
aws
SUMMIT
ONLINE
TAIPEI

Embracing Change

Olivier Klein

Lead Technologist Asia-Pacific
AWS

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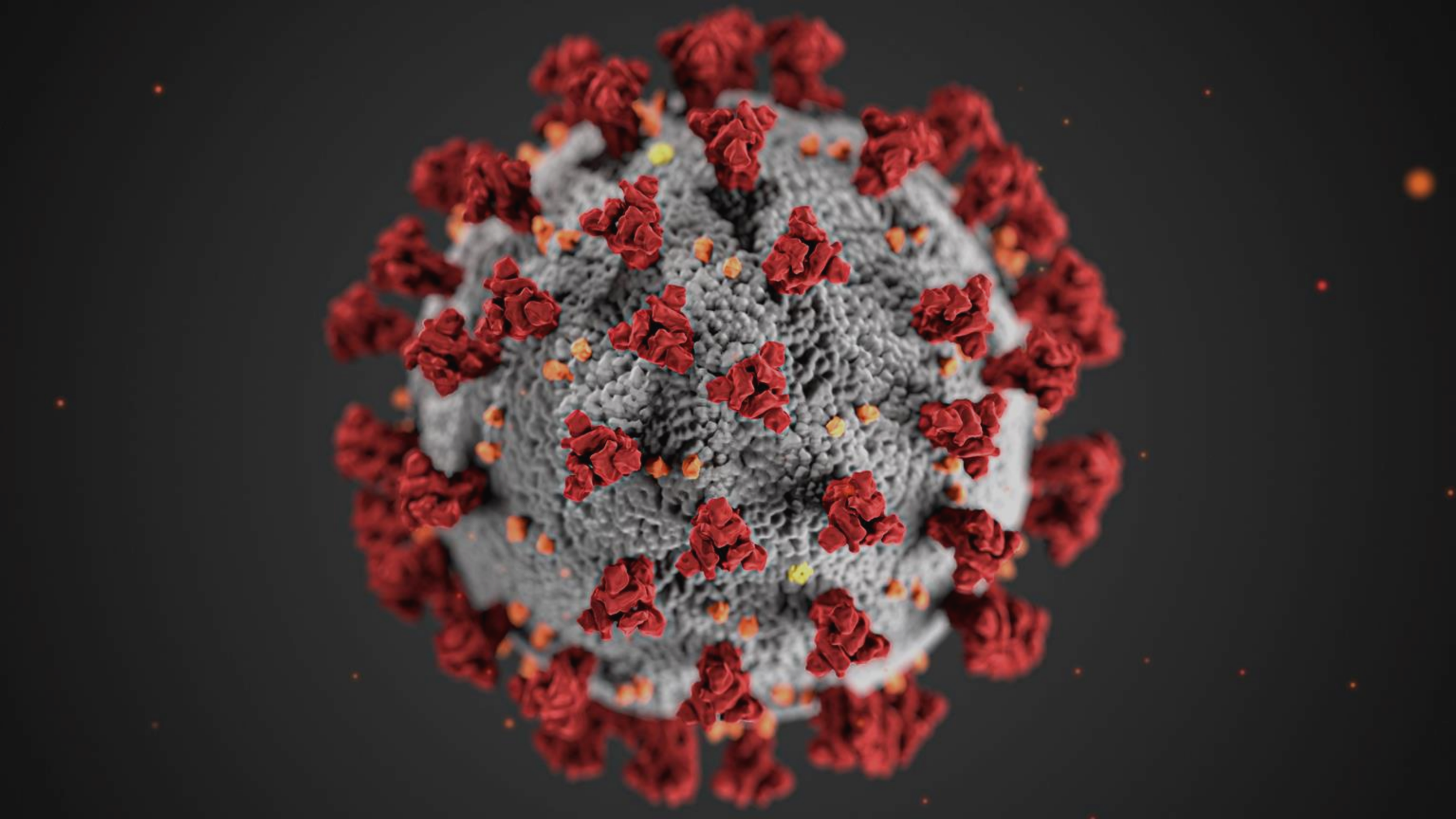
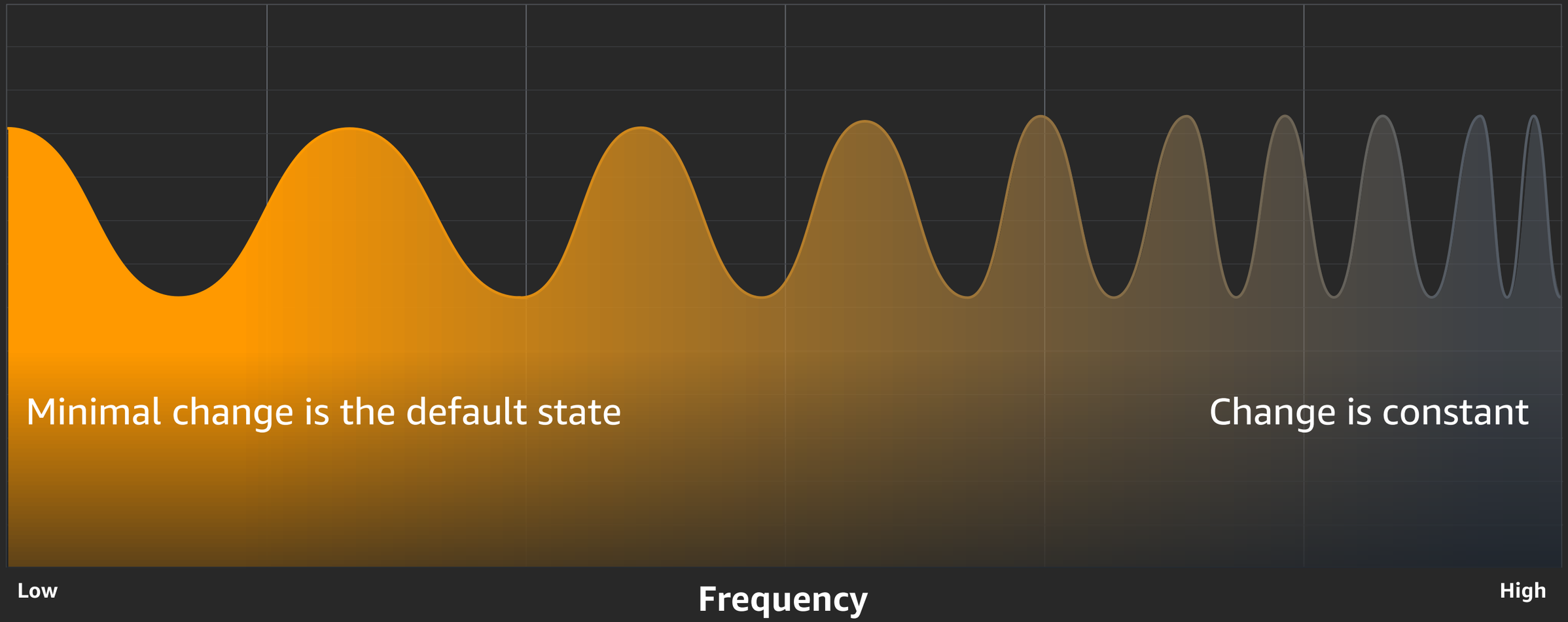
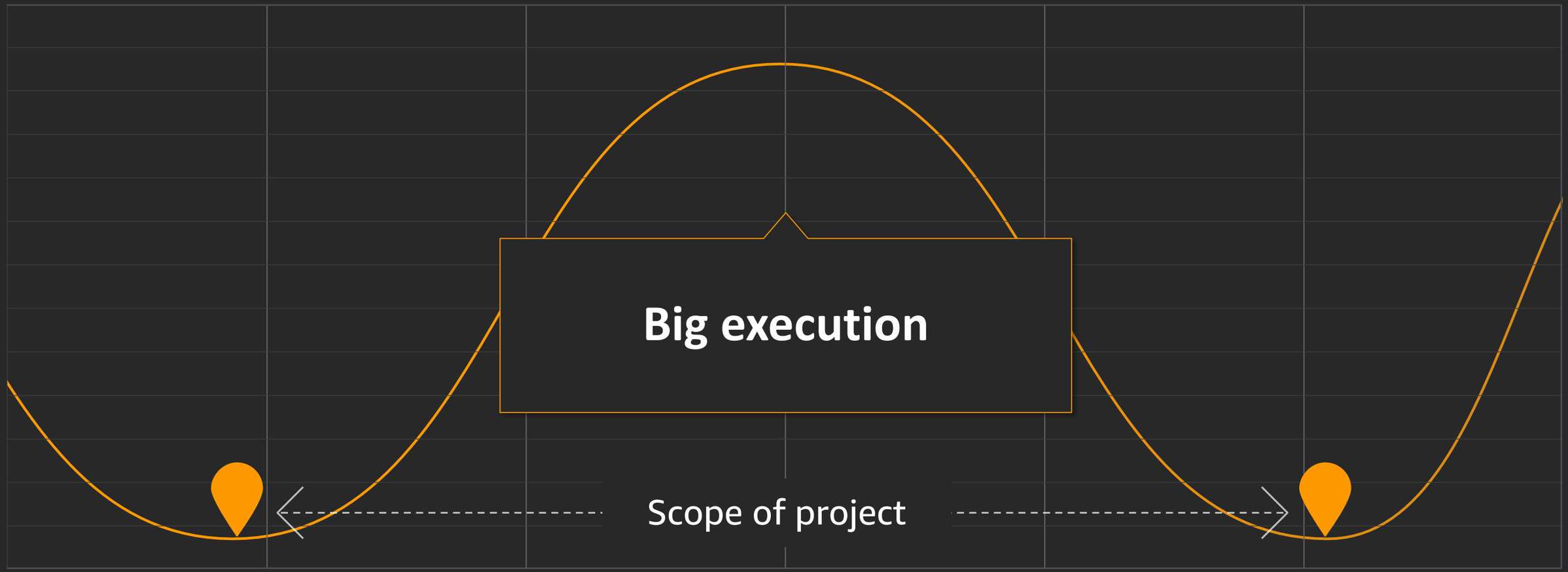


