Today's Agenda

01   **Blue Cross Blue Shield Michigan, Rich Boehm**
IT Director

Cloudticity, Gerry Miller
Founder & CEO   **02**

03   **MiHIN Group, Tim Pletcher**
Executive Director

Tools Overview and General Event Information   **04**

05   **Teams Begin Working**

INTEROPERABILITY INSTITUTE

Blue Cross
Blue Shield
Blue Care Network
of Michigan

Nonprofit corporations and independent licensees
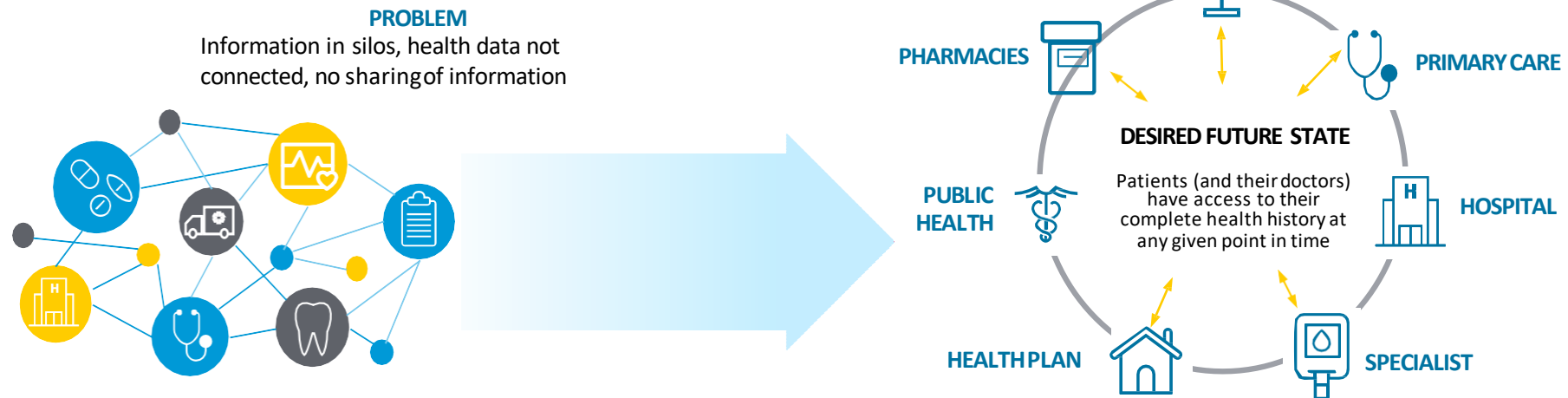of the Blue Cross and Blue Shield Association

Rich Boehm,
IT Director

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Welcome

- Thank you for participating today in these unique times

- COVID has increased the need, more than ever, for ***data exchange*** between health care providers and health care payers

  - **Patient Information and Patient Care**
    – Patient history
    – Disease registries
    – Virtual visits

  - **Reporting and Analytics**
    – Where are the hot spots?
    – Where will the hot spots be?

Interoperability: Ability to electronically share meaningful healthcare data without special effort

PROBLEM
Information in silos, health data not connected, no sharing of information

LABS

PHARMACIES

PRIMARY CARE

DESIRED FUTURE STATE
Patients (and their doctors) have access to their complete health history at any given point in time

PUBLIC HEALTH

HOSPITAL

HEALTH PLAN

SPECIALIST

BCBS INTEROPERABILITY PRINCIPLES

Patients Access to Data	Build a Strong Foundation	Data Liquidity
Patients own and should have access to their healthcare data wherever and whenever they need it.	Standardizing the way we exchange data is necessary to make health data accessible, safe and private	Remove barriers preventing flow of data to allow access in a secure, efficient and cost-effective way

Why Interoperability and Why Now?

Lower cost of care

Increased care coordination

Greater consumer engagement and shared decision making (and we are all consumers)!

