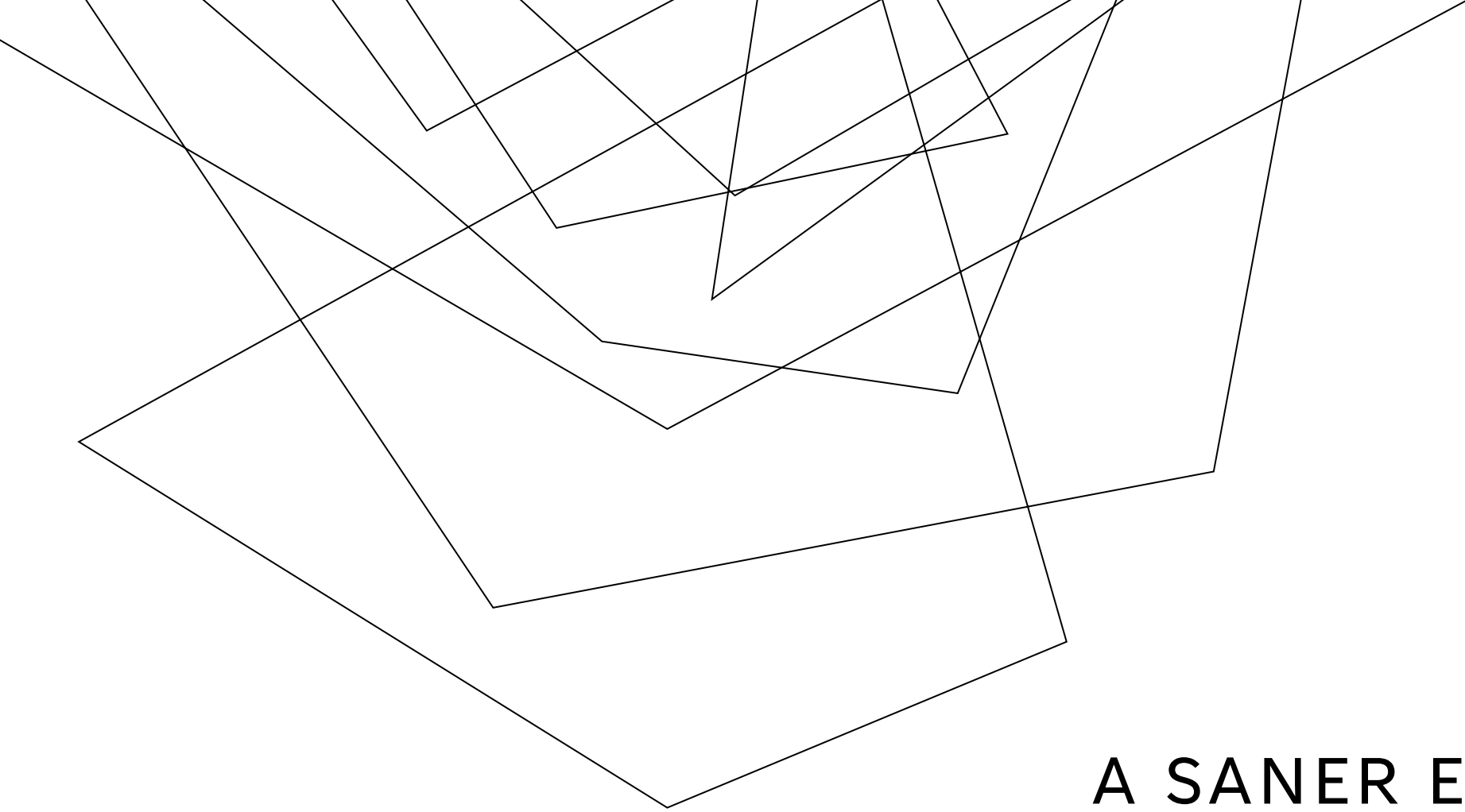




A SANER EPIDEMIC RESPONSE

By Eric Heflin
Co-Founder HealthCheck Systems

ERIC HEFLIN

Initial CTO/CISO of the eHealth Exchange (ret.)

CTO/CIO/CISO Texas Health Services Authority (ret.)

