

AWS State, Local, and Education Learning Days

Chicago



Building a Modern Data Strategy

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Agenda

Why modern data architecture

Modern data strategy

Reference architectures for common scenarios

Getting started



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Why Modern Data Architecture



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**“If we have data, let’s look
at the data.
If all we have are opinions,
let’s go with mine”**

Jim Barksdale
CEO of Netscape



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Data is just the Building Blocks

Data



Information

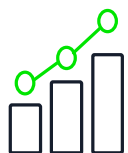


Insights



Without structure, tools and processes,
Data has very little value

The data challenge



Availability of
electronic data
is growing
exponentially



Data coming from
new, disconnected
sources



Increasingly
diverse in file type
and volume



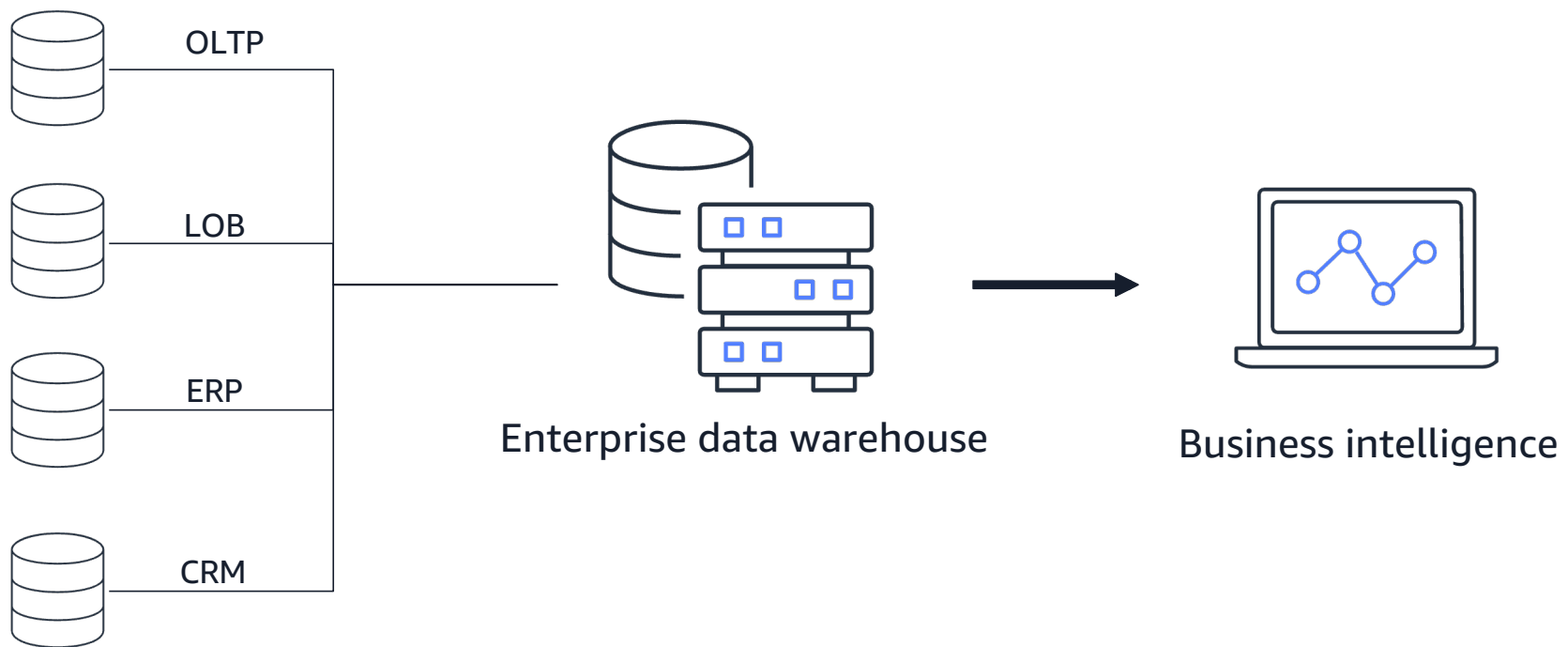
Used by
many people (e.g.
policy makers,
researchers, etc.)