Improved consumer experience

Better patient outcomes

Improved quality and safety

Greater operational efficiencies

Final Interoperability Rule – Minimum Compliance

Blue Cross Blue Shield Blue Care Network of Michigan

APIs

Make health information available electronically via open, standardized, pro-competitive application programming interfaces* that are routinely monitored and contain:

- Patient claims and encounter data
- Clinical data and lab results**
- Provider directory
- Drug benefit data

Security & ID Standards

API technology must comply with technical standards proposed by ONC, must be certified and follow security and member identification standards:

- FHIR, OAuth 2.0, OpenID Connect 1.0
- Specific technical approach and standards
- Privacy and security (including informing enrollees how they can protect their PHI)

Payer to Payer Data Exchange

Upon enrollee request, forward a beneficiary's information to a new plan or other entity for up to 5 years after the beneficiary has disenrolled (must also be able to accept incoming data sets)

Information Blocking

Information blocking is prohibited

- Health IT developers, health information networks, and health information exchanges in violation could incur fines up to $1,000,000 per violation

*Open API = technical and other information required for a third party application to connect to them is publicly available
**Only if the plan collects such data as part of regular business practice

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Gerry Miller,
Founder & CEO

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Cloud-native healthcare data interoperability: how it's changing our present, our future

Gerry Miller Founder & CEO, Cloudticity

Healthcare data interoperability is everybody's problem

o Reduce readmissions

o Improve efficacy of clinical decisions

o Create better patient experiences

o Drive additional revenue   Perform

o COVID-19 surveillance, inform response and recovery

cloudticity

The Challenge: The Old Way Isn't Working

- Ingest vast quantities of healthcare messages at scale

- Get the data into the environment immediately

- Provide actionable insights using heuristics, BI, and machine learning – in real time

- Maximize security, availability, performance, and cost-optimization

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The Solution: Cloudticity Healthcare DataHub™
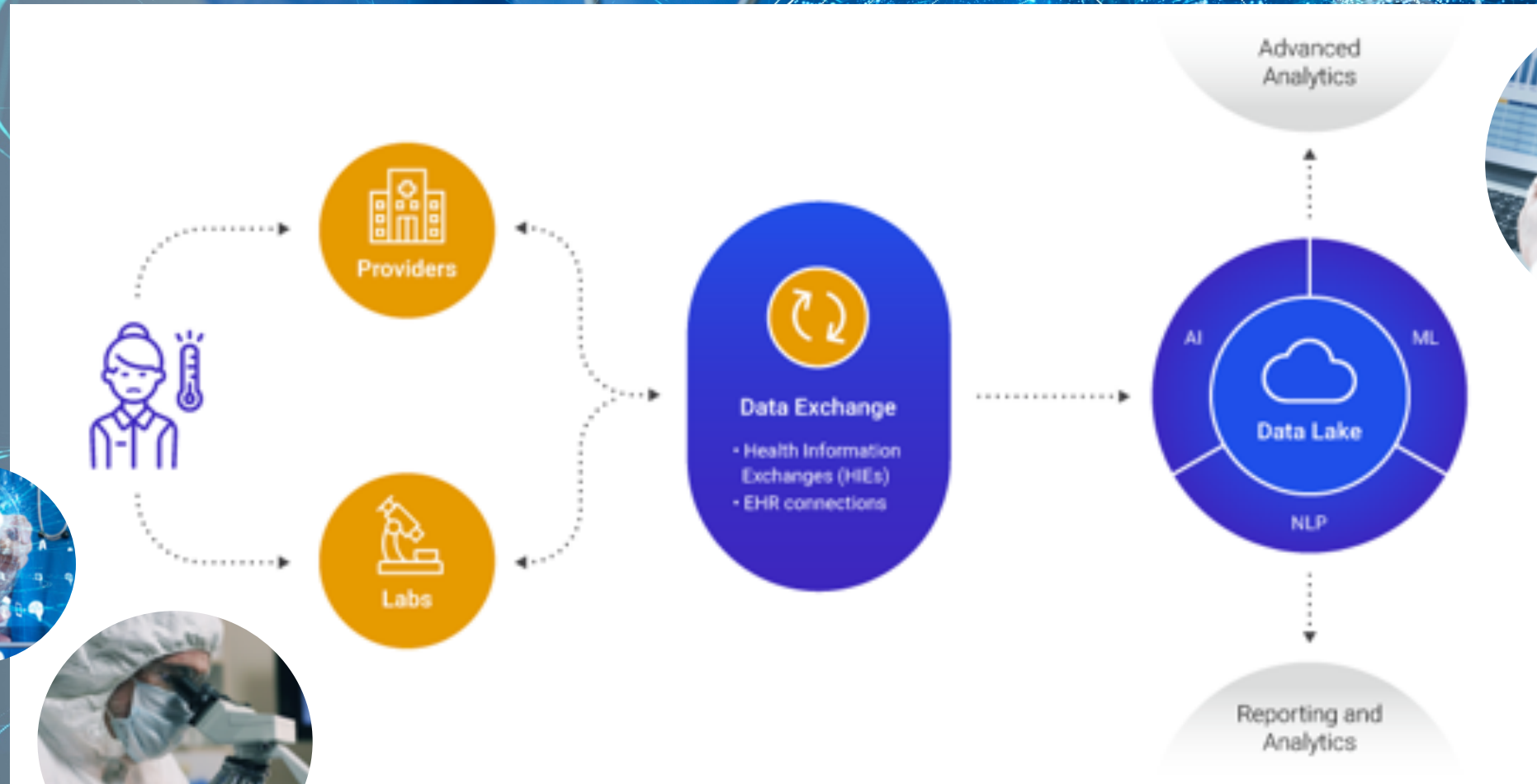
o   100% AWS-native