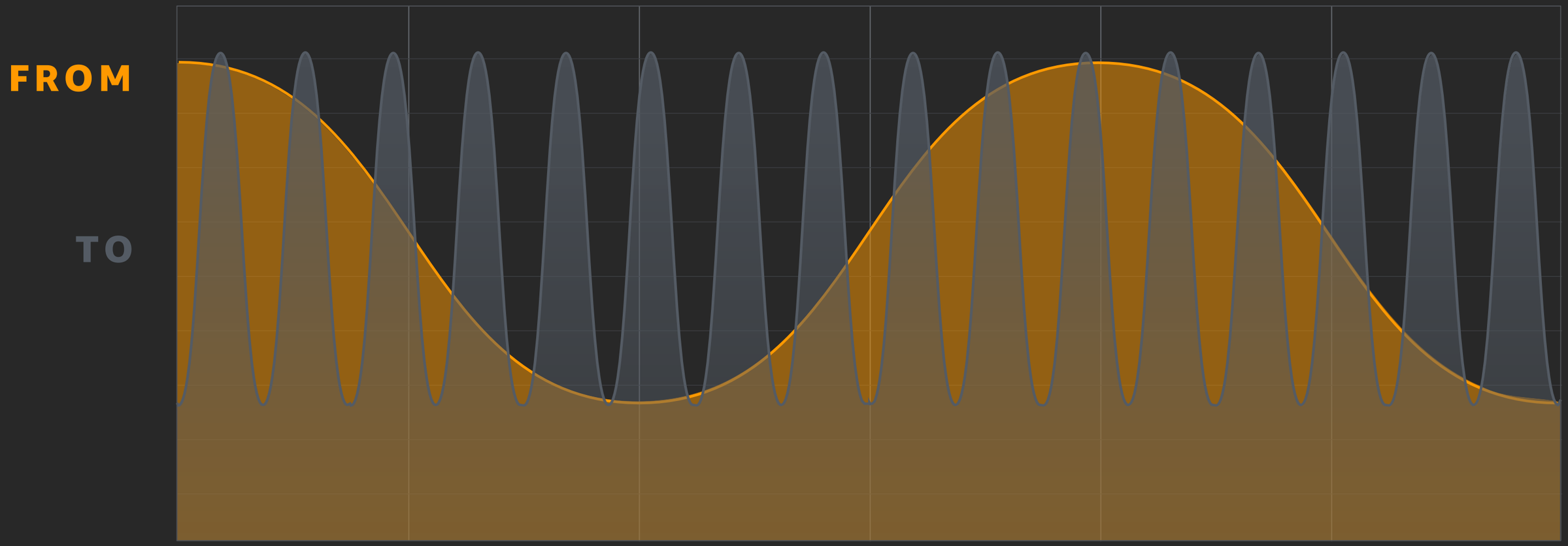
The enterprise IT spectrum



Bid ideas matched with big projects



Becoming "high frequency"



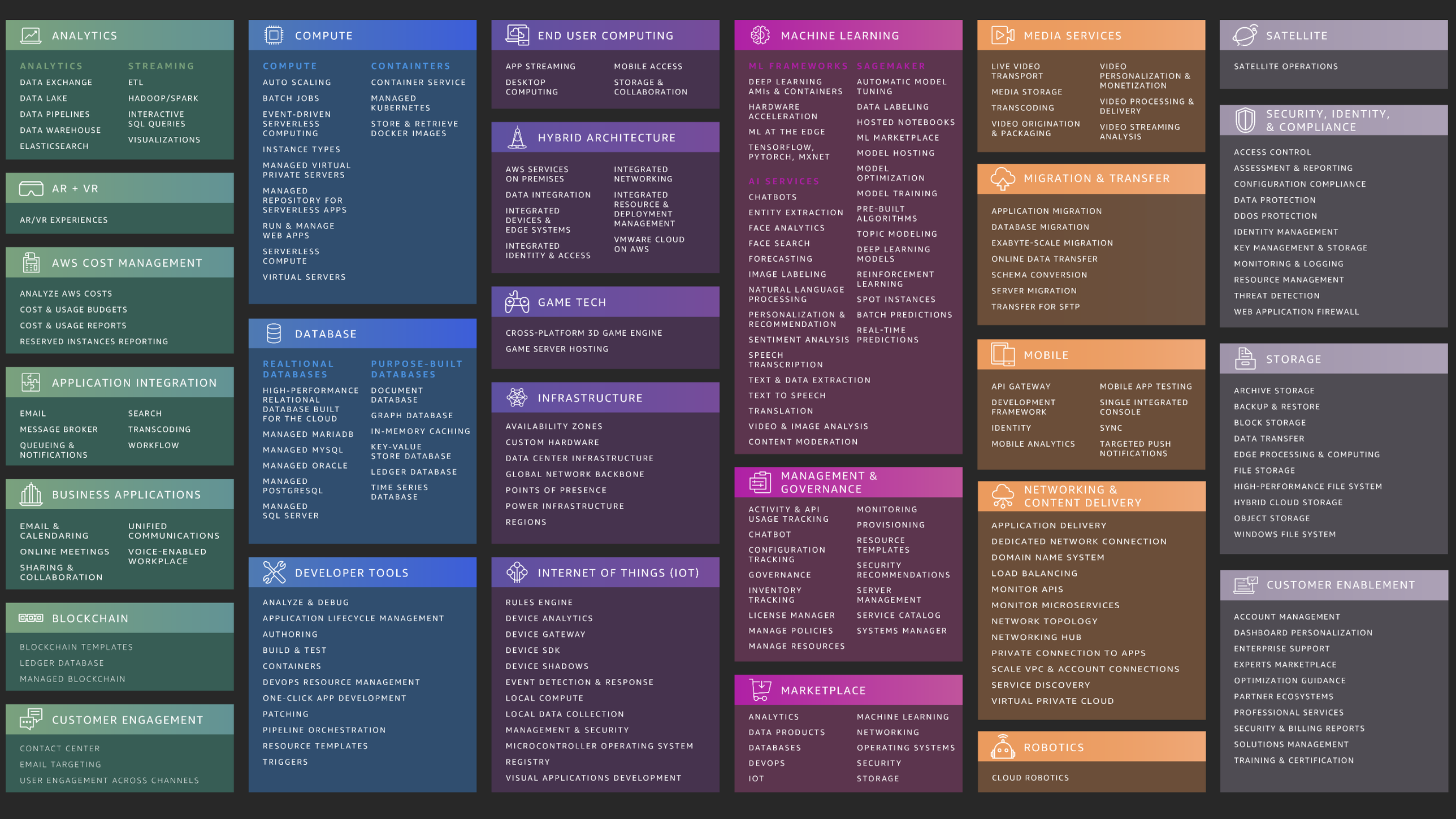
How AWS enables such customer innovation

