

UNC Health's Cloud Migration Business Case, Journey and Technology

Shaun McDonald

Mark Matthews

Annual Conference 2024

Building the Future of Health Together

HIMSS NORTH CAROLINA CHAPTER



Presenters



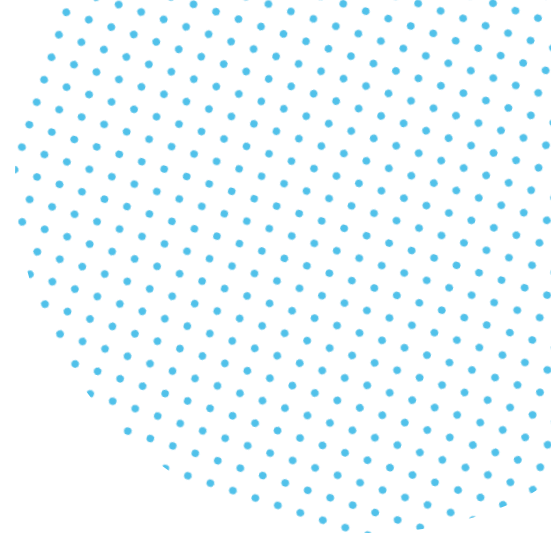
Shaun McDonald

*BI Manager –
UNC Health*



Mark Matthews

*Director –
UNC Health*



Agenda

- UNC Health Analytics Team Overview
- Business case for moving to the cloud
- Key decisions behind our strategy
- Discuss the framework and architectural decisions

Learning Objectives

Learning Objective 1:

Understand UNC Health's business case for embracing cloud migration

Learning Objective 2:

Learn about a large regional health system's plan and what drove business, functional and technical decisions

Learning Objective 3:

Opportunity to discuss various platforms considered, the framework UNC Health chose and the rationale behind the decisions



Understanding UNC Health's business case for embracing cloud migration

ISD Enterprise Analytics and Data Services (EADS) provides centralized data and analytics services and support to UNC Health

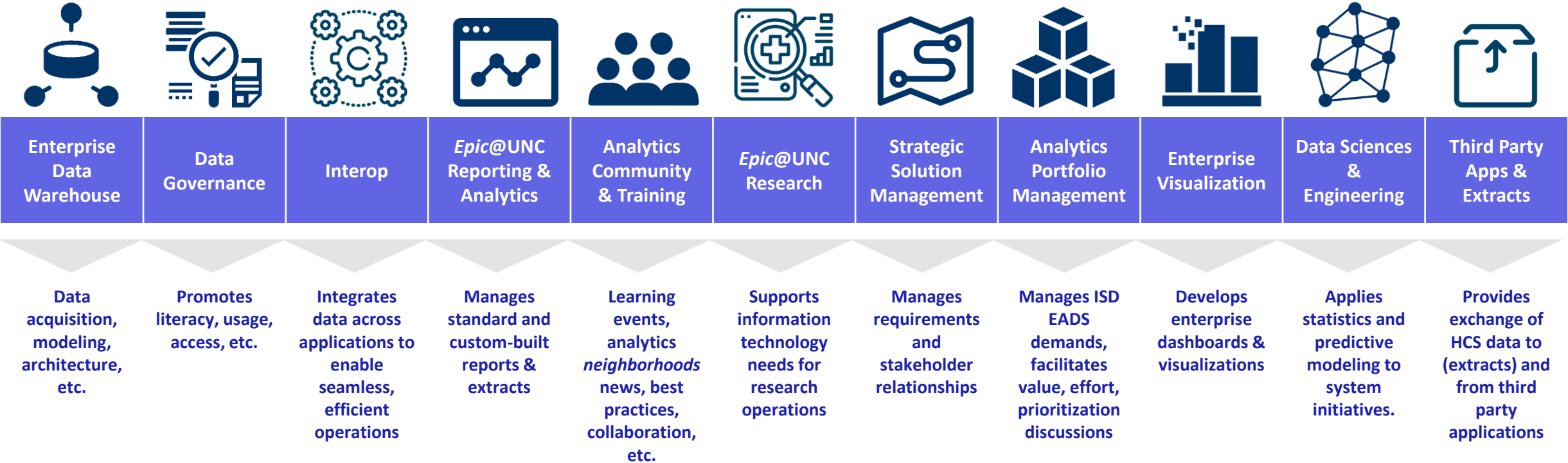


Mission
We enable the **transformation of health care decision making** through data sciences, interoperability, and analytical methods



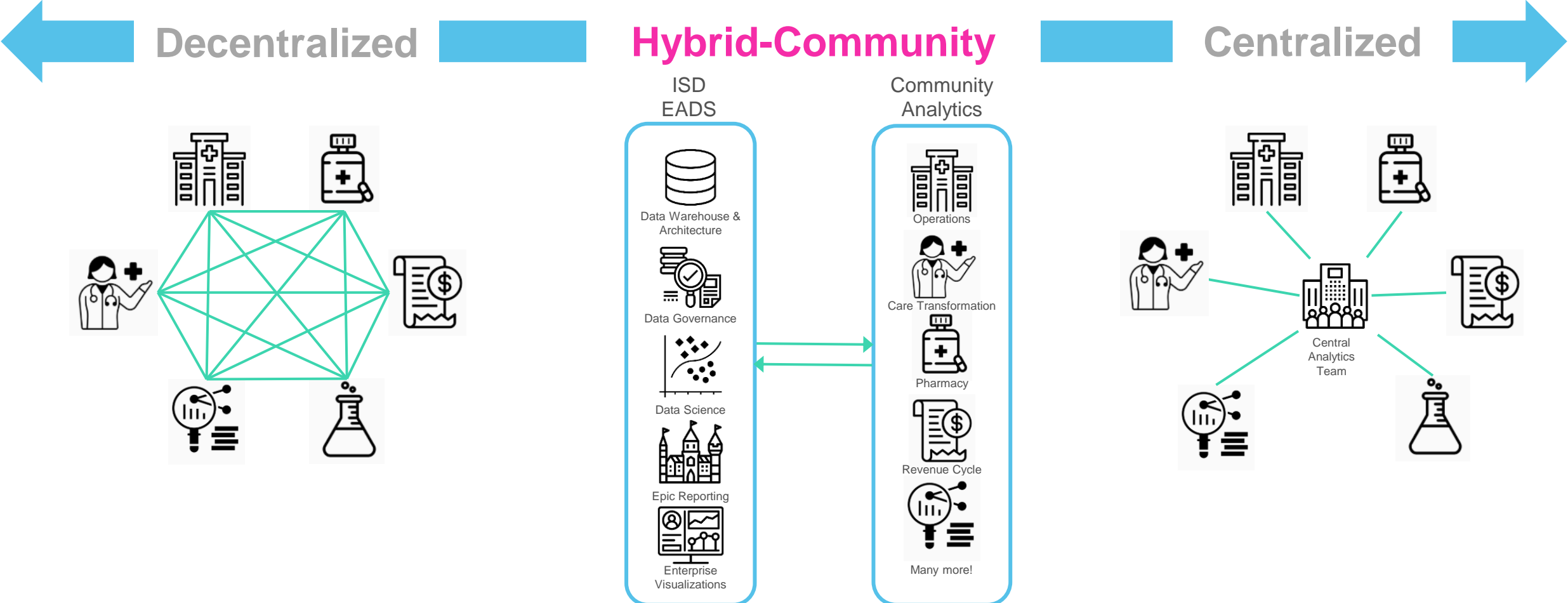
Vision
We seek to build a place where **world-class health care is naturally driven by insights**

ISD EADS Services



UNC leverages a **talented & growing community** to serve local needs, supported by a centralized resource for system-wide enablement.

