



Leveraging Cloud for IT Innovation

An Epic on Cloud Journey

Agenda

An Epic on Cloud journey

1. Introductions
2. Cloud Innovation
3. MM Cloud Journey
4. Evaluation Process
5. Cloud Migration
6. Q&A



Professional Overview

Dr. Tim Calahan – Industry Experience



- Created cloud strategy and led digital transformation for top 10 academic medical center
- Initiated migration of 4000 VMs and 900 applications to the cloud
- Planned and sourced vendors in an RFP process to support technology move to the cloud.
- Authored cloud strategy, assessing skills, performing due diligence and creating training methodology for staff to operate effectively in the cloud, creating a vision for an effective inventory of the server and application environment.
- Applied technical background to understand the technical components and underpinnings of the organization and how to transform to a more modern and efficient organization in the future through tangible objectives.



- CTO for the Virtustream Healthcare Cloud, CRN's 2017 & 2018 innovative product of the year finalist
- Created the Virtustream Healthcare Cloud, resulting in the first public cloud implementation of Epic EHR for a major healthcare provider and an insurance company.
- Initialized and led idea conception, business case development, solution launch, and product enhancements for the Virtustream Healthcare Cloud portfolio.
- Developed, improved, and led ongoing strategic planning processes for the healthcare portfolio



- Partner / Principal
- Assisted with the creation of Network Data Systems' Data Center Practice. Managed and verified the execution of reseller agreements with key data center solution providers
- Defined and formed several new managed services offerings, focused on the data center

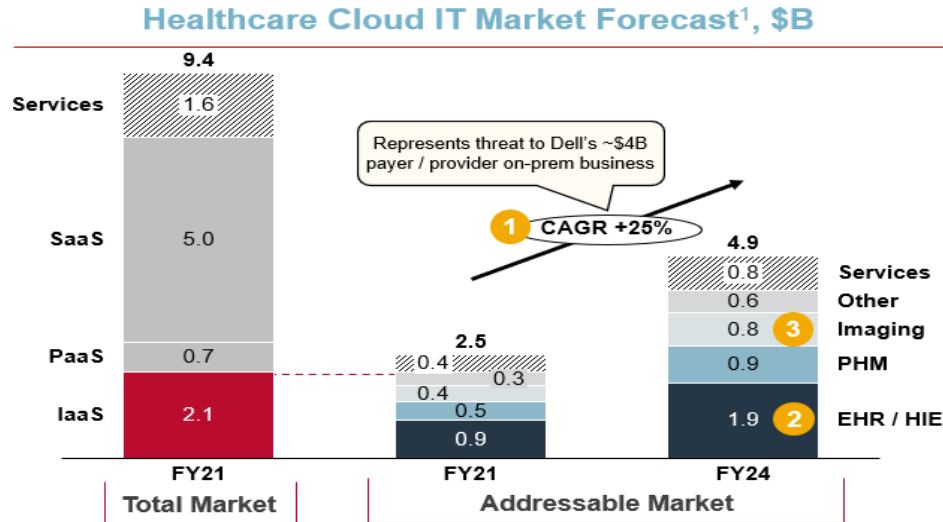


- Partner / Principal
- Instrumental in four key location startups across two states over eight years.
- Assisted with the creation of McGladrey's IP Telephony Practice.
- Created McGladrey's Enterprise Storage Practice.
- Built McGladrey's Managed Services offering for the Great Lakes Region

Market Innovation

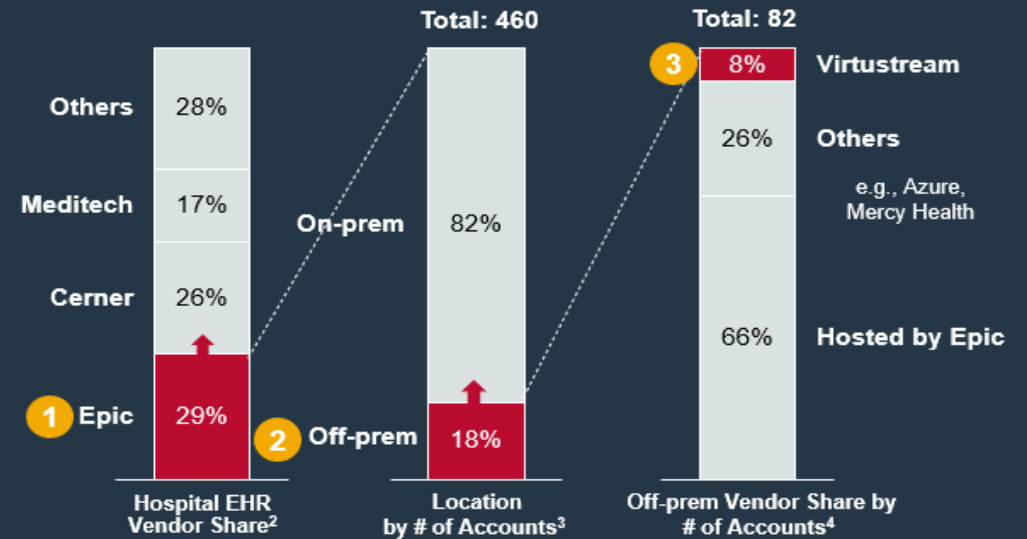
Healthcare Cloud

Healthcare Cloud is a Fast-Growing Market (\$4.9B by FY24) and EHRs Represent an Attractive Opportunity for Growth