Analyzed by
many applications

Current state

Currently, decision-making revolve around the **enterprise data warehouse**



Data no longer scales

There is more data and more diversity of data than people think

Data growth

>10x
every 5 years

Data
platforms need

To live for
15+
years

To scale
1,000x



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Accessibility of data



Data scientists



Business users



Analysts



Applications



Machine learning



SQL analytics



Scientific

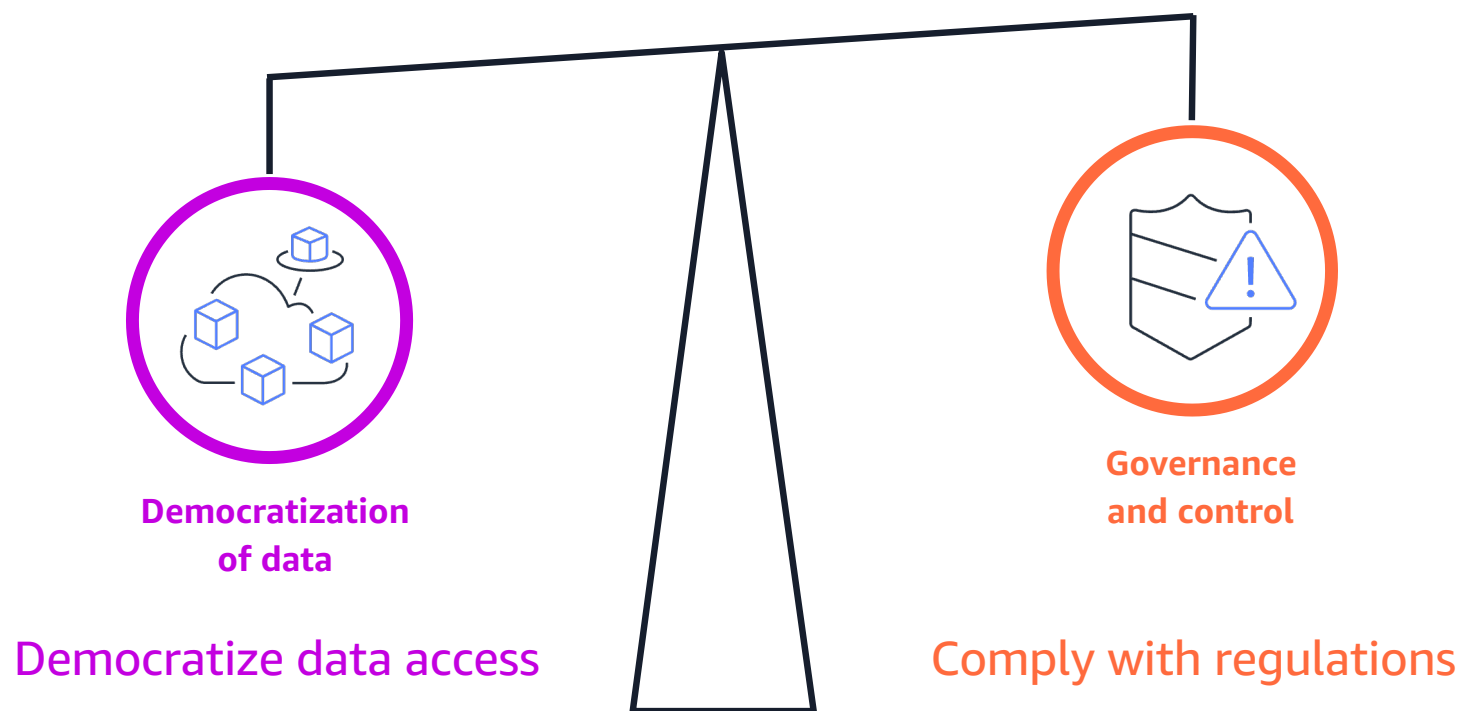


Real-time, streaming

There are **more people**
