
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

WPS102

Accelerate value-based healthcare transformation with AWS

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Agenda

Value-based healthcare overview: The what and the why

eHealth NSW – Cloud transformation journey

Farhoud Salimi, Executive Director – Service Delivery, eHealth New South Wales (NSW)

Fireside chat with Farhoud Salimi and Dr. Rowland Illing, AWS

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Did you know ...

Between 27% and 35% of emergency room patient presentations are for non-urgent conditions [1] [2]

76% of healthcare workers report experiencing exhaustion and burnout, 86% reported experiencing anxiety, 93% are experiencing stress [3]

In a study of more than 4,500 doctors and nurses, 71% saw a link between disruptive behavior, including condescending, insulting, or rude behavior, and medical errors [4]

(1) Australian Institute of Health and Welfare, June 2020
(2) National Centre for Biotechnology Information, June 2012
(3) Mental Health America, 2020
(4) National Centre for Biotechnology Information, Aug 2008

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The need for transformation in healthcare

For healthcare organizations, the challenge of providing value-based, patient-centered care amid increasing costs has never been greater

- Inefficiencies are driving up operational expenses
- Lack of personalized care can lead to unnecessary or ineffective treatments
- Clinicians are experiencing burnout
- Patients are expecting a more personal healthcare consumer experience
- And keeping health information secure and private adds yet another burden

While the challenges are great, the opportunities are greater



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Value-based healthcare is personalized and outcome-focused

