AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

ENT324

Modern application delivery:
From buzzwords to business value

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Enterprise Strategist
AWS

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Enterprise Strategist
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Modern cloud application benefits. Pick any four!



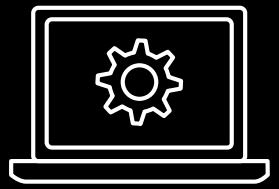
Faster to market



Increased rate of innovation



Reduced costs



More reliable applications

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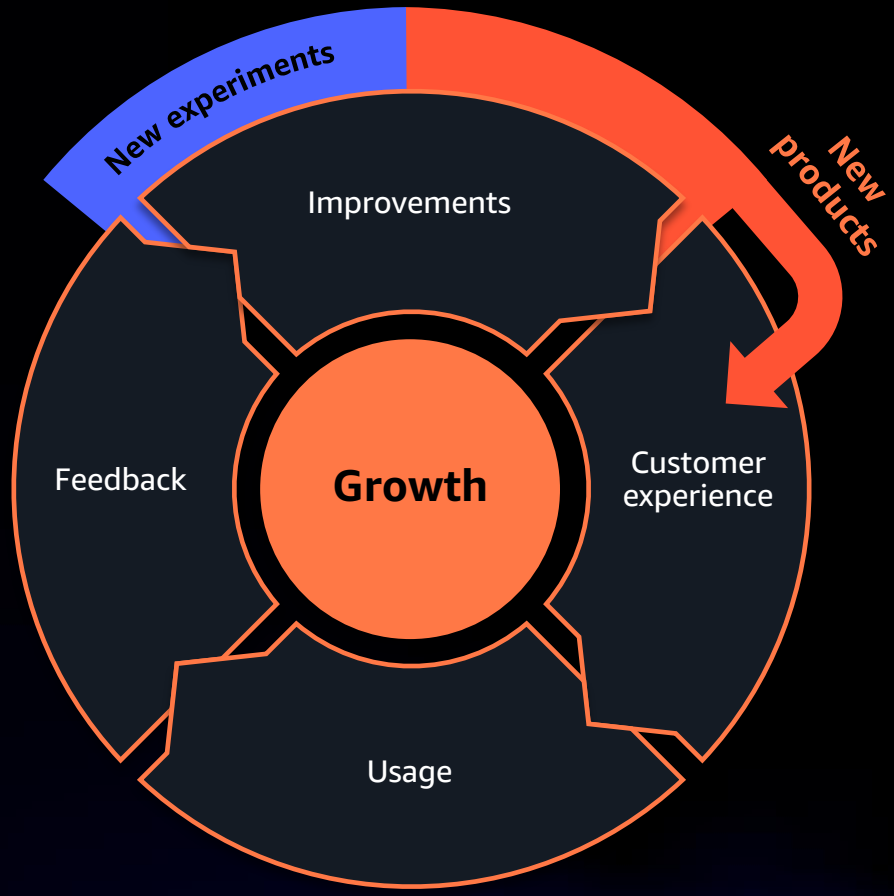
“If you can’t quickly and reliably deploy and operate software, most other concerns become secondary.”

—Your digital competitor

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Customers: Fuel for products and services

Customer experience drives the flywheel for product usage and innovation

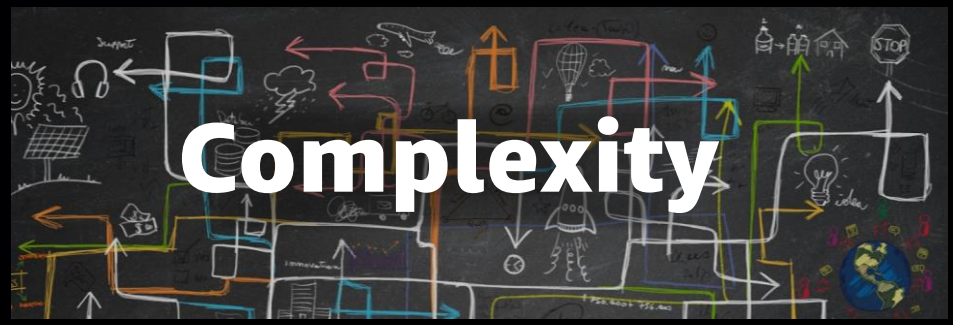


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The enemies of rapid software delivery



- Between the pieces, results from local optimization
- Leads the business to bundle all ideas into a single giant project
- Tempts developers to defer work and increase debt
- Increases when pushing harder



- Grows like entropy: accidental complexity
- Increases learning curves, wastes brain cells, slows you down
- Reduces system availability
- Confuses and frustrates customers

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Reduce complexity at Coca-Cola

"What would normally be a complex architecture—with the amount of security, precision, and latency required—is simplified by using services like **AWS Lambda** to create a magical experience for the user."

