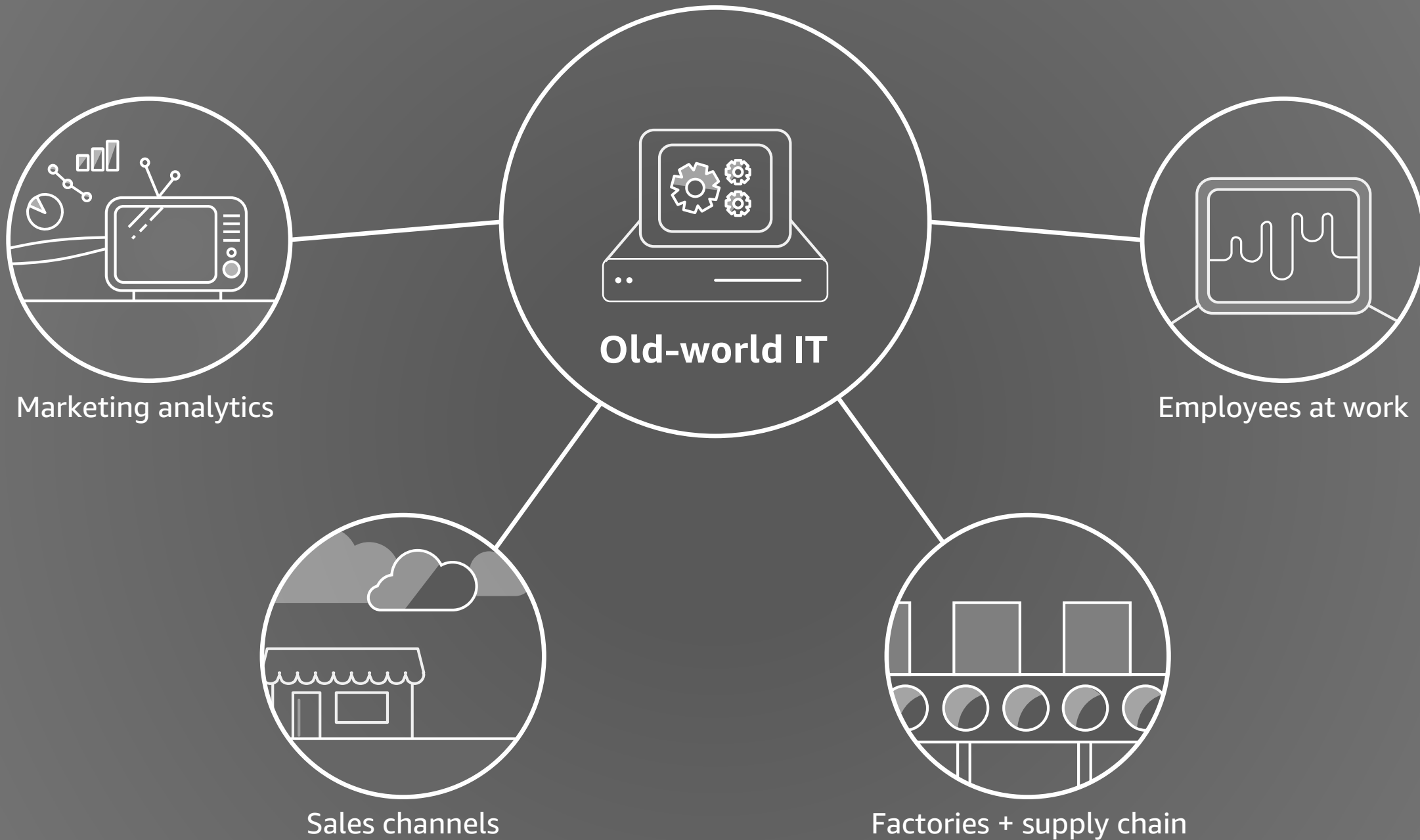# Modernizing Financial Services on AWS

Jason Barto
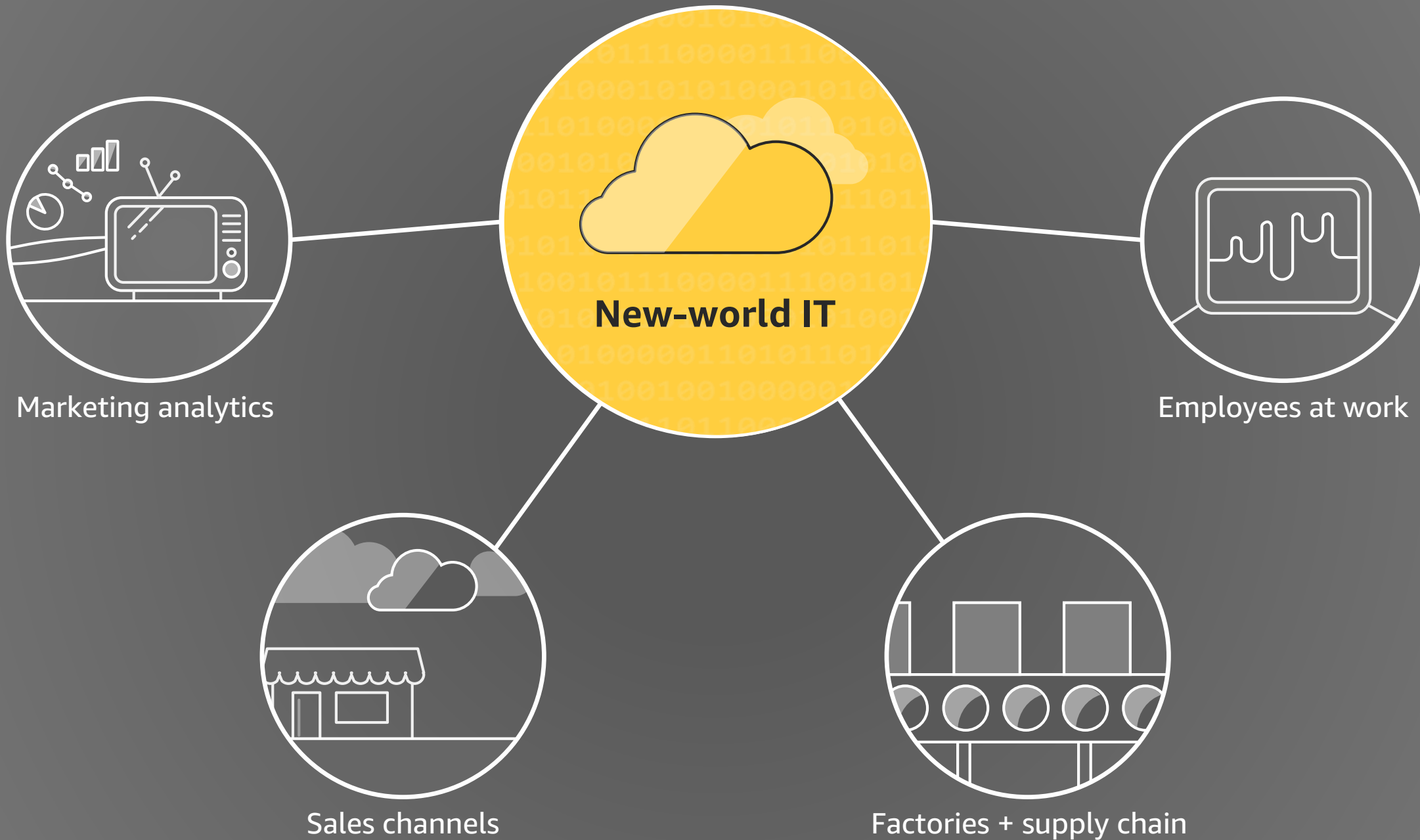Principal Solutions Architect
AWS Financial Services