Vendors

Providers

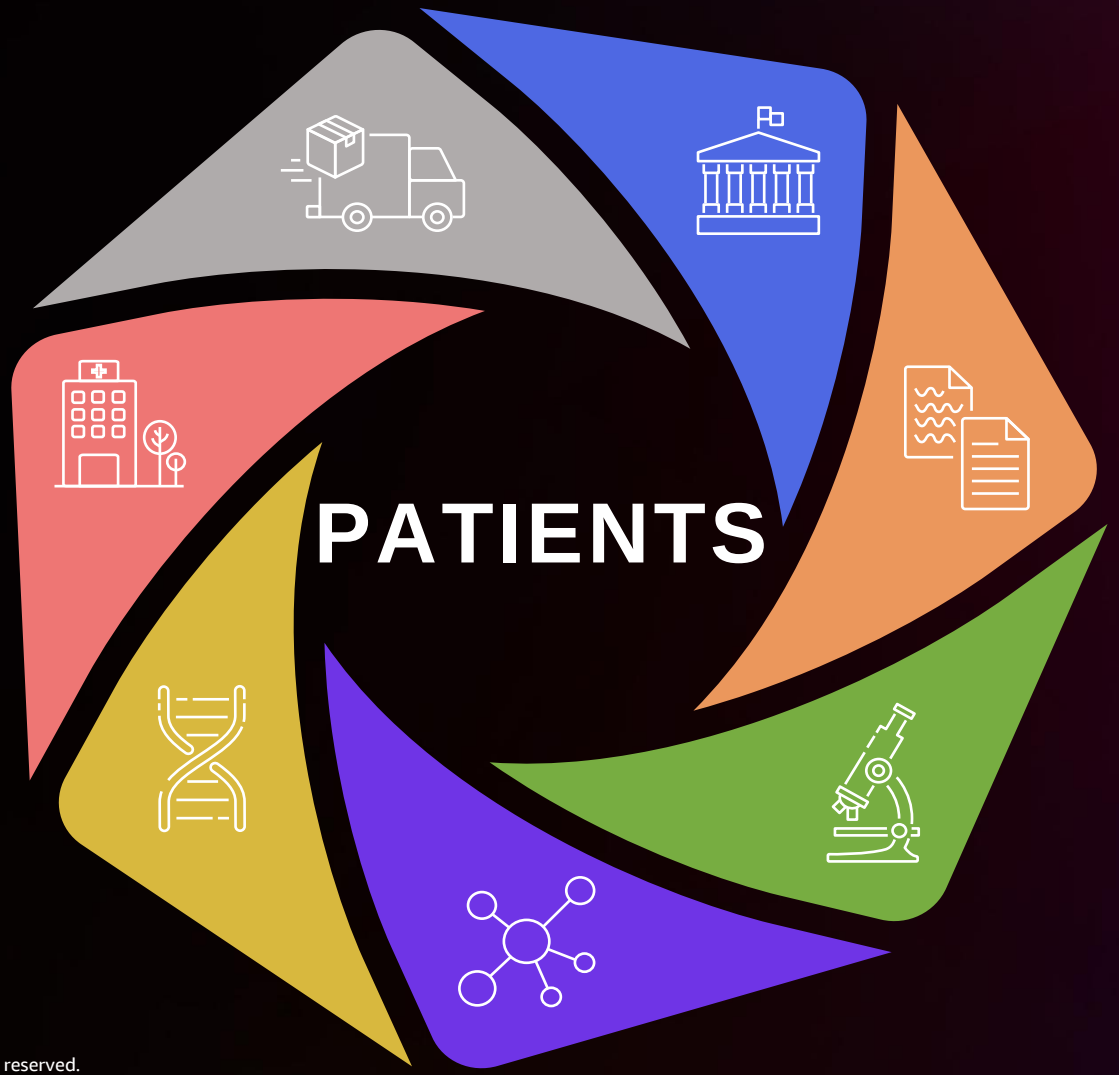
Genomics

Government

Payors

NGOs and NPOs

Pharma and med device



Right care

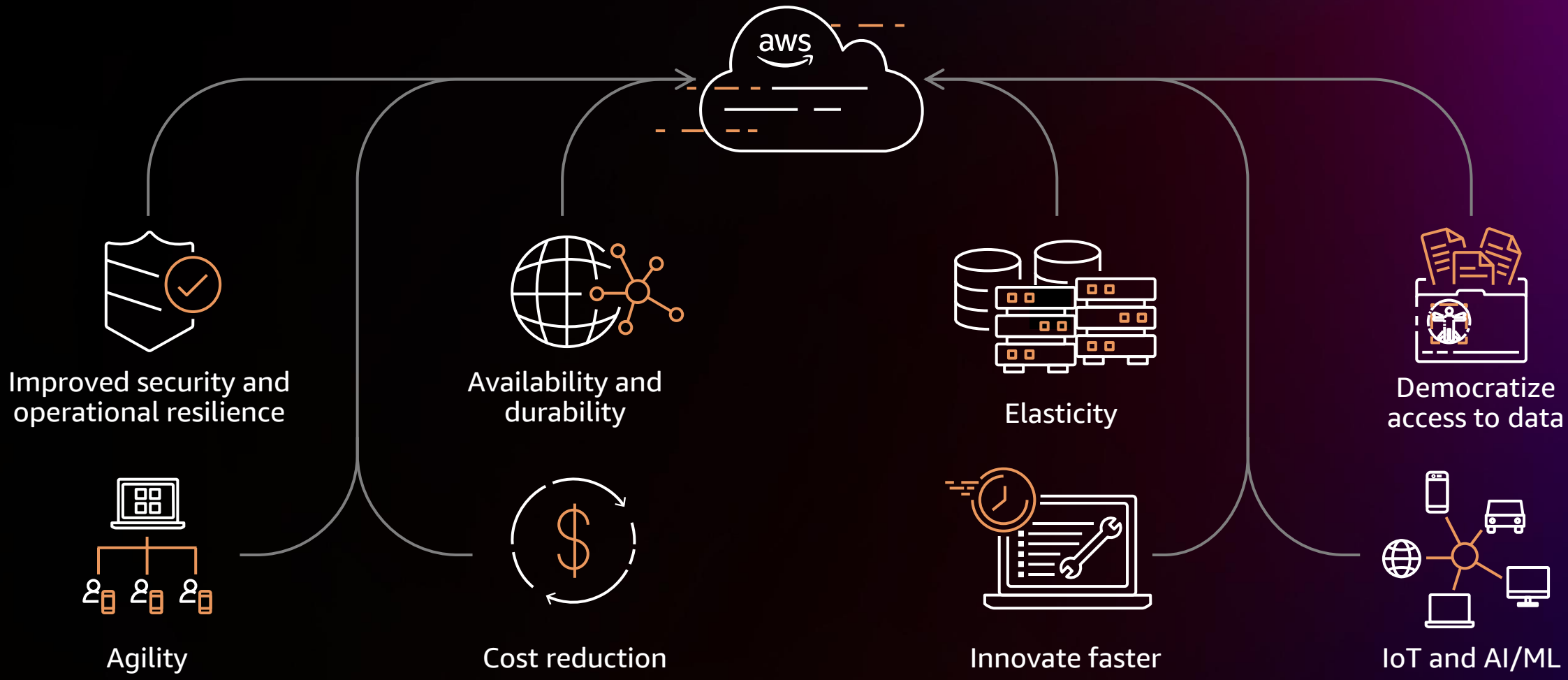
Right place

Right time

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Accelerating healthcare transformation on AWS



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What that means



Performance + Resilience + Security =

Innovation

Personalization

Value

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eHealth NSW

Accelerating healthcare transformation at eHealth New South Wales.

Farhoud Salimi
Executive Director, Service Delivery, eHealth NSW

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About Us

NSW Health snapshot

The NSW public health system is world class. It is also the largest public health system in Australia.



8.2 million
NSW residents on 809,444 sq. km.

$30.2 billion
2021-22 budget

>160,000
Total staff

228
Hospitals

17
Local health districts and specialty health networks

3.07 million
Emergency department attendances

351,000
Surgeries performed

1.9 million
Inpatient episodes

1.26 million
Ambulance emergency responses

eHealth Strategy for NSW Health

Our vision is for a sustainable health system that delivers outcomes that matter to patients, is personalized, invests in wellness and is digitally enabled.

