



Innovation Track Hackathon 2026 – The Future of Emergency Medicine

Co-creation Date: 10-05-2026

Co-creation Summary



Overview of the Co-creation

01

- ✓ The Innovation Track Hackathon 2026 – The Future of Emergency Medicine aims to engage innovators from various disciplines in developing innovative digital solutions that contribute to improving emergency medicine services. The initiative focuses on creating a comprehensive digital emergency care experience, accelerating diagnostic processes, and improving patient flow management within emergency departments, ultimately enhancing healthcare efficiency and the beneficiary experience.



Objectives of the Co-creation

02

- ✓ Develop innovative digital solutions to improve the patient journey in emergency departments.
- ✓ Support faster diagnosis and clinical decision-making in emergency cases.
- ✓ Improve patient flow management and reduce waiting times and overcrowding.
- ✓ Enable innovators and idea owners to contribute to the development of impactful healthcare solutions.



Beneficiary Category

03

- ✓ Citizen
- ✓ Resident
- ✓ Visitor
- ✓ Business sector
- ✓ Elderly
- ✓ Women
- ✓ Youth
- ✓ Persons with disabilities

Co-creation Period – Participation Channel

Indicates the project start and end dates, along with the channel of project launch



Co-creation Participation Channel

On the official website of the Health
Affairs at the Ministry of National
Guard

[Future of Emergency Medicine
Hackathon 2026](#)



Project Start and End Period

From date: 10-05-2026
Until date: 11-05-2026

3

Proposed Options



Hackathon Tracks / Challenges

01

Comprehensive Digital
Emergency Care Experience

03

Improving Patient Flow Management

02

Accelerating Diagnosis and
Decision-Making

● Current

Innovation Track 2026 Hackathon – The Future of Emergency Medicine

The Innovation Track Hackathon initiative aims to engage innovators from diverse disciplines in developing innovative digital solutions to enhance emergency medicine services. The initiative focuses on delivering a comprehensive digital emergency experien

📅 Start date: 2026-05-10

📅 End date: 2026-05-11

Initiative

Hackathons and challenges

Initiative Details



4

Submissions Analysis



Participation Statistics

01

41

Participants



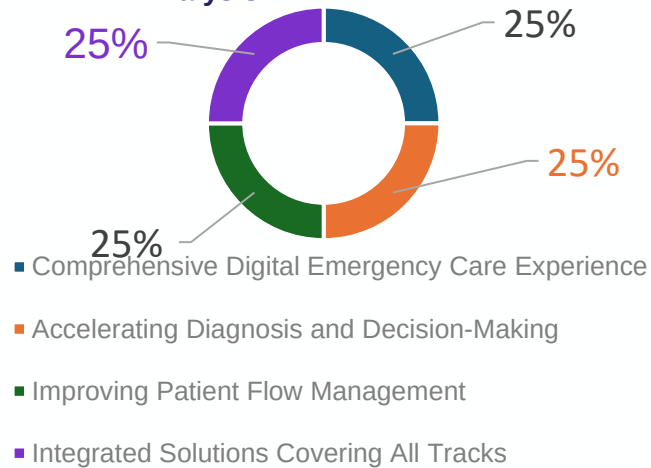
Analysis of Contributions Based on Decisions (1/2)

4.1

Present the general trends of participants' opinions

01

Data Collection & Analysis



02

Recommendations & Decisions

The initiative themes were analyzed and linked to the development needs of emergency medicine services. The analysis highlighted the importance of focusing on digital solutions that improve response time, enhance case management, support clinical decision-making, and positively impact the beneficiary experience.



The hackathon outcomes should be used to identify innovative and applicable solutions that can improve emergency care services. Priority should be given to solutions that reduce waiting times, improve triage, accelerate diagnosis, and enhance the overall patient journey.