accessing data

And in **different ways**

More regulatory pressure



What now? **Let's rethink everything**



Raw Data



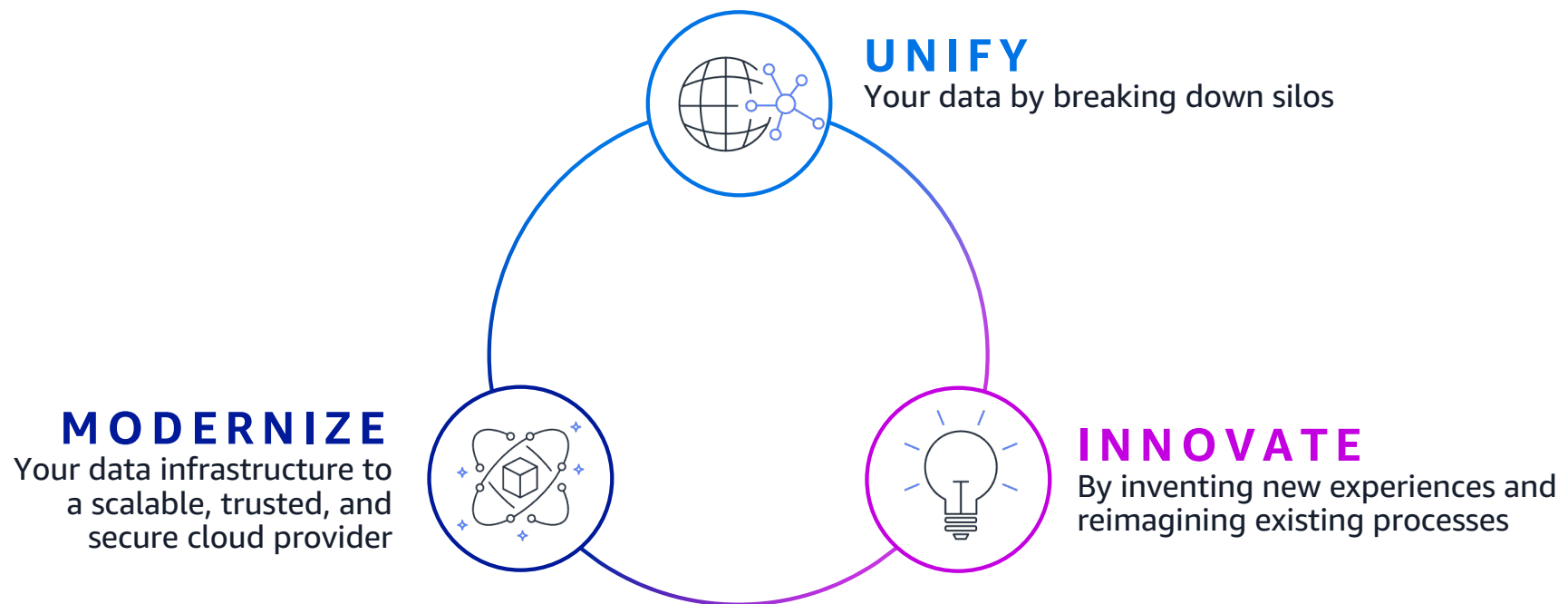
Insights

Modern Data Strategy

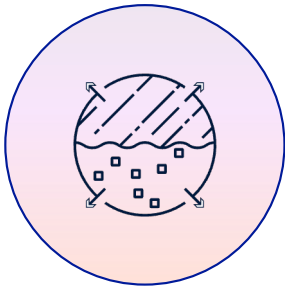


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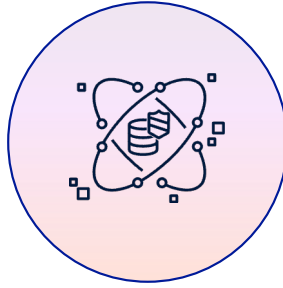
Modern data strategy for better business outcomes



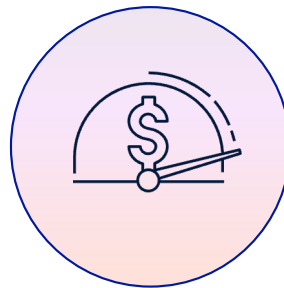
AWS modern data strategy components



Scalable
data lakes



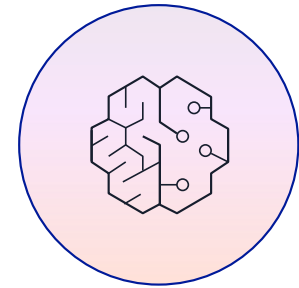
Unified data
access, security,
and governance