UNC Health has chosen a Hybrid-Community strategy, with distributed teams supported by a central ISD EADS group.



High-Performance Data & Analytics Architecture Enables Analytics Opportunities and Solutions



Reliable System Uptime



Increased System Performance



Agile Development



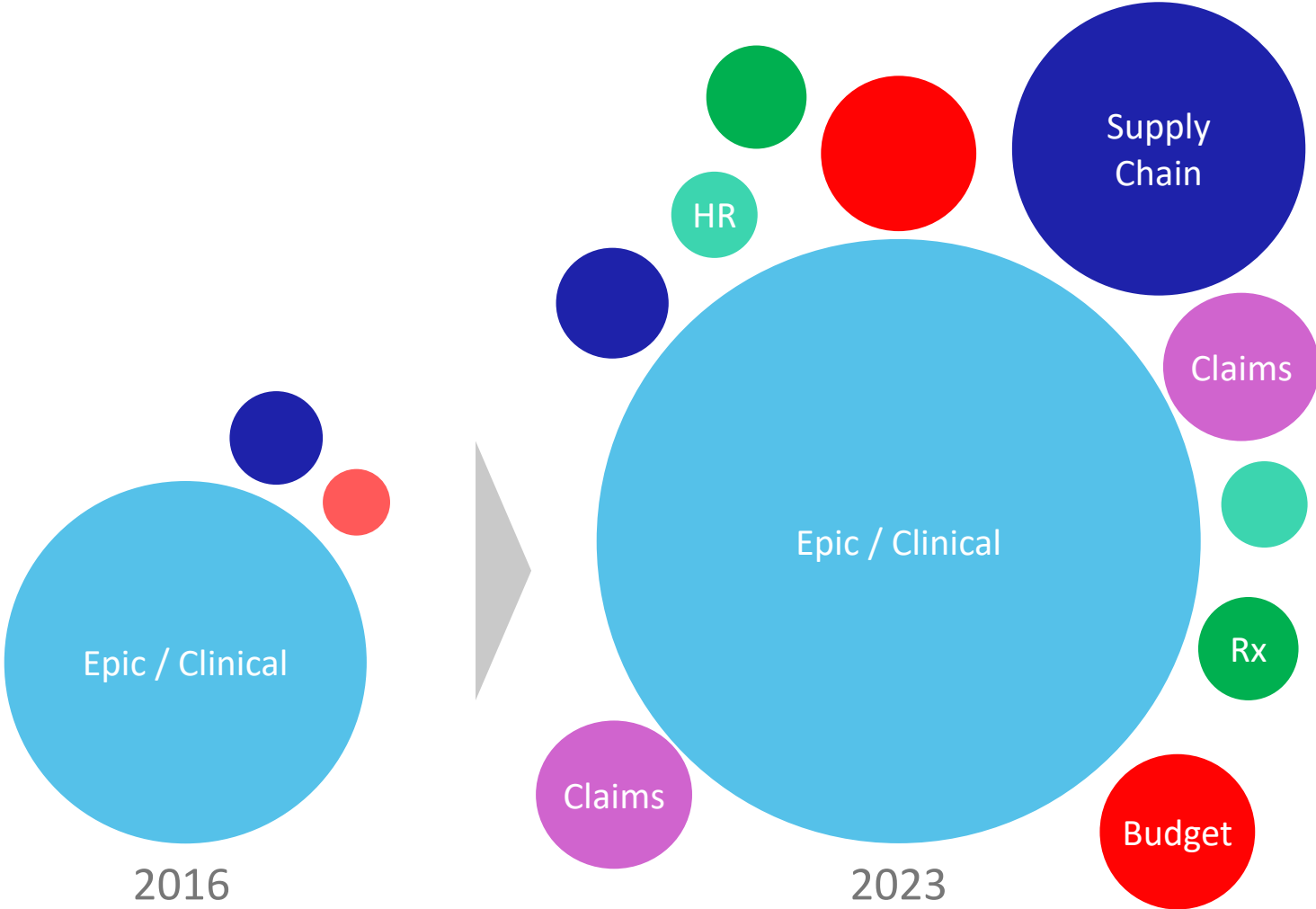
Self-Service



Supports Transformative Use Cases



The sources of data are shifting and growing, painting a fuller picture of UNC Health's business of healthcare



Demand for data leads to Exponential Growth

- Epic and Clinical data is growing exponentially
- Increased demand for data-informed decisions, fueled by COVID-inspired analytics adoption
- AI integration into how we work
- Increased demand for reduced latency in data (more real-time)
- Ad hoc data sources are increasingly needed for persistent and regular access

The sources of data are shifting and growing, painting a fuller picture of UNC Health's business of healthcare

UNC Health has more data with higher usage than ever before.

To continue leading the way, we must ensure our systems can handle the demand.

Did you know?

40% YOY

Growth in data processing. UNC Health currently processes 2 Billion rows of data *per day*.

1,556 users

Of our enterprise data and analytics platforms. The Analytics Community *has more than doubled* since 2019.

0%

Growth in infrastructure supporting the enterprise data warehouse

\$\$\$

Contract with enterprise data warehouse vendor is up for renewal in December 2024



What drove business, functional and technical decisions

Root causes and the business impacts that drove our decision to the cloud

Root Causes

Obsolete Hardware – UNC’s current landscape of on-premises hardware is obsolete, expensive, and outdated.

Service Disruptions – The third-party platforms utilized by UNC are subject to downtime and service disruptions.

Process Bottlenecks – UNC’s data warehousing team handles all change requests to enterprise data model.

License Expiration – Data Warehouse licenses are set to renew at the beginning of 2025.