Our goals

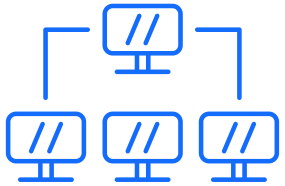
Three key goals for eHealth NSW have been identified:

- **patients** are supported, well-informed, and actively engaged in their health
- **staff** have the tools to make effective decisions with access to the very best training
- our **organizations** have the capacity for smart, transparent, and efficient management, business, and service planning

Three horizons of eHealth Strategy

Horizon 1	Horizon 2	Horizon 3
(Years 1 to 4)	(Years 1 to 7)	(Years 1 to 10)
Consistent Foundations	**Integration**	**Personalization**
"Patients have consistent interactions with healthcare systems that address their health and well-being."	"Patients benefit from strong partnerships that provide coordinated and integrated health services."	"Patients experience customized healthcare and education available when and where needed."

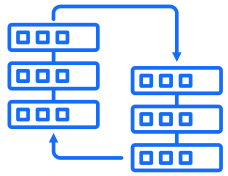
eHealth NSW's support landscape



2.2 X

Virtual machines

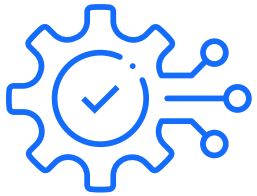
Our hosting footprint has grown from **3,500** to **8,000** virtual machines over the last six years



175 TB

VMware platform

Our VMware platform currently hosts **175 TB** of memory



696 B

Health Security Operations Centre

696 billion activity and system logs analyzed by Health Security Operations Centre per annum