- Healthcare cloud market is growing fast** due to:
 - Growing acceptance of cloud by HC IT orgs
 - Top-line pressure (exacerbated by COVID)
 - Shift to value-based healthcare
- EHR is the most attractive opportunity to enter first:**
 - Large market size
 - Mission-critical nature
 - Sticky revenue due to 5+ year commitments
 - High switching cost
 - Vendor consolidation
- Additional opportunity in imaging** can help build broad ecosystem

Current EHR and EHR Hosting Market Landscape



- Epic is largest EHR vendor and is gaining market share**
- Epic off-prem is growing rapidly, boosted by public platform improvements**
- The market is ripe to move Epic to public cloud with limited competition**

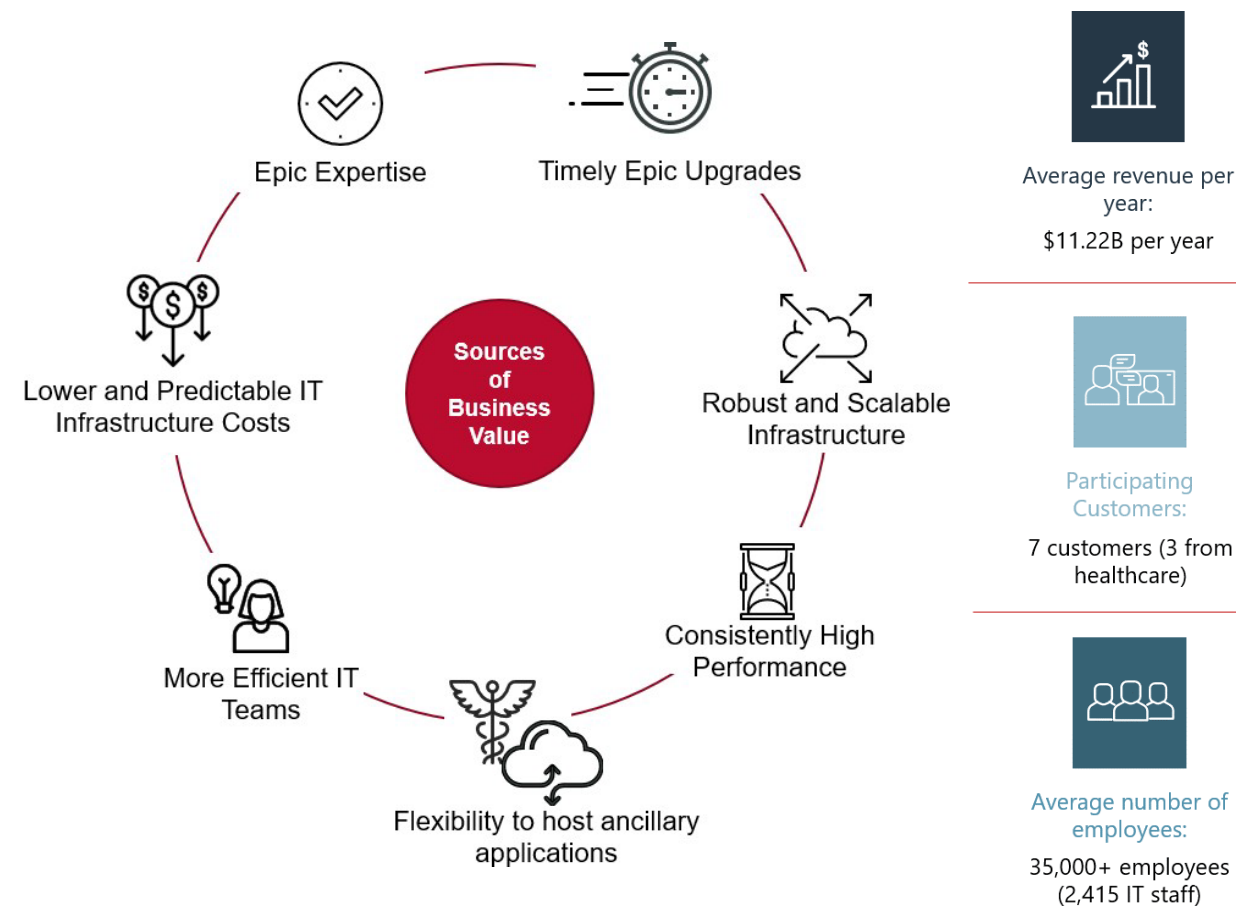
Source: 2) KLAS US Hospital EMR Market Share 2020; 3) Based on data from Epic via Darren Berg; 4) Based on SFDC pull on 8/13

The Virtustream Healthcare Cloud

What We Built

Realizing benefits for our healthcare customers

Based on IDC Business Value Research, sponsored by Virtustream



Source: IDC Business Value Solution Brief sponsored by Virtustream,
The Business Value of Running Epic and other Applications in the Virtustream Healthcare Cloud, IDC Doc. #US47201221, January 2021



85% Faster
completion of Epic upgrade cycles¹




60% Faster
Epic response times¹



20-25% Improved
performance, document imaging¹


“The **predictable cost model** of Virtustream is most important for us... We have **retooled our engineering team** to focus on ... value added services like AI. We are also **able to keep up with the quarterly upgrades coming out of Epic** capabilities online without delay. Without Virtustream, we would never have been able to keep up with them.”