Business Impacts

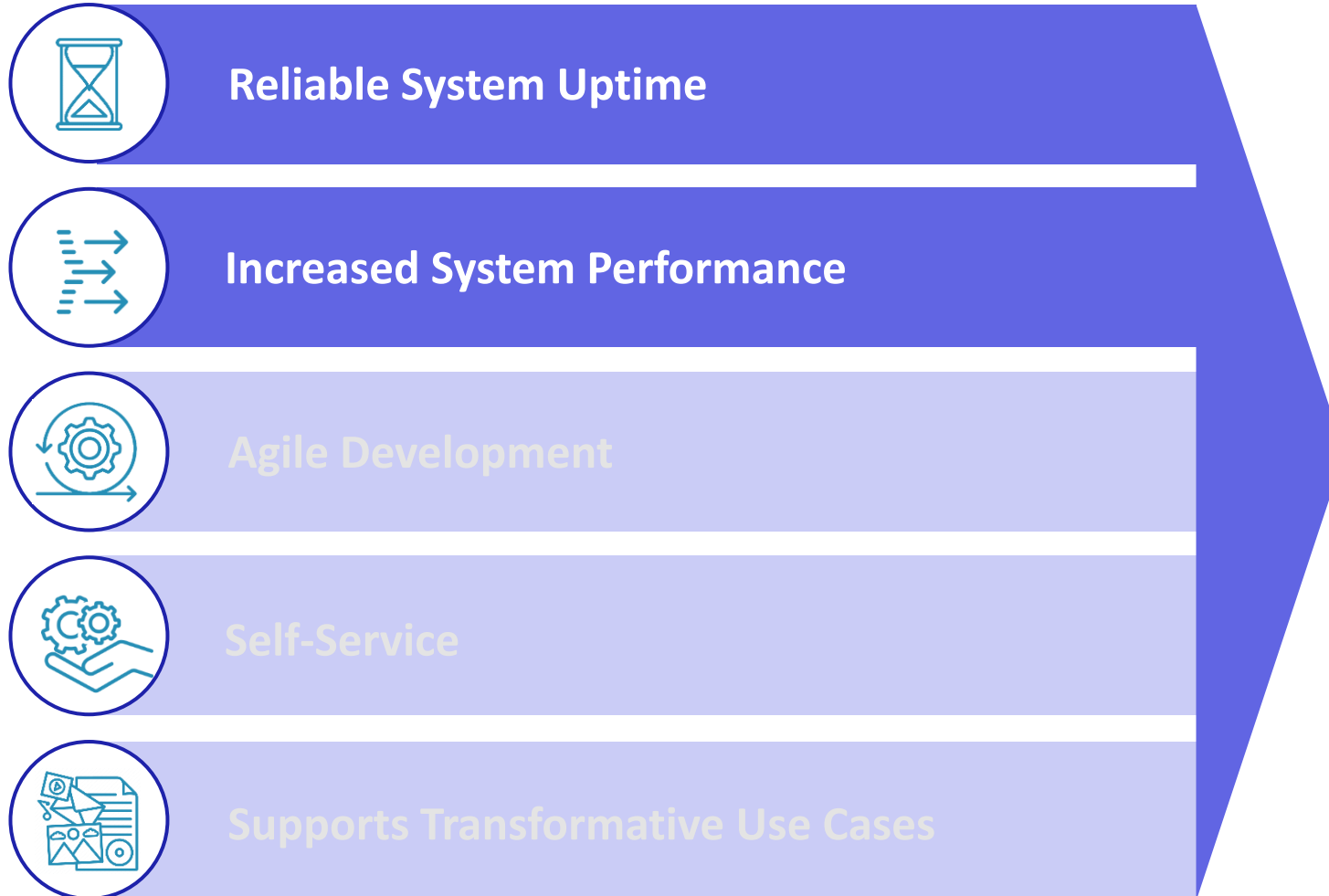
Maintenance Costs – Annual maintenance costs is excessive, limiting potential for strategic investments.

Recovery Measures – Platform unreliability forces UNC to take time-consuming measures to ensure recovery

Unmet Demands – Requests from consumers and end users of the data platforms can be delayed or unmet.

Time Pressure – UNC has limited capacity to complete migration by the end of 2024 as expected by leadership.

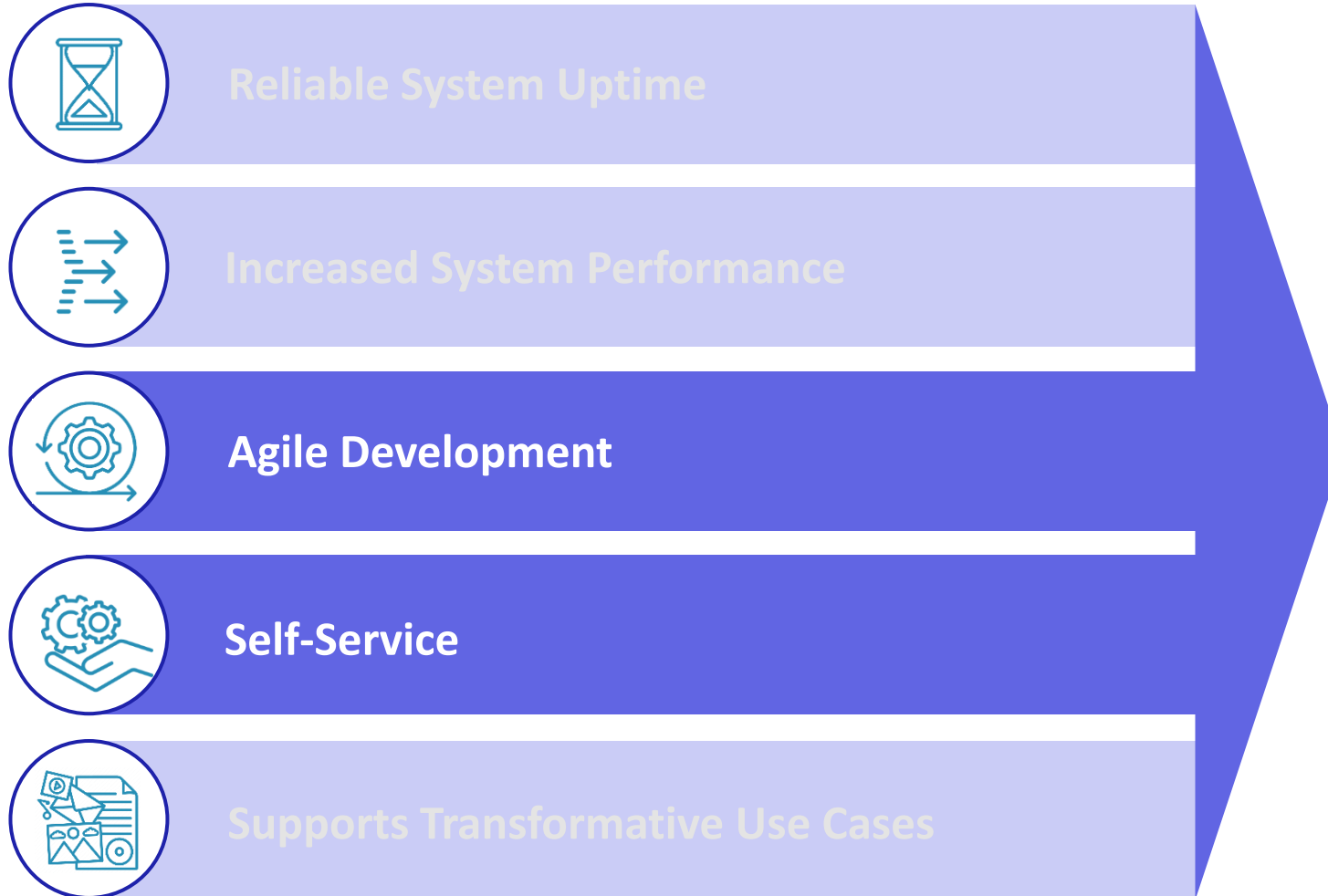
Benefits of a Reliable System with Increased Performance



What's in it for me?