o   90% cost reduction

o   Instant time to value

cloudticity

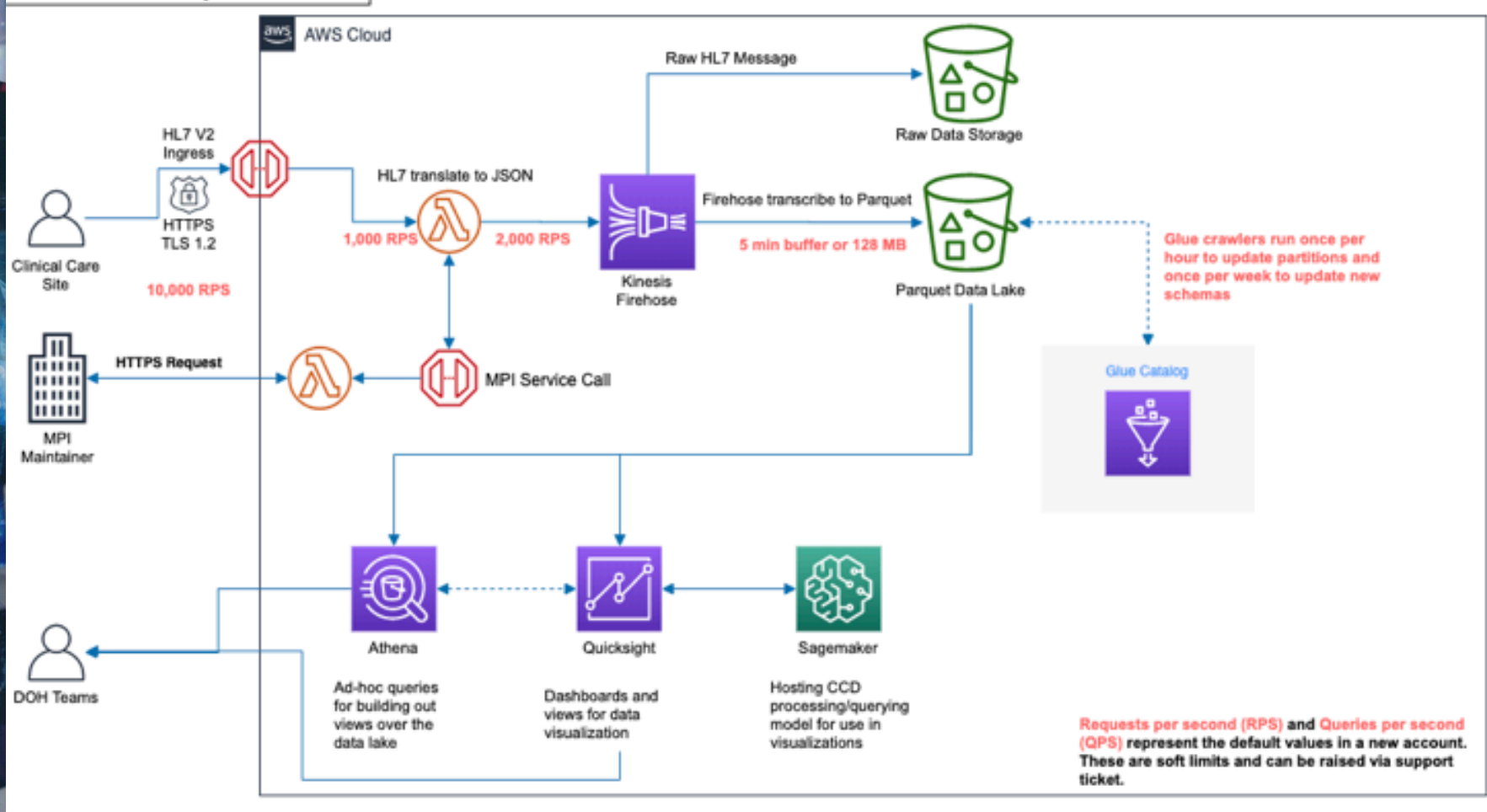# COVID-19 Use Case: A Real-Time Clinical Data Repository For Surveillance and Response