Rapid experimentation

Democratization of capabilities

Focus on what matters

Scale ideas quickly


ANALYTICS
ANALYTICS
DATA EXCHANGE
DATA LAKE
DATA PIPELINES
DATA WAREHOUSE
ELASTICSEARCH
STREAMING
ETL
HADOOP/SPARK
INTERACTIVE SQL QUERIES
VISUALIZATIONS
AR + VR
AR/VR EXPERIENCES
AWS COST MANAGEMENT
ANALYZE AWS COSTS
COST & USAGE BUDGETS
COST & USAGE REPORTS
RESERVED INSTANCES REPORTING
APPLICATION INTEGRATION
EMAIL
MESSAGE BROKER
QUEUEING & NOTIFICATIONS
SEARCH
TRANSCODING
WORKFLOW
BUSINESS APPLICATIONS
EMAIL & CALENDARING
ONLINE MEETINGS
SHARING & COLLABORATION
UNIFIED COMMUNICATIONS
VOICE-ENABLED WORKPLACE
BLOCKCHAIN
BLOCKCHAIN TEMPLATES
LEDGER DATABASE
MANAGED BLOCKCHAIN
CUSTOMER ENGAGEMENT
CONTACT CENTER
EMAIL TARGETING
USER ENGAGEMENT ACROSS CHANNELS
COMPUTE
COMPUTE
AUTO SCALING
BATCH JOBS
EVENT-DRIVEN SERVERLESS COMPUTING
INSTANCE TYPES
MANAGED VIRTUAL PRIVATE SERVERS
MANAGED REPOSITORY FOR SERVERLESS APPS
RUN & MANAGE WEB APPS
SERVERLESS COMPUTE
VIRTUAL SERVERS
CONTAINTERS
CONTAINER SERVICE
MANAGED KUBERNETES
STORE & RETRIEVE DOCKER IMAGES
DATABASE
REALTIONAL DATABASES
HIGH-PERFORMANCE RELATIONAL DATABASE BUILT FOR THE CLOUD
MANAGED MARIADB
MANAGED MYSQL
MANAGED ORACLE
MANAGED POSTGRESQL
MANAGED SQL SERVER
PURPOSE-BUILT DATABASES
DOCUMENT DATABASE
GRAPH DATABASE
IN-MEMORY CACHING
KEY-VALUE STORE DATABASE
LEDGER DATABASE
TIME SERIES DATABASE
DEVELOPER TOOLS
ANALYZE & DEBUG
APPLICATION LIFECYCLE MANAGEMENT
AUTHORING
BUILD & TEST
CONTAINERS
DEVOPS RESOURCE MANAGEMENT
ONE-CLICK APP DEVELOPMENT
PATCHING
PIPELINE ORCHESTRATION
RESOURCE TEMPLATES
TRIGGERS
END USER COMPUTING
APP STREAMING
DESKTOP COMPUTING
MOBILE ACCESS
STORAGE & COLLABORATION
HYBRID ARCHITECTURE
AWS SERVICES ON PREMISES
DATA INTEGRATION
INTEGRATED DEVICES & EDGE SYSTEMS
INTEGRATED IDENTITY & ACCESS
INTEGRATED NETWORKING
INTEGRATED RESOURCE & DEPLOYMENT MANAGEMENT
VMWARE CLOUD ON AWS
GAME TECH
CROSS-PLATFORM 3D GAME ENGINE
GAME SERVER HOSTING
INFRASTRUCTURE
AVAILABILITY ZONES
CUSTOM HARDWARE
DATA CENTER INFRASTRUCTURE
GLOBAL NETWORK BACKBONE
POINTS OF PRESENCE
POWER INFRASTRUCTURE
REGIONS
INTERNET OF THINGS (IOT)
RULES ENGINE
DEVICE ANALYTICS
DEVICE GATEWAY
DEVICE SDK
DEVICE SHADOWS
EVENT DETECTION & RESPONSE
LOCAL COMPUTE
LOCAL DATA COLLECTION
MANAGEMENT & SECURITY
MICROCONTROLLER OPERATING SYSTEM
REGISTRY
VISUAL APPLICATIONS DEVELOPMENT
MACHINE LEARNING
ML FRAMEWORKS
DEEP LEARNING AMIs & CONTAINERS
HARDWARE ACCELERATION
ML AT THE EDGE
TENSORFLOW, PYTORCH, MXNET
AI SERVICES
CHATBOTS
ENTITY EXTRACTION
FACE ANALYTICS
FACE SEARCH
FORECASTING
IMAGE LABELING
NATURAL LANGUAGE PROCESSING
PERSONALIZATION & RECOMMENDATION
SENTIMENT ANALYSIS
SPEECH TRANSCRIPTION
TEXT & DATA EXTRACTION
TEXT TO SPEECH
TRANSLATION
VIDEO & IMAGE ANALYSIS
CONTENT MODERATION
SAGEMAKER
AUTOMATIC MODEL TUNING
DATA LABELING
HOSTED NOTEBOOKS
ML MARKETPLACE
MODEL HOSTING
MODEL OPTIMIZATION
MODEL TRAINING
PRE-BUILT ALGORITHMS
TOPIC MODELING
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REINFORCEMENT LEARNING
SPOT INSTANCES
BATCH PREDICTIONS
REAL-TIME PREDICTIONS
MANAGEMENT & GOVERNANCE
ACTIVITY & API USAGE TRACKING
CHATBOT
CONFIGURATION TRACKING
GOVERNANCE
INVENTORY TRACKING
LICENSE MANAGER
MANAGE POLICIES
MANAGE RESOURCES
MONITORING
PROVISIONING
RESOURCE TEMPLATES
SECURITY RECOMMENDATIONS
SERVER MANAGEMENT
SERVICE CATALOG
SYSTEMS MANAGER
MARKETPLACE
ANALYTICS
DATA PRODUCTS
DATABASES
DEVOPS
IOT
MACHINE LEARNING
NETWORKING
OPERATING SYSTEMS
SECURITY
STORAGE
MEDIA SERVICES
LIVE VIDEO TRANSPORT
MEDIA STORAGE
TRANSCODING
VIDEO ORIGINATION & PACKAGING
VIDEO PERSONALIZATION & MONETIZATION
VIDEO PROCESSING & DELIVERY
VIDEO STREAMING ANALYSIS
MIGRATION & TRANSFER
APPLICATION MIGRATION
DATABASE MIGRATION
EXABYTE-SCALE MIGRATION
ONLINE DATA TRANSFER
SCHEMA CONVERSION
SERVER MIGRATION
TRANSFER FOR SFTP
MOBILE
API GATEWAY
DEVELOPMENT FRAMEWORK
IDENTITY
MOBILE ANALYTICS
MOBILE APP TESTING
SINGLE INTEGRATED CONSOLE
SYNC
TARGETED PUSH NOTIFICATIONS
NETWORKING & CONTENT DELIVERY
APPLICATION DELIVERY
DEDICATED NETWORK CONNECTION
DOMAIN NAME SYSTEM
LOAD BALANCING
MONITOR APIS
MONITOR MICROSERVICES
NETWORK TOPOLOGY
NETWORKING HUB
PRIVATE CONNECTION TO APPS
SCALE VPC & ACCOUNT CONNECTIONS
SERVICE DISCOVERY
VIRTUAL PRIVATE CLOUD
ROBOTICS
CLOUD ROBOTICS
SATELLITE
SATELLITE OPERATIONS
SECURITY, IDENTITY, & COMPLIANCE
ACCESS CONTROL
ASSESSMENT & REPORTING
CONFIGURATION COMPLIANCE
DATA PROTECTION
DDOS PROTECTION
IDENTITY MANAGEMENT
KEY MANAGEMENT & STORAGE
MONITORING & LOGGING
RESOURCE MANAGEMENT
THREAT DETECTION
WEB APPLICATION FIREWALL
STORAGE
ARCHIVE STORAGE
BACKUP & RESTORE
BLOCK STORAGE
DATA TRANSFER
EDGE PROCESSING & COMPUTING
FILE STORAGE
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CUSTOMER ENABLEMENT
ACCOUNT MANAGEMENT
DASHBOARD PERSONALIZATION
ENTERPRISE SUPPORT
EXPERTS MARKETPLACE
OPTIMIZATION GUIDANCE
PARTNER ECOSYSTEMS
PROFESSIONAL SERVICES
SECURITY & BILLING REPORTS
SOLUTIONS MANAGEMENT
TRAINING & CERTIFICATION