Current State	Future State
Compute is limited (Out of memory errors)	Compute is serverless and unlimited capacity
Resources are shared by ETLs and Queries	System scales to allow multiple processes to run at once
On-premise hardware has been prone to errors	Redundant cloud environments
Timely process for ETLs	No ETL required for Epic Data

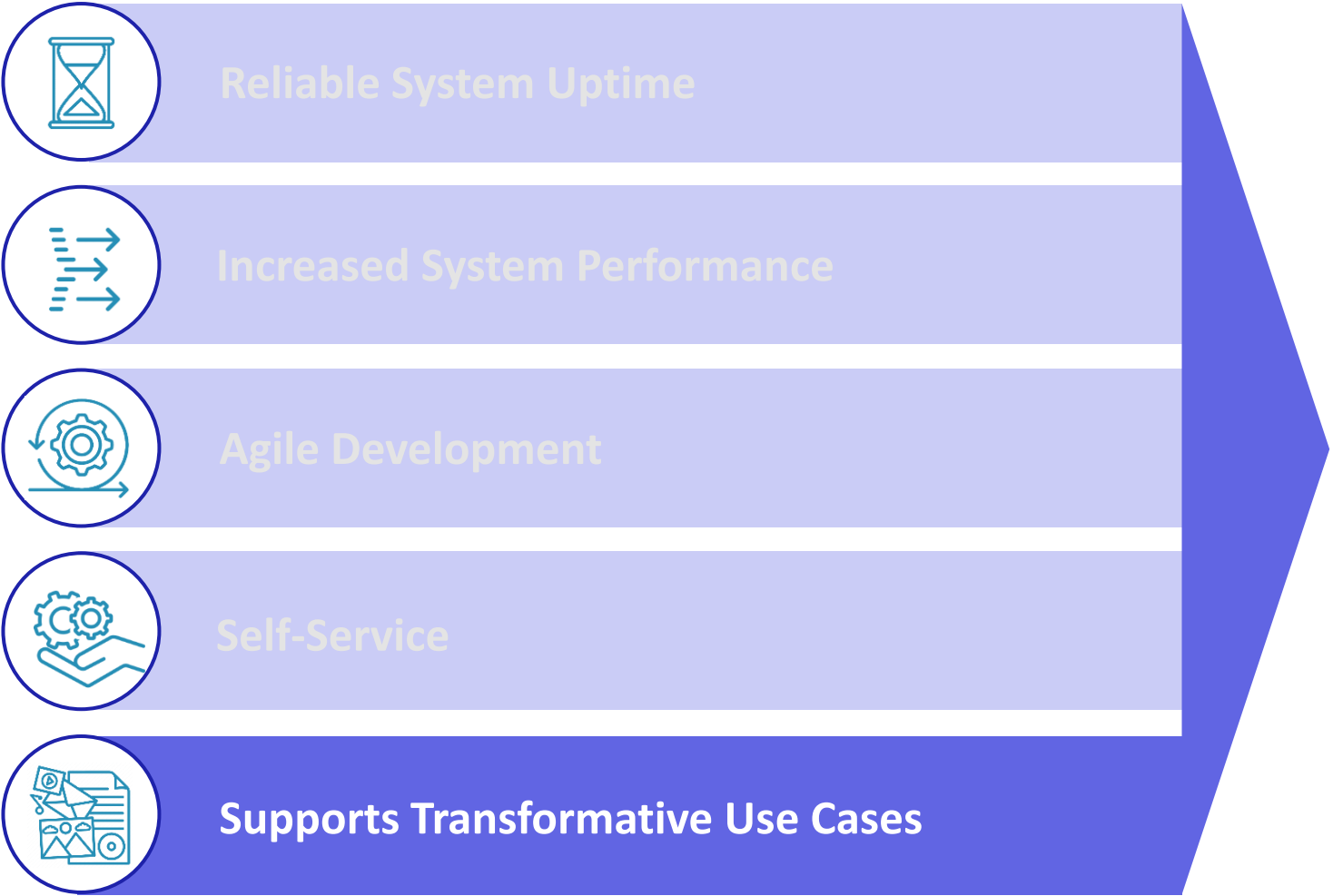
Impact on the Analytics Community ability to provide value quickly



What's in it for me?

Current State	Future State
Proprietary view build methods	SQL-based views
No access to source data for view creation	Development access to participate in asset creation
Limited data governance tool integration	Built-in data governance capabilities with integration
Confusing schema names and syntax	Streamlined names and mixed case support

Architecture that supports transformation and growth of our organization



What's in it for me?

Current State	Future State
Relational databases only	Supports all files and filetypes
No support for AI	Built-in AI functionality and Copilot assistants
Single environment centered around clinical operations	Ability to grow to support new areas like research
No support for advanced analytics	Natural Language Processing (NLP), IoT and advanced modeling