VIRTUSTREAM HEALTHCARE CLOUD CUSTOMER¹



32% Lower
IT infrastructure costs compared to previous environment

Lower overall infrastructure costs than on-premises:
“We did a cost analysis on running Epic on-premises compared with the projected costs of Virtustream — including factoring in anticipated growth — **the Virtustream model came in \$1.5 million less.**”



71% Less time
to manage and run equivalent application workloads

Reduced effort by internal staff:
“Virtustream has reduced the amount of effort required by internal staff to run the Epic environment. As such, it’s reduced the number of people we have to have supporting our use of Epic.”

Transforming to Cloud

The Benefits

Legacy IT Challenges

Business Challenges

Speed to deliver

Budget and resources to innovate

SLAs and high availability for mission-critical applications

Operational Challenges

Management and operational complexity

Skills and talent availability

Vendor management

Evolving cyber threats

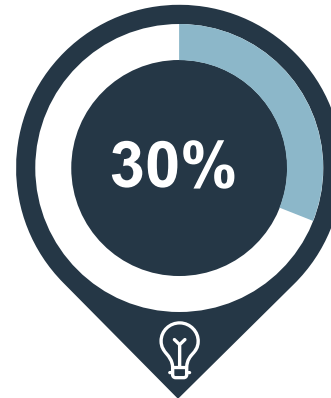
Financial Challenges

Environmental and facilities costs

Investment lifecycle protection (TCO)

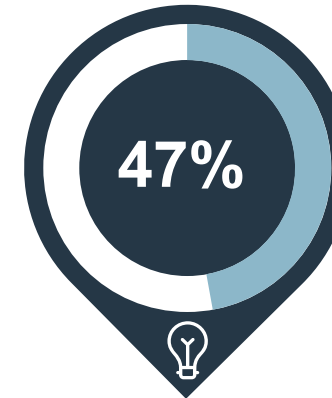
Transformed Organizations Allocate 17% More of Their Annual IT Budget Towards Innovation