1.06 M

IT support requests

Over a million IT support requests are received per annum



474.5 M

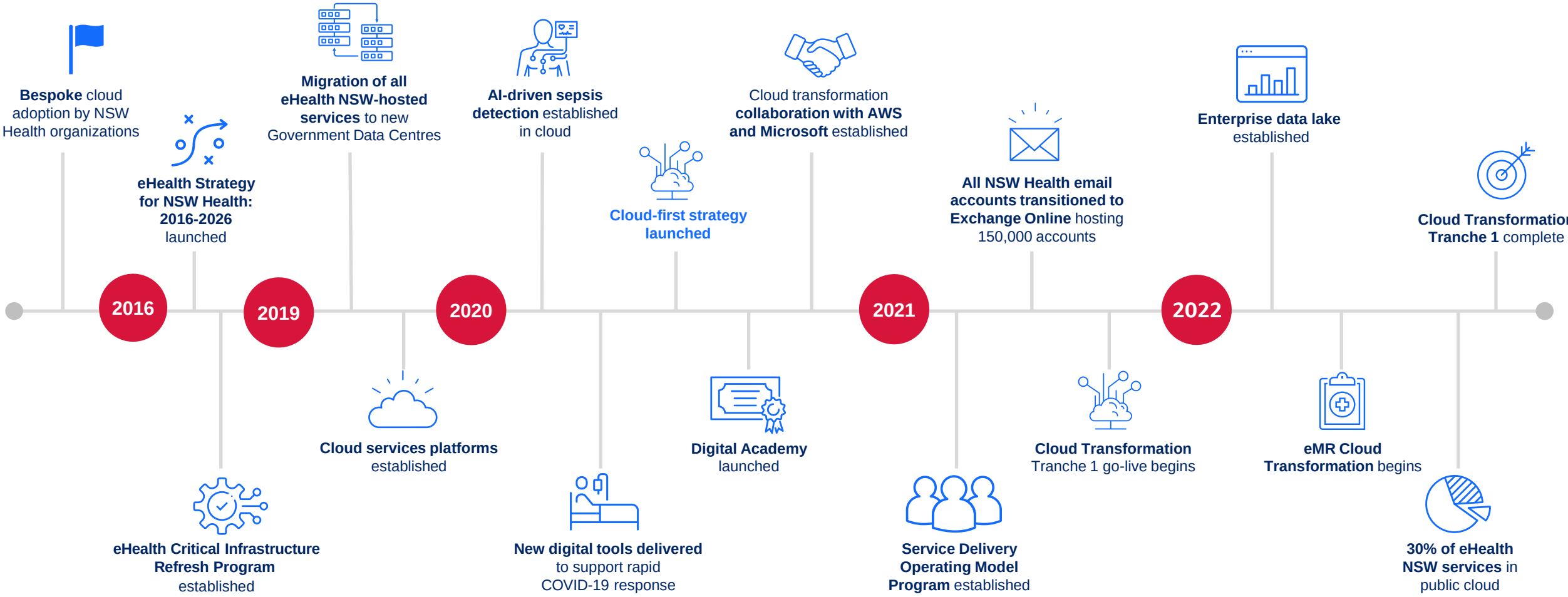
Patient charts

474.5 million patient charts accessed each year

eHealth NSW

Key achievements across cloud platforms

Since the release of the previous eHealth NSW Strategy for NSW Health 2016-2026, much has been achieved working in partnership with all NSW Health entities and our suppliers.



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The Platform

The NSW Government Cloud Strategy: An overview

The vision for NSW Government is to “Enable **government-wide adoption** of **public cloud services** in an **aligned** and **secure** manner, to accelerate innovation, modernize service delivery and **drive better outcomes for the citizens of NSW”**

Key tenets of the vision

- Government-wide adoption
- Public cloud services
- Aligned
- Secure
- Drive better outcomes for the citizens of NSW

Principles

- Use public cloud services as the default
- Modernize applications to make use of cloud-native services
- Measure services and use data to optimize
- Automate infrastructure where possible
- Optimize operations to reduce manual toil and operational burdens
- Configure services as the preference to customization