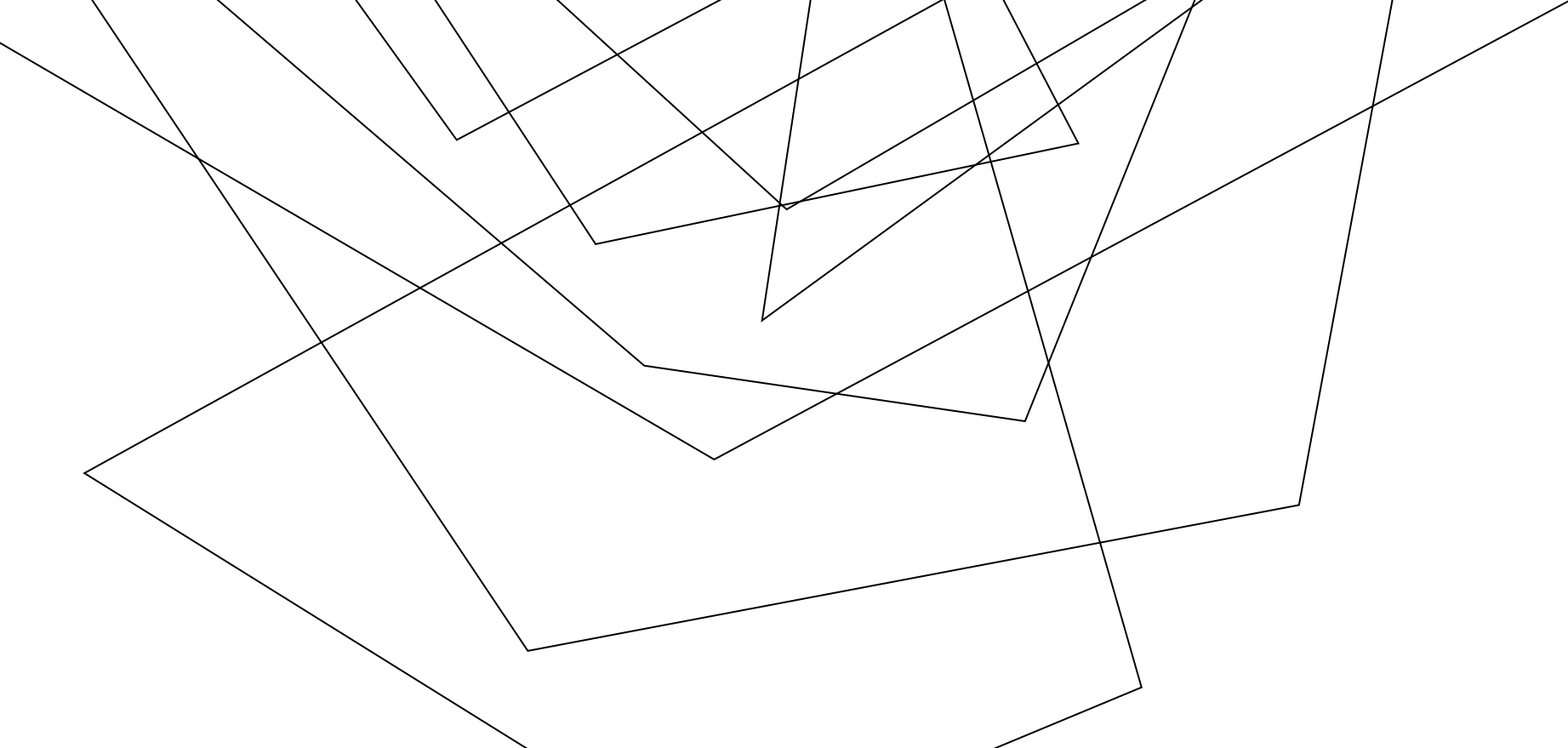
Lecturer in Cybersecurity for University of Texas at Austin
School of Business, and Strass Center for International Security
at the UT School of Law

Co-Founder of multiple startups (AI, Cybersecurity, Healthcare
IT) none of which will be mentioned today

Board Member IHE USA and SHIFT Inc.

M.A. Cybersecurity, Harvard University

All views expressed are my own
and are not intended,
necessarily, to represent any
organizations I am or was
affiliated with.

A series of thin, black, overlapping geometric lines forming various polygons and shapes, primarily located in the upper left quadrant of the slide.

Although I'm no longer staff at the eHealth Exchange, I do limited consulting for them. Nothing I'm discussing today provides any direct financial benefit to me.