Agility through modern application design

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Modern applications - Architectural foundations

Architecture

Modular Services via APIs

Data

De-coupled and purpose-built

Delivery

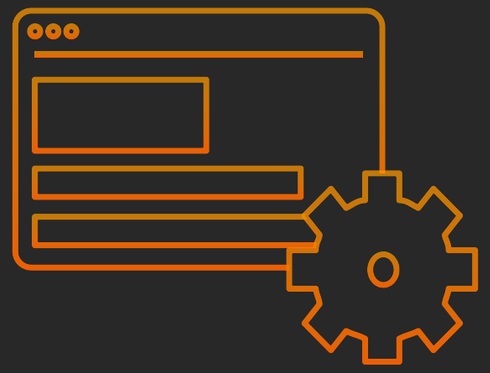
Automated & standardized

Operations

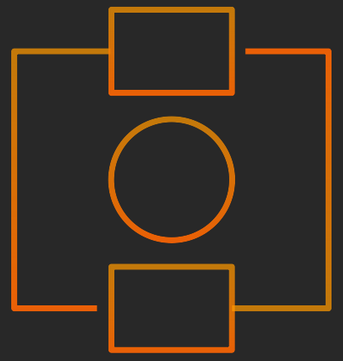
As managed as possible

Security

Everybody's responsibility

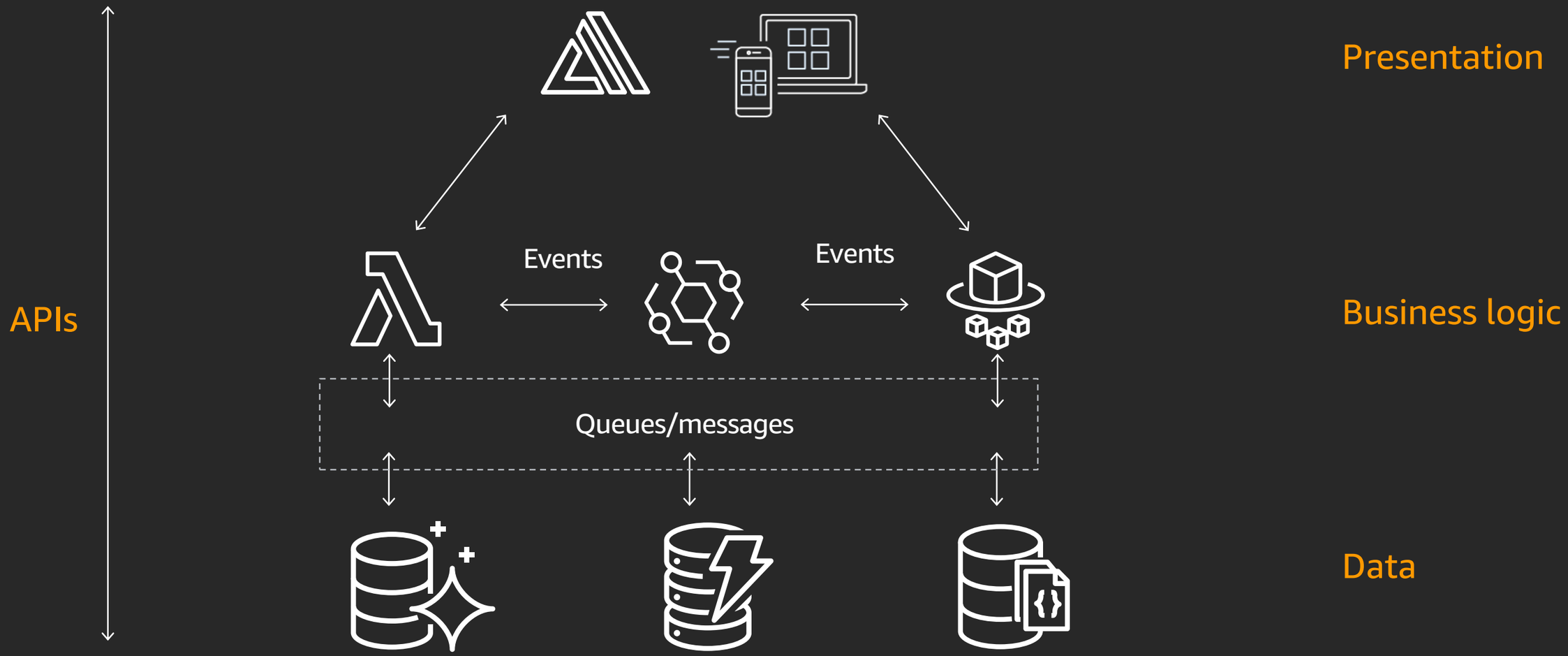


APIs are the front door of your modular services

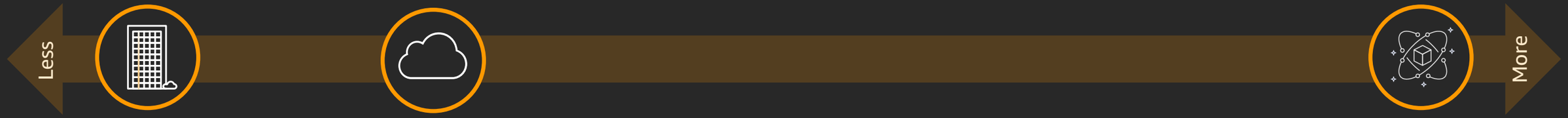


Events are the connective tissue of modern applications

A modern three-tier application architecture



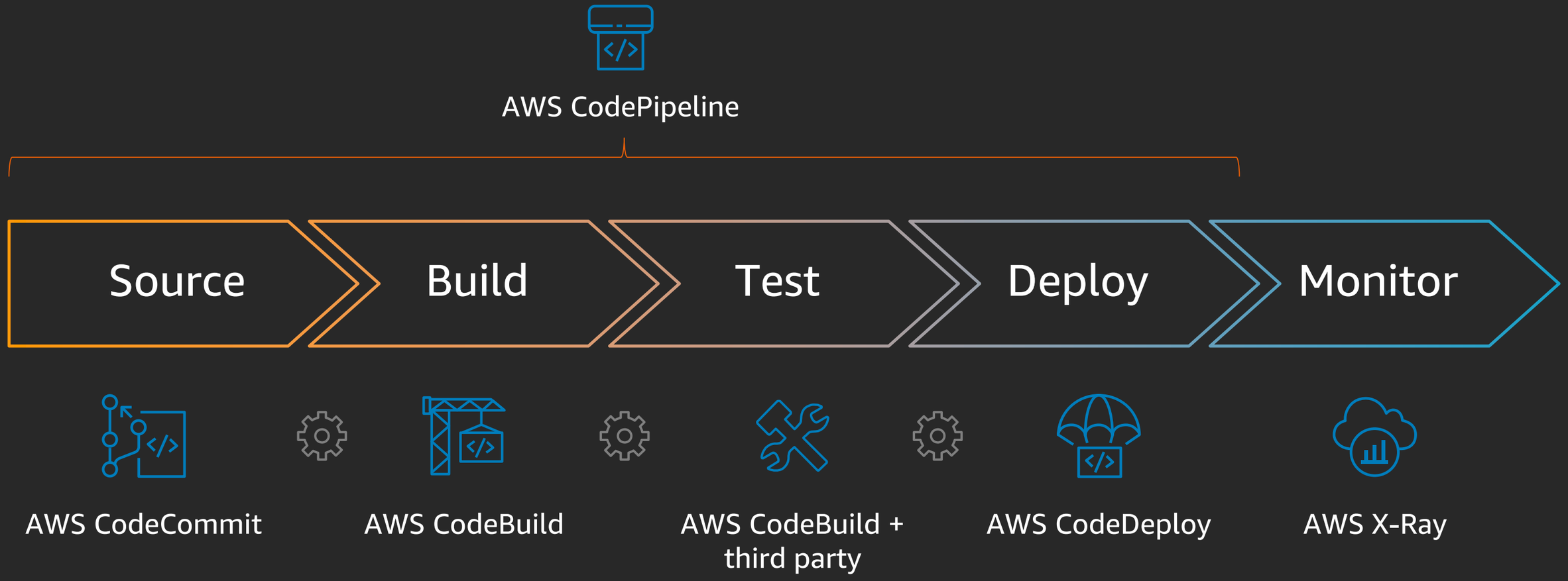
AWS operational responsibility models



On-premises | Cloud

Compute	Virtual machine	Amazon EC2	AWS Elastic Beanstalk		Fargate	Lambda
Databases	MySQL	MySQL on Amazon EC2	Amazon RDS for MySQL	Amazon RDS	Amazon Aurora	DynamoDB
Storage	Storage					S3
Messaging	ESBs		Amazon MQ	Amazon Kinesis		EventBridge/SQS/SNS
Analytics	Hadoop	Hadoop on EC2	EMR	Amazon Elasticsearch Service		Amazon Athena

Builder platforms



What are the approaches to operations?