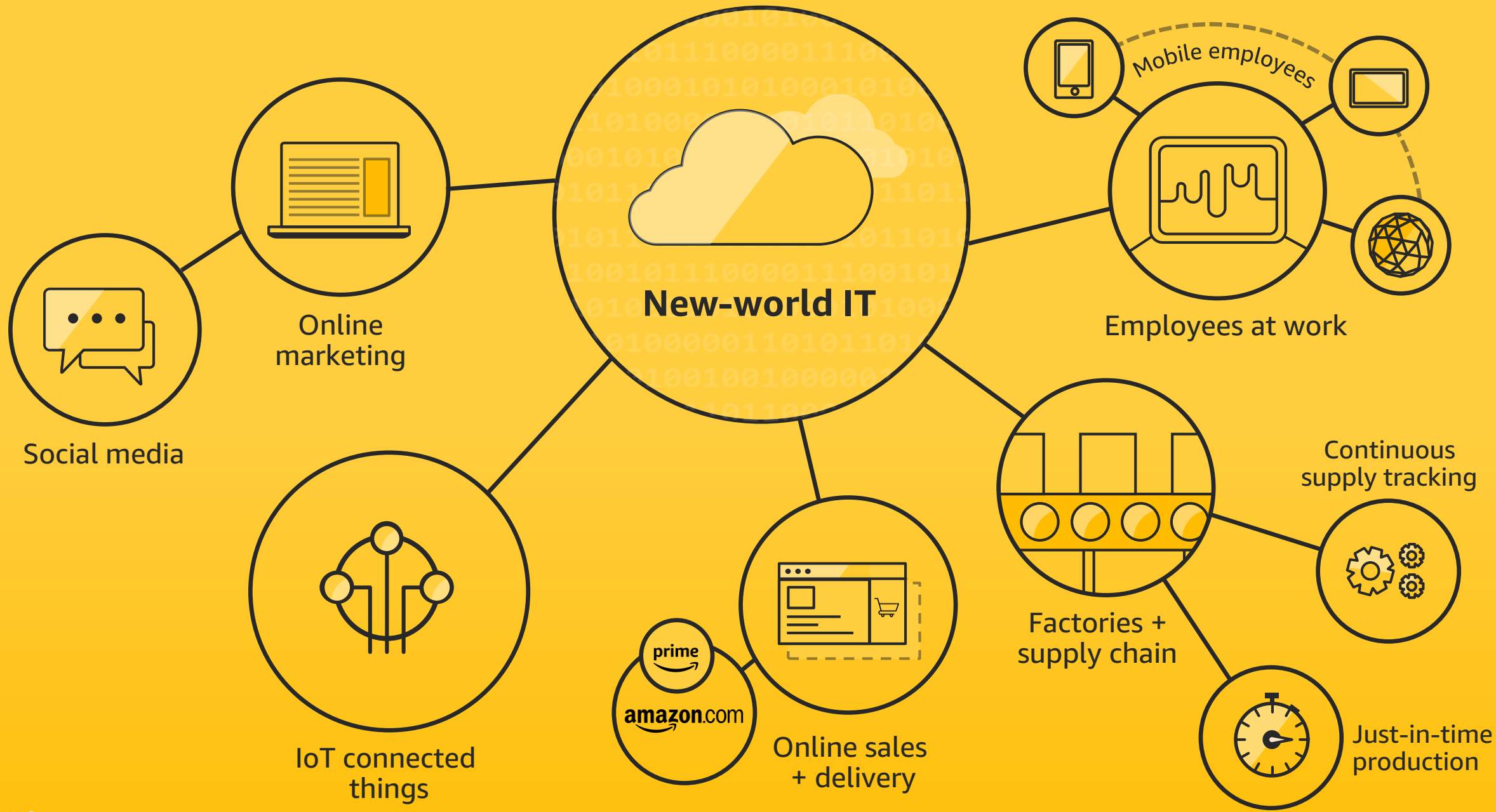Nicolai Gajhede
Chapter Lead, Software Engineering
Danske Bank Group A/S

Old-world IT

Marketing analytics

Employees at work

Sales channels

Factories + supply chain

New-world IT

Marketing analytics

Employees at work

Sales channels

Factories + supply chain

New-world IT

Social media

Online marketing

Mobile employees

Employees at work

IoT connected things

Online sales + delivery

Factories + supply chain

Continuous supply tracking

Just-in-time production

prime
amazon.com

aws

New needs

Personalization

Responsive features

Customer analytics

More things, more scale, rapid change

The Financial Services industry is Evolving in the Cloud

Strength of Infrastructure and Services

- Innovative engineering

- Committed customer relationships

- Setting the pace in the market

Financial institutions are transforming on AWS

Extensive Partner Network for Customer Choice

AWS Partner Network technology providers

Bloomberg   CALYPSO   COREZOID hyperautomation engine   DataRobot   DOMINO DATA LAB   EISA

FAST A Verisk Business   FICO   Infosys Finacle   GUIDEWIRE   IHS Markit   insurity   TickSmith

MAMBU   Moven   MUREX   NICE ACTIMIZE   xignite   experian

AWS Partner Network systems integrators & consultants

2ND WATCH   accenture   Capgemini   Cloudreach   Cognizant   CONTINO   Deloitte.

DXC TECHNOLOGY   Itoc   NRI   sopra steria   Mphasis stelligent The Next Applied   wipro

Modernizing Core Systems

"On AWS, we're able to adopt pricing changes within 3 weeks, whereas before it took at least 6 months. "

Simon Dalton
Senior Principal Application Architect, Discover Financial Services

About Discover Financial Services

Discover Financial Services is a leading digital banking and payment services company. Founded in 1985 and headquartered north of Chicago, the company's mission is to help people spend smarter, manage debt better, and save more.