DISCLOSURE

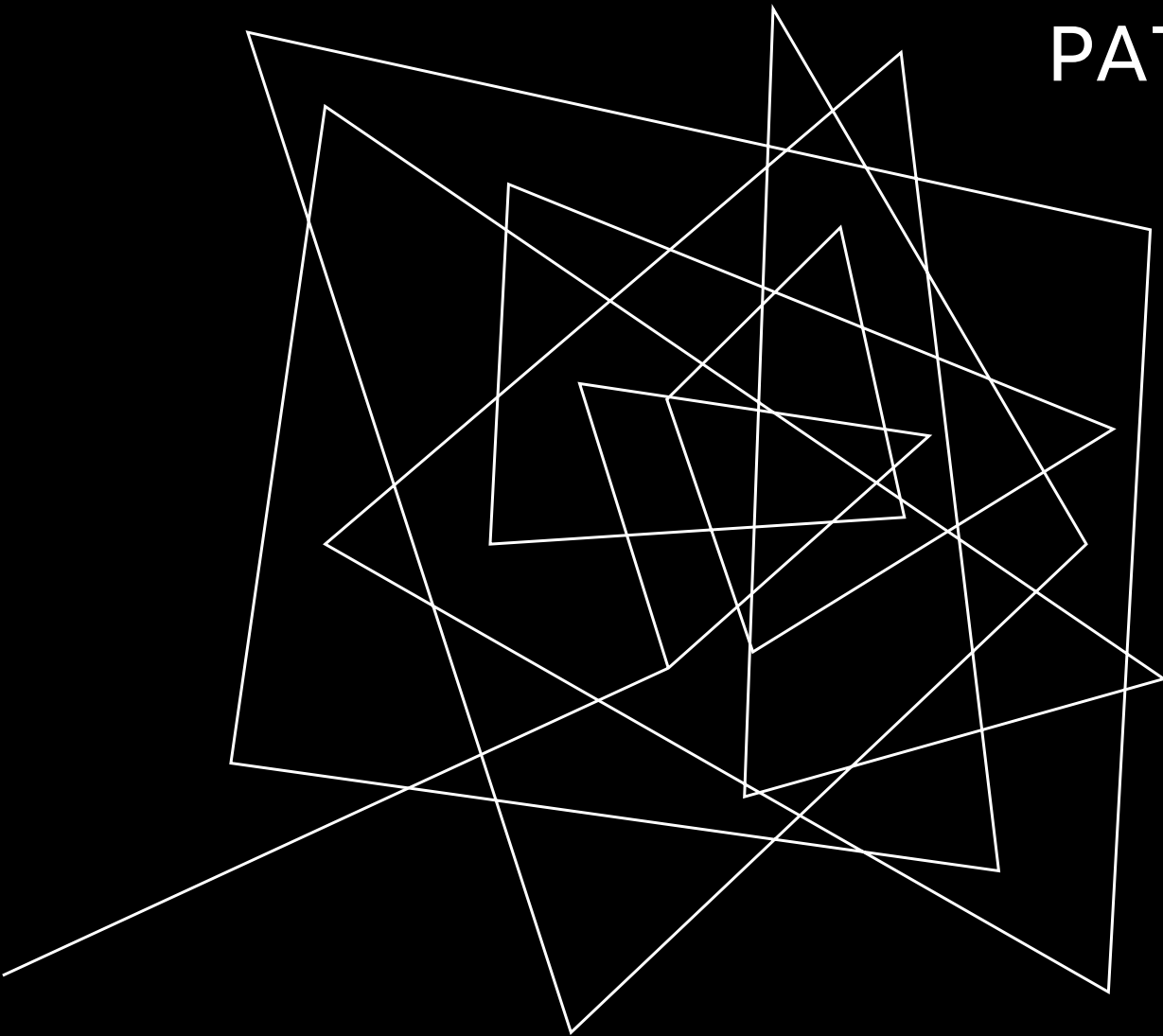
Two thin, dark gray lines intersect diagonally on a light gray background. One line runs from the top-left towards the bottom-right, and the other runs from the top-right towards the bottom-left. They cross each other in the upper-left quadrant of the image.

THE PROBLEM

CHALLENGES COLLECTING SITUATIONAL DATA

US National Strategy for Situational Awareness during COVID:

- Directives for hospitals to provide frequent reports
- As we learned more, those directives changed ... frequently
- Data resided in different hospital systems (bed mgmt, inventory, EHR, etc.)
- Required each hospital to procure open-ended R&D
- Less resourced hospitals used manual means for the entire pandemic
- Aggregation was a challenge
- No standards existed resulting in a nation with ad hoc reporting solutions

An abstract graphic on the left side of the slide, consisting of several overlapping, tilted rectangles and lines that create a complex, layered geometric pattern.

PATIENTS AND PROVIDERS...

PEOPLE RESORTED
TO MANUAL CALLS
TO IDENTIFY
AVAILABLE BEDS –
SEVERAL HOURS OF
EFFORT IN MANY
CASES



EHEALTH EXCHANGE ...

