

# CASE STUDY: Impact Lab

LAB RESULT DELIVERY: FROM TECHNICAL FAILURE TO CARE IMPACT

# INTRODUCTION

EXT Impact Lab examines lab result delivery as a high-consequence workflow, showing how outages, delays, access failures, and data integrity issues can translate into care disruption, patient-safety risk, and operational impact. This case study maps the workflow, identifies critical failure points, and shows how technical breakdowns can produce real-world healthcare consequences.

# AUDIENCE / CLIENT TYPE

## Healthcare

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- Care/delivery organizations that depend on timely, accurate lab result access to support diagnosis, escalation, and continuity of care.
- Hospitals, clinics, and health systems
- Clinical, informatics, and IT stakeholders
- Workflows where result delays can affect care decisions

## Public Health Organizations

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Mission-driven organizations that rely on reliable data flow and coordinated action across programs, reporting pathways, and operational teams.

- Public health agencies and health programs
- Surveillance, reporting, and coordination teams
- Settings where workflow failure can create wider operational impact

# PROBLEM

## Traditional Threat Modeling Falls Short

Traditional threat modeling often stops at technical exposure, system severity, or compliance risk. It does not always show how disruption affects care continuity, workflow reliability, or patient safety in real-world settings.

- Technical risk is not the full story
- Workflow disruption can change decisions and timing
- Patient-safety consequence must be made visible

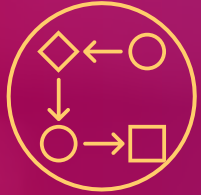
## Lab Result Delivery Is High Consequence

In a lab result workflow, delay, blocked access, or integrity loss can prevent the right result from reaching the right person at the right time. That can lead to delayed action, missed escalation, unsafe assumptions, or incorrect follow-up.

- Results may be delayed, unreachable, or altered
- Clinical review can be disrupted or mistimed
- Small failures can create real care risk

# WHAT WE CREATED

Q1 2026



## Workflow Model

Lab result delivery mapped end to end



## Reference Architecture

Cross-platform healthcare workflow design



## Synthetic Data Environment

Safe lab workflow using synthetic records



## Failure Scenario Set

Outage, blocked access, workflow disruption



## Workflow Risk Assessment

Technical disruption tied to operational impact



## Safeguard Recommendations

Resilience and continuity measures

# HOW WE APPROACHED IT

## Methodology

EXT Impact Lab applies a consequence-aware threat-modeling approach to a defined healthcare workflow. The work begins by setting the service boundary, identifying dependencies required for safe performance, mapping possible points of disruption, and tracing downstream operational and patient-safety effects. The goal is not only to identify technical exposure, but to show where technical failure can become workflow disruption, delayed action, or unsafe outcomes.

## Implementation

The case study was carried out in a controlled environment designed to represent realistic healthcare workflow conditions.

The environment used synthetic data, monitored workflow activity, and three core failure scenarios (e.g., outage, blocked access, and integrity change) to make workflow disruption observable and documentable.

# OUTCOMES

EXT Impact Lab produced a repeatable case-study framework for analyzing lab result delivery as a high-consequence workflow. The outcome is a repeatable method for tracing outages, delays, access failures, and integrity issues into workflow disruption, patient-safety exposure, and safeguard recommendations.

## Key Outcomes Include:

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- A structured case study method for examining how technical failure affects a critical healthcare workflow
- A repeatable analysis approach that connects outages, delays, access breakdowns, and integrity issues to downstream operational consequence
- Clearer visibility into workflow disruption, including where retrieval, timing, coordination, and follow-up begin to break down
- A patient safety lens on technical failure, showing how system issues can translate into delayed action, unsafe conditions, or incorrect follow-up
- A safeguard-oriented output, producing resilience measures, workflow protections, and continuity focused recommendations
- A reusable foundation for future scenarios, allowing the same approach to be extended to other healthcare workflows beyond lab result delivery