Barriers to Change
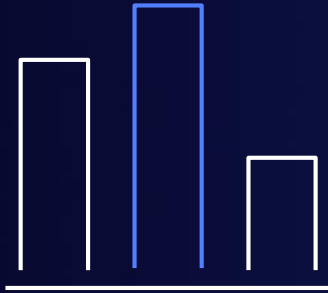
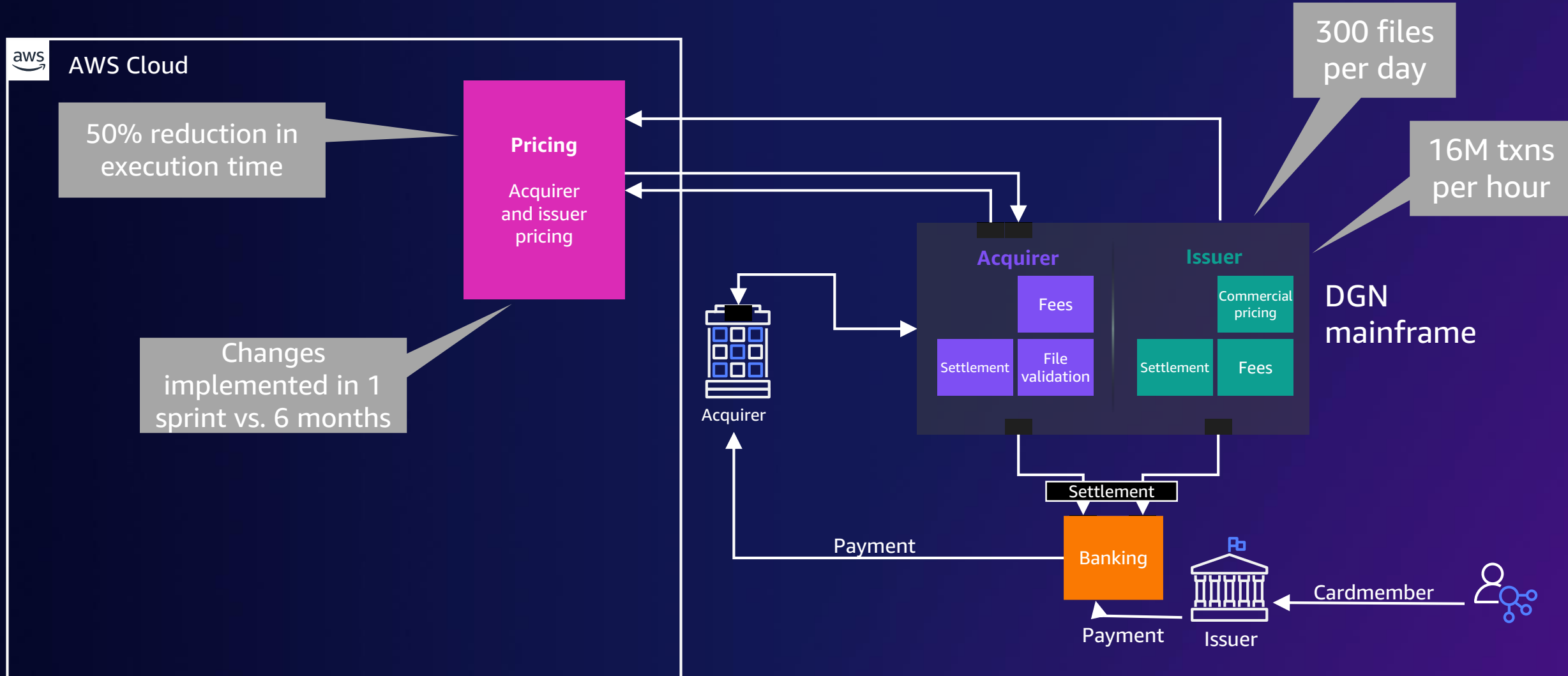The technology that got us here will not allow us to compete in the future

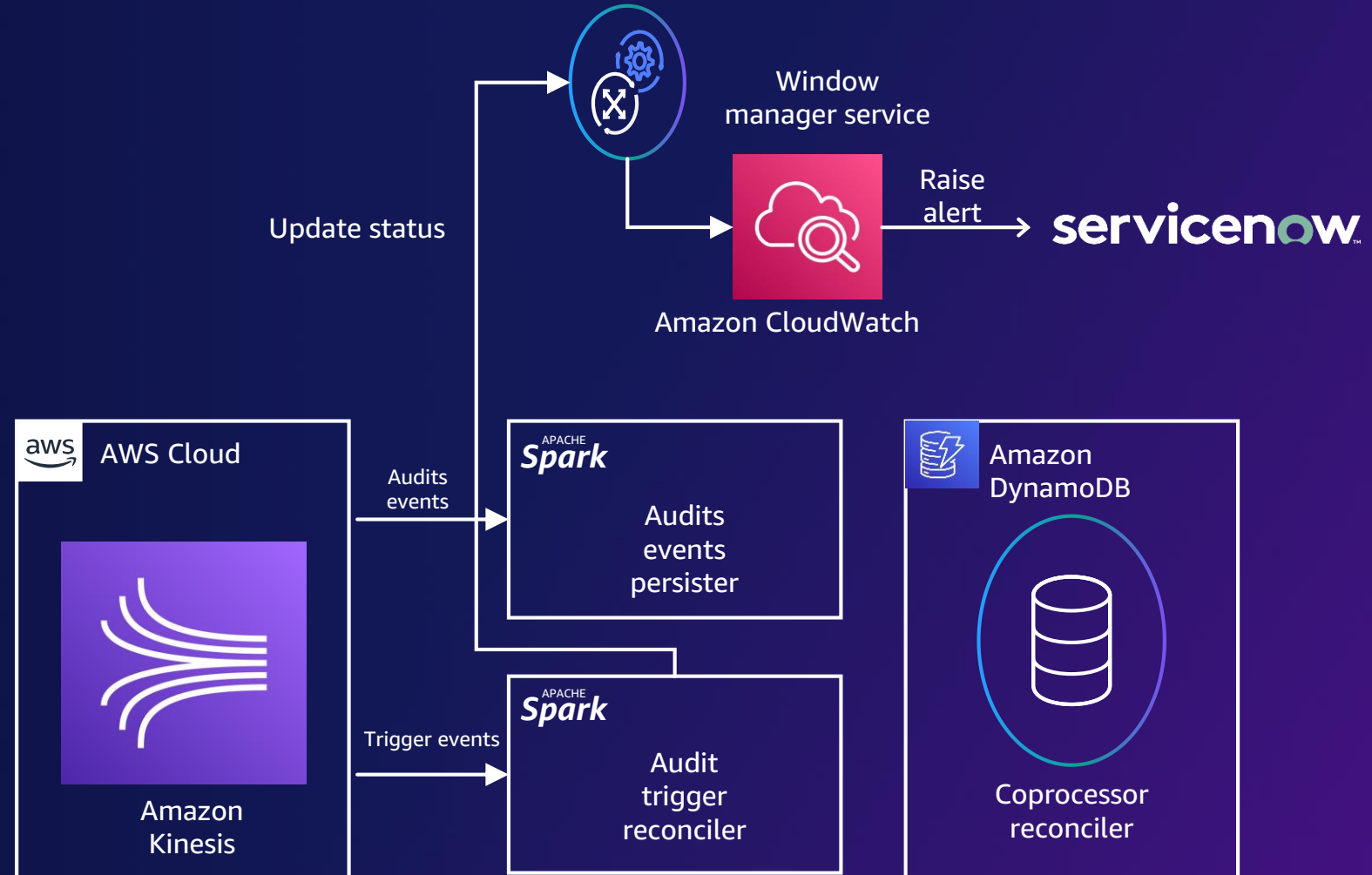A global solution to compete on the world stage