Free for all	Guardrails	Central control
Fast dev time, but risk to legal & app reliability	Fast time & low risk to the business	Low risk but very slow to release
Chaos	**Win win**	**Dependencies & time lags**

Mechanisms, such as processes or practices, that reduce both the occurrence & blast radius of undesirable behavior

What are some real world guardrails?

Monitoring

CPU Utilization

Database throughput

Business processes

Provisioning

Access permissions

Resource availability

Configuration

Deployment

Time window

Toolsets available

Size or timing of test releases

Cost management

Resource costs

Resource utilization

Spend run rates

Security & compliance

Account set up/access

Standards compliance

Certificate maintenance

Purpose built databases

What are the data needs of each modular service?

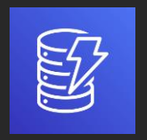
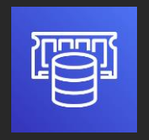
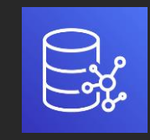
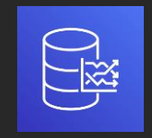
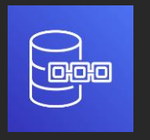
Massive data volume?

High data velocity?

Data warehousing?

One size does not fit all.

AWS purpose-built databases

Relational	Key-value	Document	In-memory	Graph	Time-series	Ledger
						
Amazon RDS Aurora, Community, Commercial	**Amazon DynamoDB**	**Amazon DocumentDB**	**Amazon ElastiCache** Redis, Memcached	**Amazon Neptune**	**Amazon Timestream**	**Amazon QLDB**
Lift and shift, ERP, CRM, finance	Real-time bidding, shopping cart, social, product catalog, customer preferences	Content management, personalization, mobile	Leaderboards, real-time analytics, caching	Fraud detection, social networking, recommendation engine	IoT applications, event tracking	Systems of record, supply chain, health care, registrations

Modern Data Designs

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Rapid expansion of data requirements

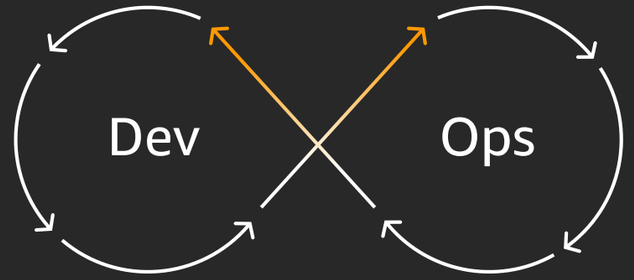
Explosion of data

Data grows 10x every 5 years driven by network-connected smart devices

Microservices change data and analytics requirements

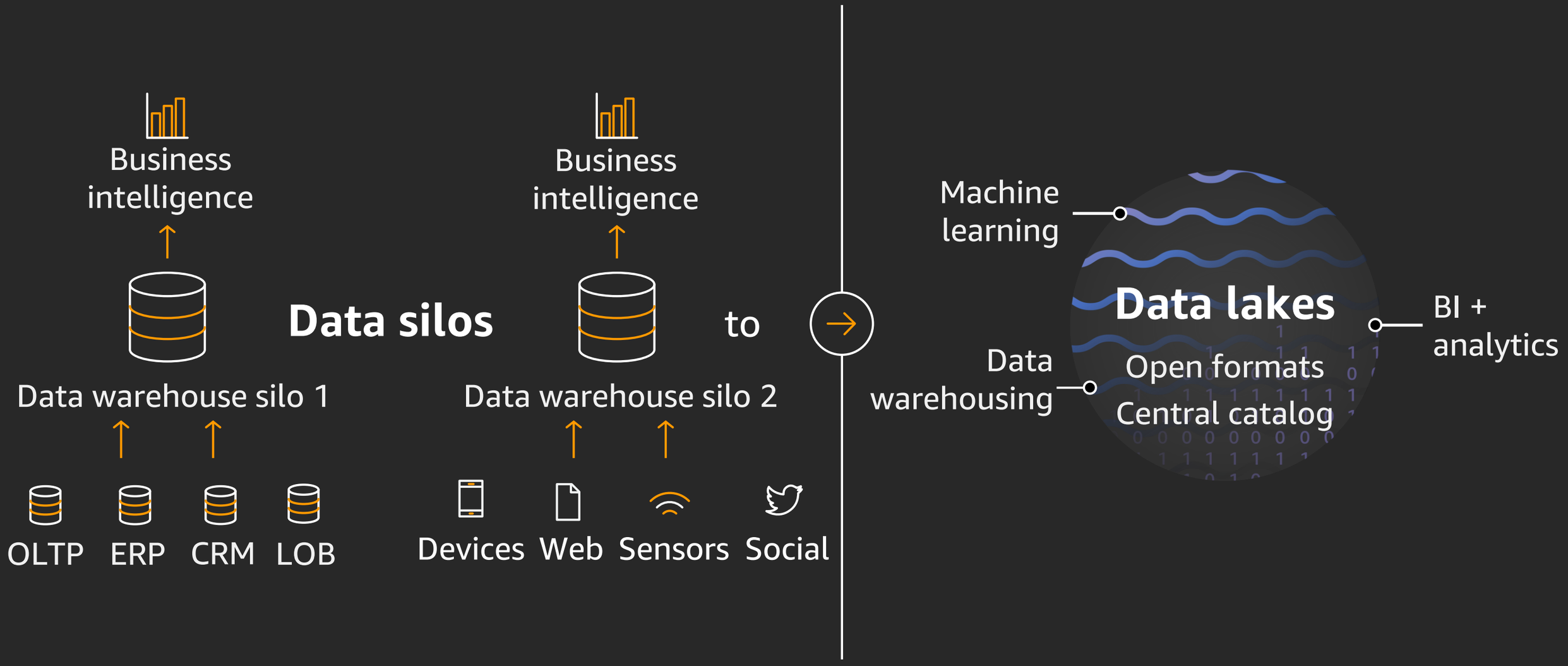
Microservices architecture decreases need for “one size fits all’ databases and increases need for real-time monitoring and analytics