Capabilities

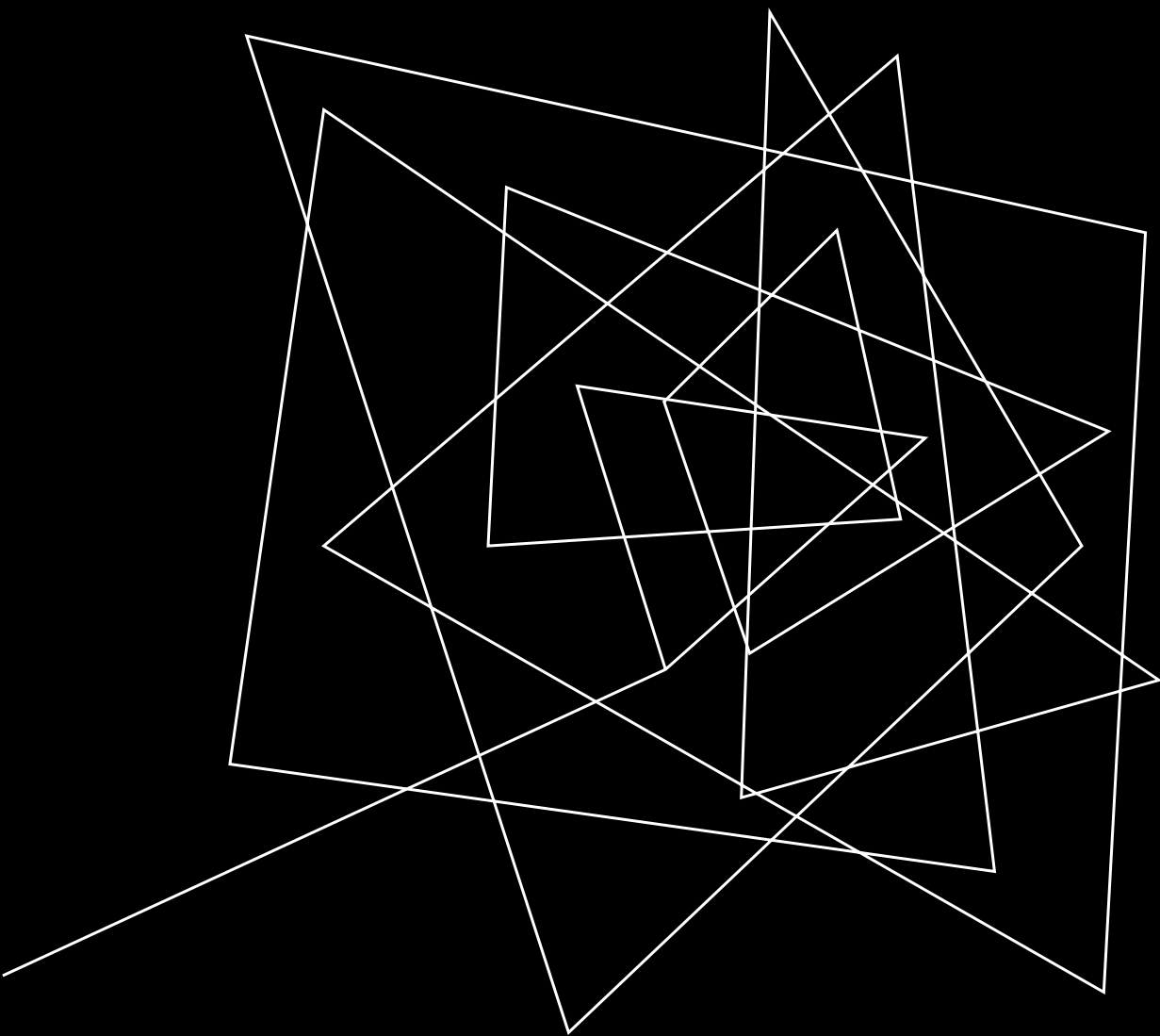
The eHealth Exchange was founded by the HHS, CMS and ONC:

- 3.5 billion monthly transactions
- Quality assured structured data
- Oldest and largest Health Information Exchange in the USA
- Connected to IHS, SSA, NIH (now), DoW/DoD, VHA, FDA, and CMS (previously), about 80% of hospitals
- 35+ other networks (TEFCA, Carequality, CommonWell, etc.)