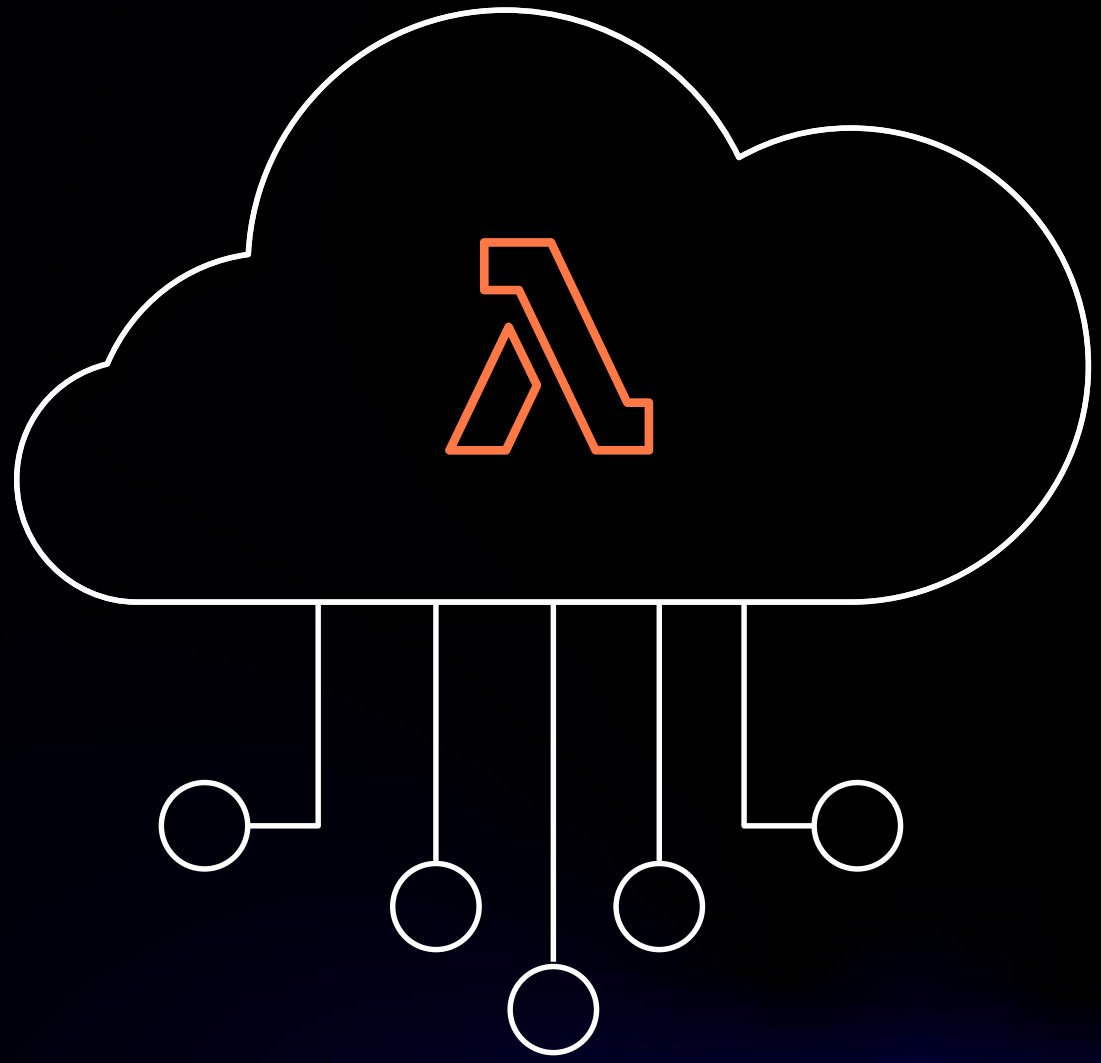
—**Michael Connor**, Chief Architect, Coca-Cola Freestyle