2023 success measures

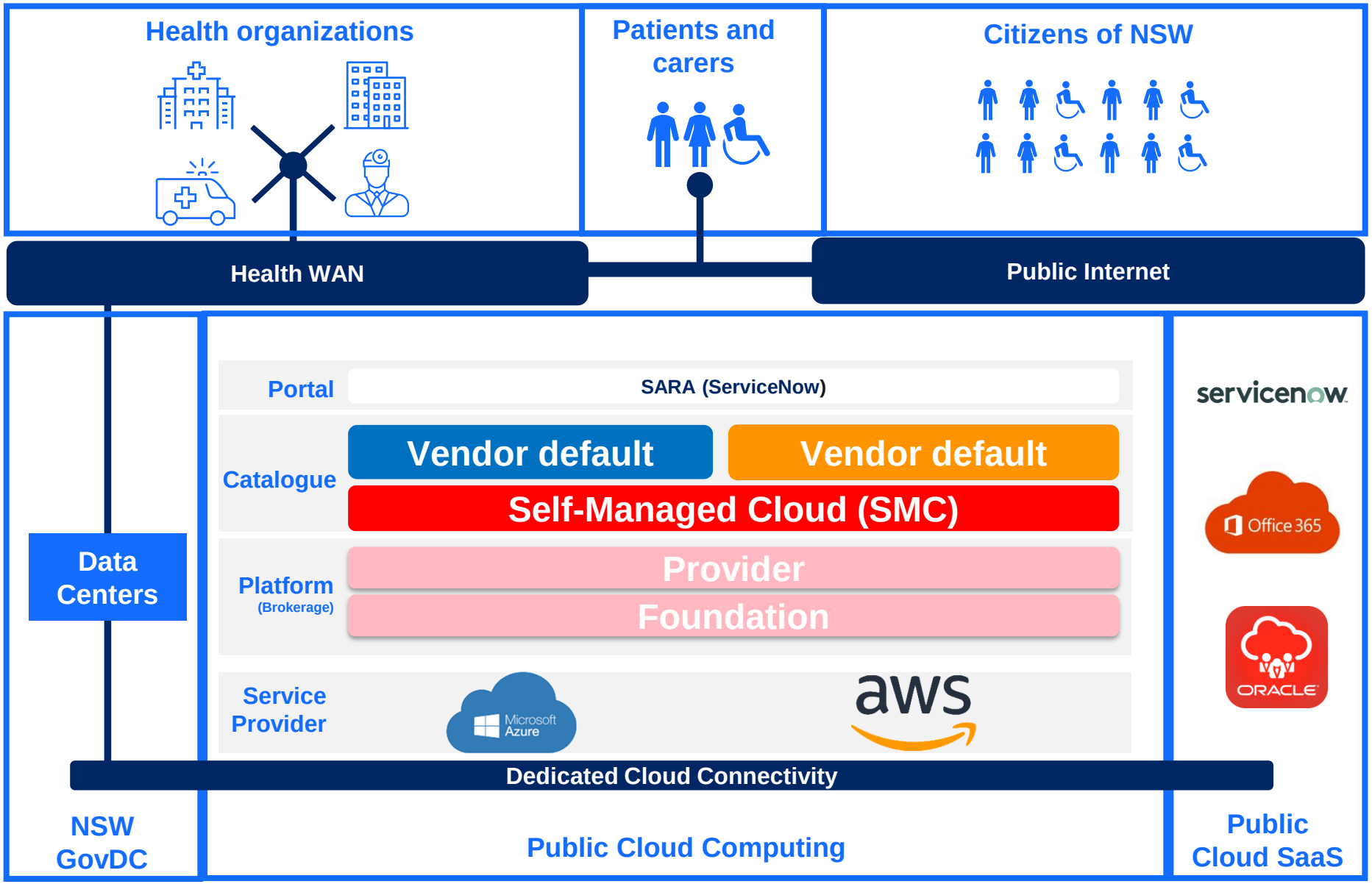
- **All NSW Government agencies to use public cloud, for a minimum of 25% of their ICT services**
- **Less than 5% of requests for ICT services funding require exception from the NSW Government Cloud Policy**
- **25% reduction on ICT infrastructure procured by NSW Government agencies with capital expenditure**

Cloud exemptions

(Cloud Circular)

- Case-by-case basis, substantiated and demonstrate future alignment to cloud
- Exemption requests are via the NSW Health CIO
- NSW Health CIO submits to Department of Customer Service
- Further approval may be required from Delivery and Performance Committee of Cabinet

Visit: https://www.digital.nsw.gov.au/policy/cloud-strategy-and-policy/ for details on the state cloud strategy and policy