Analysis of Contributions Based on Decisions (2/2)

4.1

Present the general trends of participants' opinions

03

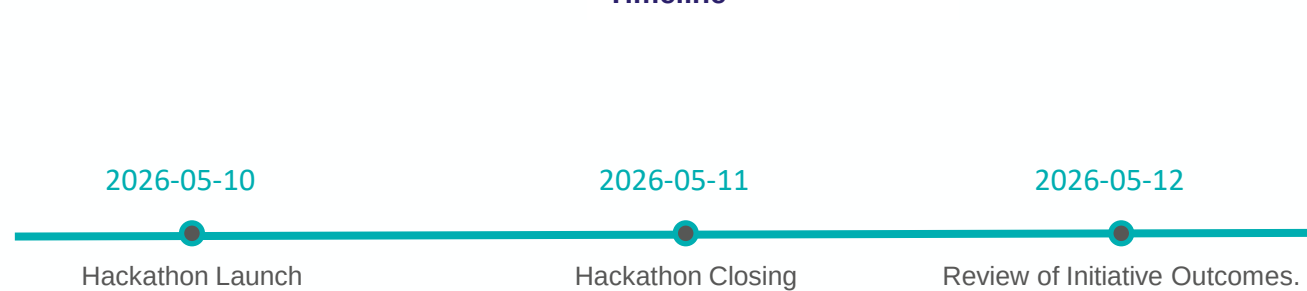
Linking the Decision to the Final Decision

The submitted ideas and proposed solutions focused on developing digital solutions that support improving the beneficiary experience in emergency departments, accelerating diagnostic processes, and organizing patient flow. The initiative also highlights the importance of leveraging innovation and emerging technologies to address operational and clinical challenges in emergency medicine.



04

Implementation Timeline



Results and winners

Clarify the recommendations and decisions made based on participants' feedback

The activities of the **Innovation Track Hackathon 2026** concluded under the theme “**The Future of Emergency Medicine with New Perspectives.**” The hackathon witnessed inspiring innovative competition, with **12 participating teams** presenting innovative solutions to address the challenges of emergency medicine and anticipate its future.

The hackathon resulted in three winning projects focused on improving the patient experience, supporting smart triage and diagnosis, and enhancing patient flow management in emergency departments:

- **First Place: Emergency Turjuman** — An AI-powered solution that translates Saudi Sign Language and facial expressions for patients with hearing disabilities into medical data, while also supporting visual explanations of medical procedures.
- **Second Place: Clinic Sense** — An AI-based solution that triages and directs patients to the appropriate level of care before visiting the emergency department, contributing to reduced overcrowding and improved resource utilization.
- **Third Place: Live ED Twin** — A digital twin solution for emergency departments that analyzes real-time data, predicts overcrowding, and provides proactive operational recommendations.



Next Phase and Support

Clarify the recommendations and decisions made based on participants' feedback

The winning projects are analyzed in coordination with the relevant authorities, and a decision will be made during the fourth quarter- 2026 regarding the most suitable solutions for implementation within the MNGHA. The possibility of supporting these solutions through research and development pathways, innovation support programs, and opportunities for building prototypes or conducting pilot projects within the healthcare environment will be explored, ensuring that outstanding ideas are transformed into solutions with a sustainable impact.





هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Winning Projects in the Innovation Track Hackathon 2026



3 winning projects in the Innovation Track Hackathon 2026

Third Place



Live ED Twin



Brief About the Project



An intelligent solution that shifts emergency management from a reactive model after a crisis occurs to a predictive and preventive model. The solution is based on live digital twin technology, which goes beyond simply displaying data by transforming real-world inputs and surrounding risks into practical forecasts and immediate operational recommendations, enabling teams to make the right decision at the right time.

Second Place



Clinic Sense

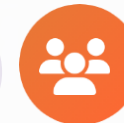


Brief About the Project



An intelligent solution that uses artificial intelligence to triage and direct patients to the appropriate care pathway before visiting the emergency department.

First Place



Emergency Turjuman



Brief About the Project



A technology that detects hand movements and facial expressions for people with hearing disabilities and translates them into medical data. It is also linked to the Saudi Sign Language dictionary to explain and help patients understand medical procedures, while building and developing a dedicated database.

First Place

Team No. (7)

Emergency Turjuman



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Emergency Turjuman

An AI-powered sign language translation system for emergency departments

Digital Inclusion Track

Team No.7



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

الفريق

Hussam Mohammed Alharbi

Healthcare Practitioner ·
Designer

Khalid Badr Alhussaini

Technical Specialist ·
Researcher

Fahad Shujaa Alhabout

Team Leader · Healthcare
Practitioner · Researcher

Badr Riyadh Alhuzaimi

Technical Specialist · Designer

Mohammed Ali Alsharie

Technical Specialist · Designer

Challenge

Deaf patients in emergency departments face communication isolation that affects their privacy and independence, delays diagnosis, increases the risk of medical errors and resource waste, and makes it difficult to explain medical procedures to them.