The framework UNC Health chose and the rationale behind the decisions

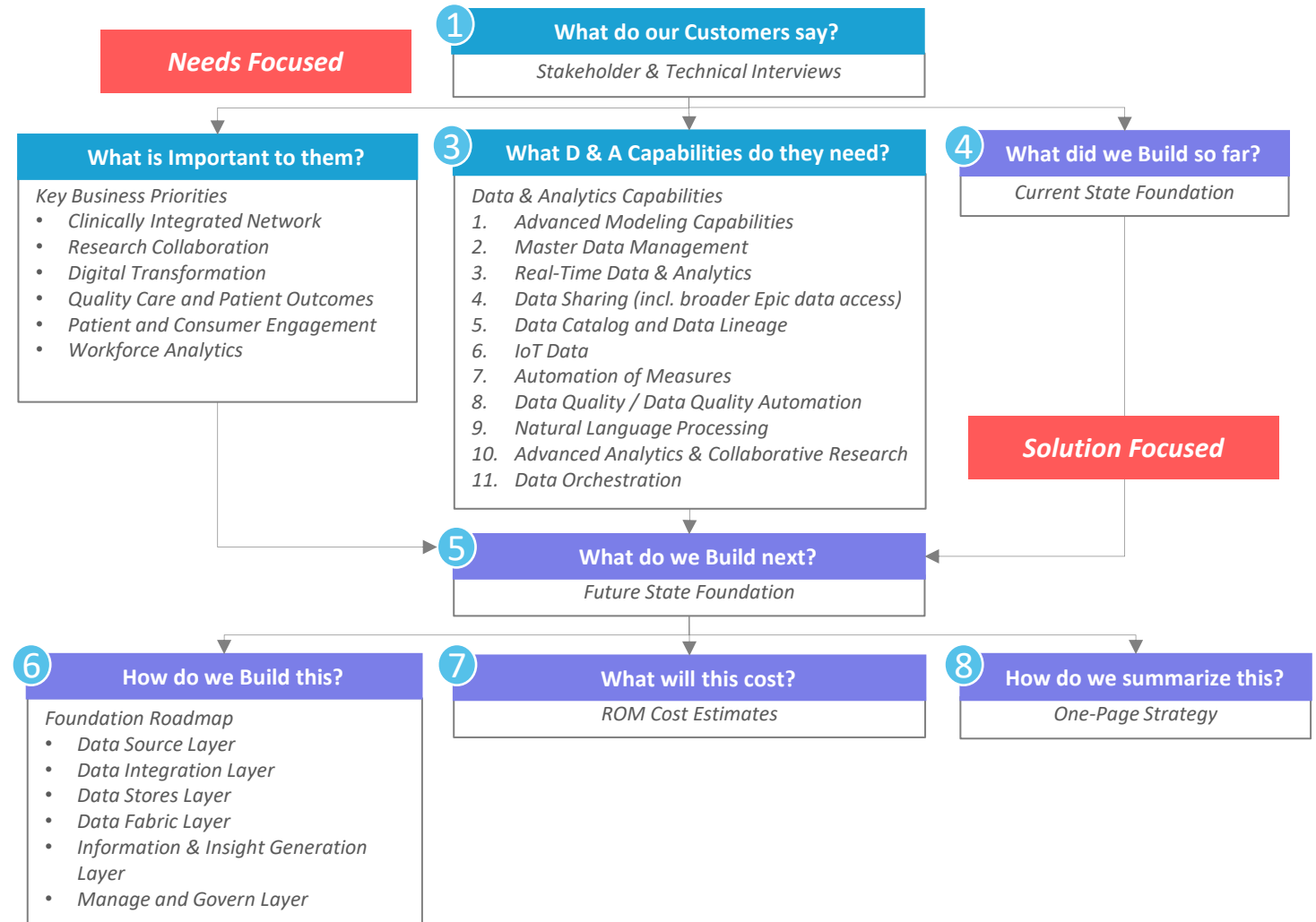
Stakeholder Interviews helped define our vision for our future architecture

Stakeholder Interviews








- Interviews were conducted in a series of meetings over Summer 2022.
- Primary focus of these interviews was centered around business needs, technology and data architecture.

Evaluation & Next Steps

- Evaluated stakeholder needs against our current state foundation
- Gaps in capabilities helped to define the future state foundation.

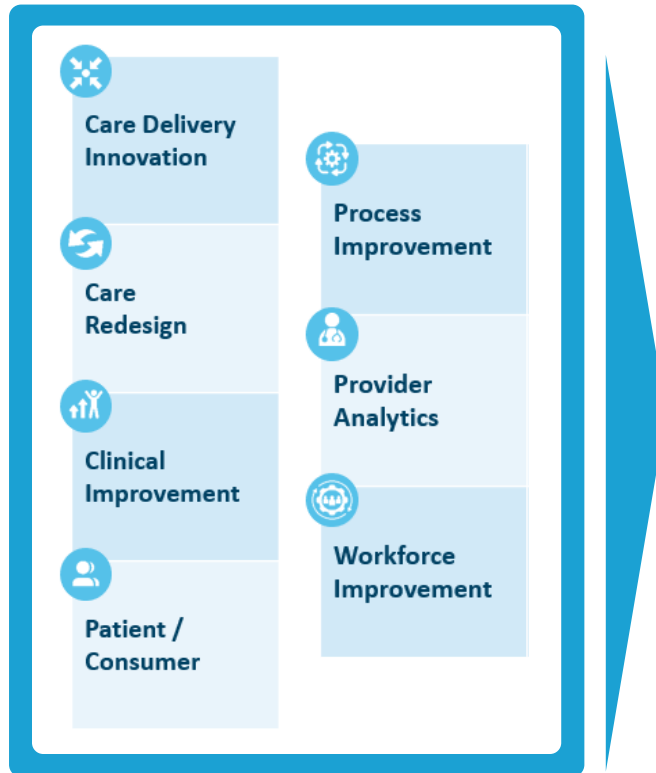


Leaders identified these current and transformational data and analytics use cases...

 <p>Care Delivery Innovation</p>	<ul style="list-style-type: none"> • Forecast demand and capacity • Recommend next steps for patients seeking services • Understand and mitigate delays 	 <p>Process Improvement</p>	<ul style="list-style-type: none"> • Analytics to address quality, safety, throughput, etc. • Assess value / ROI with attributed financial data
 <p>Care Redesign</p>	<ul style="list-style-type: none"> • Adapt pathways to meet patient specific needs • Validate pathways with outcomes data • Correlate pathway needs with offerings / capabilities 	 <p>Provider Analytics</p>	<ul style="list-style-type: none"> • Referral data to improve care and coordination • Better patient provider attribution to improve care • Ensure data integrity of Provider Directory
 <p>Clinical Improvement</p>	<ul style="list-style-type: none"> • Match care team resources to patient needs • Improve drug adh., palliative care, genetic conditions • Interpret notes data to aid Clinician efficiency 	 <p>Workforce Improvement</p>	<ul style="list-style-type: none"> • Analytics to attract, grow, and retain talent • Inform workforce decisions and planning
 <p>Patient / Consumer</p>	<ul style="list-style-type: none"> • Personalize experience via tailored interactions • Recommend next best action to guide consumers • Personalize communications to patients 		

... and related capability needs

Use Cases



Capability Needs



Advanced Tools

- **Expand advanced modeling** to support alerting, next best actions, forecasting, etc.
- **Implement Natural Language Processing (NLP)** to convert notes to structure data for mining
- **Deploy research collaboration tools** to enhance sharing with internal / external partners



Data Integrity

- **Leverage Master Data Management** and automation to deliver accurate, consistent, quality data



Universal Data Catalog

- **Establish a data catalog** to show definitions, logic, and track data lineage across data models