Health organizations
Patients and carers
Citizens of NSW
Health WAN
Public Internet
Data Centers
Portal
SARA (ServiceNow)
Catalogue
Vendor default
Vendor default
Self-Managed Cloud (SMC)
Platform
(Brokerage)
Provider
Foundation
Service Provider
Microsoft Azure
aws
servicenow
Office 365
ORACLE
Dedicated Cloud Connectivity
NSW GovDC
Public Cloud Computing
Public Cloud SaaS

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The People



Digital Academy offering

	NOW LIVE	COMPLETIONS	IN PROGRESS
Human Centred Design	✓	184	
Service Management	✓	4533	
Safety & Quality	✓	1666	
Start with the customer in mind	✓	270	
Cloud	✓	1057	
Analytics	✓	98	
Agile	✓	599	
Cyber Security			⏳
Integration & Interoperability			⏳
		8407	

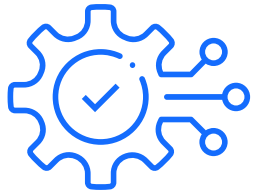
eHealth NSW Digital Academy:

Cloud Stream learning pathways



Cloud Essentials

Learn cloud fundamentals and best practices



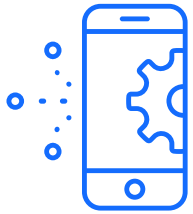
Security

Learn processes and best practices for securing the platforms



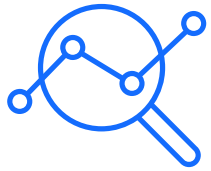
Engineer/Architect

Learn to automate applications and networks and design highly available systems



App Developer

Learn to develop applications for the cloud



Data Analytics

Learn to design, build, secure, and maintain analytics solutions

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Digital Academy: Graduate survey results

78% of participants have had the opportunity to apply learnings

81% of participants have seen an improvement in their ability to deliver work faster or more efficiently

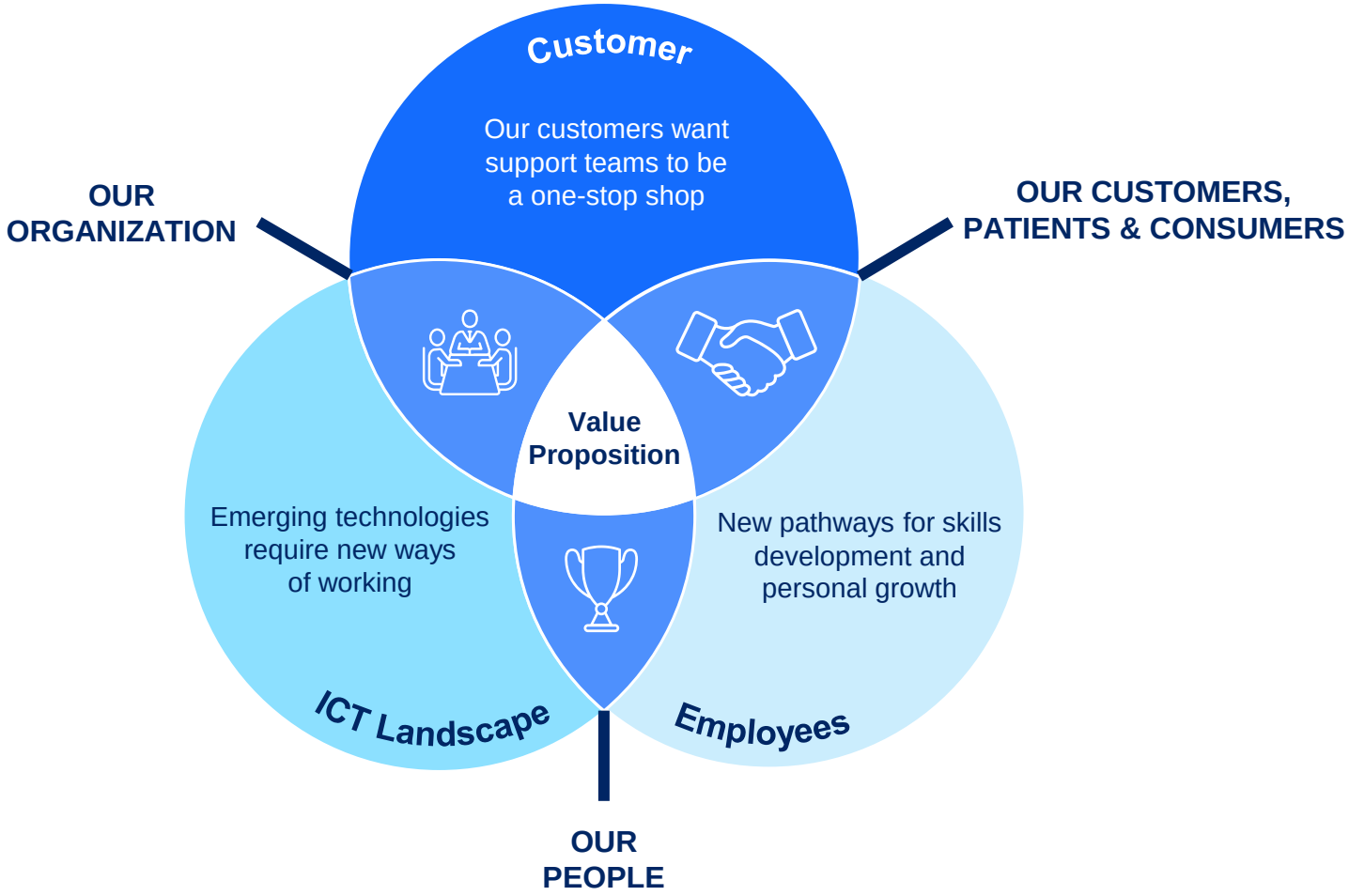
71% of participants have rated the Academy as adding value to their career progression