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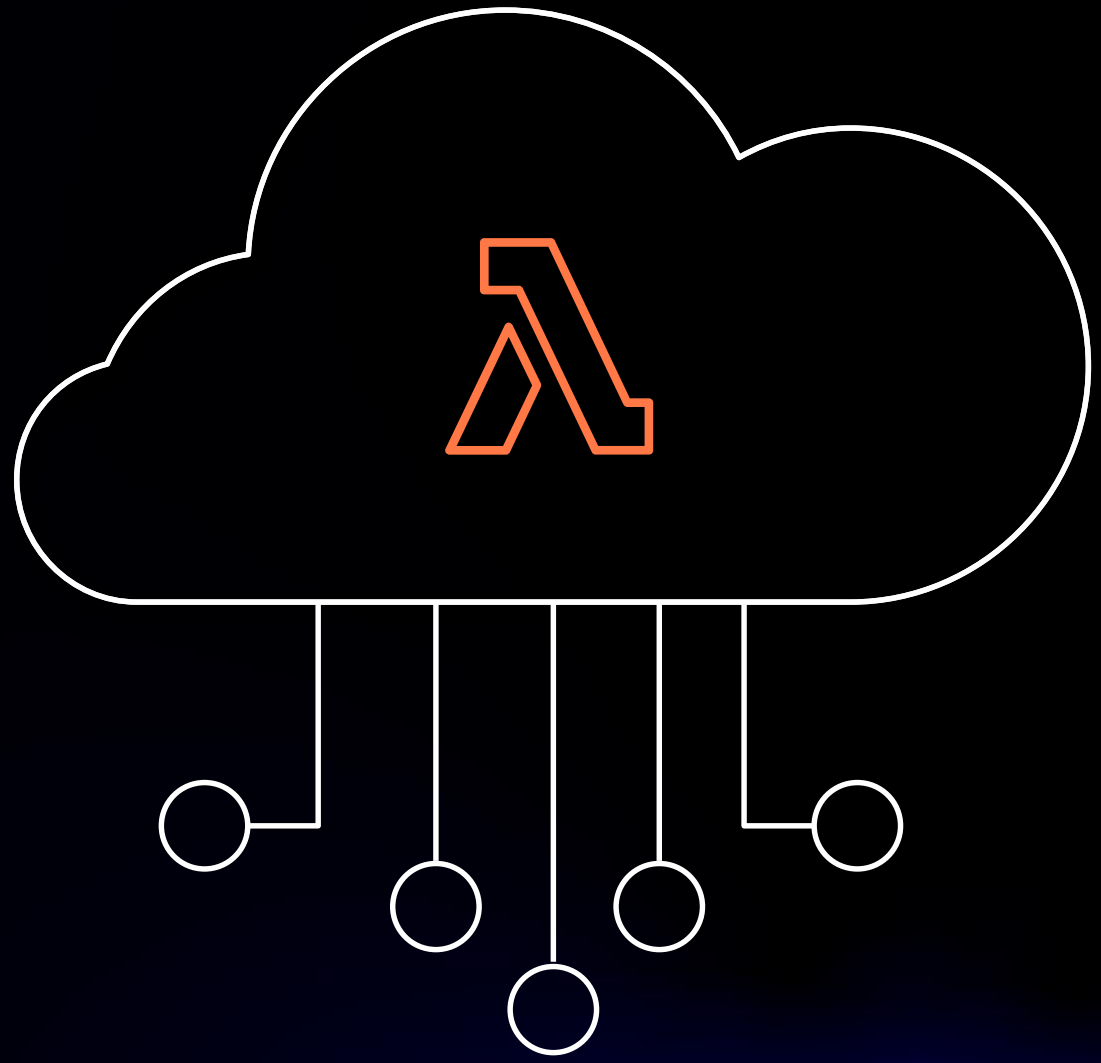
Your future is serverless...



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Your future has...

- Reduced friction:
  Rapid deploy with built-in compliance and vulnerability checks
- Reduced complexity:
  Provider-managed, independently scalable operations
- Better cost transparency:
  Function-level cost visibility & near-zero stand-by cost (“scale to zero”)