Purpose-built
data services for
performance
and cost



Serverless
and easy to
use



Built-in
machine
learning



Create better business outcomes with data



Make better, faster decisions



Improve customer experience



Prepare for the future



Reduce costs and improve productivity

Examples



Create better citizen & student experiences & outcomes



Student success & community relevance



Respond to the unexpected



Support research in the swine industry



Unifying data to enable 360-degree views



Transform human services



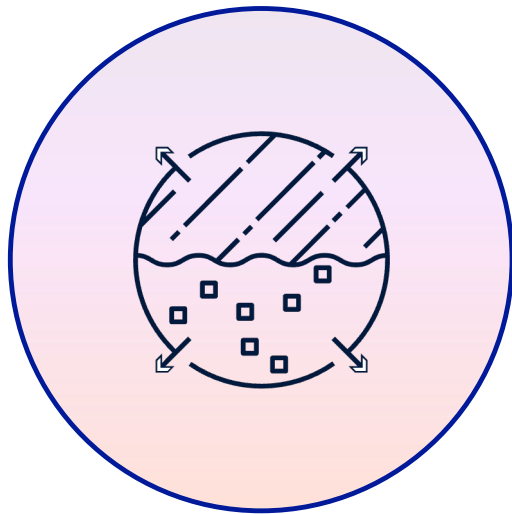
Enhancing efficiency



Create end-to-end visibility

Port of Long Beach





Unify Data with **Scalable** data lakes



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Amazon S3: Data lakes on AWS

Store unlimited data in open file formats

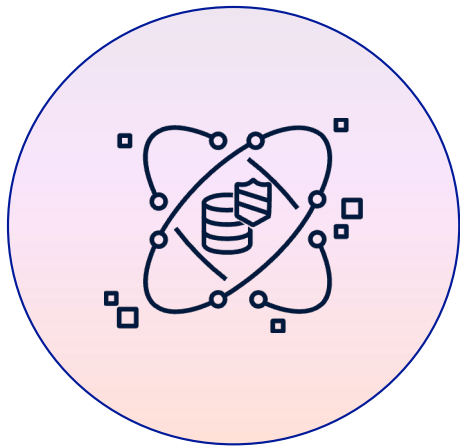
Unmatched durability, availability, and scalability