Analytics Automation

- **Automate data set creation** used for regulatory submissions and standard reporting requirements
- **Implement orchestration tools** to automate manual tasks and better enable self-service



Analytics Automation

- **Increase data frequency** from daily loads to multiple times per day to potentially real-time
- **Acquire Internet of Things (IOT) data** from remote devices, wearables, etc.
- **Expand secure data sharing capabilities**
- **Improve Data Virtualization** to better to increase access to data without moving it

Along with stakeholder interviews, we were guided by market research, consulting engagements and customer references

**What technology investments are needed?
How do we evolve our data ecosystem with minimal disruption?**

114
UNC Health
Interviews

Gartner®

Microsoft

HDA+
HEALTHCARE DATA &
ANALYTICS ASSOCIATION

Children's Hospital Colorado

3Cloud

denodo

MAYO
CLINIC

Harbor-UCLA
MEDICAL CENTER

UR
MEDICINE

HIMSS
NORTH CAROLINA
CHAPTER

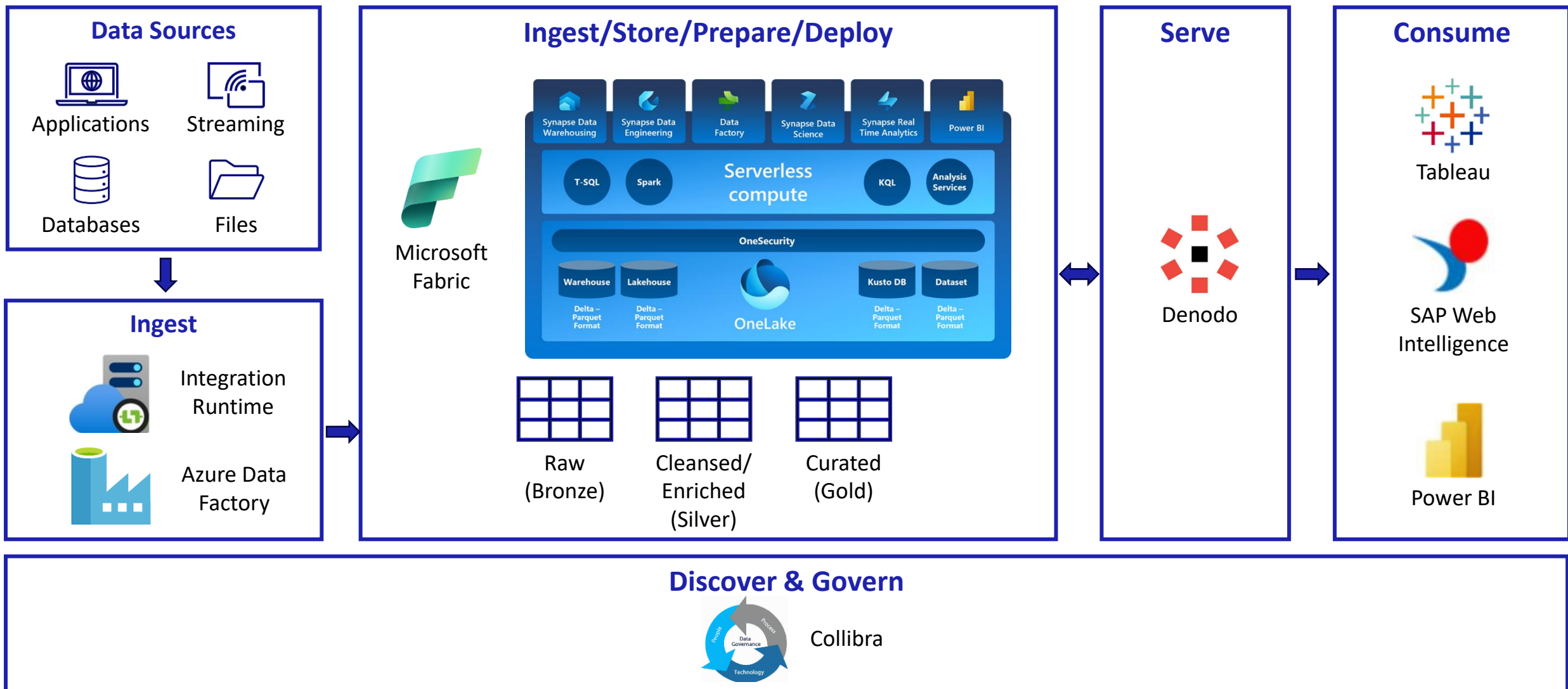
syngenta®

MUSC
Medical University
of South Carolina

Cincinnati
Children's™

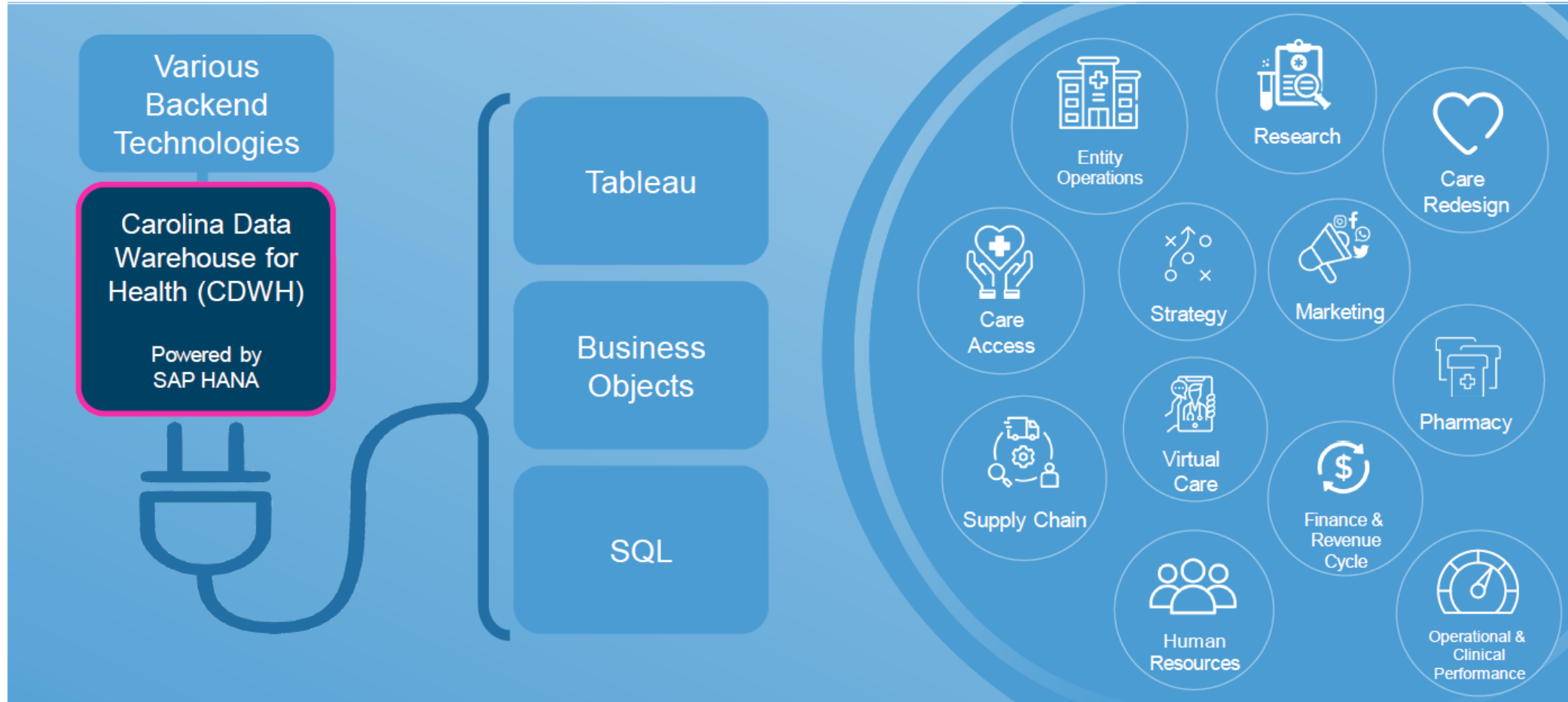
... and more!