Legacy Organizations



Budget Allocated to Innovation

Transformed Organizations

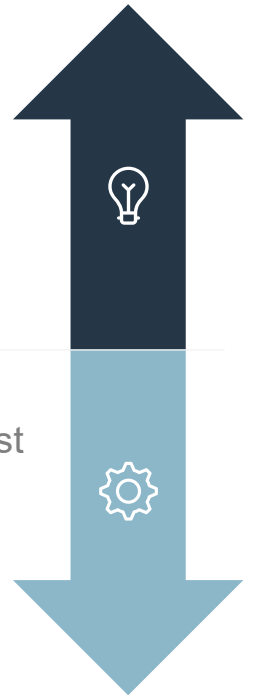


Budget Allocated to Innovation

Outcomes by Transforming to Cloud

Increased innovation and speed

Reduced cost and complexity

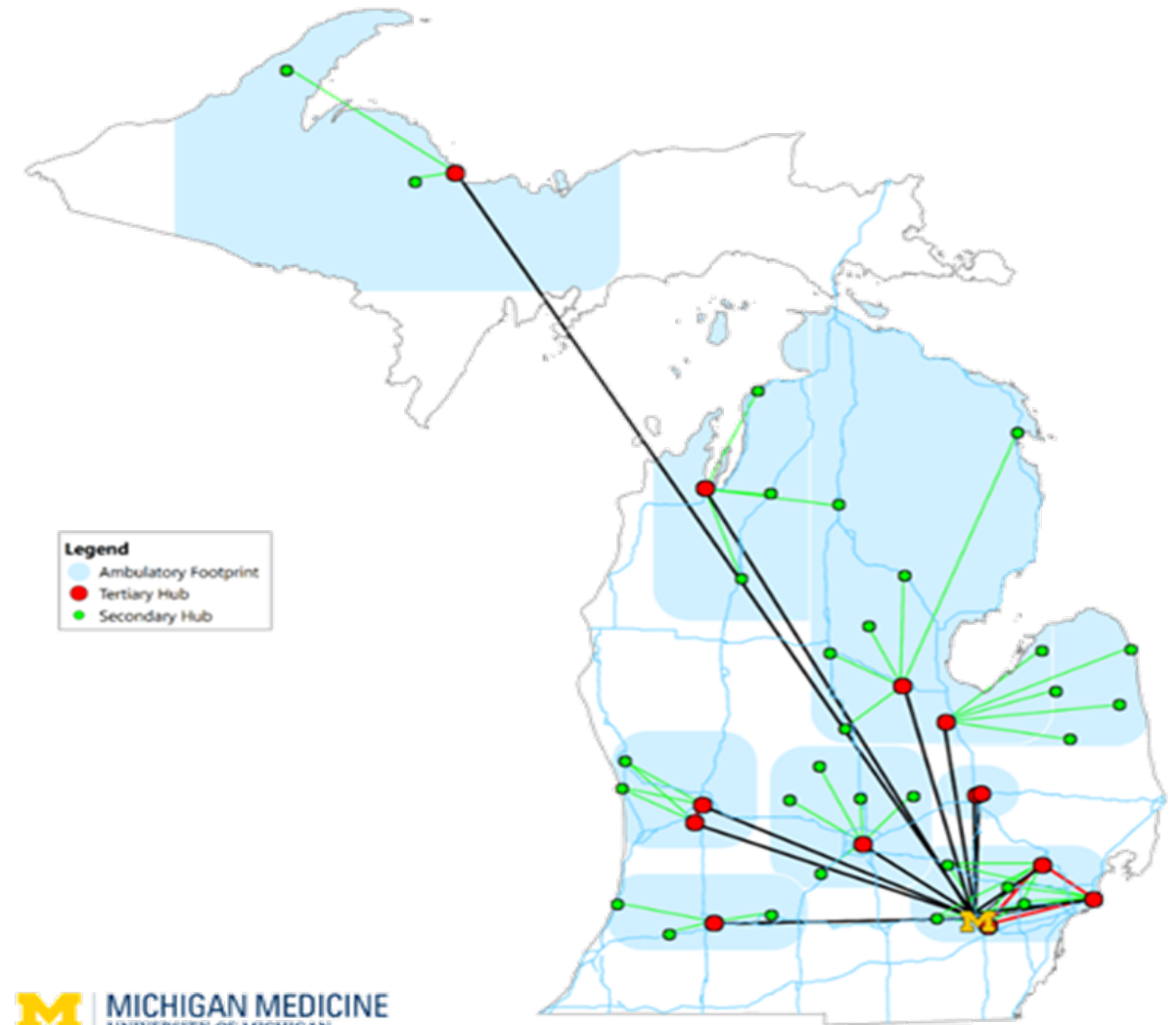


Michigan Medicine's Cloud Journey

Michigan Medicine

UM's Unique Place in the US

- **Statewide Reach Across Urban & Rural Michigan**
One of the only AMCs with a clinical footprint spanning an entire state — including both peninsulas — delivering advanced care to urban, rural, and remote communities.
- **Integrated Academic, Clinical & Research Mission**
Fully unified health system, medical school, and research enterprise under one governance, accelerating innovation from bench to bedside.
- **Strategic Regional Partnerships & Telehealth**
Extends tertiary and specialty care through partnerships and virtual outreach, bringing top-tier expertise into local communities statewide.
- **Public University Mission with National Impact**
Combines a public university's access mission with elite, NIH-funded research strength — a rare balance compared to many private AMCs.



IT Modernization Vision

Cloud Strategy (Years 0-5)

Improve Operational Efficiencies and Agility, while Strengthening Data Assurance and Resiliency Posture

Michigan Medicine will drive the transition to the cloud and maintain steady-state operations thereafter



Cloud Disaster Recovery

Decommission Arbor Lakes Data Center by FY27



Run Epic & Sectra in the Cloud

Implement and operate Epic & Sectra in the cloud



Enhance Academic use cases leveraging Cloud

Develop a self-service catalogue that delivers infrastructure on demand



Strengthen Data Assurance and Resiliency

Optimize assurance controls and improve risk posture, while enhancing flexibility



Simplify Affiliate Integration

Exit the data center business, reduce and consolidate workloads in the cloud

Implement Industry Standard Playbooks

- Infrastructure aligned to Epic's stringent application requirements
- Disaster Recovery as scripted by industry developed playbooks

Adhere to Michigan Medicine Principles

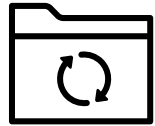
- Programmatically deliver infrastructure on-demand
- Modernize data assurance and resiliency through cloud transformation

Cloud Platforms Drive Innovation

Innovative Companies Leverage Technology to Outperform



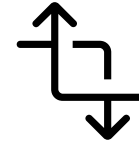
Improve
Security



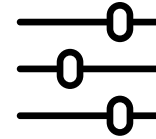
Enhance
Availability



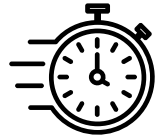
Accelerate
Performance



Transform
Data



Access
Flexibility



Service
On-Demand

Gartner predicts that Industry Cloud Platform (ICP)
Adoption will grow in Healthcare