Decouple storage from compute

Choice of analytical and ML engines

Pay as you go



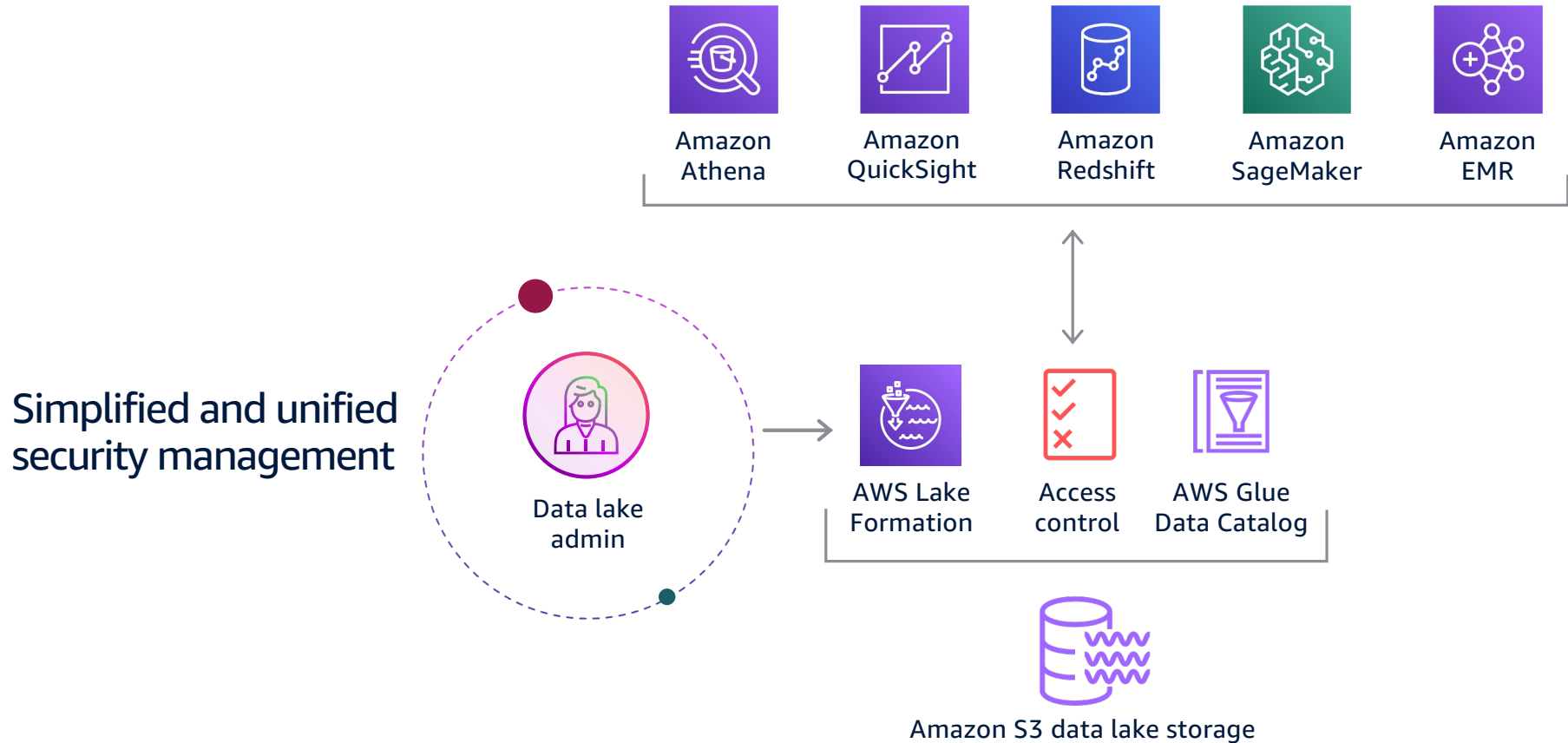


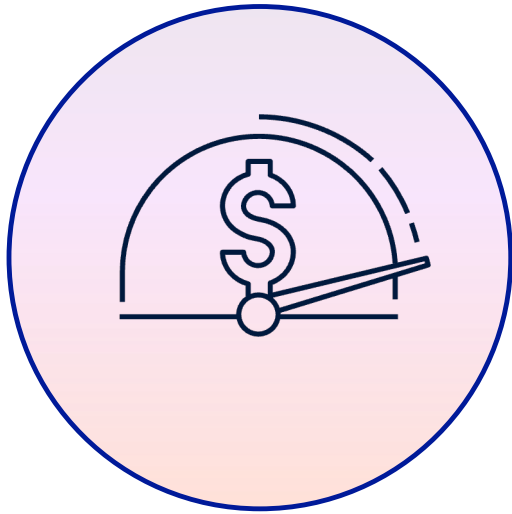
Unified data access, security, and governance



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AWS Lake Formation: Unified data governance





Modernize with Purpose-built data services

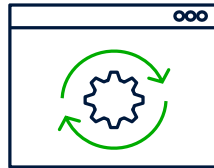


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To get more value from their data, customers are...



Breaking free from
legacy databases



Moving to fully
managed database
and analytics services














Modernizing your
data warehouse








Building modern
applications with
purpose-built
databases

A family of purpose-built data services









Business intelligence and machine learning

 Amazon QuickSight Visualizations	 AWS Data Exchange Data exchange	 Amazon SageMaker ML	 Amazon Comprehend NLP	 Amazon Transcribe Speech-to-text	 Amazon Textract Extract text
 Amazon Personalize Recommendations	 Amazon Forecast Forecasts	 Amazon Translate Translation	 Amazon CodeGuru Code reviews	 Amazon Kendra Enterprise search	Plus many more


Analytics

 Amazon Redshift Data warehousing	 Amazon EMR Hadoop + Spark	 Amazon Athena Interactive analytics
 Amazon OpenSearch Service Operational analytics	 Amazon Kinesis Data Analytics Real time	




Databases

 Amazon Aurora MySQL, PostgreSQL	 Amazon DynamoDB Key value, Document	 Amazon Neptune Graph
 Amazon RDS MySQL, PostgreSQL, MariaDB, Oracle, SQL Server, DB2	 Amazon DocumentDB Document	 Amazon Timestream Time series
	 Amazon Keyspaces (for Apache Cassandra) Wide column	 Amazon ElastiCache Redis, Memcached

Blockchain

 Amazon Managed Blockchain
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Data lake

