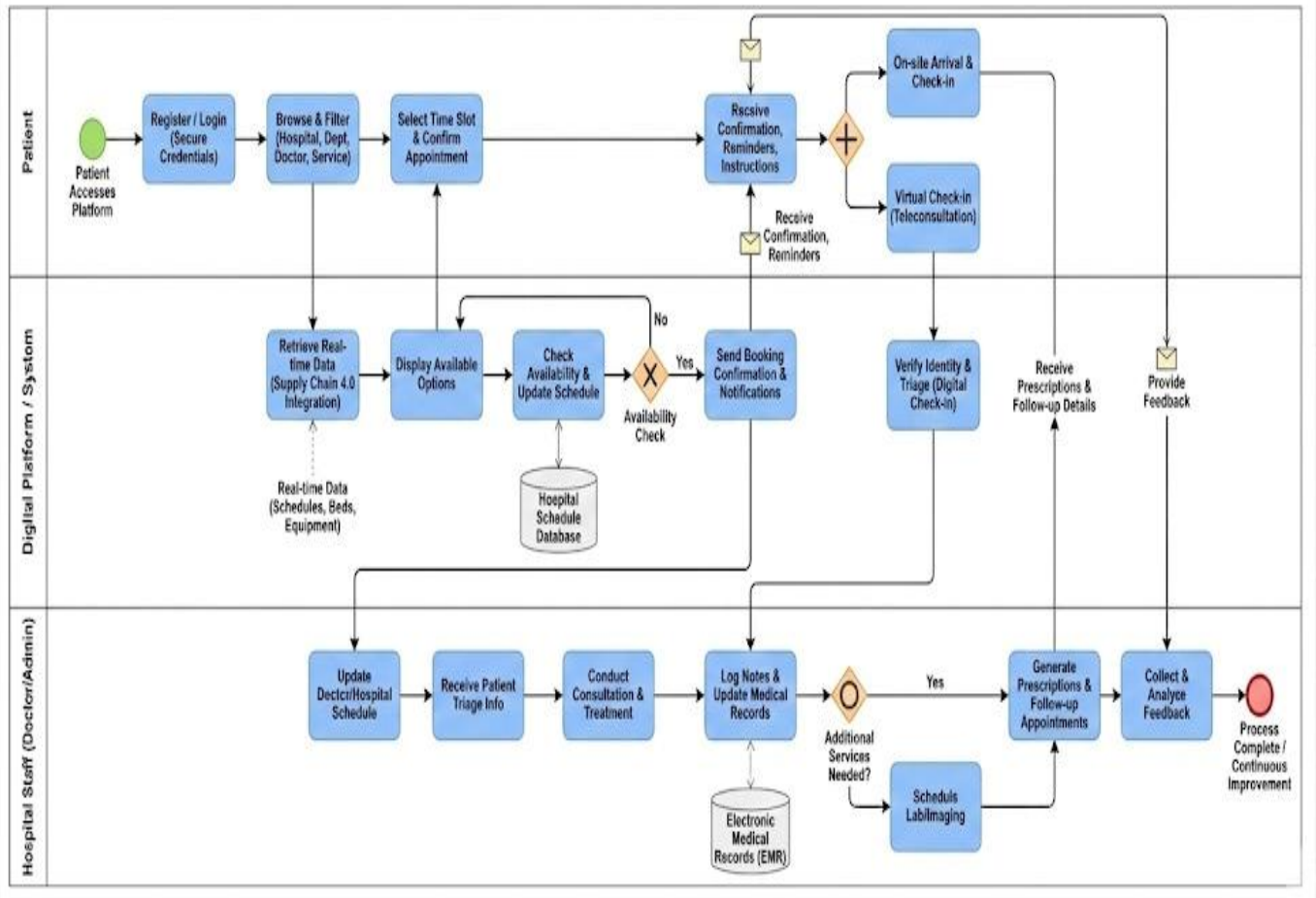
Remodeling-Applied Digital Business Strategy (Supply Chain 4.0)

Remodling-Applied Digital Business Strategy (Supply Chain 4.0)



Business Process Model-Revisited

Revised Digital Hospital Booking Process



Final Analysis Report

Decision Support Capabilities

- **Operational Level**
 - Automates daily tasks and routine decisions
 - Reduces human errors and processing time
 - Improves efficiency of system operations
- **Management Level**
 - Provides analytical reports and dashboards
 - Supports performance evaluation and resource planning
 - Helps identify problems and improvement opportunities
- **Strategic Level**
 - Supports long-term planning and policy decisions
 - Helps management evaluate future growth opportunities
 - Enables data-driven strategic decisions

Data Analysis & Intelligence

- Uses historical and real-time data for analysis
- Supports descriptive and predictive analysis
- Helps identify trends and patterns in system usage
- Improves accuracy and reliability of decisions

System Impact

- Improves decision quality and speed
- Enhances overall system performance
- Increases user satisfaction
- Supports organizational sustainability and growth

Future Decision Making

1. Operational Decisions (Structured)

- Automatic appointment scheduling and reminders
- Managing doctor availability
- Reducing waiting times
- Handling routine daily operations

2. Tactical Decisions (Semi-Structured)

- Adjusting staff schedules based on demand
- Analyzing cancellation and no-show rates
- Improving service efficiency
- Evaluating department performance

3. Strategic Decisions (Unstructured)

- Expanding services or hospitals
- Introducing new healthcare features
- Long-term planning and partnerships
- Digital transformation decisions

Decision-Making Process

- Identify problems using system data
- Analyze possible solutions
- Choose the best option based on reports
- Implement the decision through the system
- Monitor results using dashboards and KPIs

Business Intelligence Support

- Dashboards show key performance indicators (KPIs)
- Reports help managers understand trends
- Predictive analytics helps forecast future demand

Location & Predictive Decisions

- Analyze patient demand by location
- Improve resource distribution
- Predict peak times and future needs