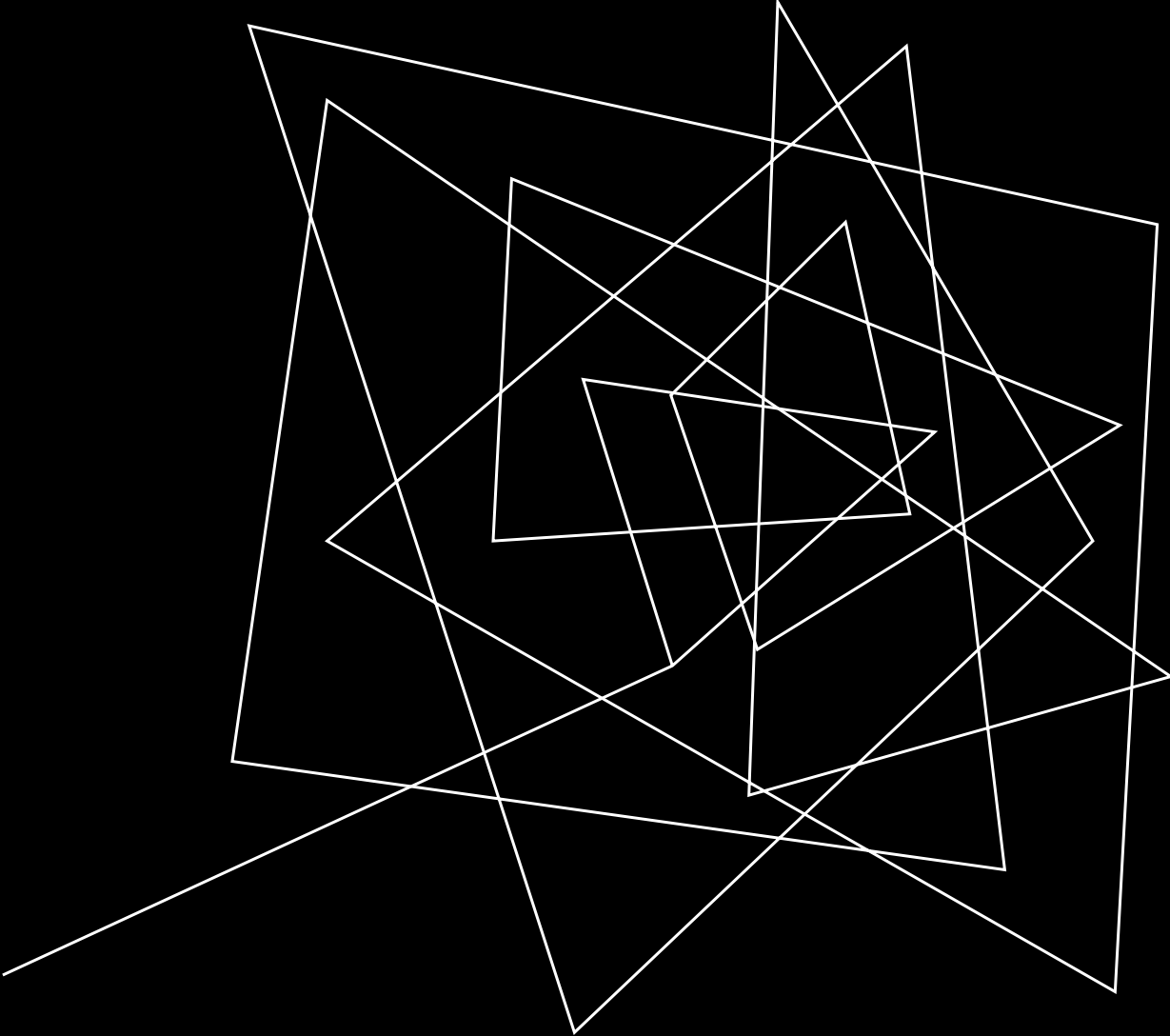
Utilization

During COVID-19 the eHealth Exchange was used for:

- Treatment use cases
- Care coordination among treating entities
- Benefits determination



TOTAL USE OF THE
EHEALTH
EXCHANGE FOR
SITUATIONAL
AWARENESS...



TOTAL USE OF THE
EHEALTH
EXCHANGE FOR
SITUATIONAL
AWARENESS...

ZERO



EHEALTH EXCHANGE

Directly connected to about 80% of all
hospitals in the USA

Indirectly connected to close to 100% of
hospitals

That national asset was not used to
get situational data from those
hospitals... **a lost opportunity**

TEXAS HEALTH SERVICES AUTHORITY

State-Wide HIE of HIEs

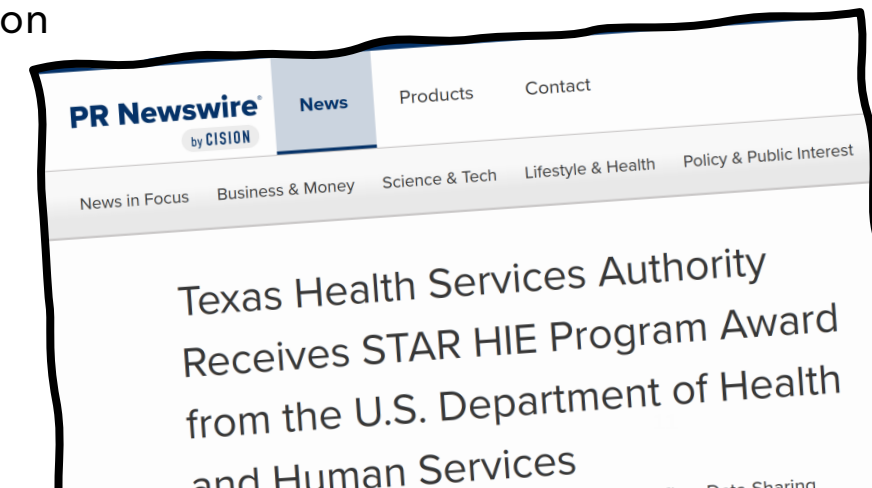
- Guided by a Board of Directors appointed by the Governor and oversight by the State Legislature
- Established state-wide health IT connectivity
- Texas HIT Disaster response system