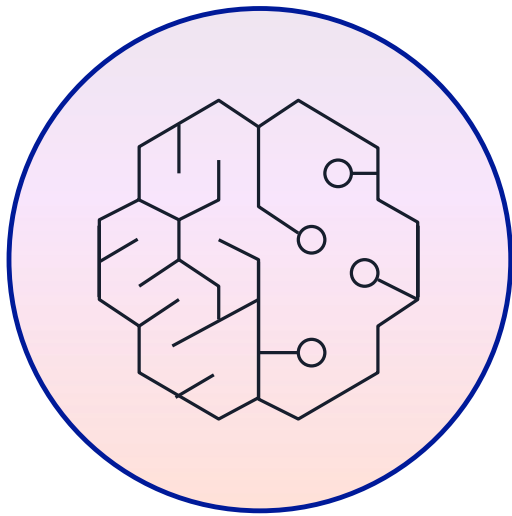
 Amazon S3/Amazon S3 Glacier	 AWS Lake Formation Data lakes	 AWS Glue ETL and Data Catalog
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Data movement

AWS DMS AWS Transfer family AWS Glue AWS Snowball Amazon Kinesis Data Firehose Amazon Kinesis Data Streams Amazon MSK
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Innovate with AI & machine learning



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Build new experiences and reimagine old processes with AI/ML



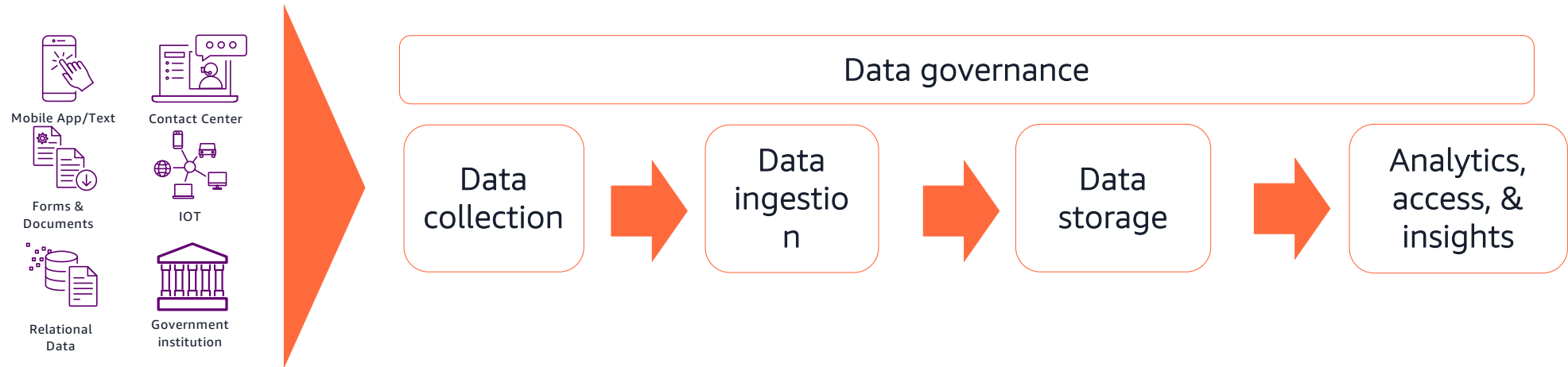
- Make accurate predictions, get deeper insights from your data, and improve customer experience
- Create ML predictions without any ML experience or writing any code
- Build applications with our pre-trained models
- Train and apply your own models
- Use your own algorithms by working directly with ML-optimized AWS infrastructure
- 100,000+ customers use AWS AI and ML services to make predictions from their data

Putting it all together



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Key components of modern data architecture



Security – Reliability – Operational Excellence – Performance Efficiency – Cost Optimization – Sustainability

Key considerations:

1

Ability to handle the increasing volume, velocity, and variety of data

2

Each component should be independently scalable

3

Make data easily accessible and sharable

Reference Architectures



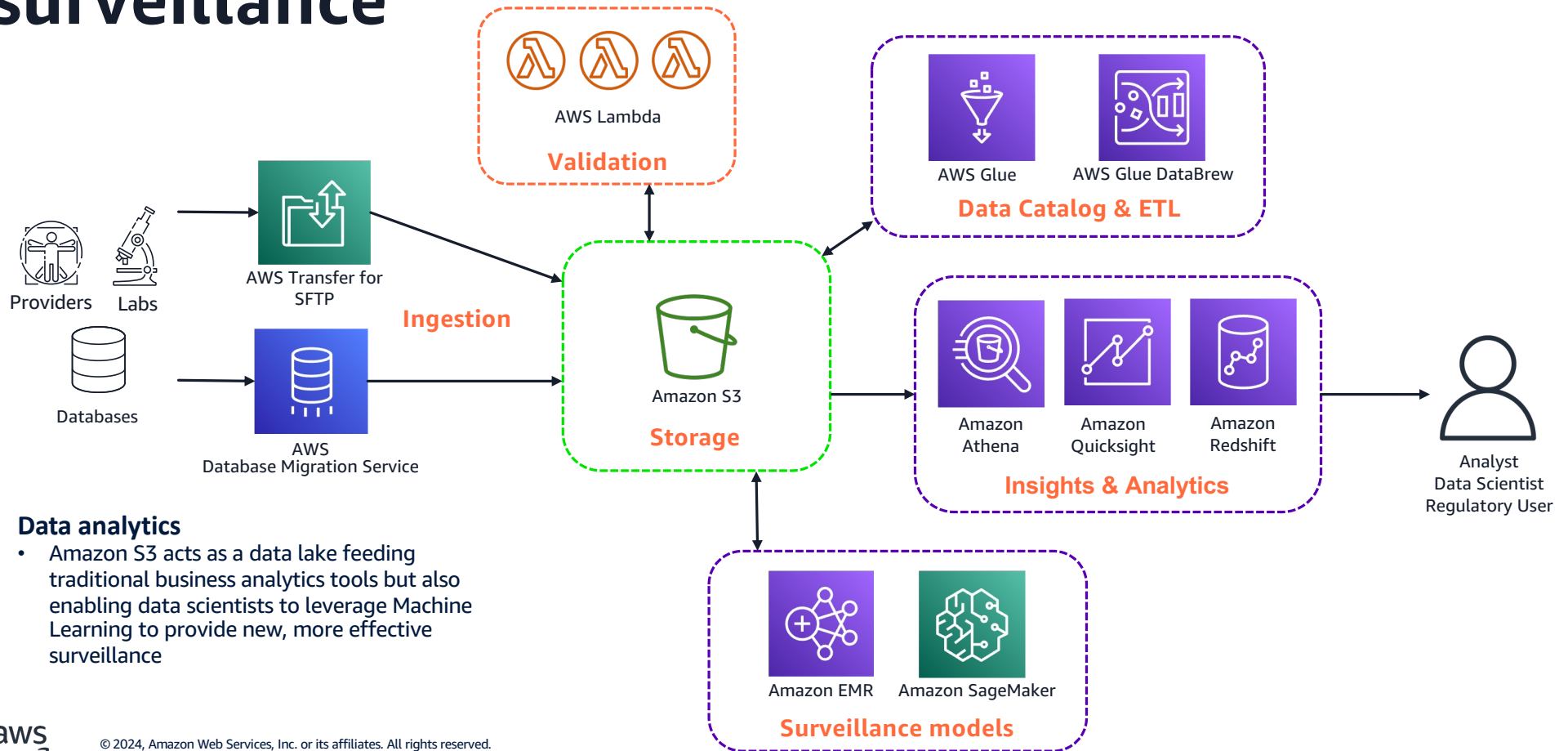
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Public Health Organization

- 1 Pandemic brings 1000% increase in disease surveillance data
- 2 Legacy management systems
- 3 Limited capabilities to consolidate data sets from multiple systems
- 4 Difficulty mandating data formats from various partner organizations