Accelerated rate of change driven by DevOps



Transition from IT to DevOps increases rate of change

Traditional data warehousing approaches don’t scale



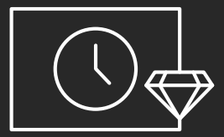
Serverless analytics

Deliver on-demand analytics on the data lake

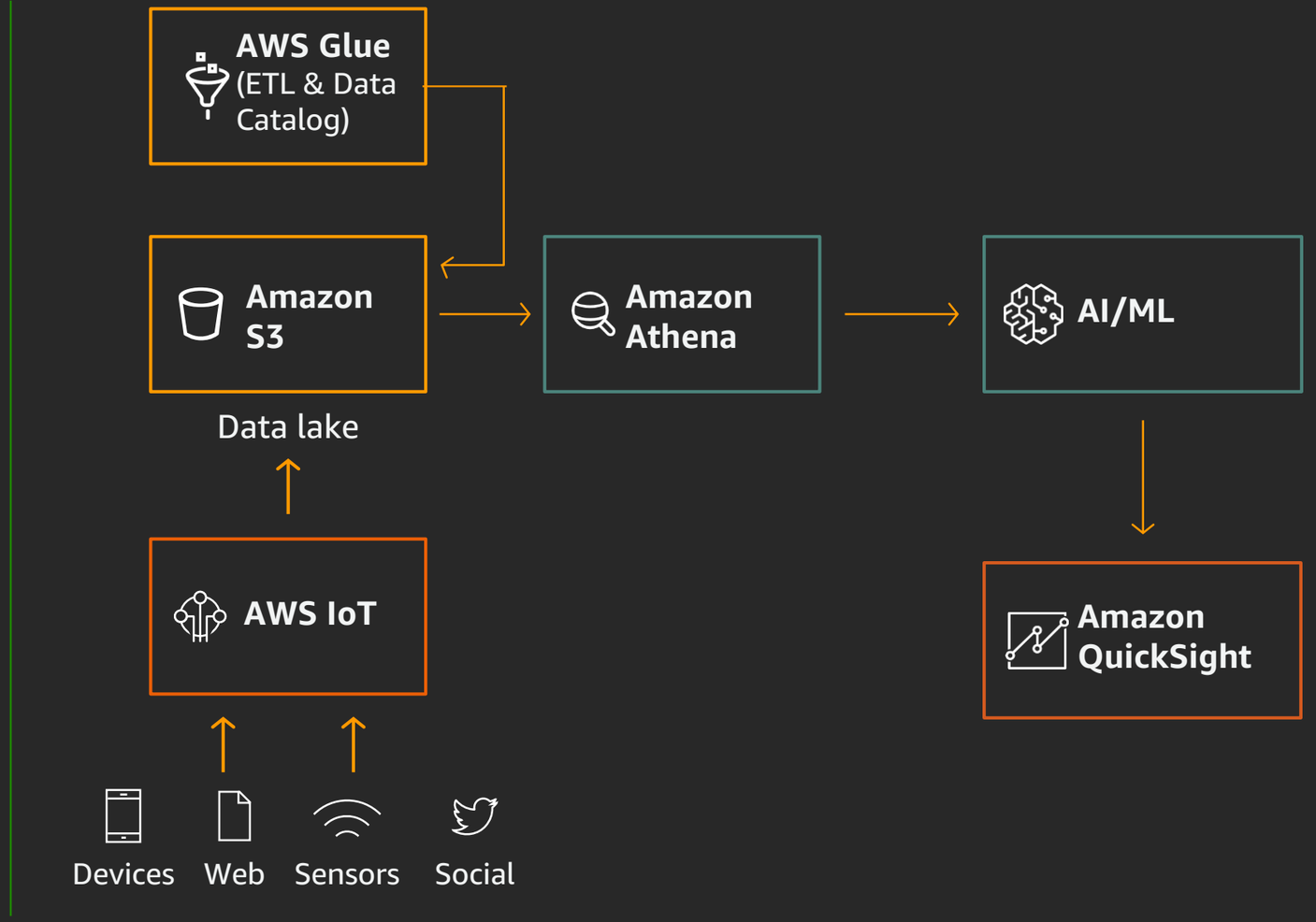
Serverless,
zero infrastructure,
zero administration

Never pay for
idle resources

Automatically scales
resources with usage



Availability and fault
tolerance built in



AWS ML Stack

AI SERVICES

VISION	SPEECH		TEXT			SEARCH	CHATBOTS	PERSONALIZATION	FORECASTING	FRAUD	DEVELOPMENT	CONTACT CENTERS
Amazon Rekognition	Amazon Polly	Amazon Transcribe *+Medical*	Amazon Comprehend *+Medical*	Amazon Translate	Amazon Textract	Amazon Kendra	Amazon Lex	Amazon Personalize	Amazon Forecast	Amazon Fraud Detector	Amazon CodeGuru	Contact Lens *For Amazon Connect*

ML SERVICES

Amazon SageMaker	Ground Truth	ML Marketplace	SageMaker Studio IDE							Neo	Augmented AI
			Built-in algorithms	Notebooks	Experiments	Model training & tuning	Debugger	Autopilot	Model hosting	Model Monitor		

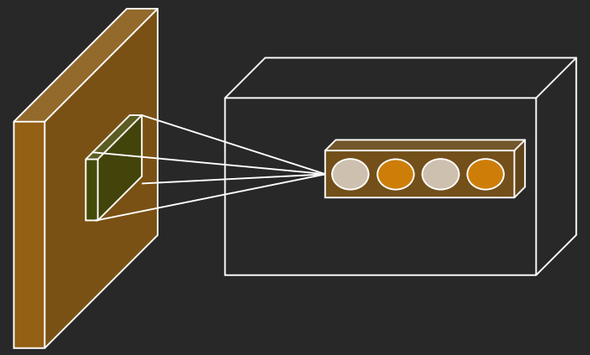
ML FRAMEWORKS & INFRASTRUCTURE

TensorFlow mxnet PYTORCH

GLUON Keras DeepGraphLibrary

Deep Learning AMIs & Containers | GPUs & CPUs | Elastic Inference | Inferentia | FPGA

Trained in TF:
FaceNet + MobileNet



No Mask

Mask

Demo

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Generative AI

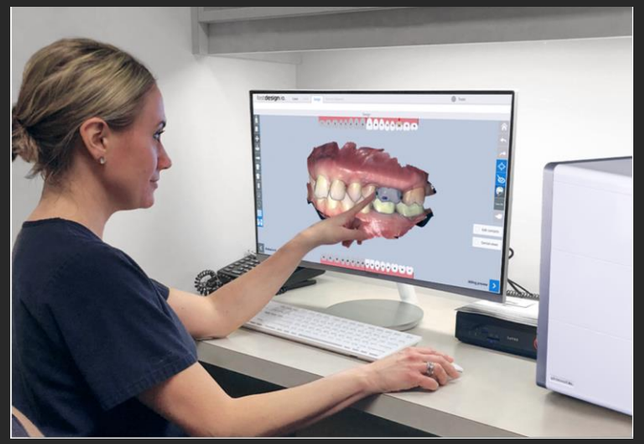
"One of the most promising advances in AI in the past decade"