Planned architecture based on interviews, research, use cases and capability needs



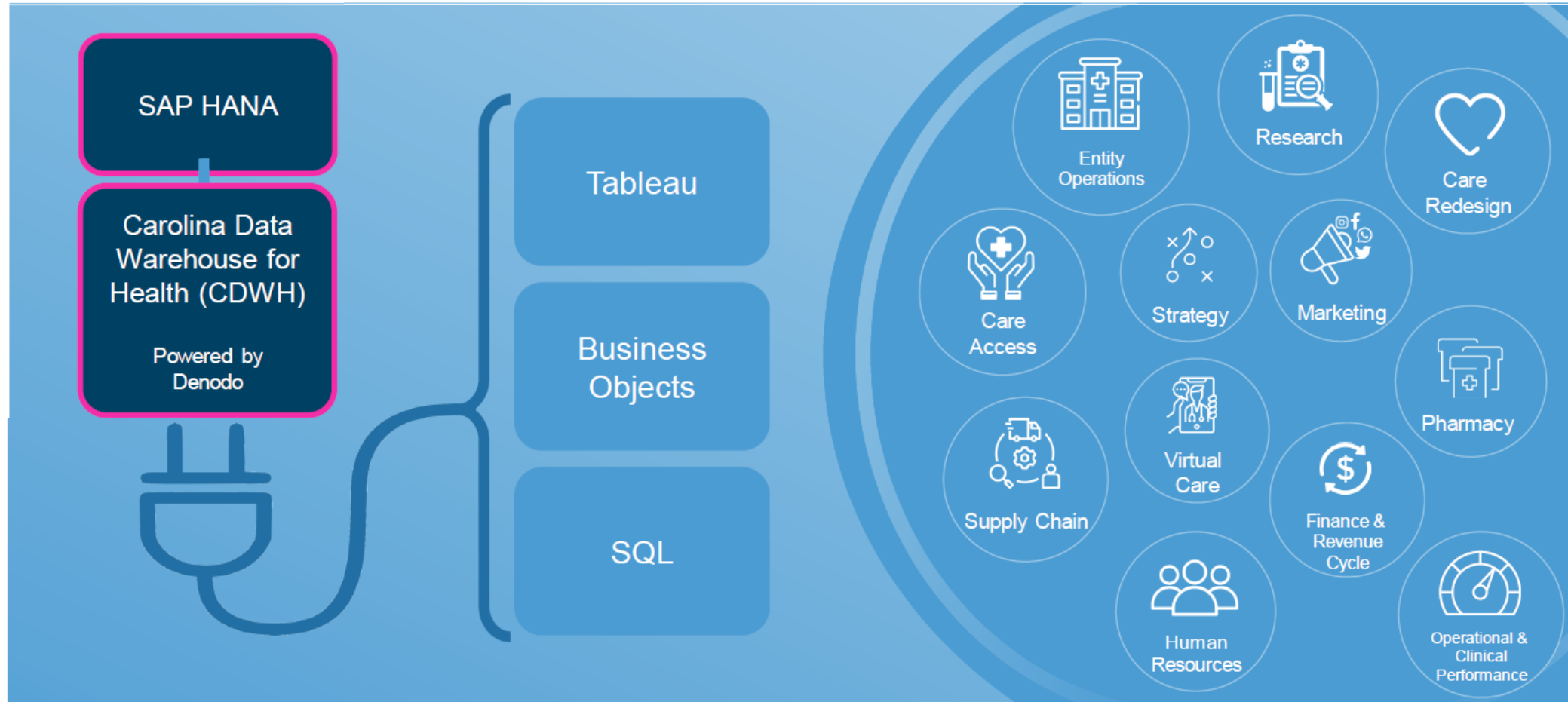
How do we evolve our data ecosystem with minimal disruption?

We need to modernize our back-end systems over multiple phases.