Sample reference architecture for disease surveillance

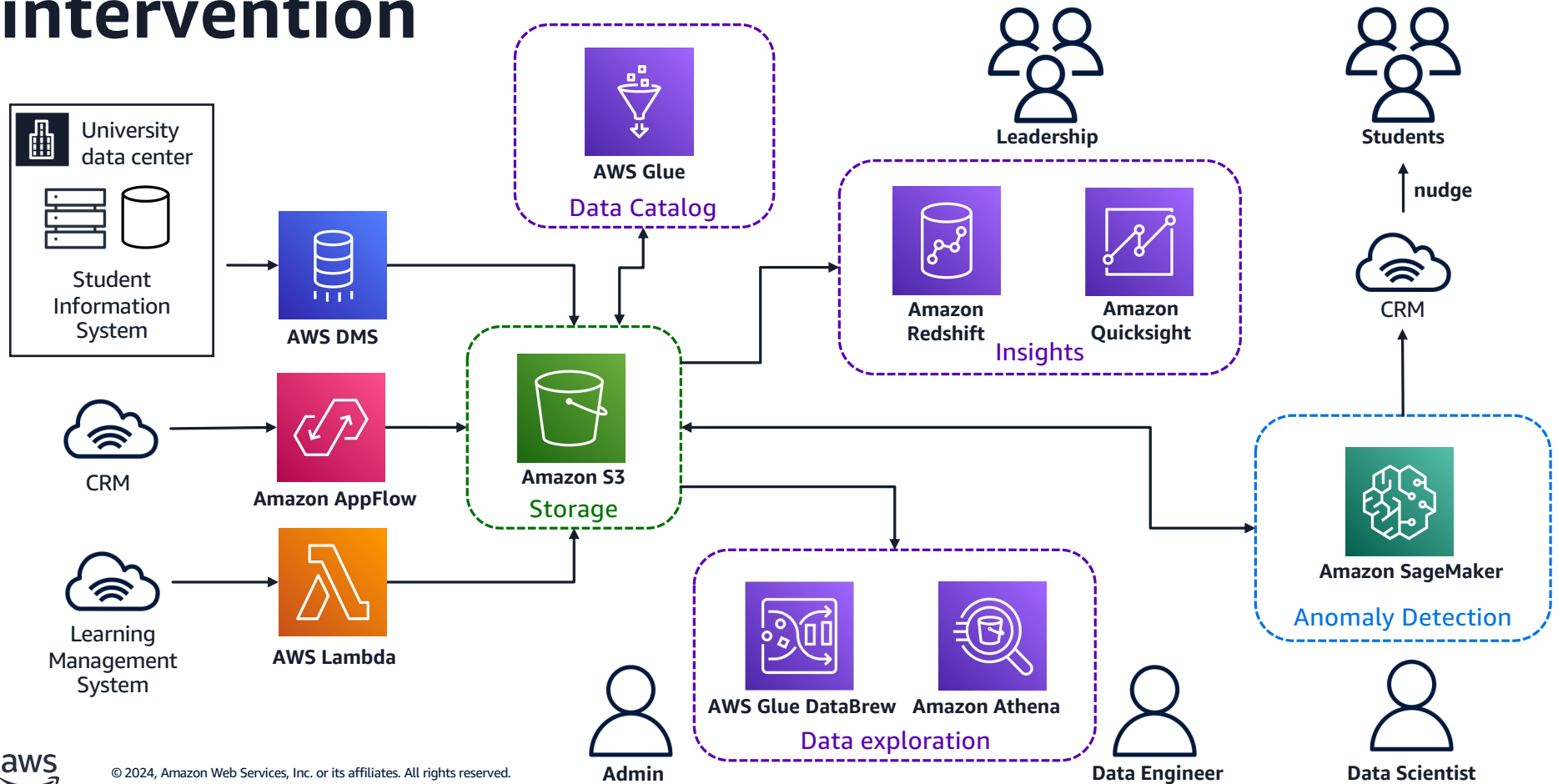


Improving student outcomes - Retention

- 1 Identify at-risk students from behaviors
- 2 Aggregated student touchpoint data from the **SIS, LMS, and CRM**
- 3 Feed insights into communication platform for **early intervention and nudging**



Sample reference architecture for student intervention



Moving the needle on retention

MARYVILLE UNIVERSITY

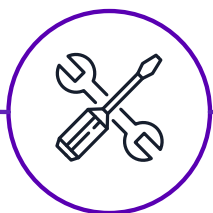
- 1 IT staff participated in data lake and modern data architecture **skills development**
- 2 Aggregated student touchpoint data from the **SIS, LMS, and CRM** into a data lake in 6 weeks
- 3 Automated processing and machine learning to **identify at-risk students** from behaviors
- 4 Fed insights into communication platform for **early intervention and nudging**



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Get started

BUILD WITH US



ML Solutions Lab
AWS Professional Services
AWS Immersion Day
Data-Driven Everything
Migration Assistance Program

BUILD WITH PARTNERS



AWS Partner Network—
100,000+ partners
AWS Marketplace (ISVs)

UPSKILL YOUR TEAMS



AWS Training and Certification
ML Embark Program



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Thank you!

Chris Kuehn

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Track: Data & Analytics

Session: Building a modern data strategy



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