HHS / ONC Program Awardee

Provided a program award. Objectives:

- Test a new candidate national situational awareness solution
- Finish a new HL7 standard
- Develop a reference implementation
- Recruit hospitals
- Deploy
- Monitor
- Assess and report-out

My role: Chief
Technology Officer



RESULT: SITUATION AWARENESS FOR NOVEL EPIDEMIC RESPONSE (SANER)

Successfully

1. Standardized (HL7)
2. Built
3. Deployed
4. Now ready for Trial
Use under HL7

Result

- New standard anyone in the world can use for free

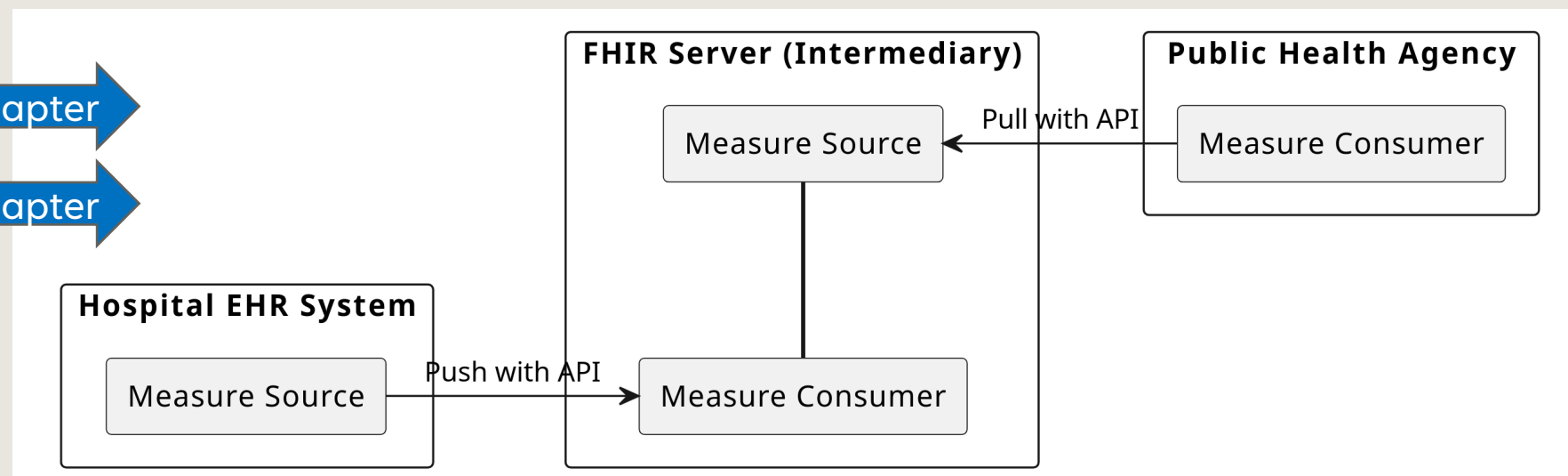
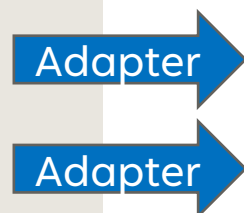
Use Cases

- Measurement definition distribution
- Measurement data collection
- Measurement calculation
- Aggregation and analysis of discrete data
- Dashboards and reporting

HOW SANER WORKS

Hospital Data Sources:

- Bed management systems
- In-house Labs Infor Mgmt
- Inventory management
- Electronic Health Records
- In-house Pharmacy System
- Spreadsheets (CSV)
- Manual data entry (if needed as a stop gap)