Impact on the Organization

- Faster and more accurate decisions
- Reduced operational errors
- Improved patient satisfaction
- Better planning for the future

Project Milestones

Activity	Start Date	End Date	Time Spent (Optional)
Project Idea & Scope Definition	01/10/2025	03/10/2025	3 Days
Research & Market Analysis	04/10/2025	08/10/2025	5 Days
Persona & Journey Mapping	09/10/2025	11/10/2025	3 Days
Requirements Gathering	12/10/2025	15/10/2025	4 Days
System Design (Architecture & UI)	16/10/2025	20/10/2025	5 Days
MVP Development	21/10/2025	30/10/2025	10 Days
Testing & Bug Fixing	31/10/2025	03/11/2025	4 Days
Data Analysis & Decision Support	04/11/2025	06/11/2025	3 Days
Final Improvements	07/11/2025	08/11/2025	2 Days
Documentation & Final Submission	09/11/2025	12/11/2025	4 Days


MVP



MedFlow

Find doctors and book appointments easily

Choose Your Theme




Light Mode
Clean and bright interface



Dark Mode
Easy on the eyes





Focus Mode
Larger buttons, calmer colors

Continue

Get Started

Welcome to MedFlow
Enter your details to get started

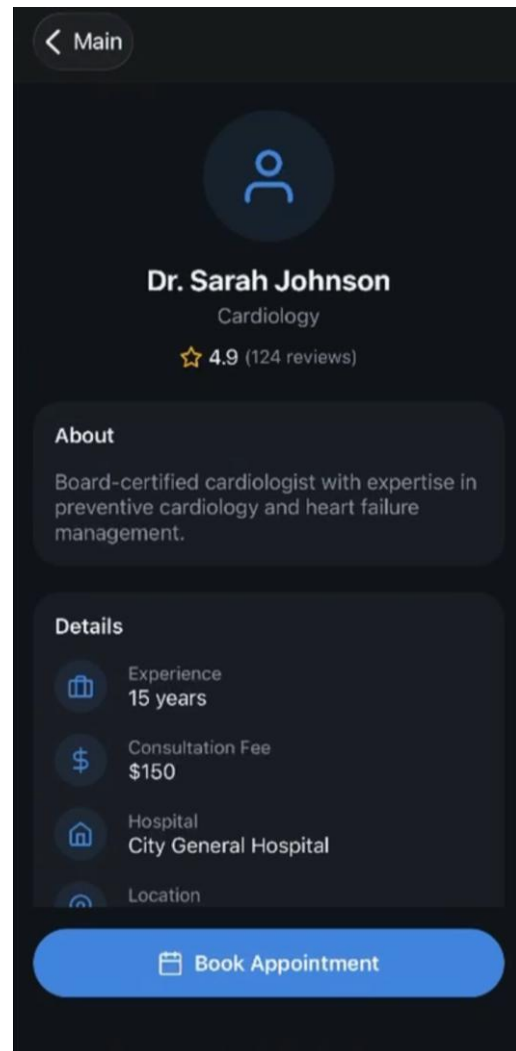
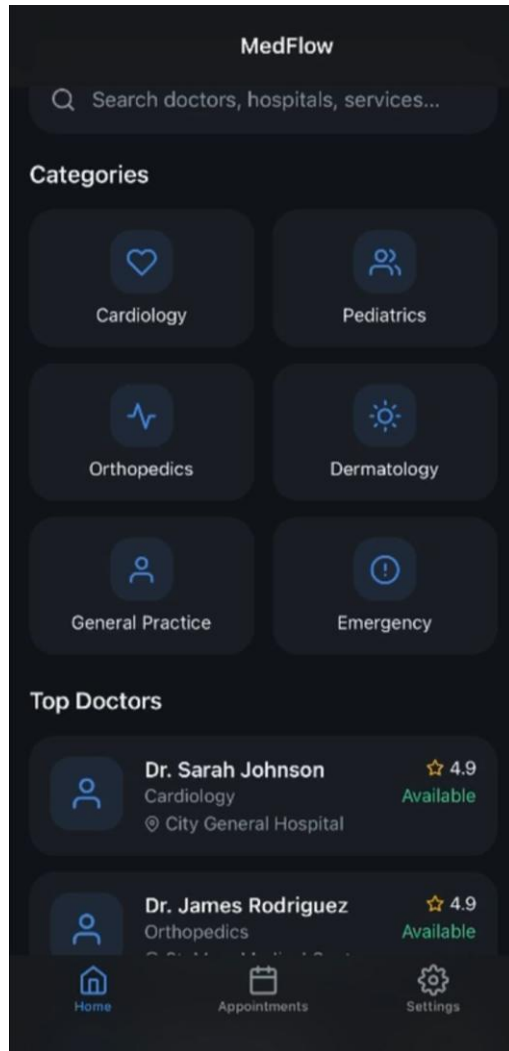
Full Name

Email Address

Phone Number (Optional)


Get Started

By continuing, you agree to our [Terms of Service](#) and [Privacy Policy](#)



Select Date & Time

1 Select — 2 Confirm — 3 Done

 **Dr. Sarah Johnson**
Cardiology at City General Hospital

Select Date

Mon	Tue	Wed	Thu	Fri
8	9	10	11	12

Monday, December 8

Available time slots


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11:00 AM	11:30 AM	2:00 PM
3:00 PM	4:00 PM	


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
Confirm Details


✓ Select — 2 Confirm — 3 Done

Appointment Summary

 Doctor
Dr. Sarah Johnson

 Hospital
City General Hospital

 Date
Friday, December 12, 2025

 Time
11:30 AM

Patient Details

Full Name

Youssef


Phone Number

Enter phone number

Reason for Visit (Optional)