Research Questions

How can the system explain medical procedures and examinations to the patient?

2

How can the system enable deaf patients to describe their symptoms accurately?

1

What is the impact of the digital intermediary on the patient's privacy and independence?

4

What is the system's impact on reducing medical triage time?

3



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Solution

Solution

Enable deaf patients to communicate independently and understand medical procedures accurately and quickly.

Description

An AI system that translates Saudi Sign Language and facial expressions. It also provides the physician with a sign-language video library to explain medical procedures to the patient.

Target Beneficiaries

Healthcare staff

Physicians and nurses in emergency departments

84,200

beneficiaries with hearing disabilities



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Technologies and Features

Key Features

- Translates sign language and facial expressions to understand the patient's complaint.
- Visually explains medical procedures to the patient.
- Enhances patient independence and confidentiality of medical information.
- Reduces waiting time and helps avoid diagnostic errors.

Technologies Used

- **Computer Vision**
Analyzes camera footage, hand movements, and facial expressions.
- **Saudi Sign Language Dictionary**
A video database for medical terms and procedures.
- **Artificial Intelligence**
Converts sign language into textual data.
- **Interactive Interface**
Facilitates use and improves emergency department efficiency.

Main Stages

Main Stages

Building a database for the program in collaboration with the Saudi Society for Hearing Disability.

Training AI models to recognize Saudi Sign Language.

Conducting a field trial in a simulation environment to collect statistics and measure impact.

Launching a pilot implementation in a partner healthcare facility's systems.

Official launch and offering the solution to healthcare facilities.

1

2

3

4

5

Expansion and Sustainability

Sustainability

Integration with Healthcare Entities

Integration with hospital management systems.

Continuous Technical Support

Monitor performance and resolve issues around the clock.

Technical Sustainability

Update data and systems through feedback from physicians.

Strategic Partnerships

Build partnerships with associations and educational institutions.

Data Protection

Ensure the confidentiality and security of patient information according to high standards.

Expansion

Geographic Expansion

Start with hospitals in Riyadh and Jeddah, then cover the

Holy Sites.
Inclusive Expansion

Add global sign language dictionaries and support local dialects.

Digital Integration

Full technical integration with the unified patient record platform.

Technical and Medical Expansion

Detect facial asymmetry and hand movements to identify strokes and seizures.

Impact

Impact Measurement Methods

- Satisfaction survey for beneficiaries with hearing disabilities ●
- Response time indicator ●
- Diagnostic accuracy rate ●

Emergency Turjuman contributes to:

- Enhancing triage efficiency and accelerating access to clinical information ●
- Avoiding financial burdens resulting from delayed procedures and medical errors ●
- Improving the quality of life for people with hearing disabilities ●
- Promoting digital transformation in the healthcare sector ●
- Strengthening privacy and trust between the patient and the healthcare practitioner ●



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Second Place

Team No. (10)

Clinic Sense



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA



- Shahad Alsuwat, Team Leader & Clinical Strategy
- Ghaidaa Alosaimi, Research & Investigation Lead
- Ghadeer Alhazmi, Content Writer & Presenter



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Group 10



ClinicSense

Accelerating and supporting diagnosis

تسريع ودعم التشخيص



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Emergency Departments are overwhelmed



30%–60% of Emergency Department visits globally are classified as non-urgent.

Emergency Departments are overwhelmed



In Saudi Arabia, non-urgent Emergency Department visits range from **50%–60%.**

DOI: 10.2147/IJGM.S170682





AI-Powered Pre-ED Triage System for All Patients Integrated into Existing Healthcare Apps:

توكلنا
Tawakkalna



صحتي
Sehhaty



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



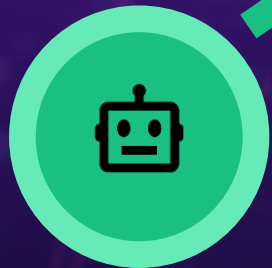
الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Inputs and analysis



EMR-Based Medical
Risk Assessment

Hidden Needs &
Reassurance Detection



AI-Powered Adaptive
Conversation



Risk Stratification
(ESI-Based)