SANER DATA COLLECTION

Measures Definitions

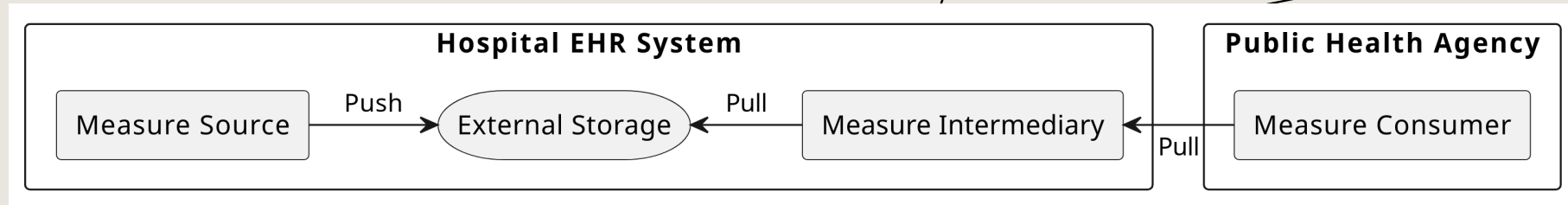
- Allows definition and collection of almost any available data
- Numerator / denominator format
- Extensible – designed to allow additional data sources to be added post-deployment
- Does not require a redesign to add new data source
- Process is to add a new adapter to collect those data automatically, or manually
- Data are in FHIR MeasureReport resources

Examples

1. Available licensed beds / Total licensed beds
2. Available surge beds / Total surge beds
3. Available ventilators / Total ventilators
4. Available staff (RNs, MDs, etc.) / Total staff
5. Available specific medications / Total medications
6. Many more