Booking


✓ Select — ✓ Confirm — ✓ Done





Booking Confirmed

Your appointment has been successfully booked

 **Dr. Sarah Johnson**
Cardiology

 City General Hospital

 Friday, December 12, 2025

 11:30 AM

View Appointments

Done

1. Smart Appointment Booking

Details:

- Patients can easily search for hospitals and doctors
- Available time slots are shown in real time
- Booking is completed in a few clicks

Why it matters (Business Value):

- Saves time for patients
- Reduces pressure on hospital reception staff
- Increases booking conversion rate

2. Real-Time Availability Management

Details:

- Hospitals control doctor schedules
- Instant updates when a slot is booked or changed

Why it matters (Business Value):

- Prevents overbooking
- Maximizes resource utilization
- Reduces operational errors

3. Automated Confirmations & Reminders

Details:

- Instant booking confirmation
- Reminder notifications before appointments

Why it matters (Business Value):

- Reduces no-show rates
- Improves patient commitment
- Increases daily appointment efficiency

4. Simple & Clean User Experience

Details:

- Minimal steps to book an appointment
- Clear design focused on speed and clarity
- Accessible for all age groups

Why it matters (Business Value):

- Faster adoption
- Lower learning curve
- Higher user satisfaction

5. Hospital Admin Dashboard

Details:

- View daily and upcoming appointments
- Manage schedules easily

Why it matters (Business Value):

- Better control for hospital management
- Faster decision-making
- Reduces administrative overhead

6. Basic Patient Profiles

Details:

- Store basic patient data
- View upcoming appointments

Why it matters (Business Value):

- Encourages repeat usage
- Builds long-term customer relationships

2. Why Our MVP Has a Strong Competitive Advantage

1. Focus on the Most Critical Pain Point

Most competitors try to do too much.

Our MVP focuses only on **fast, reliable appointment booking**.

Advantage:

- ✓ Faster development
- ✓ Lower cost
- ✓ Higher reliability

2. Business-First, Not Feature-Heavy

Competitors include complex features that:

- Increase cost
- Increase failure risk
- Confuse users

Our MVP:

- Solves one problem extremely well
- Delivers immediate value

Advantage:

- ✓ Clear value proposition
- ✓ Faster market validation

3. Reduced No-Show Rates

Through reminders and confirmations, hospitals:

- Lose less revenue
- Use time more efficiently

Advantage:

- ✓ Direct financial impact for hospitals
- ✓ Strong reason to pay for the service

4. Low Entry Barrier for Hospitals

- No hardware required
- Minimal training needed
- Simple subscription model

Advantage:

- ✓ Easier onboarding
- ✓ Faster hospital adoption

5. Scalable Business Model

The MVP is designed to:

- Start small
- Scale features gradually

Advantage:

- ✓ Lower initial investment
- ✓ Easy expansion into payments, records, and analytics

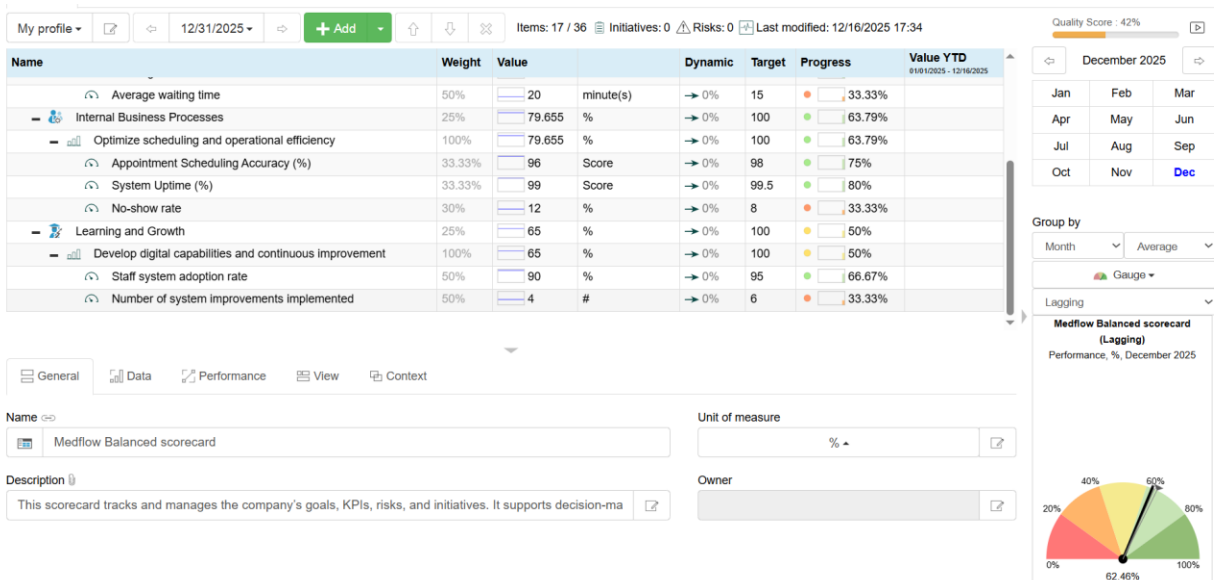
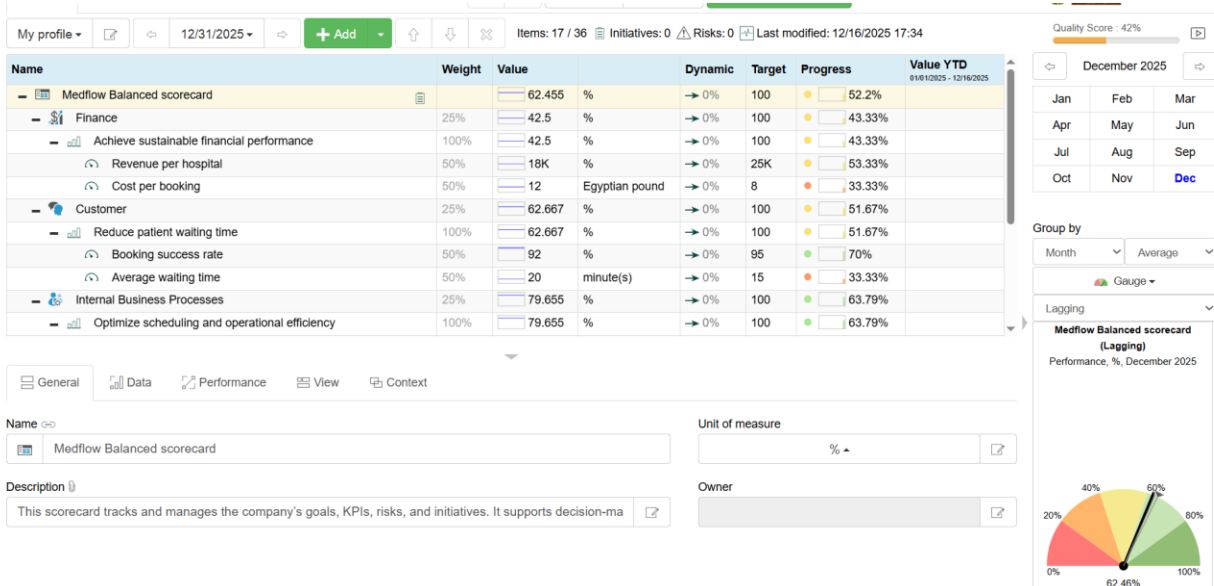
6. Strong Trust & Reliability