Eliminate client irritants and speed to market capabilities

Phased mainframe migration

Payment Processing in the Cloud

- Streaming audit architecture
- Audit every transaction through the service
- Reconcile the data frequently
- Immediate reconciliation feedback
- Flexibility to cope with sudden bursts
- Separate audit and application infrastructure

Window manager service

Update status

Raise alert

Amazon CloudWatch

servicenow

AWS Cloud

Audits events

APACHE Spark

Audits events persister

Amazon DynamoDB

Amazon Kinesis

Trigger events

APACHE Spark

Audit trigger reconciler

Coprocessor reconciler

Benefits to date

- 66% increase in Transaction Processing Speed

- 93% cost savings over 5 years

- Process 1 day's worth of files in 90 minutes

- Pricing changes performed in 3 weeks

- Supports processing in 12 currencies

Rapidly Changing Expectations

Adapting to Change is Critical

New forms of risk are constantly emerging

Data is revealing go-to-market and cost-saving opportunities

Consumers have higher expectations and more choices

Market volatility increases focus on operational resiliency

> " Going serverless accelerated our engineering teams, the more we experimented with a serverless mind-set, the more se started to see a flywheel effect where we could deliver value into the hands of our business partners quickly. "

Dave Anderson

Director of Technology, Liberty Mutual

About Liberty Mutual

In business since 1912, Liberty Mutual is currently the sixth-largest global property and casualty insurer and is currently ranked 77th on the Fortune 100 list of largest corporations in the U.S. based on 2019 revenue. The company offers a wide range of insurance products and services, including personal automobile and homeowner's insurance.

Financial Central Services

- 100 million transactions

- Highly resilient

- $60 per month
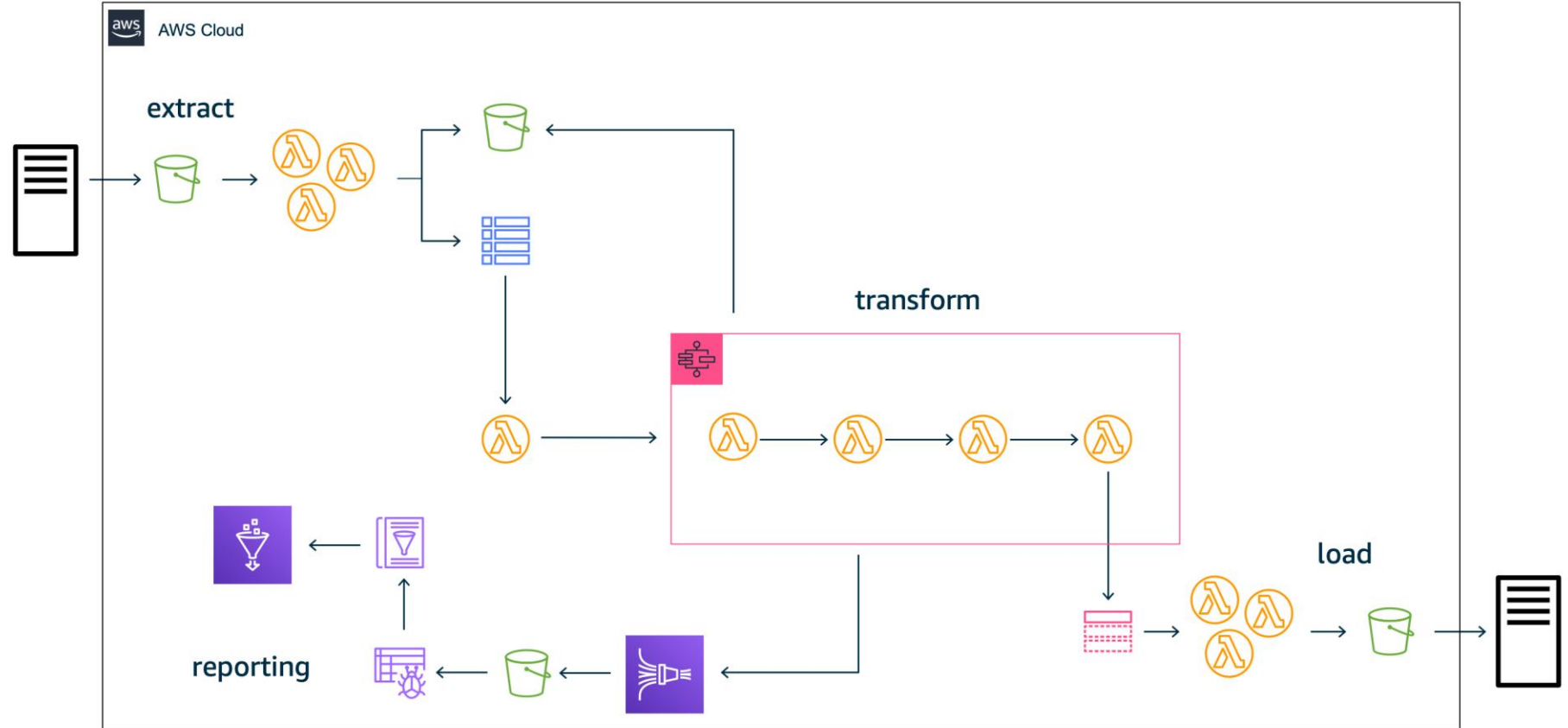
Standardized Patterns

 AWS Cloud Developer Kit (CDK) Patterns

22 open-source serverless patterns (and counting)

Software Accelerator
 – Liberty Mutual tailored CDK Patterns
 – 3500 serverless patterns deployed (Sept 2020)