o Environments stood up in matter of hours

o Real time data on COVID-19 patients for real time policy responses

o Managed data lake

How It Works:
Creating a flow of clinical and lab data to a data lake

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Data Lake Architecture

Healthcare Analytics on AWS

AWS Cloud

Clinical Care Site — HL7 V2 Ingress — HTTPS TLS 1.2 — 10,000 RPS

HL7 translate to JSON — 1,000 RPS — 2,000 RPS

Raw HL7 Message → Raw Data Storage

Kinesis Firehose — Firehose transcribe to Parquet — 5 min buffer or 128 MB → Parquet Data Lake

Glue crawlers run once per hour to update partitions and once per week to update new schemas

Glue Catalog

MPI Maintainer — HTTPS Request — MPI Service Call

Athena — Ad-hoc queries for building out views over the data lake

Quicksight — Dashboards and views for data visualization

Sagemaker — Hosting CCD processing/querying model for use in visualizations

DOH Teams

Requests per second (RPS) and Queries per second (QPS) represent the default values in a new account. These are soft limits and can be raised via support ticket.

What Insights Are We Discovering?

Response ❯ Recovery

Comorbidities

Contact tracing

Hospital capacity

Genetic predispositions

Building risk profiles

Planning recovery

Patient trends

Managing ventilator inventory

Social determinants of health

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Reporting

PERSONA
Governor's Office

REPORTING OUTCOMES
Summary and Dashboard

PERSONA
Public Health Department

REPORTING OUTCOMES
Summary, dashboard, and Geographic Reporting for swells, policy decisions

PERSONA
Hospital/Physician

REPORTING OUTCOMES
Hospital trends, patient trends, co-morbidities and linked outcomes

PERSONA
Epidemiologists

REPORTING OUTCOMES
Contact tracing, co-morbidities linked to outcomes, patient profiling, inputs to policy at Department Level
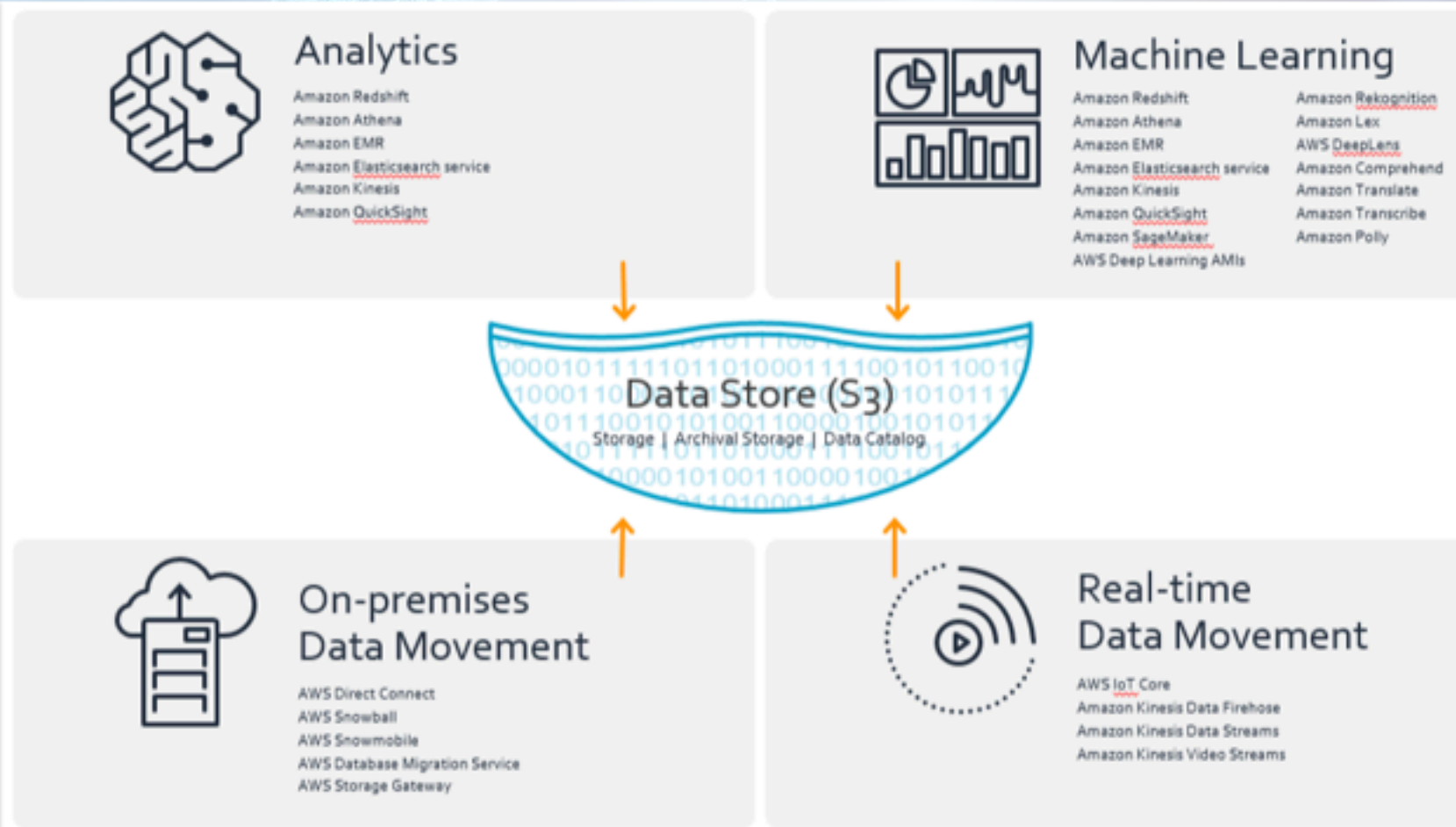
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What Does It Look Like To Stand Up a Data Lake?