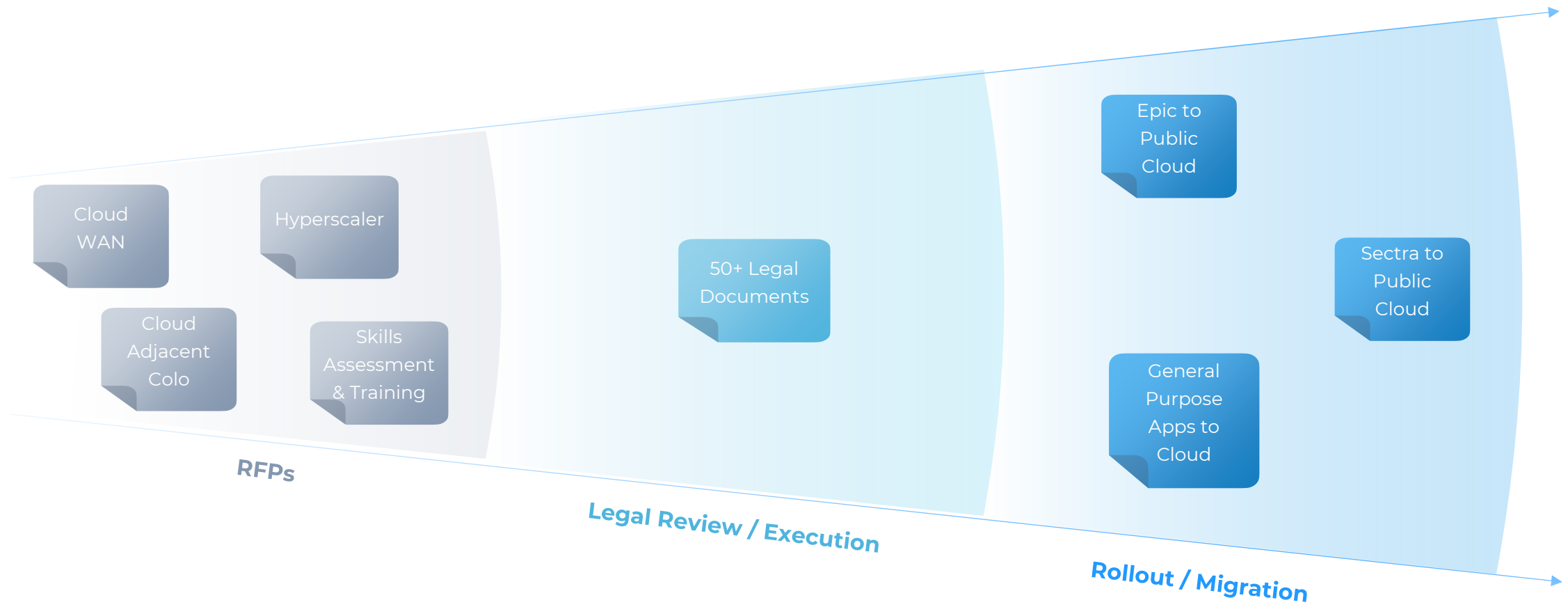
Public Cloud ICPs will usher in a new chapter in application
capabilities with a feature-rich and plug-in-play array of options

Public cloud capabilities can unlock business value and insights.

Evaluation Process

Evaluation Process

RFPs, Legal Reviews, Kick-off



Preferred Public Cloud Provider

Accelerating Value Through Partnership(s)

Michigan Medicine's innovation mission

- We will be a destination for health care and spread our innovations in clinical excellence, education, and discovery around the globe.
- We will be a national leader in transforming health care through superior safety and quality, and our patient outcomes will be the best in the country.



Microsoft's innovation mission for Michigan Medicine

- Empower Michigan Medicine to deliver exceptional patient care and research outcomes by leveraging the power of cloud computing, AI-driven solutions, and Microsoft's integrated partner ecosystem.
- Enable Michigan Medicine to achieve its strategic goals by providing a secure, scalable, and cost-effective cloud platform that accelerates innovation and enhances patient experiences.