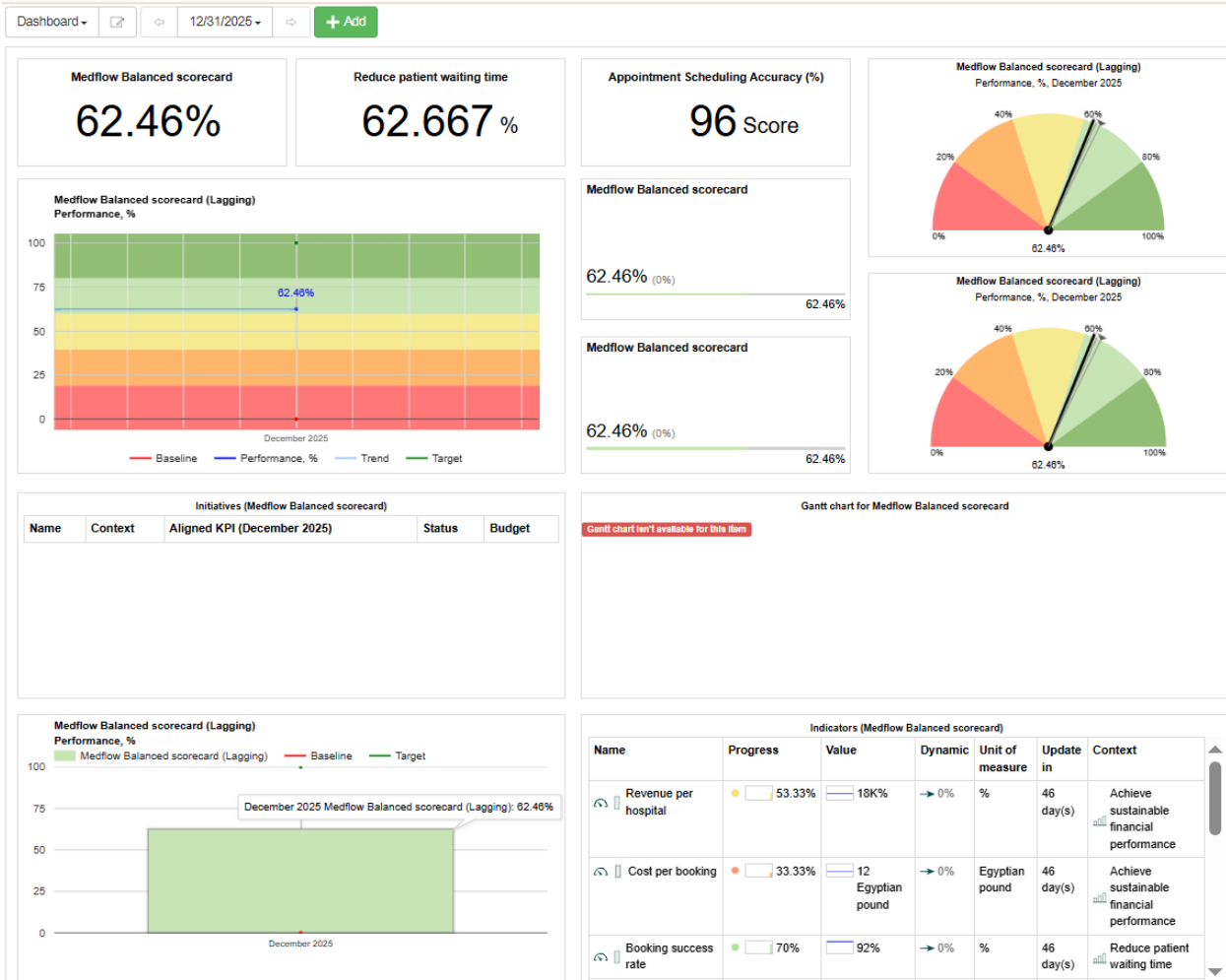
- Accurate schedules
- No double bookings
- Clear confirmations