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The Structure

Focus on outcomes

Maximizing value for our customers, our people, and our organization



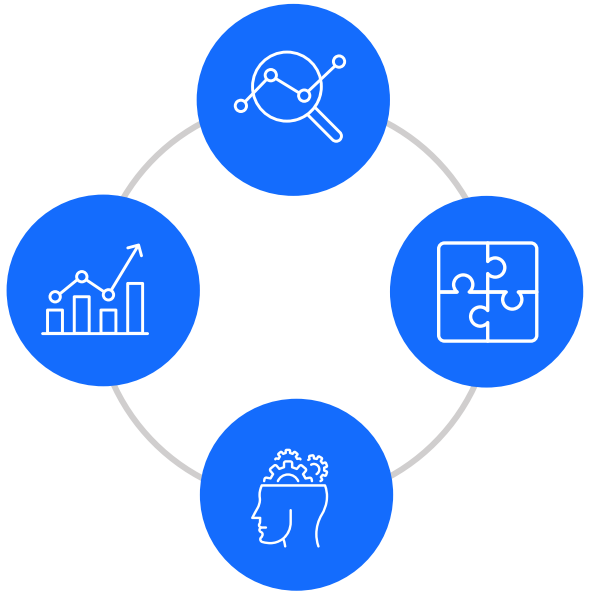
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Operating Model Program

A change enablement team to lead operating model transformation for over 1,600 people centered around core products, platforms, and services

Test and refine the model on cloud "pilot product teams" before scaling

Drive and measure incremental value through transparent OKRs



Systems thinking around people, process, technology, culture, customers, and knowledge

Leverage insider knowledge and upskill our people



“Think big, start small, learn fast”

Testing and refining the model in partnership with AWS Professional Services (Proserve)

Cloud Transformation Services project teams operated as a **unified, virtual product team** for the duration of the project.