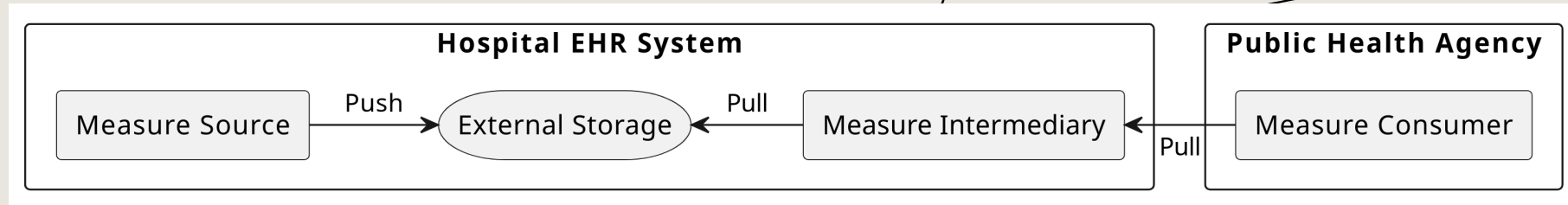
FLEXIBLE DEPLOYMENT

Option 1: Hospital Does Most of the Work

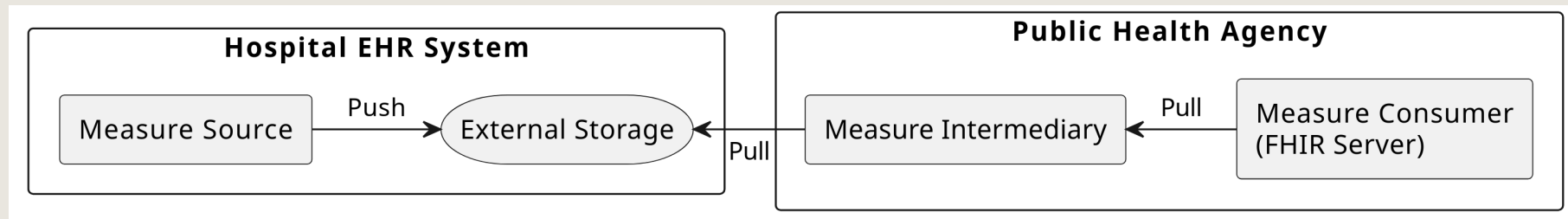


FLEXIBLE DEPLOYMENT

Option 1: Hospital Does Most of the Work

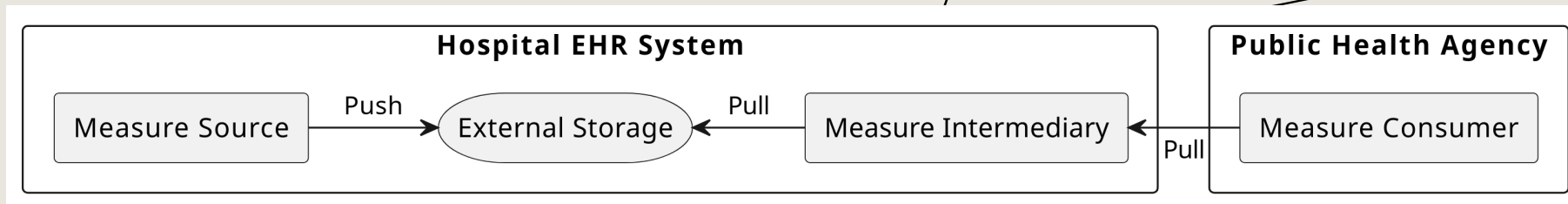


Option 2: Shared Work

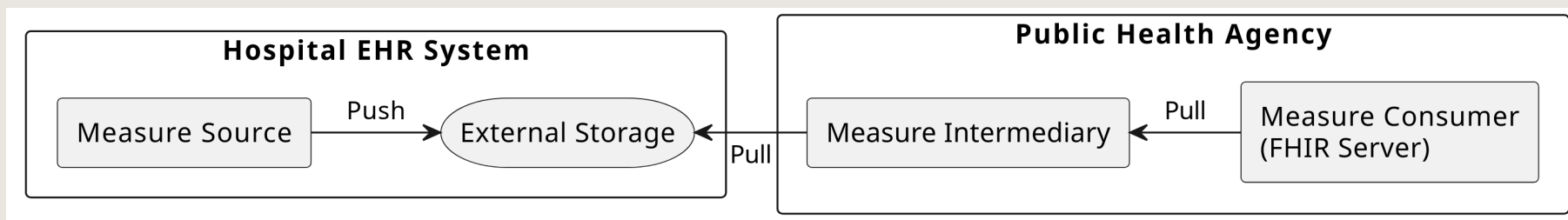


FLEXIBLE DEPLOYMENT

Option 1: Hospital Does Most of the Work



Option 2: Shared Work



Option 3: Public Health Does Most of the Work

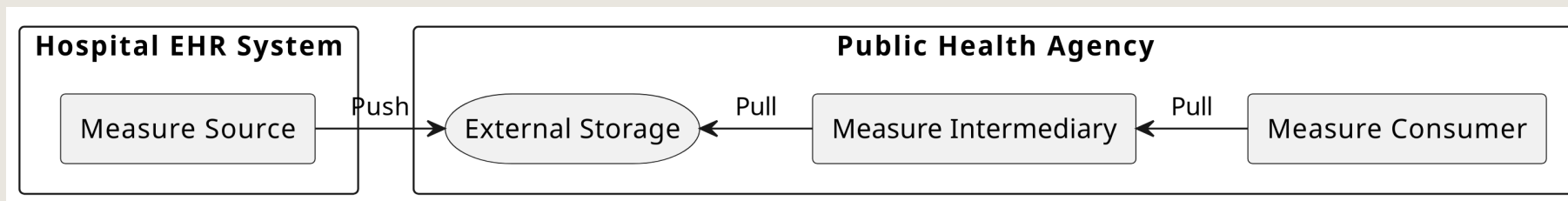


Image credits: https://build.fhir.org/ig/HL7/fhir-saner/Architecture_and_Implementation.html

Successes:

- **Mostly** successful!
- Now an HL7 Standard for Trial Use (STU)
- Piloted at two hospitals in Texas

Opportunities for Improvement:

- Timing of the funding needs to be **before** the next pandemic
- In Texas it took many months and calls to probably almost every hospital in the state to finally get two two participants (Knox Country and Parkland). Reason: **Timing! SANER was too late to help**

OUTCOMES OF THE SANER PILOT



LESSONS LEARNED

- Let's leverage TEFCA, CommonWell, Carequality, and the eHealth Exchange national networks
- Use SANER... it's free and open source
- Provide leadership focus on SANER
- Prioritize the deployment of SANER before the next pandemic hits

REFERENCES

1. Main SANER HL7 page
 1. <https://build.fhir.org/ig/HL7/fhir-saner/>
2. THSA GitHub source code repository
 1. <https://github.com/AudaciousInquiry/THSALink/tree/master>
3. SANER Use Cases
 1. https://build.fhir.org/ig/HL7/fhir-saner/use_cases.html
4. SANER Architecture and Implementation
 1. https://build.fhir.org/ig/HL7/fhir-saner/use_cases.html
5. Profiles and Extensions
 1. https://build.fhir.org/ig/HL7/fhir-saner/profiles_and_extensions.html
6. FHIR MeasureReport Resource
 1. <https://hl7.org/fhir/R4/measurereport.html>
7. FHIR Profile Public Health Measure Report
 1. <https://build.fhir.org/ig/HL7/fhir-saner/StructureDefinition-PublicHealthMeasureReport.html>
8. CSV Option and Pull Option
 1. <https://build.fhir.org/ig/HL7/fhir-saner/CapabilityStatement-MeasureSource-QueryMeasure-CSV-Pull.html>
9. Query Measure Transaction
 1. <https://build.fhir.org/ig/HL7/fhir-saner/transaction-1.html>



Eric Heflin
Cybersecurity Board Member



THANK YOU

Please stay
in touch!

<https://linkedin.com/in/eric-heflin/>