Customer-centric Agility

- 100 million transactions processed for $60

- Decreased build time to 3 months

- Reduced onboarding time for engineers

- Boosted system flexibility and resilience

Drive Business Growth with Machine Learning

Making Things Personal

Legacy system modernization

The COVID-19 pandemic and global regulatory pressures have accelerated financial institutions' digital transformation journeys and plans to modernize legacy systems
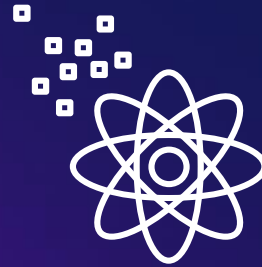
Leveraging data

Financial services companies want to gain deeper insights, optimize processes, and accelerate innovation with AI/ML

Customer experience

Financial institutions recognize the need to deliver seamless omnichannel experiences; consumer loyalty is often aimed toward the last, best experience and the cost of switching is low

Machine Learning is Driving Business Growth

AI/ML is becoming a key component for business transformation. With the abundance of data collected by companies, as well as the labor-intensive, manual, and—in some cases—paper-based processes still used by many financial institutions, it is an industry ripe for product enhancement and disruption via AI/ML.

" **Building a minimum viable product in 6 weeks proved that we could deliver value to our clients much more quickly than we had previously thought possible** "

Joseph Salerno
Vice President and Global Head of Debtdomain, HIS Markit

About HIS Markit

IHS Markit provides critical information, analytics, and solutions to major industries and markets that drive economies worldwide, including financial services.

Accelerating Innovation

- Working backwards from business objectives

- Changing the interface to support loan sales

- Workflow enhancement through sentiment analysis

- Delivered initial capability in 6 weeks

Amazon FinSpace

Reduce Data Preparation Time
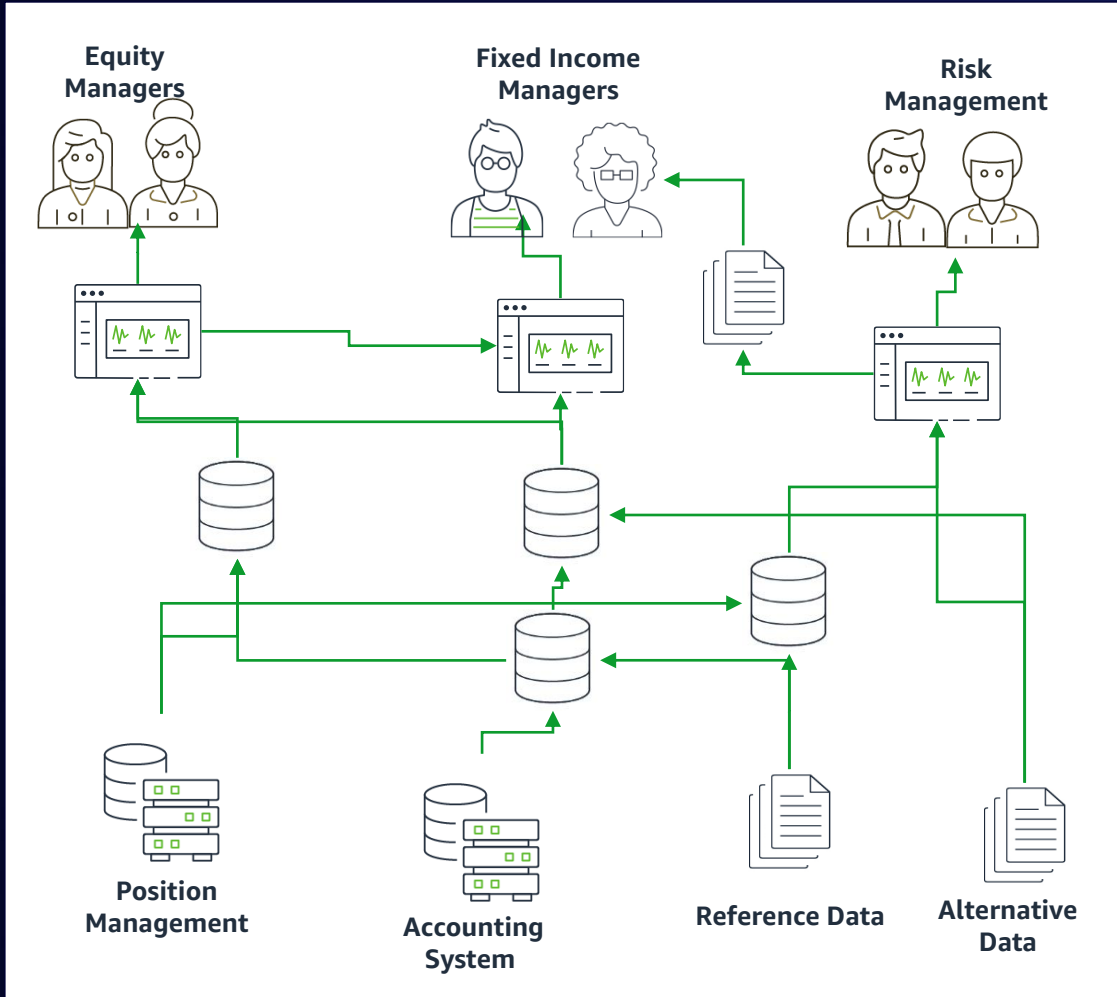
Extensive custom development