o   These are the critical paths required to implement a real-time data lake for COVID-19

o   State agencies must exercise authority to collect minimum data (patient level HL7 and CCDs) necessary forpublic health surveillance to combat COVID-19 with support from Governor

o   Identify and integrate key stakeholders who manage healthcare data networks

o   Deploy Data Lake   Start collecting lab confirmed COVID cases

o   Work within stakeholders to onboard gap of non-connected hospitals

o   Establish real-time connection with Data Lake

o   Start engaging with data, with support from AWS and Cloudticity for AI/ML and queries

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Cloudticity Healthcare DataView™

For COVID registry, AWS organized requirements across multiple HIEs and 118+ stakeholders, deployed AWS services, and trained analysts in eleven days.

They used services such as Amazon API Gateway, AWS Lambda for conversion, Amazon S3 storage, Amazon Glue crawler on a data lake S3 bucket, and ran the data through Amazon Kinesis.

Analytics
Amazon Redshift
Amazon Athena
Amazon EMR
Amazon Elasticsearch service
Amazon Kinesis
Amazon QuickSight

Machine Learning
Amazon Redshift
Amazon Athena
Amazon EMR
Amazon Elasticsearch service
Amazon Kinesis
Amazon QuickSight
Amazon SageMaker
AWS Deep Learning AMIs

Amazon Rekognition
Amazon Lex
AWS DeepLens
Amazon Comprehend
Amazon Translate
Amazon Transcribe
Amazon Polly

Data Store (S3)
Storage | Archival Storage | Data Catalog

On-premises Data Movement
AWS Direct Connect
AWS Snowball
AWS Snowmobile
AWS Database Migration Service
AWS Storage Gateway

Real-time Data Movement
AWS IoT Core
Amazon Kinesis Data Firehose
Amazon Kinesis Data Streams
Amazon Kinesis Video Streams

Data Bringing Light to Darkness
Illuminated By the Cloud

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THE MiHIN GROUP

Tim Pletcher,
Executive Director

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Why "InterOpathon"?

Hackathon
Hub for product design and creation

InterOpathon
Merges the inventive nature of a hackathon with the collaborative, implementation-focused nature of a connectathon to create a space of ultimate interoperability and product implementation.