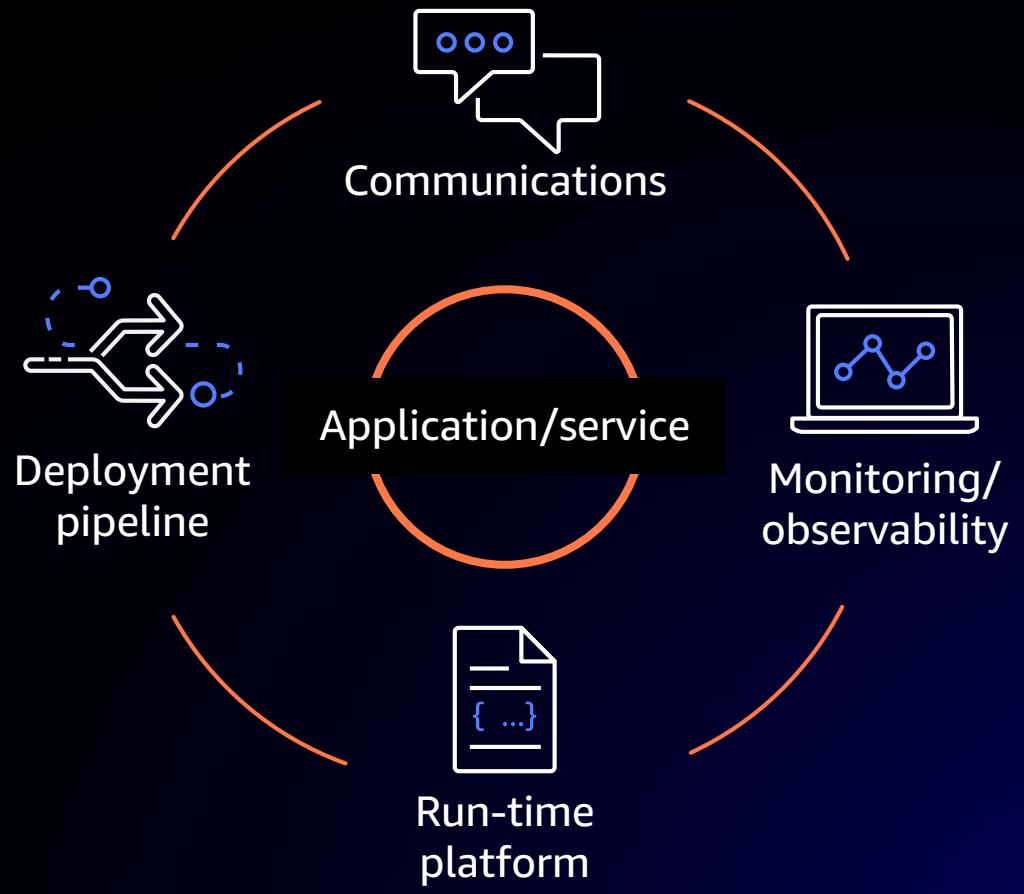


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Myth:
“Cloud is infrastructure.”

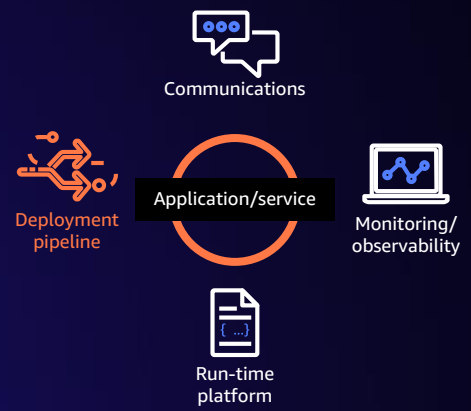
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The application-centric cloud



Source: Cloud Strategy—A Decision-Based Approach to Successful Cloud Migration

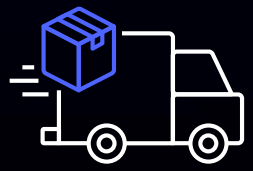
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Myth:
“We automate to increase efficiency.”

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Automation isn’t about efficiency



Speed

Deploy many times a day instead once every few months



Repeatability

Never send a human to do a machine’s job. Humans are error-prone



Confidence

If you’re not sure whether it’ll work, you’ll hesitate. That slows you down and keeps you from fixing problems