Longer time to market

Higher cost

Higher operational complexity

Harness Financial Data
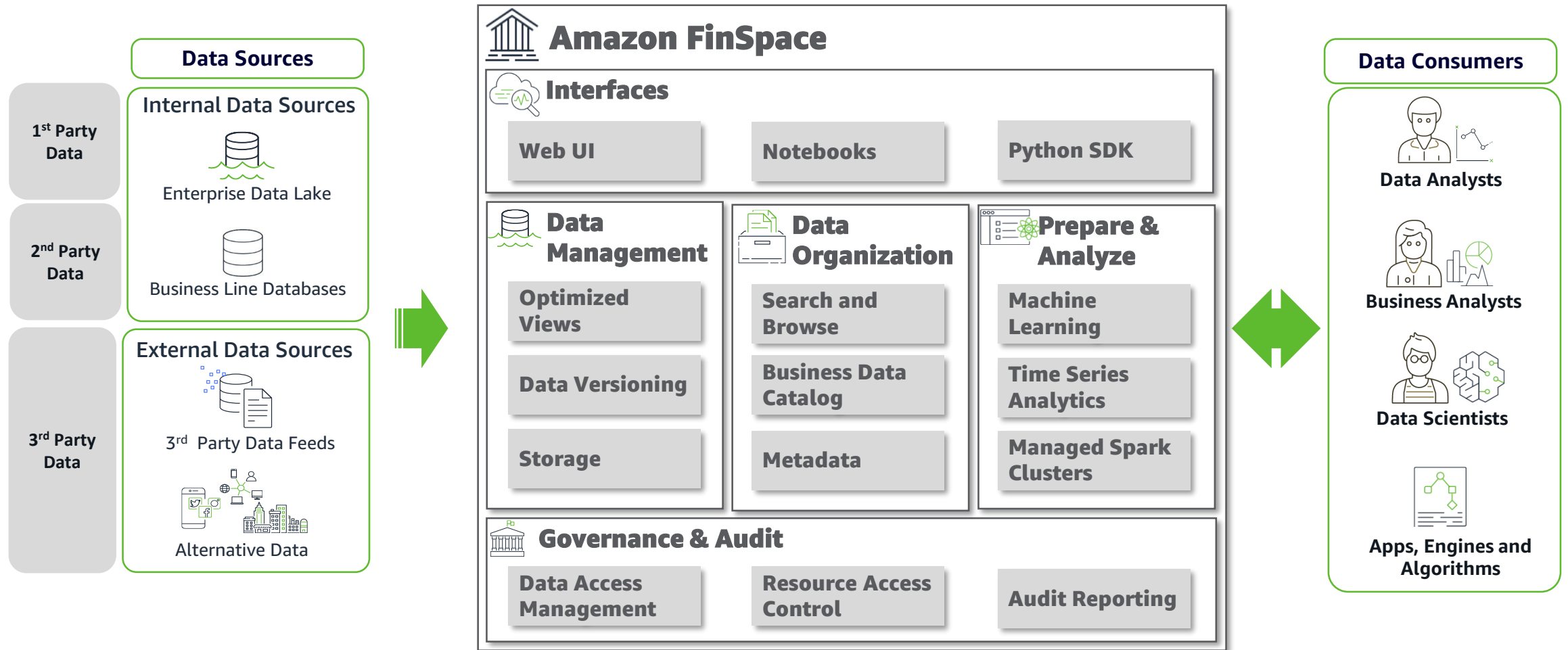
Accelerate Time to Insight

Improve productivity of your research and analytics team
Accelerate new teams on-boarding and faster experimentation

Derive more value from your data
Increase data availability and democratize data access

Get started immediately while saving cost
Deploy in minutes and save 50% over custom built solutions

Offload undifferentiated heavy lifting
Zero infrastructure to manage and maintain

Resilience in the Cloud

AWS Regions and Availability Zones

26 AWS Regions World-Wide

○ AWS Regions

○ Announced Regions

Each AWS Region has multiple AZs

Transit — AZ — AZ — AZ — Transit — AZ
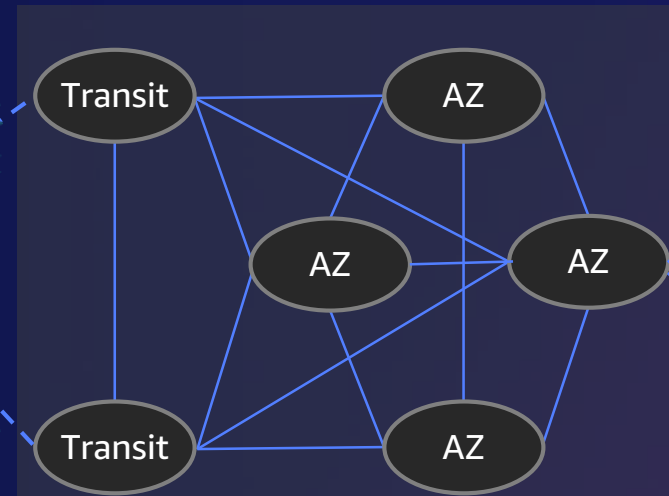
A Region is a physical location in the world

Each AZ is one or more discrete Data Centres

Data centre   Data centre   Data centre
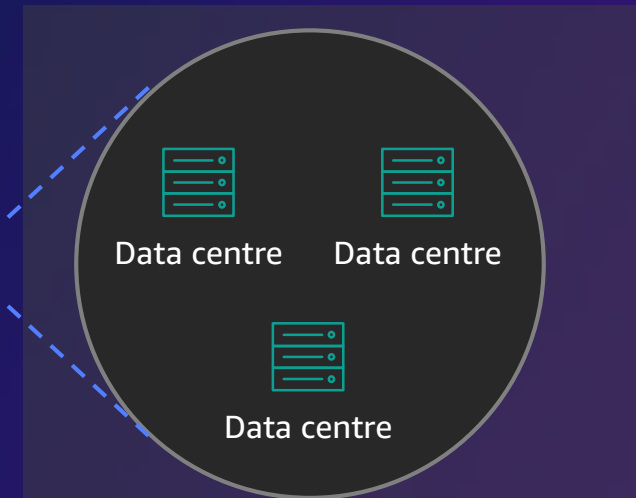
Data centres, each with redundant power, networking, and connectivity, housed in separate facilities.
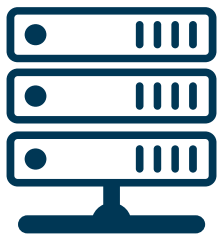
AWS Resilience Hub