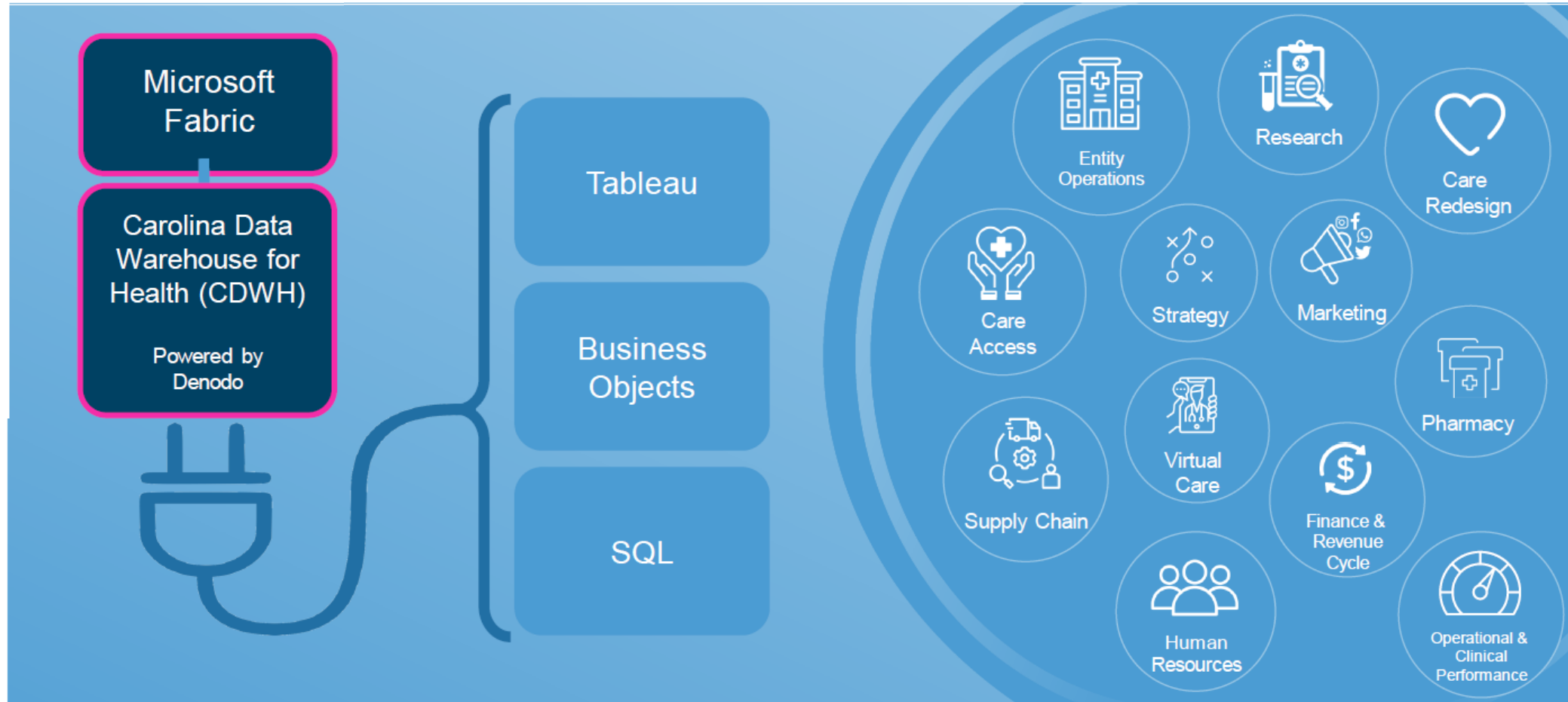
How do we evolve our data ecosystem with minimal disruption?

Phase 1: Add a new consumer layer first, to limit disruption.



How do we evolve our data ecosystem with minimal disruption?

Phase 2: Migrate Warehouse to Cloud





Key Points and Questions

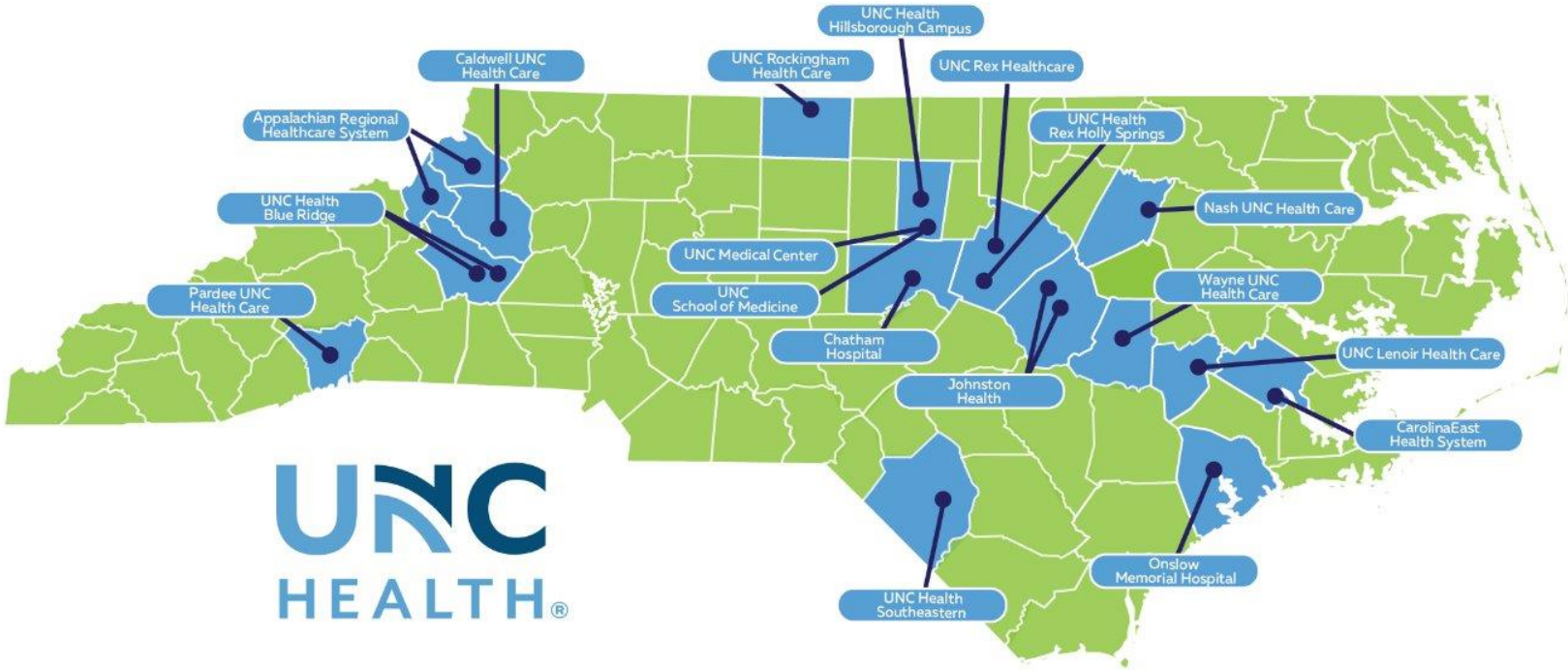
In Summary

- The increasing data volume and limitations of our on-premise architecture—such as outdated hardware, frequent service disruptions, and high maintenance costs—drove the need for a re-vamped, cloud-first strategy. Leveraging a cloud architecture allows for reliable system uptime, enhanced performance, and scalability to accommodate the rising demand for data-driven decision-making and advanced analytics.
- Engaging in stakeholder interviews, market research, and collecting customer references offered crucial insights that informed our architectural decisions. These efforts ensured our strategy was aligned with business needs, technological requirements, and industry best practices, ultimately guiding us to develop a robust and future-proof data ecosystem.
- Implementing a phased approach to cloud transition minimized business disruption by enabling gradual integration and adaptation. Introducing a consumption layer insulated the analytics community from backend architecture changes, ensuring continuity and stability.
- Choosing Microsoft Fabric as our data warehouse aligns with Epic's strategy to use Microsoft Fabric for Cogito, facilitating seamless integration and enhanced data interoperability. This alignment enhances data analytics capabilities and creates a unified platform that promotes collaboration and innovation.

Questions



Thank You!



Shaun McDonald (Shaun.McDonald@uncheath.unc.edu)
Mark Matthews (Mark.Matthews@unchealth.unc.edu)