—MIT Technology Review

Practical uses of generative AI

Autodesk – Airbus

Autodesk – NASA JPL



Glidewell Laboratories

Enabling the next ML developers

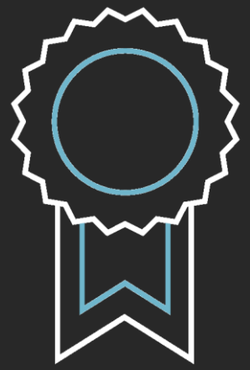
ML educational devices

AWS DeepLens
Deep learning

AWS DeepRacer
Reinforcement learning

AWS DeepComposer
Generative AI

Training and certification



AWS ML training
and certification

UDACITY

coursera

edX

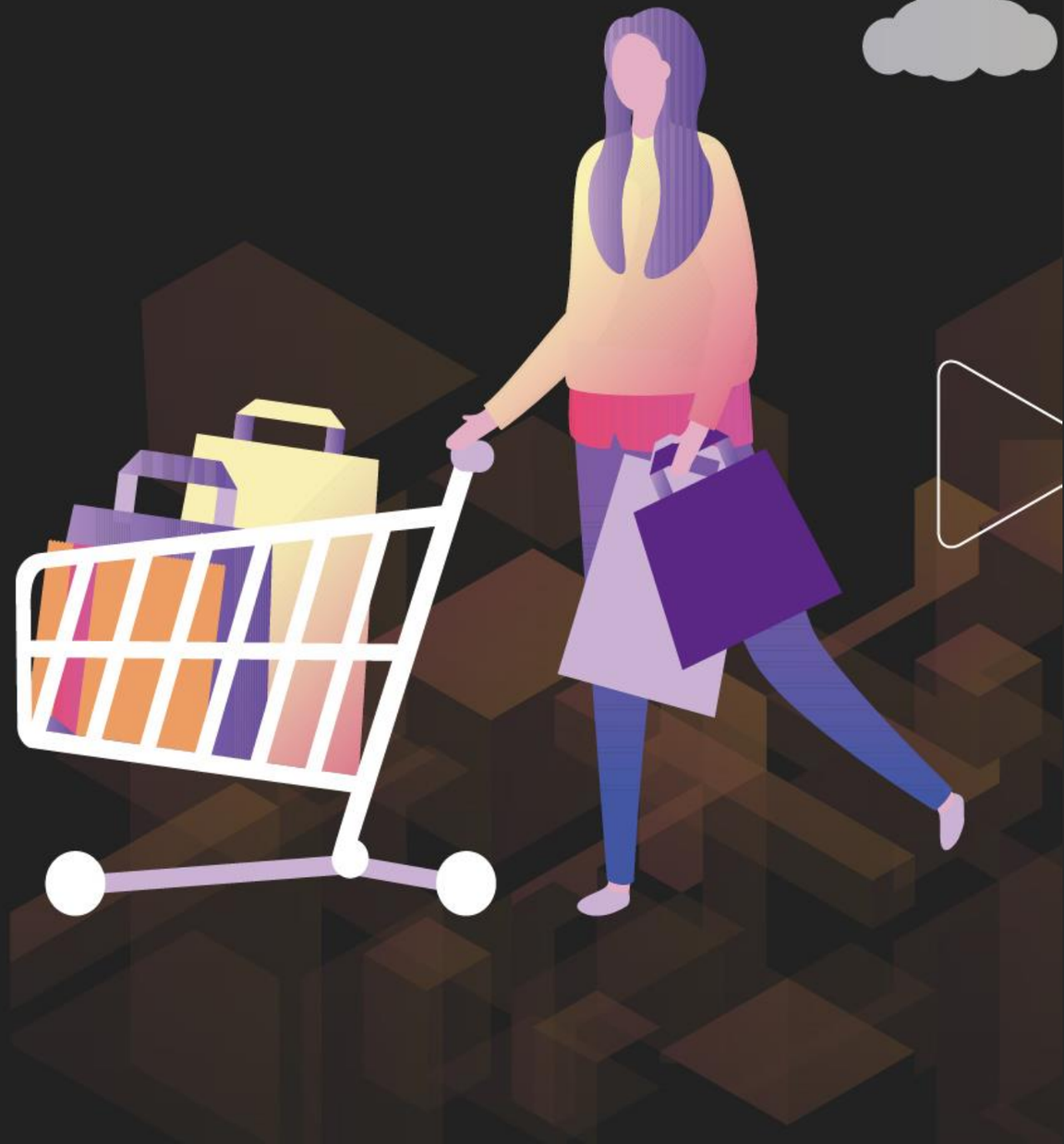
Partnerships
with MOOCs

Ever-changing customer experiences

Move towards digital and online

Customer = Channel

Experiences change

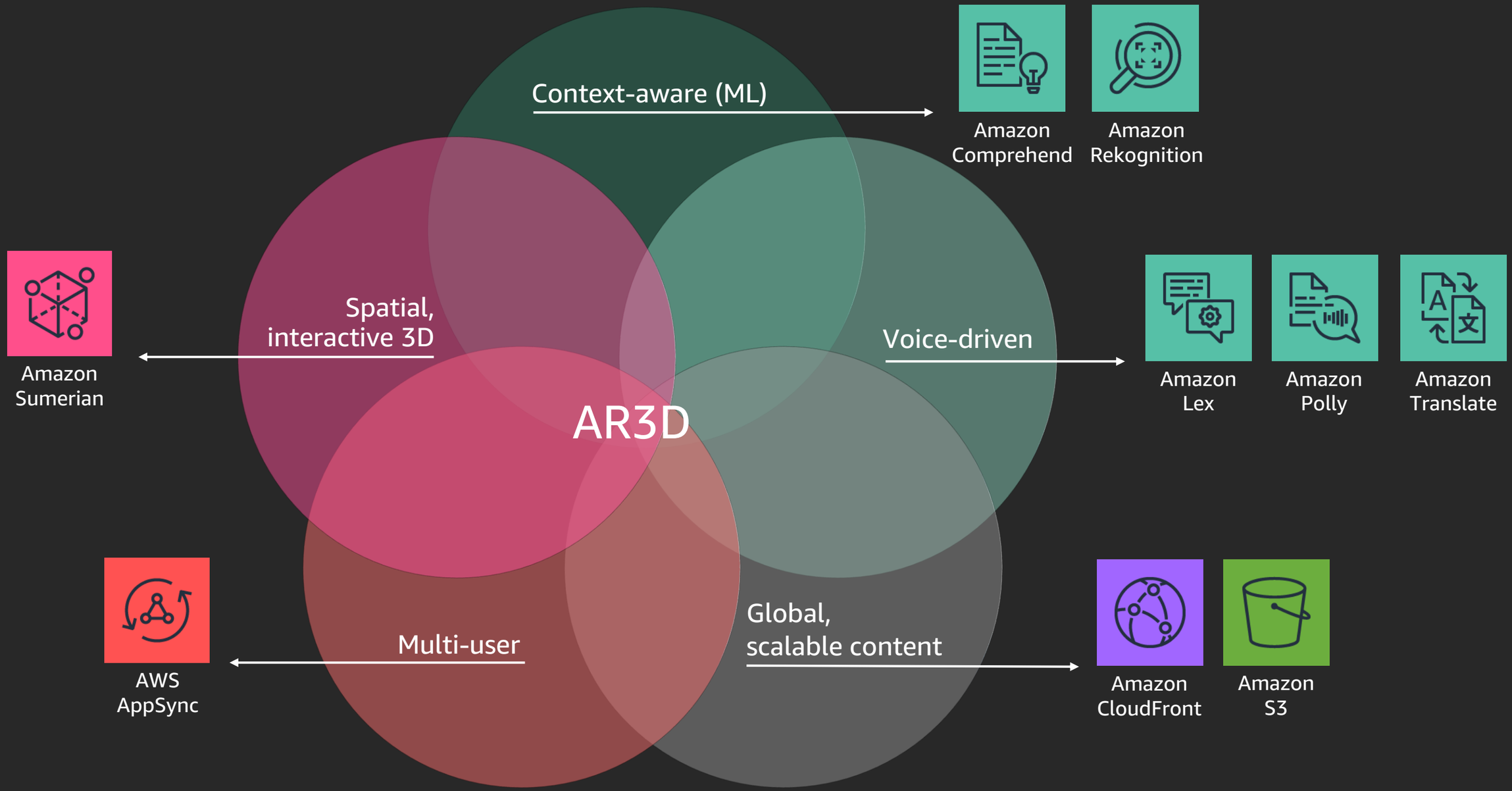


3D immersive computing to create new experiences

Web Mobile Cloud Immersive

… all in-browser

AR3D immersive experience pillars across AWS



Demo

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Demo

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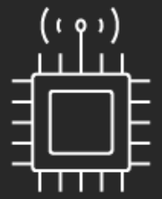
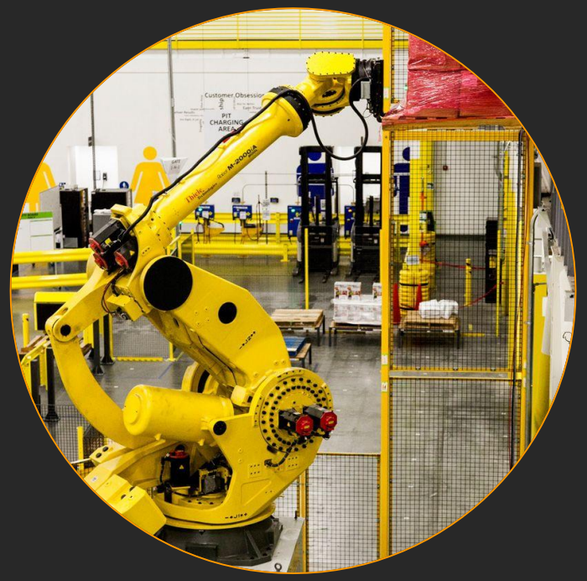
Sense