AWS Resilience Hub provides a central place to define, validate, and track the resilience of your applications on AWS.
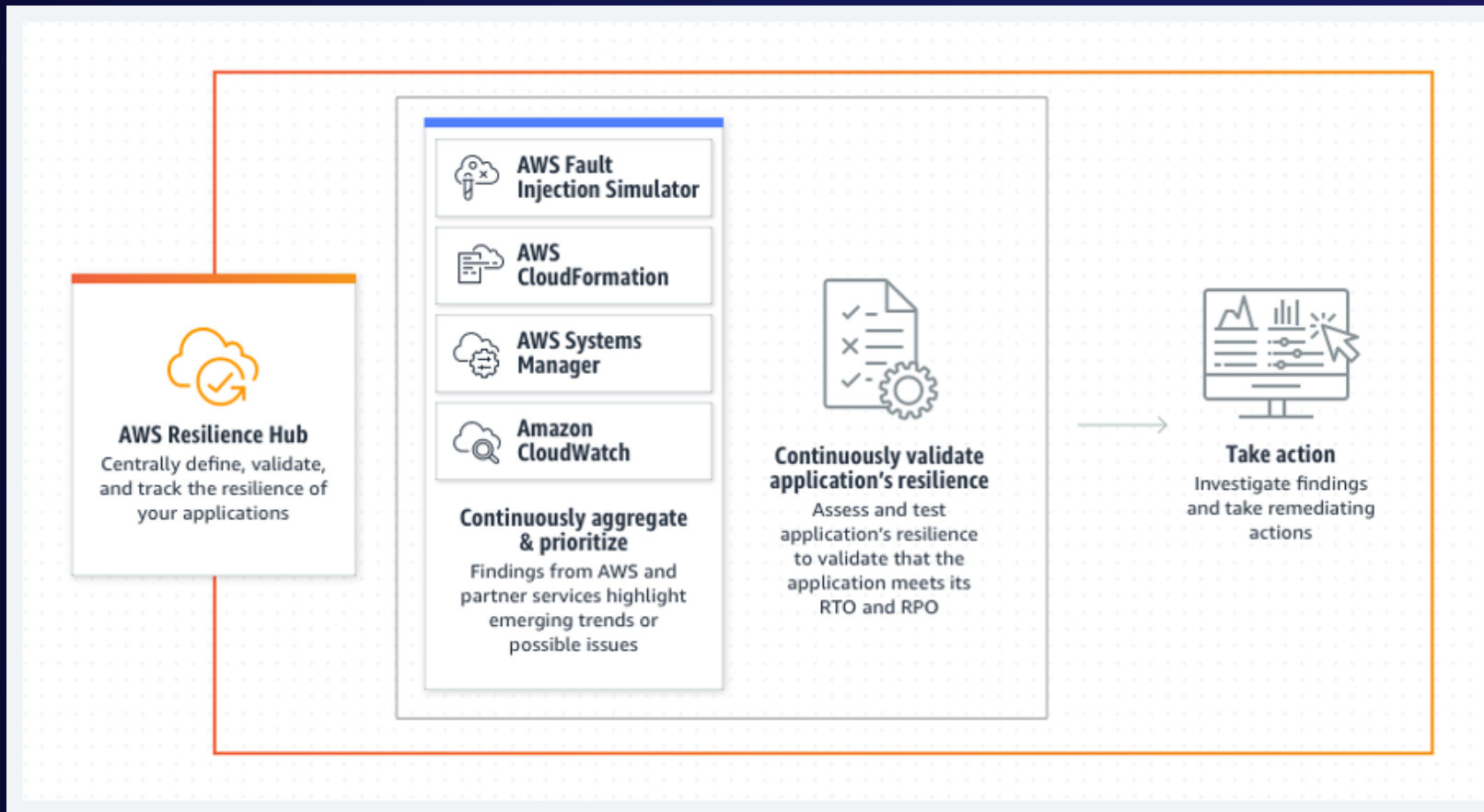
Digital transformation and turning to new technology, while becoming a better bank

Limitations
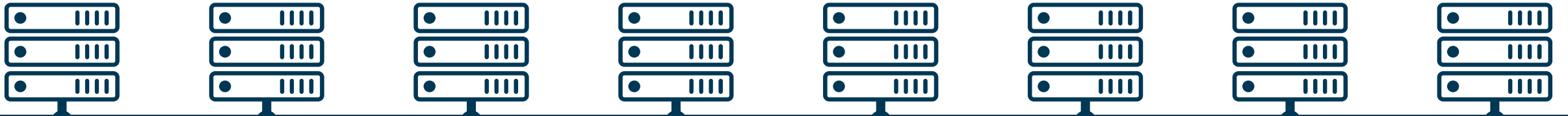
Continuous hardware renewal
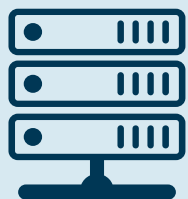
High-performance computing

Private cloud

Idle-time on premise

Do we invest in additional physical hardware?

Do we establish a new data center?

Ambition

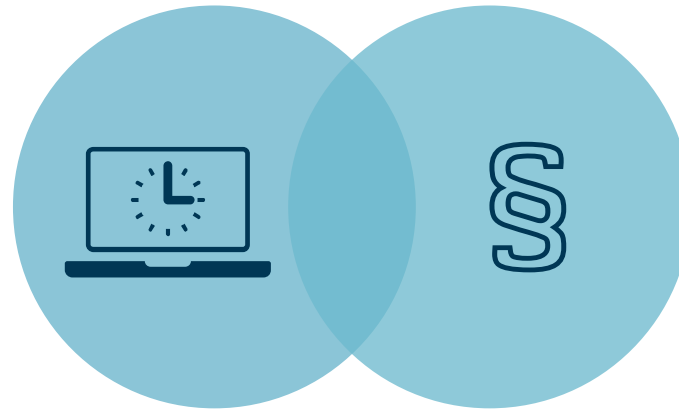**USD 0.5m** per year   **95%** idle time   Public   Private   **≈0%** idle time

Using our Multi-Cloud strategy for liquidity calculations, we can lower infrastructure cost significantly and provide a more flexible setup

We can ensure >99,7% **availability** and meet **regulatory** demands
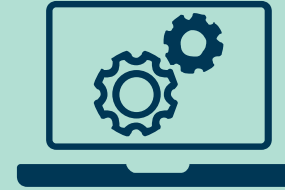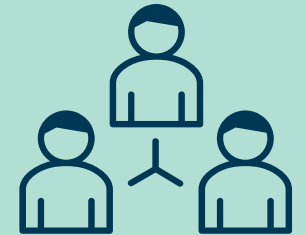
Collaborators

Security   **Compliance**   **Legal**   **Technology Services**   **Application Teams**
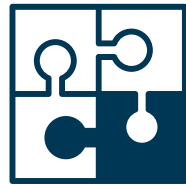
Proof of Concept

Using AWS as a cloud vendor lead time for **infrastructure changes** can be **reduced**. And **overall infrastructure cost lowered** by **more than 50%**