Employee benefits:

- Mobility
- Training
- Hands-on experience
- Coaching support
- Product team/scrum exposure
- T-shaped skills
- Andon cord

NSW Health
Cloud Partners
Application Vendors

aws professional services

VERSENT



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The Benefits

eHealth NSW

eHealth NSW's cloud transformation

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Electronic Medical Records

40% of eHealth NSW's hosting footprint

Cerner

eMaternity

First eMaternity migration to AWS globally

meridian HEALTH INFORMATICS

Endoscopy Imaging System

Infrastructure deployment fully automated

provation

Enterprise Data Lake

One of the largest health data lakes in the southern hemisphere

Enterprise Imaging Repository

Largest APJ early adopter of the NetApp on FSX storage solution released late 2021.
First organization globally to host Synapse VNA on Cloud Native

SYNAPSE

electronic Oral Health Record

Australia first migration to AWS

Titanium solutions

iPatient Manager

First iPM (APAC) migration to AWS globally

Dedalus

Enterprise Service Bus

Major re-architecture decoupling and de-risking customer instances

Genetic Information System

First TrakGene migration to AWS globally

TrakGene

Enterprise Patient Records

Second migration to AWS globally, first migration in Australia

ORACLE

eHealth NSW Cloud Transformation

eHealth NSW

Cloud migration benefits



$25M

of benefits already realized due to avoided costs, reduction in capital and expenditure, and improvements in productivity



10x

increased deployment speed on average. This opens opportunities for modern management and DevOps techniques



$33K

per month already saved on 2 of our applications due to FinOps insights



8,407

Digital Academy courses completed by NSW Health staff



4 + 2

World-first migrations to cloud-native architecture for 4 of our clinical applications, and Australian first for another 2



116K to 144K

hours of productivity saved for frontline clinicians due to increased platform stability



1.7 PB

worth of storage migrated to AWS

532 servers

16 TB memory



70%

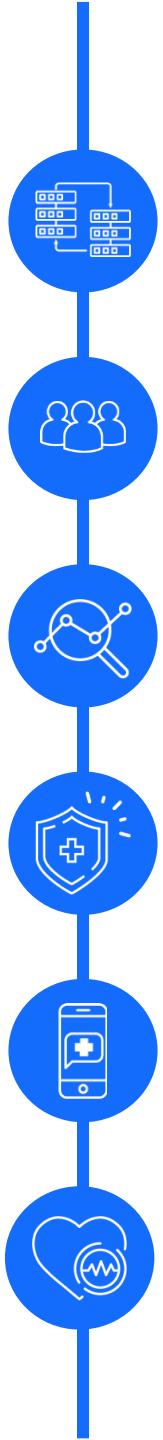
reduction in unplanned outages due to repeatable infrastructure as code and modern deployment models

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What's Next

Next phase of the digital health journey

Continuing the digital journey, eHealth NSW is focusing on the following key areas, while aligning to the state strategies through to local health strategies



Migration of **90%** of our critical applications to **cloud by the end of 2024**, and decommission our on-premises footprint

Continue to build **product teams** focused of DevOps delivery of value to NSW citizens

Expand integration points with data lake to enable big data and advance real-time **analytics** (including IoT and AI)

Expand the **Digital Academy** offerings to the whole of **NSW Health** and focus on continual staff development

Modernization of legacy systems/architectures (move to cloud-hosted, API-enabled platforms) and infrastructure (Health Grade Enterprise Network initiative)

Supporting **Future Health Strategy** and related themes:

- Value-based healthcare
- **Elevating Human Experience** (CX + EX)
- Empowering patients/consumers
- Innovation and research
- Digital health workforce development

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68%

“Government respondents list a lack of internal cloud expertise as a barrier to migrating to the cloud”

Source: ADAPT Sector Analysis – Government 2022

Cloud adoption challenges in NSW Health

- Vendor roadmap maturity and capability
- Medical equipment certification (e.g., TGA) timeframes
- Market resourcing and skill availability
- NSW Health staff skill uplift
- Operating models and business process uplift
- CapEx to OpEx funding

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Thank You

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Fireside chat

Dr. Rowland Illing, Director & Chief Medical Officer, AWS



Farhoud Salimi, Executive Director – Service Delivery, eHealth NSW



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“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.”

An interpretation of Charles Darwin’s “On the Origin of Species”

By Leon C. Megginson, Louisiana State University

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Thank you!

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