Total Economic Impact

Reported Benefits From Running Epic in the Cloud



ROI

140%



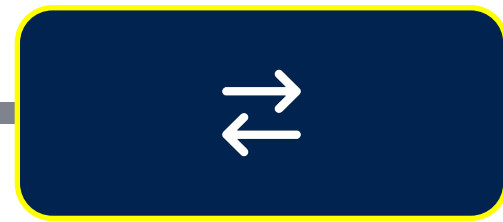
Benefits PV

\$17.01M



NPV

\$9.92M



Payback

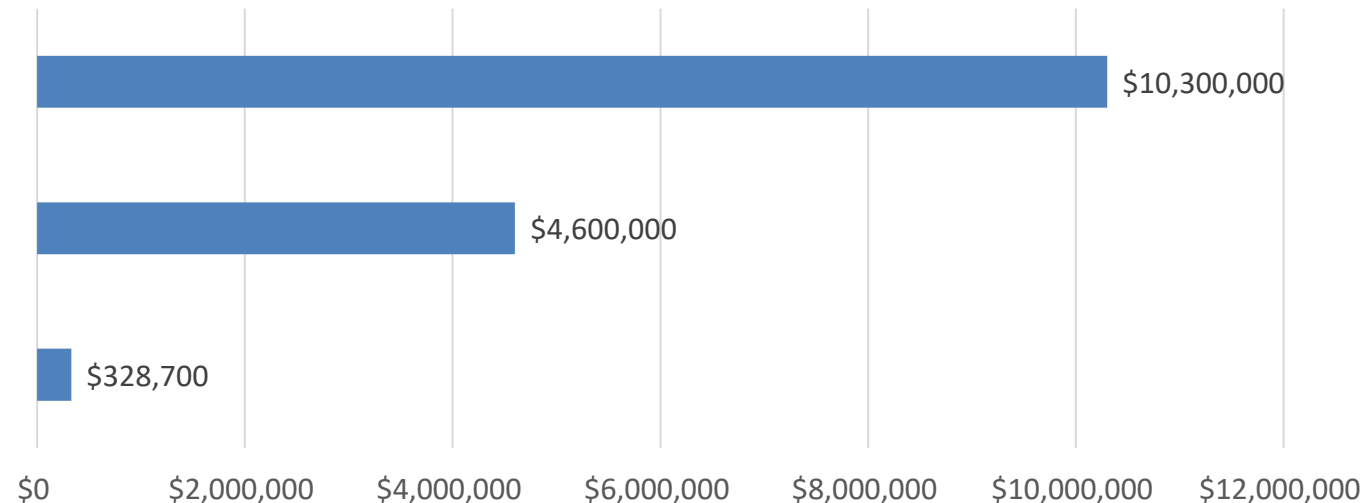
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Benefits (Three Year)

Annual Savings from sunseting on-premises hardware

Increased productivity from reduction in effort to build and manage network and storage capabilities

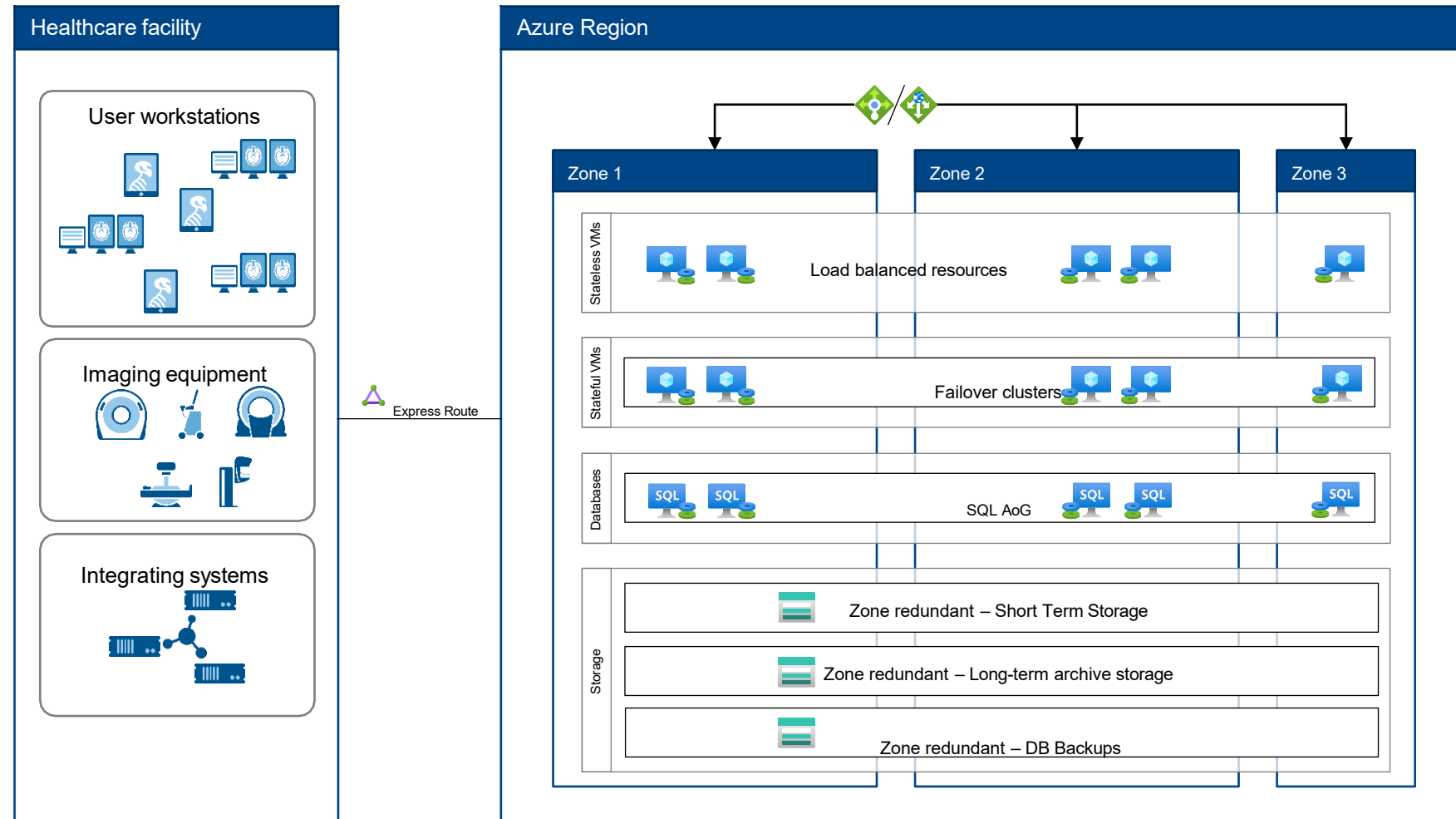
Reduction in effort to deploy VMs and projects