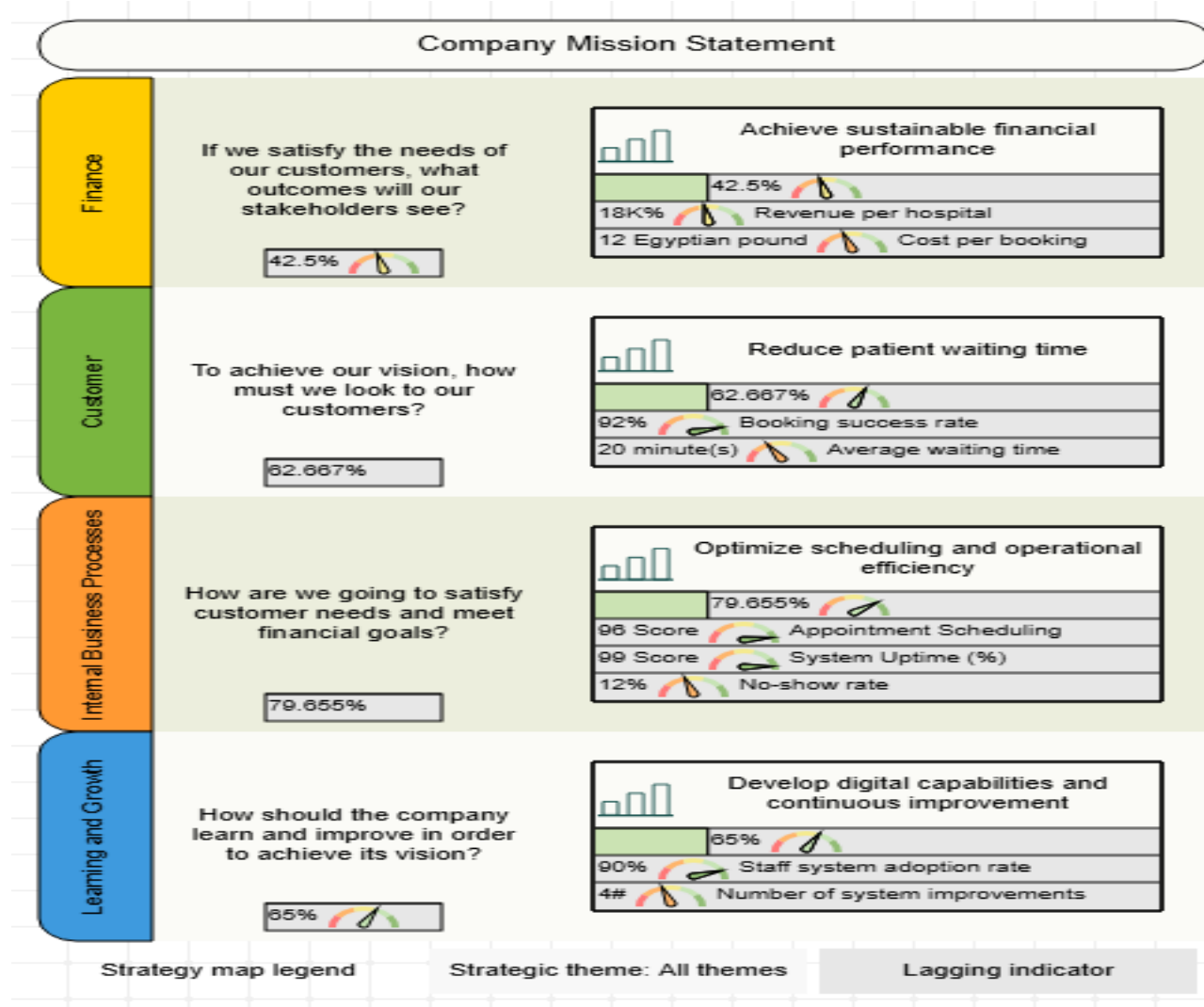
Advantage:

- ✓ Builds trust with patients
- ✓ Increases long-term usage

Bsc







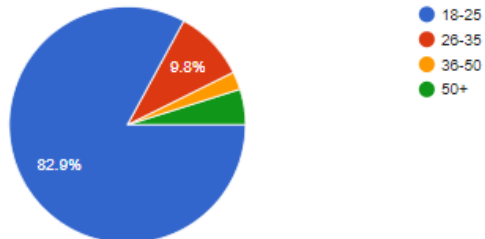
Appendix

Survey Results

What is your age group ?

41 responses

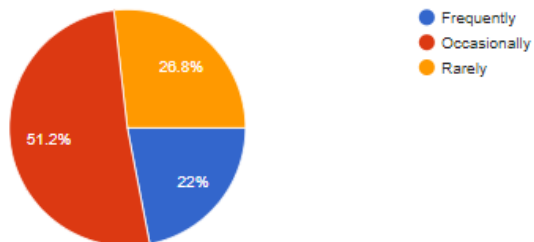
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How often do you visit hospitals or clinics?

41 responses

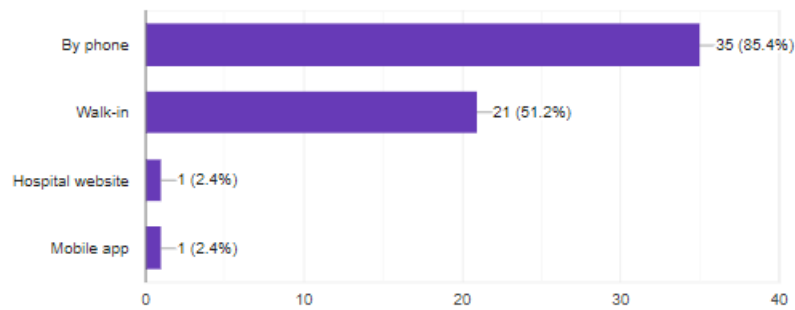
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How do you usually book appointments at hospitals or clinics ?

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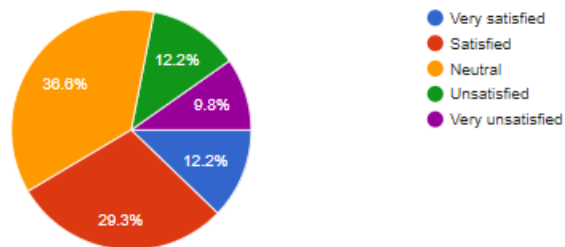
41 responses



How satisfied are you with the current booking process?