Connectathon
Focus on implementation and testing of products
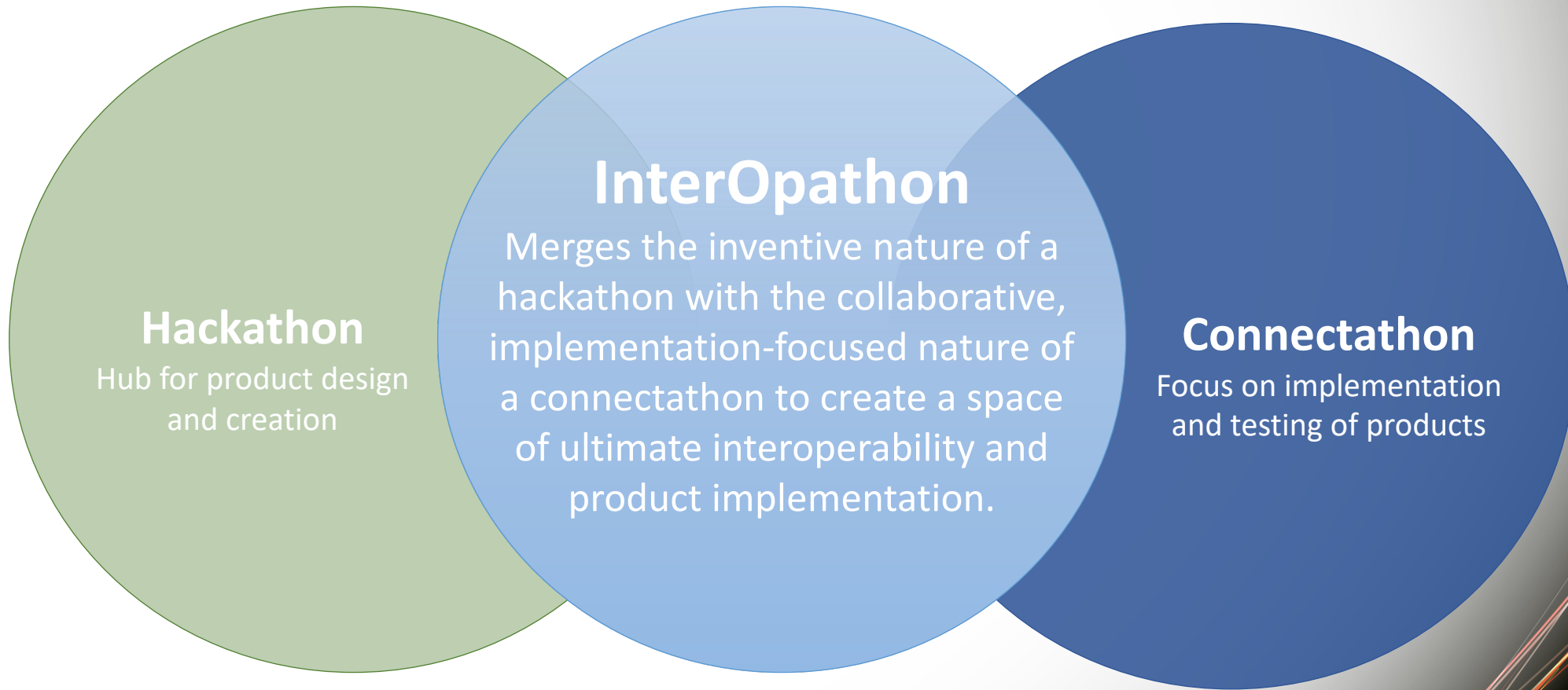
#InterOpathon

HL7 FHIR Accelerators come together to address TEFCA compliance

As COVID pivoted the world from in-person to virtual venues, the MiHIN InterOpathon leveraged Interoperability Land ™ to implement a live virtual event. Working collaboratively with the HL7 FHIR Accelerators, the HL7 Connectathon – to develop the HL7 standard – moved to the InterOpathon – cross FHIR Acceleration of real world interoperability solutions for TEFCA compliance.

IOL Roadmap

ONC/CMS rule compliance

- Patient Access API – Claims and Encounter Data (aka BlueButton)

- Provider Directory API

- Payer-to-Payer Data Exchange

- Patient Access API – Clinical Data

- Patient Access API – Plan Coverage and Formularies

2. IOL Network for collaborative community of partners to share   persistent Testbed-of-Testbeds environment

- IOL Network creation - continue to pursue answers, learn together and share a legal environment

- Synthetic Personas to represent common use case scenarios

- API library – fast links to ubiquitous API solutions

3. Interoperability Land ™ for academics creating virtual

Sandbox Persistence

- Utilize the persistent InterOpathon simulation environment from internal organization testbed to pre-Production as part of the path to real world solutions, standards and regulatory compliance

- Collaborate with other organizations to enable interoperability, first in a 'safe' shared testbed environment

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