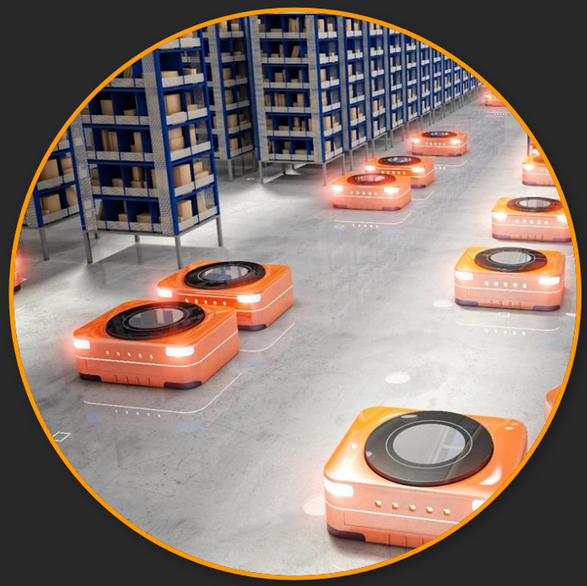
Compute

Act

Drones



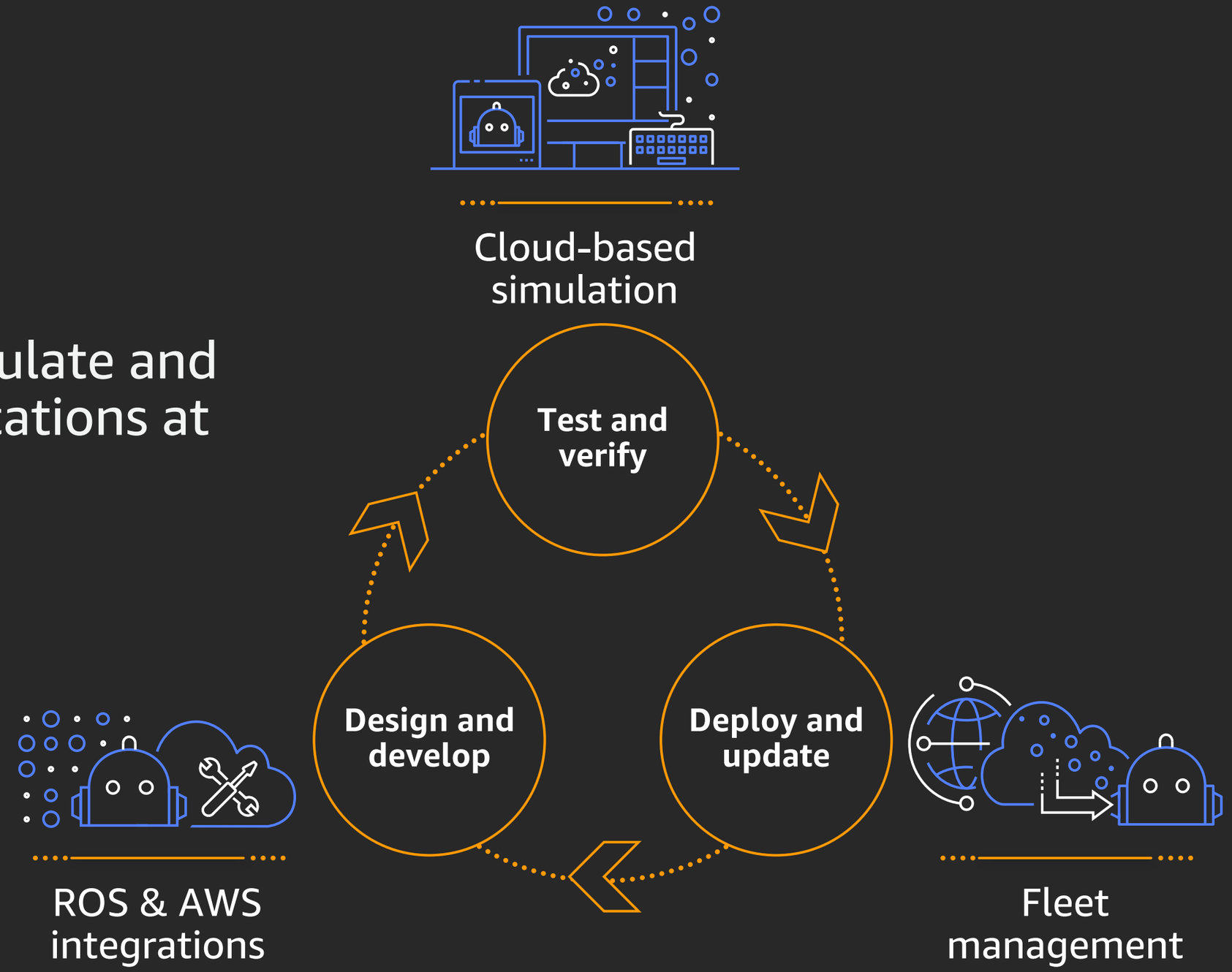
Robotic Arms

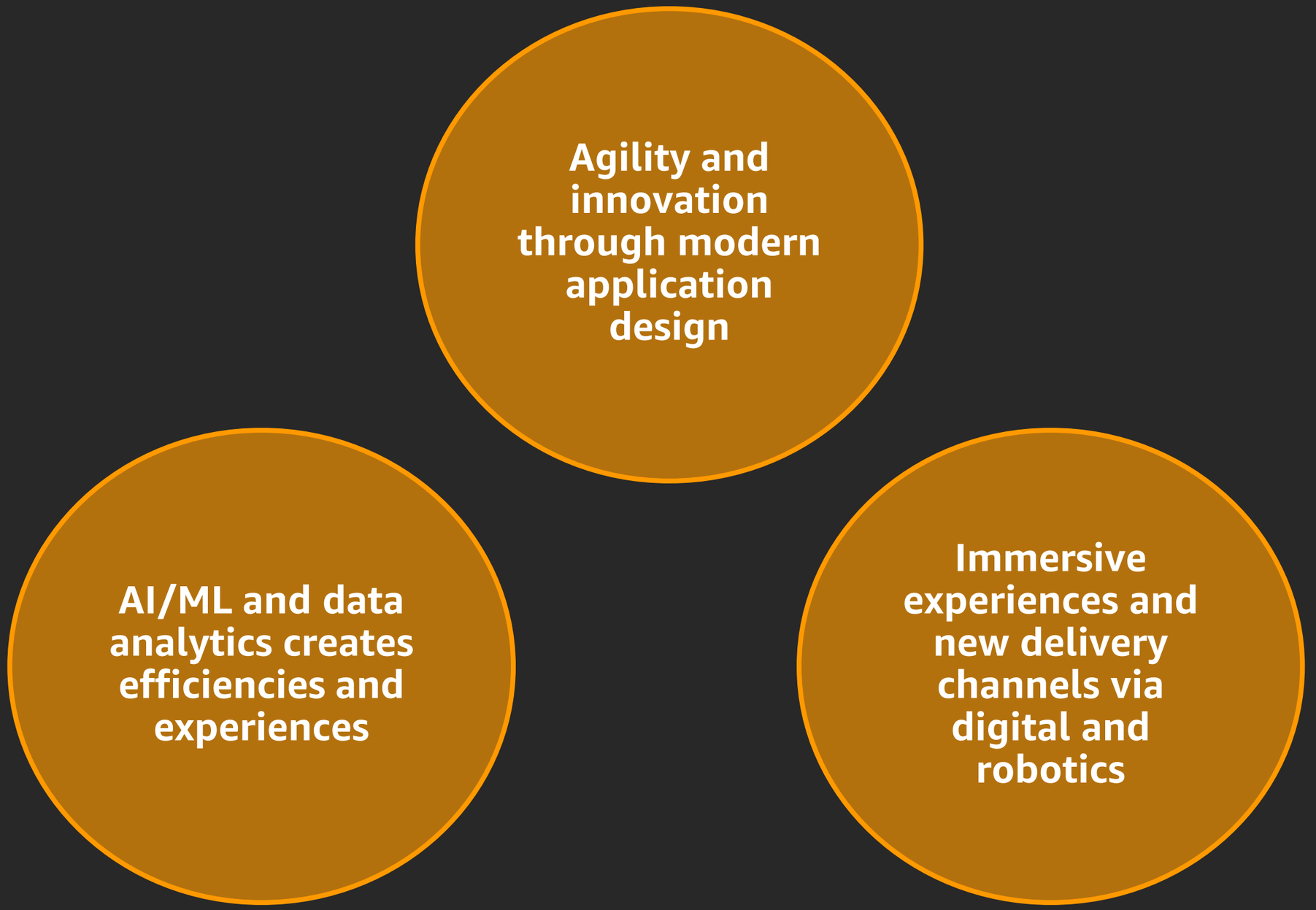


Ground Mobility

AWS RoboMaker

A cloud service to simulate and deploy robotics applications at cloud scale




Agility and innovation through modern application design
AI/ML and data analytics creates efficiencies and experiences
Immersive experiences and new delivery channels via digital and robotics

Thank you!

Olivier Klein
@captainklein

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