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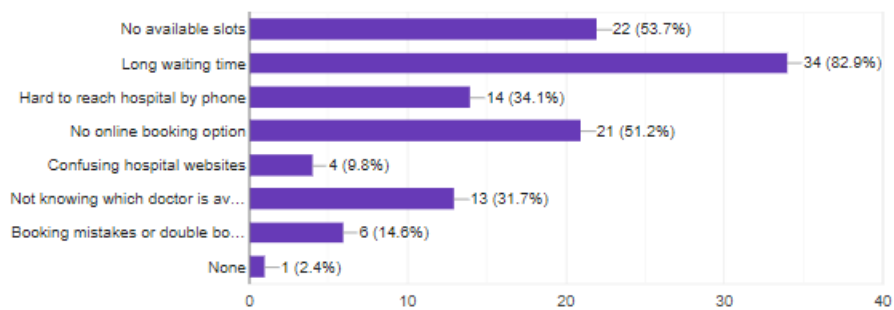
41 responses



What challenges do you face when booking appointments? (Select all that apply)

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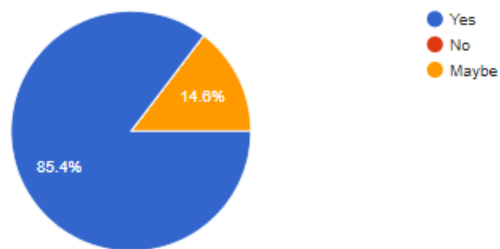
41 responses



Would you prefer a single platform where you can see all hospitals and book appointments instantly?

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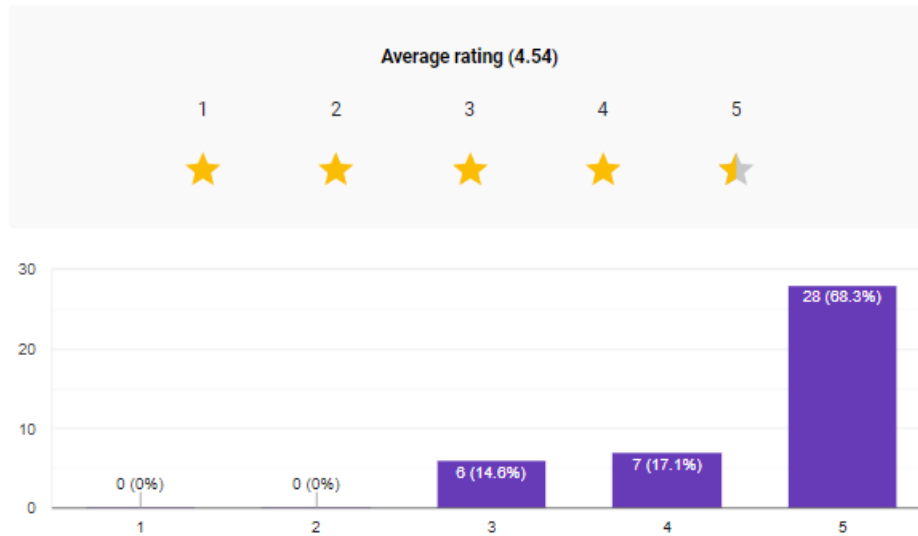
41 responses



How useful would viewing available doctors and appointment times be for you ?
 Rate from 1 (Not useful) to 5 (Very useful):

 [Copy chart](#)

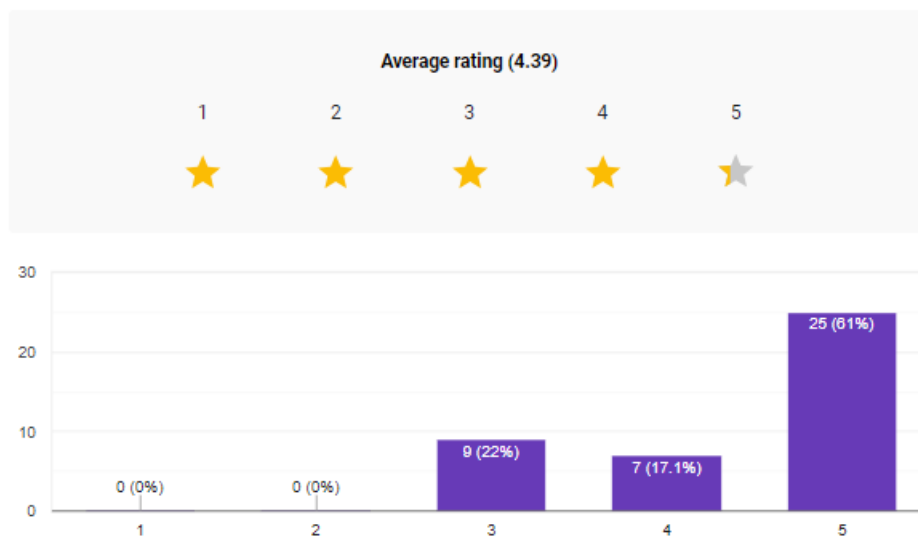
41 responses



How useful would online appointment booking be for you ?
 Rate from 1 (Not useful) to 5 (Very useful):

 [Copy chart](#)