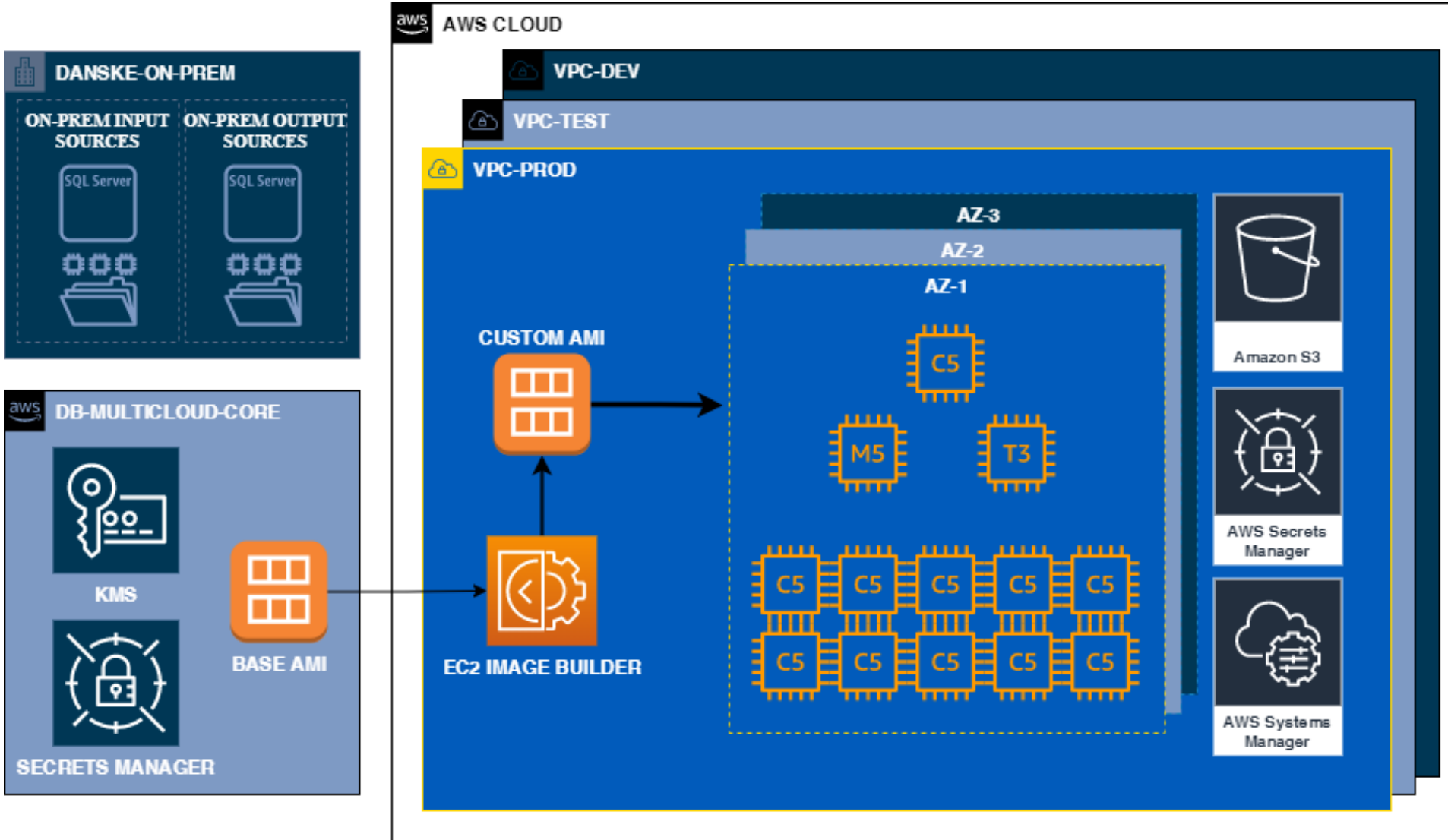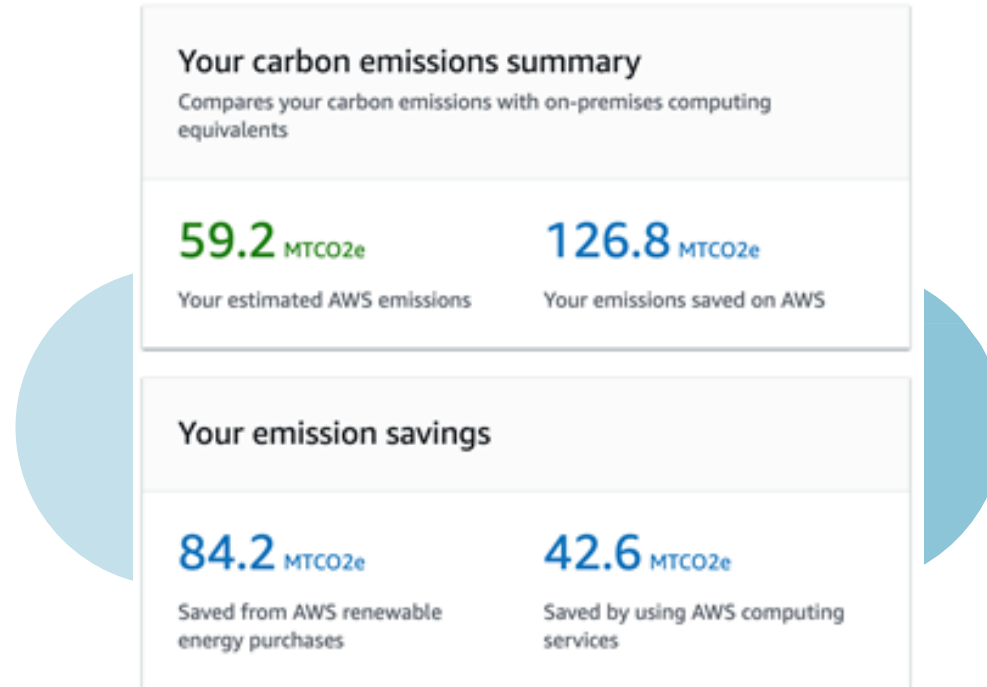# Building and Transforming

Upskilling

Target Architecture

Cloud Native Standard

Architecture

Sustainability

Carbon Footprint Tool

Your carbon emissions summary
Compares your carbon emissions with on-premises computing equivalents

59.2 MTCO2e

126.8 MTCO2e

Your estimated AWS emissions

Your emissions saved on AWS

Your emission savings

84.2 MTCO2e

42.6 MTCO2e

Saved from AWS renewable energy purchases

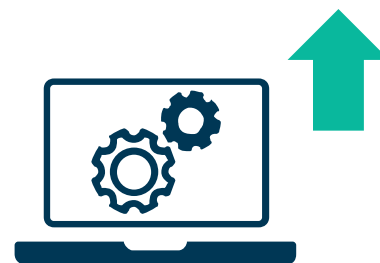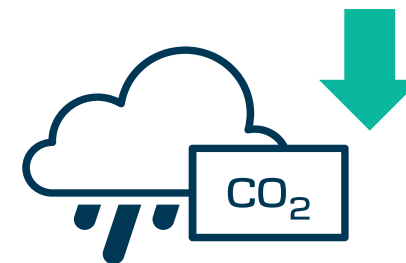Saved by using AWS computing services

Elasticity

Outcome

Reduced lead time for infrastructure changes **from *months* to *minutes***

Lowered infrastructure costs **by 63%**

Increased technical capabilities

Less carbon emitted – **69%**

Danske Bank

Feel free to reach out.

Closing Remarks

Helping Modernize Financial Services

- Modernize heritage systems

- Accelerate time to delivery

- Innovation through machine learning

- New ways of reaching customers

Learn in-demand AWS Cloud skills

AWS Skill Builder

Access **500+ free** digital courses and Learning Plans

Explore resources with a variety of skill levels and **16+** languages to meet your learning needs

Deepen your skills with digital learning on demand

Train now

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Receive Foundational, Associate, Professional, and Specialty certifications

Join the **AWS Certified community** and get exclusive benefits

Access **new** exam guides

Thank you!

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