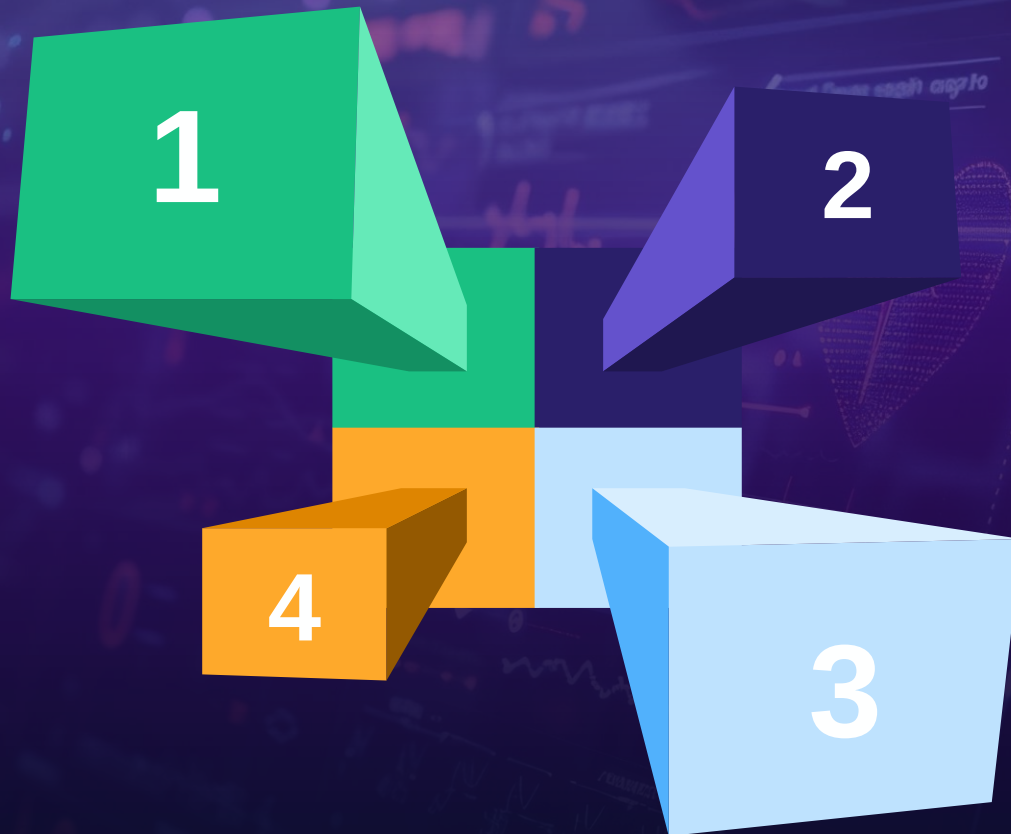
Location-Based
Outbreak Detection

Outputs



ClinicSense

Patient Classification & Smart Direction



ESI 1-3, ED Referral & Physician Handoff



ESI 4, Telemedicine

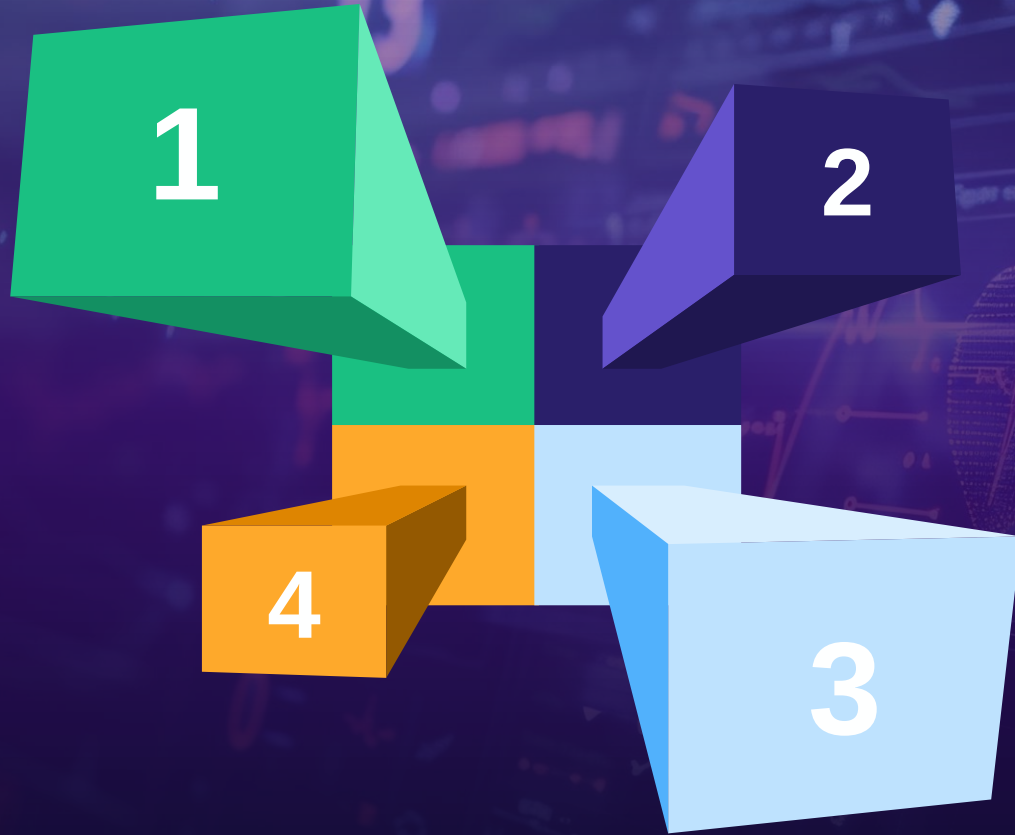


ESI 5, Home Care, OTC, and AI recommendations.



Smart follow-up & sick leave

Expected Impact



Reduced overcrowding, AI-based ED triage reduced mis-triage rates by 0.3–8.9% and improved documentation speed by 19%.



Decrease Wait Times AI triage clinical decision support reduced ED length of stay by 15.6 minutes overall, and up to 92.2 minutes for admitted patients, in a multisite implementation study.



Lower Healthcare Costs When patients are directed to the right care level before reaching the ED, low-acuity visits drop by 17.2% — reducing unnecessary costs



Improve Patient Experience AI triage gets patients to the right care faster, reduces unnecessary ER visits, and improves overall satisfaction.

ClinicSense phases

01 Build & Pilot 0 – 6 months	02 Measure Impact 6 – 12 months	03 Scale Up 12 – 24 months	04 Sustain 24 months+
Deploy in 1 facility	Track ED visits & wait times	Multi-site rollout	MOH / insurer funding
Train staff	Measure cost savings	Clinical outcome research	Continuous model updates
Test triage accuracy	Survey patient satisfaction	Regulatory approvals	Expand specialties
Working prototype	Evidence report	Regional deployment	Self-funded system



Third Place

Team No. (4)

Live ED Twin



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



الشؤون الصحية - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Digital Twin for the Emergency Department

Team No. 4

Team Members

Musa Musaad Al-Suwailim

Mohammed Nahar Al-Azmi

Zaid Ali Al-Harbi

Patient Flow Management Track



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



لشؤون الصحة - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Challenge

- After reviewing several medical sources and consulting emergency medicine experts, we found that the problem lies in more than one aspect.
- During a single shift, multiple factors may occur at the same time, such as an increase in patient volume, triage pressure, bed availability, and delays in lab results. However, all of these indicate a gap in reading the current situation and managing patient flow in the emergency department.
- Another part of the problem is the lack of full integration between the emergency department and the external environment.

**Slow patient
admission and
discharge**

**Lower
utilization of
staff**

**Inflexible
triage**

Solution

The solution is an advanced AI tool added to the system and connected to all supporting factors to perform two main functions:

Proactive Forecasting and Recommendations

- Predict peak demand hours before they occur.
- Detect pressure patterns or early outbreak indicators.
- Suggest actionable operational decisions during the shift.

Real-Time Data Analysis

- Patient arrival, triage, beds, and staff.
- Laboratory and radiology turnaround times.
- Admission and discharge times.
- Weather, air quality, events, schools, and daily activity.