41 responses

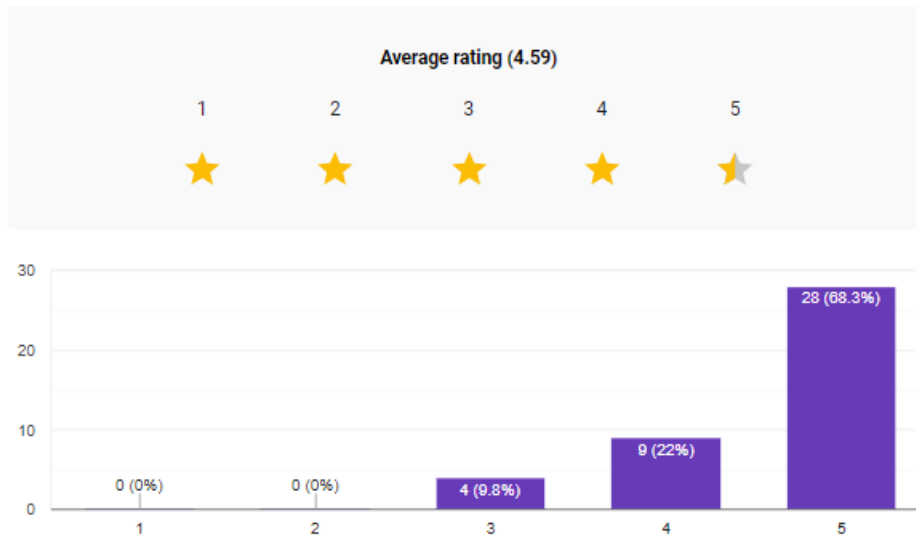


How useful would reminder notifications be for you ?

 Copy chart

Rate from 1 (Not useful) to 5 (Very useful):

41 responses

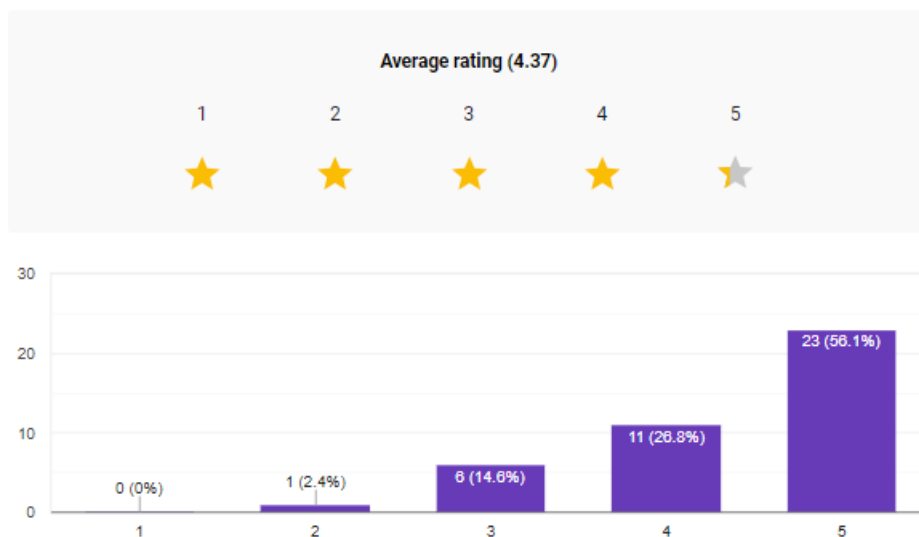


How useful would viewing hospital departments and services be for you ?

 Copy chart

Rate from 1 (Not useful) to 5 (Very useful):

41 responses

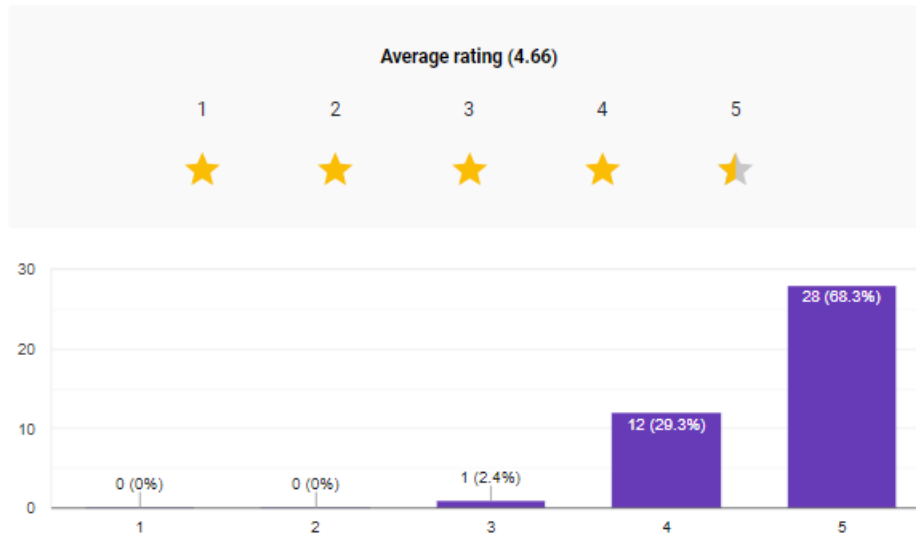


How useful would the ability to cancel or reschedule appointments online be for you ?

 [Copy chart](#)

Rate from 1 (Not useful) to 5 (Very useful):

41 responses

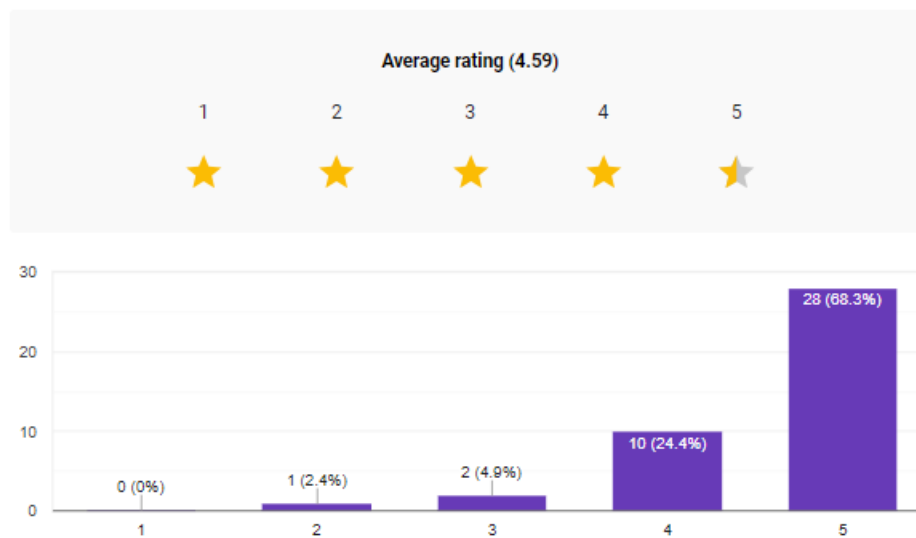


How useful would viewing doctor reviews and ratings be for you ?