Sectra on Azure

How Sectra Factored Into MM's Decision Criteria

- **Leverages Sectra's Managed Expertise** - Shifts management and operational complexity to Sectra's specialized cloud team, reducing internal support burden and ensuring expert oversight.
- **Improved Scalability & Flexibility** - Enables dynamic scaling of storage and compute resources to meet growing imaging demands without the need for major on-prem hardware investments.
- **Enhanced Reliability & Business Continuity** - Gains access to cloud-native high availability, redundancy, and disaster recovery features, improving uptime and reducing risk.
- **Faster Innovation & Access to New Capabilities** - Positions Michigan Medicine to adopt new Sectra cloud features and innovations more rapidly, staying at the forefront of enterprise imaging technology.



Sectra Anticipated Economic Impact

Financial Highlights

Cloud Platforms will deliver.....



Enhanced
Labor efficiencies¹



Integrated
Self-scaling architectures¹



Enhanced
Automated Provisioning¹



Improved
Infrastructure Cost Visibility¹

Sources:

1. Deloitte IT Modernization – Deloitte Executive Committee Read Out, June 2022
2. * Deloitte IT Modernization – Deloitte Executive Committee Read Out, June 2022, Deloitte provided estimate, plus estimated growth
3. ** Neutral – Based on a 5-year cost of ownership accounting for capital and operating expenses

At an equivalent or more cost-effective solution

Cloud
\$26.3M
5Yr Cost

Anticipated
Neutral**
Savings

OpEx Only					
Sectra Related Budget	FY25 Budget	FY25 Forecast	FY25 Variance	FY26 Request	Chng Rel to FY25 Budget
Direct Sectra OpEx	-	\$2,428	(\$2,428)	\$3,714	(\$3,714)
FY25 CEI and Digital Pathology COG OpEx	\$7,529	\$2,031	\$5,497	\$177	\$7,352
FY25 ID OpEx Budget for CEI Data Migration	\$766	\$766	-	-	zero-ed out
FY25 ID OpEx Budget for CEI POC Image Capture Software	\$15	-	\$15	-	\$15
FY25 ID OpEx Budget for Digital Path Sectra	\$540	-	\$540	-	\$540
FY25 CORE OpEx Budget for CEI Mach 7	\$123	\$123	-	\$123	-
FY25 CORE OpEx Budget for CEI Sectra	\$823	-	\$823	-	\$823
Total	\$9,796	\$5,348	\$4,447	\$4,013	\$5,016
UMH West Variable re Sectra Maintenance	\$187	not in HITS	\$187	shift to HITS	\$191
Potential Future OpEx Impact	\$9,796	\$5,348	\$4,635	\$4,013	\$5,207

- There is a \$4.6M positive OpEx variance in shifting Sectra from on-prem to cloud.
- We anticipate Epic and General-Purpose workloads to follow similar accounting patterns (i.e. less OpEx than legacy in the initial years).