Data turns into decisions

Added Value

01

Early
Epidemic
Radar



03

Real-Time
Staff
Allocation



02

Improving
Patient
Admission and
Discharge



04

Analyzed Data
for Research and
Development



Competitive Analysis Table

Epic / Oracle Cerner	TeleTracking	Qventus / LeanTaaS	Traditional	Digital Twin ED	Criteria
Manual documentation, unchecked reality context	Movement tracking, reasons unverified	Operational adjustments, not reality-documented	Relies on limited, non-real-time data	Automatic documentation, reality-verified surroundings	Verification & Documentation
Limited system visibility internally	Real-time tracking of movement inside the facility	Focuses on resources, no real-time transparency	Historical, non-real-time reports	Comprehensive real-time transparency (Inside/Outside ED)	Tracking & Transparency
Complex, resource-intensive operational burden	Requires training and adaptation	Requires extensive setup and customization	Complex reports for the end-user	Unified, simple interface (for all users)	Ease of Use
Traditional operational reports	Limited predictive analytics	Advanced operational efficiency with integrated predictive insights	Descriptive, non-predictive analysis	Predictive analytics + scenario simulation	Analytics & AI
Limited internal integration	Focuses on tracks-only data	Limited integration with external systems	Disconnected from operational systems	Open integration with all systems and sources	Integration & Flexibility
Data input system, not smart documentation	Internal tracking without cause verification	Operations improvement, not verified documentation	Non-real-time, non-predictive reports	Smart, reality-verified documentation connecting the ED to the entire health system, providing comprehensive contextual forecasting.	Unique Value

Technologies Used

4

Simulation and Dashboard

Tests scenarios and displays recommendations with a confidence indicator for the shift leader.

3

Official External Sources

Weather conditions, air quality, school schedules, events, sports activities, and epidemiological indicators.

2

AI Engine

Predicts demand, overcrowding, and the likelihood of bottlenecks within the coming hours.

1

Live Emergency Data

Patient arrivals, triage, beds, staff, laboratory, radiology, and admission/discharge times.

Final Output: A dashboard that explains: What is happening now? What will happen later? What is the best action?

Data + surrounding reality + artificial intelligence + simulation = faster decision-making and better patient flow

Target Beneficiaries

The target beneficiaries of the solution are emergency departments in hospitals.
The direct operational beneficiaries are as follows:

What Solution Offers	Current Need	Beneficiary
Early Prediction and recommendations for resource distribution and opening new paths.	Knowing upcoming pressure before peak hours.	Emergency Director
Clearer visibility of case volume and flow before overcrowding.	Reducing surprises during the shift.	On-Call Doctor
Alert when additional support or staff redistribution is needed.	Better workload balance.	Nurses
Faster coordination with internal departments before case accumulation.	Forecasting demand for admission and transfer.	Bed Management
More streamlined experience and faster service during peak hours.	Less waiting and a clearer journey.	Patient

Impact: The impact goes beyond the Emergency Department to finance, resources, the city, and people's quality of life.

Financial Impact

Reducing financial waste caused by unexpected peaks.



Quality of Life Impact

A clearer patient journey and less pressure on healthcare staff.



Operational Impact

Shifting the shift from reactive response to proactive leadership.



Enhancing the city's readiness during seasons and events.

Urban Impact



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



لشؤون الصحة - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MNGHA

Work Plan

The plan starts with the smallest version that proves value, then expands based on prediction accuracy and operational indicators, not assumptions only.

Months 9-12

Network Expansion

Transitioning the modal into a deployable product across other facilities or a health cluster with unified governance standards.

Metric of Success: Model Replicability

Months 6-8

Intersal Expansion

Allowing the laboratory, laboratory, redicology, hospitalization, nation and dashmand zchbars for support departments after the the pulcess of the fight.

Metric of Success: Hoser Adoption and Integration Stability

Months 3-5

Emergency Pirot

Silent run followed by assited run within specic shifts, measuring waiting times, waiting times, flow, and recommendation accuracy.

Metric of Success: Measurable impact within 90 days.

Weeks 4-8

Prototype

Building a live dashInoard and a short-term predictive modal with the inclusion of of weather and selected exernal indicators.

Metric of Success: First Complarable Prediction

Weeks 1-3

Diitra Preperation

Identifying emergency sources, source:s, data dictionary, permissions, and initial linking of key indicators arrival, triage, beds, and staff

Metric of Success: Completion of a Reliable Data Line

Future Plans and Expansion



Digital Integration Full technical integration with the unified health record.



Developing a Sustainable Financial Model



Expansion to a Network of Hospitals



هاكاثون مسار الابتكار ٢٠٢٦
Innovation Track Hackathon 2026



لشؤون الصحة - وزارة الحرس الوطني
Ministry of National Guard Health Affairs
MINGHA



Thank you