 [Copy chart](#)

Rate from 1 (Not useful) to 5 (Very useful):

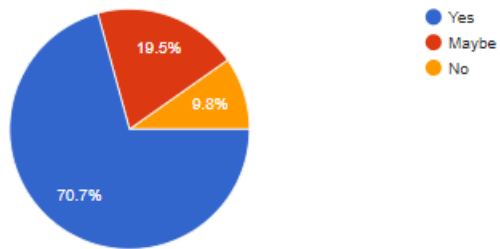
41 responses



Would online booking reduce your time and effort?

41 responses

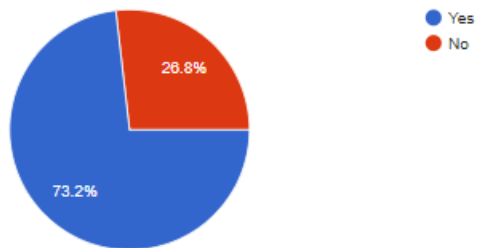
 Copy chart



Have you ever missed an appointment because you forgot the time?

41 responses

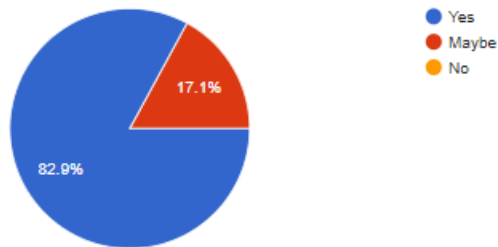
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Do you think hospitals should move to a digital booking system?

41 responses

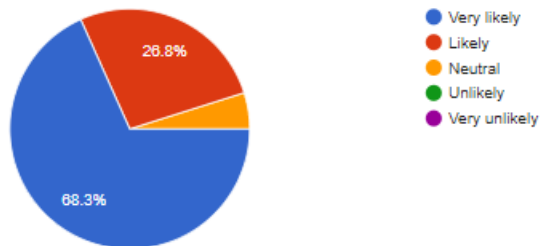
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If a system like this was available, how likely would you be to use it?

41 responses

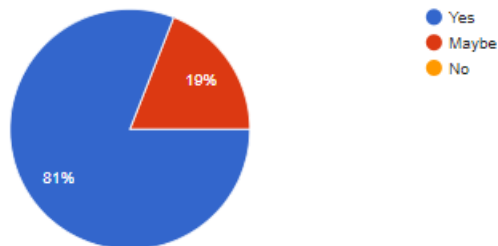
 [Copy chart](#)



Would you trust a digital system to handle your bookings securely?

42 responses

 [Copy chart](#)



Persona

Persona 1: Patient User

- **Name:** Ahmed Hassan
- **Role / Category:** Patient
- **Age Group:** 25–55
- **Technical Level:** Basic smartphone user
- **Goals:**
 - Book medical appointments quickly
 - Avoid long waiting times
 - Receive reminders and updates
- **Challenges (Pain Points):**
 - Long phone calls to hospitals
 - Unclear doctor availability
 - Appointment delays and cancellations
- **Strengths:**
 - Uses mobile applications regularly
 - Comfortable with notifications and reminders

Journey Map – Patient Persona

(Journey maps can be designed using LucidChart or Miro)

Stages

1. **Awareness**
 - Needs to book a doctor appointment
2. **Search**
 - Looks for available hospitals or doctors
3. **Booking**
 - Selects doctor, date, and time

4. Confirmation

- Receives appointment confirmation

5. Visit

- Attends the appointment

6. Follow-up

- Receives reminders or feedback requests

Pain Points

- Slow booking process
- Unclear waiting times

Opportunities

- Online booking
- Automated reminders

Persona 2: Hospital Administrator

- **Name:** Dr. Sara Mahmoud
- **Role / Category:** Hospital Administrator
- **Age Group:** 35–55
- **Technical Level:** Moderate system user
- **Goals:**
 - Manage doctors' schedules efficiently
 - Reduce booking conflicts
 - Improve hospital performance
- **Challenges (Pain Points):**
 - Manual scheduling errors
 - Overbooked doctors
 - Lack of real-time performance data
- **Strengths:**
 - Decision-making authority
 - Experience in hospital operations

Journey Map – Hospital Administrator Persona

Stages

1. **Planning**
 - Reviews doctor availability
2. **Scheduling**
 - Assigns time slots and resources
3. **Monitoring**
 - Tracks appointments and attendance
4. **Analysis**
 - Reviews reports and KPIs
5. **Optimization**
 - Adjusts schedules and resources

Pain Points

- Lack of real-time data
- Manual reporting

Opportunities

- Dashboards and automated reports
- Performance analytics

Persona Selected for MVP Focus

Selected Persona: Patient User

Selected Pain Point

- Difficulty in booking appointments and long waiting times

Reason for Selection

- Patients are the **primary users** of the system
- Improving patient experience provides **immediate value**
- Reduces hospital workload and operational pressure
- Easier to validate during MVP testing

Selected Strength

- High adoption of mobile applications
 - Willingness to use digital solutions
-

MVP Features Addressing Persona Needs

- Online appointment booking
- Real-time doctor availability
- Automated reminders
- Simple and user-friendly interface

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[survey](#)