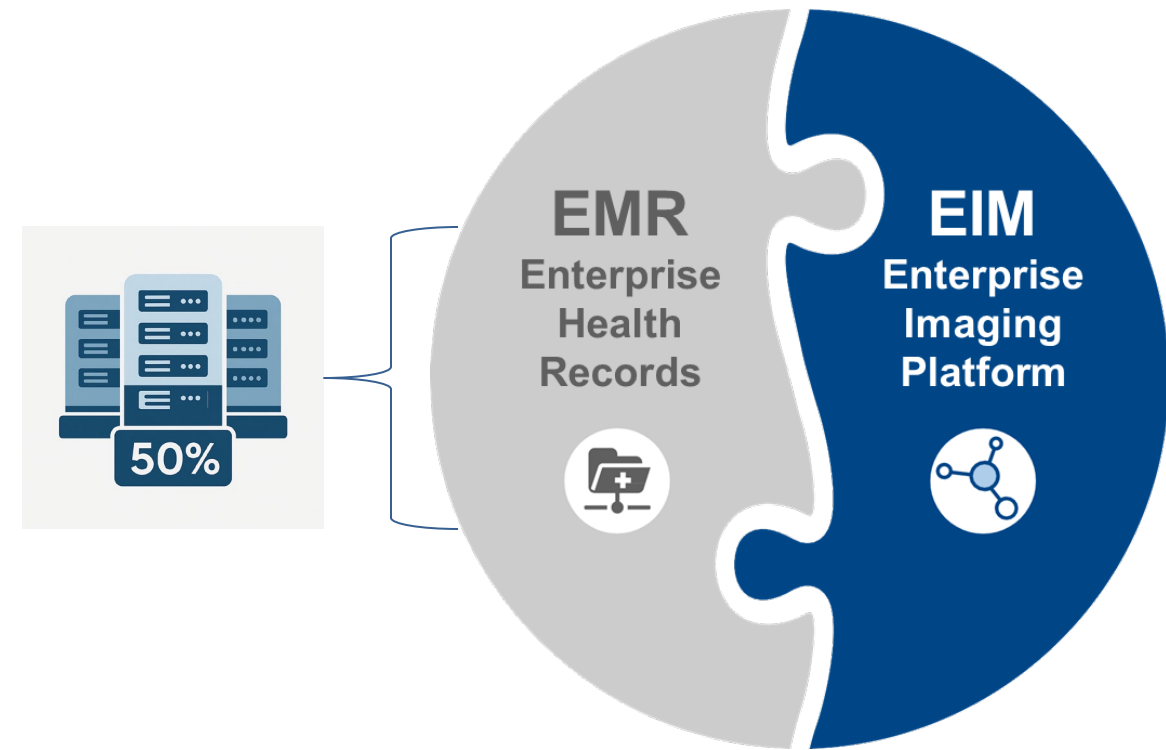
**Positive OpEx
Variance**

Cloud Migration

Application Environment

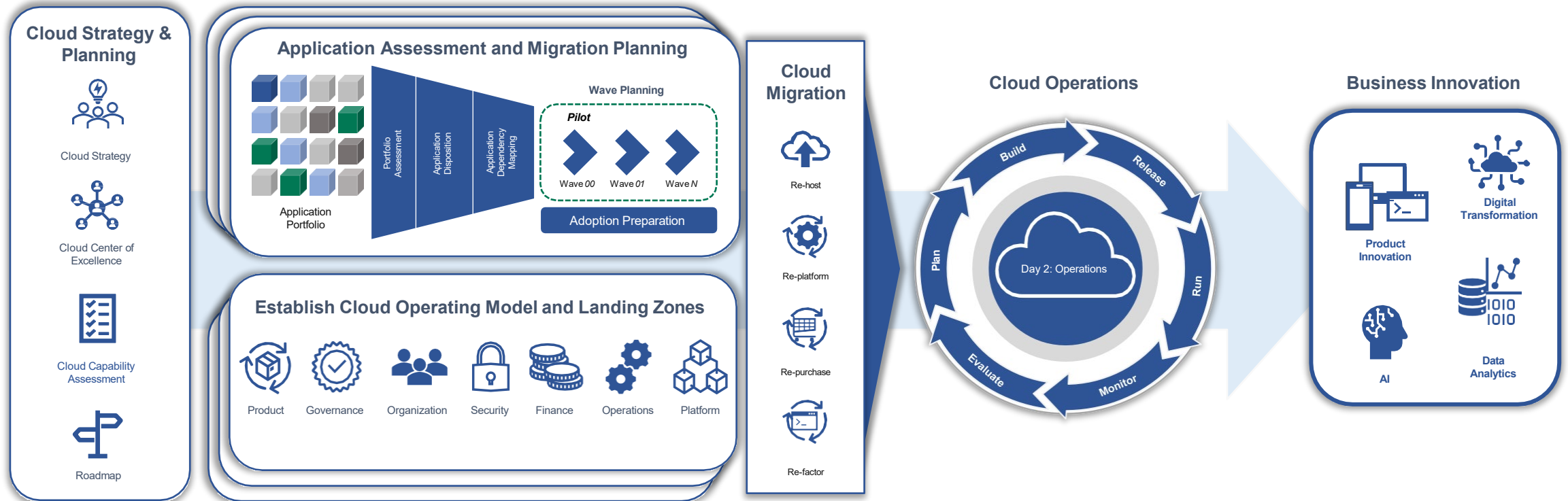
Two Critically Important Applications

- **Epic & Sectra Drive ~50% of Data Center Footprint**
The Epic EHR and Sectra enterprise imaging platforms are mission-critical, together accounting for roughly half of Michigan Medicine's data center environment.
- **Clear, Established Cloud Paths for Epic & Sectra**
Epic has a well-defined, recommended architecture and approach for cloud migration; Sectra offers a managed cloud service, bringing its own expertise to handle the transition.
- **The Remaining 50%: A Complex Cloud Challenge**
Unlike Epic and Sectra, the rest of the application landscape lacks a standardized cloud migration path, making these workloads far more complex to move.
- **Application Migration Factory: Structured Migration Engine**
Michigan Medicine is standing up an Application Migration Factory to provide the people, processes, and technology needed to methodically migrate remaining applications in a structured, scalable way.



Beyond the Cloud Migration

The Journey to the Cloud is Just the First Step



Digital

Security

Data

Automation

Data Center

Networking

Labs

Questions

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Appendix