Transparency

Automated processes are easier to measure and improve

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A modern automation stack

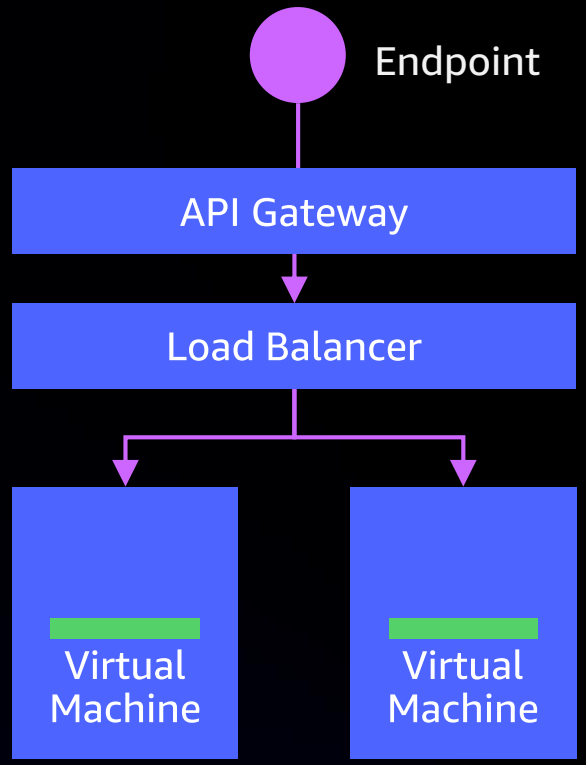
Config

Compose

Deploy

Provision

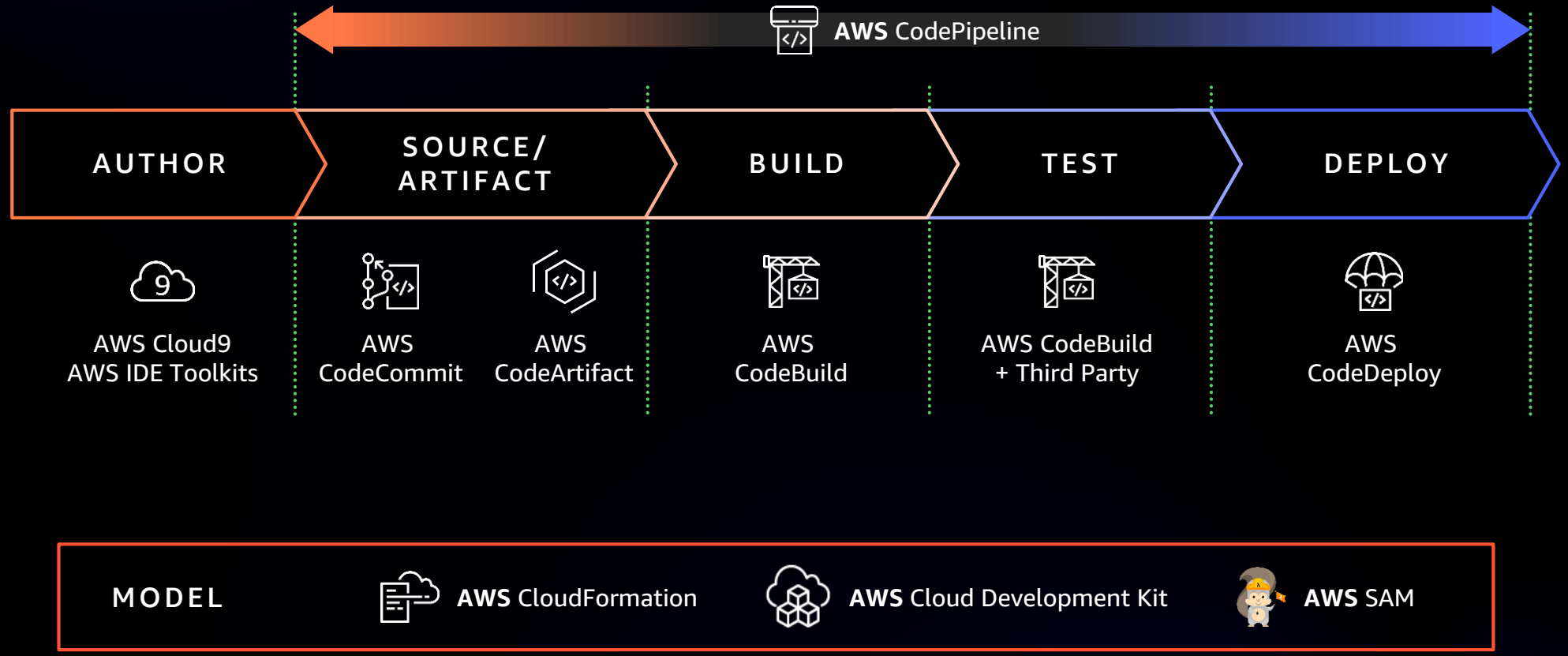




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AWS Developer Tools for modern software delivery



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Myth:

“The runtime platform addresses application availability.”

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Defying failure

Robust

- Traditional IT
- Maximize MTBF
- Failure prevention
- Planning & verification
- Infrastructure-based

"Hope for the best"

Resilient

- Distributed applications
- Minimize MTTR
- Rapid failure recovery
- Redundancy & automation
- Application-based

"Prepare for the worst"

Anti-fragile

- Self-healing system
- Eliminate system failures
- Always failing
- Design for failure
- System-based

"Failure makes us stronger"

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Serverless is much more than compute

Compute


AWS Lambda


AWS Fargate

Data stores


Amazon S3


Amazon Aurora Serverless


Amazon DynamoDB

Integration


Amazon EventBridge


Amazon API Gateway

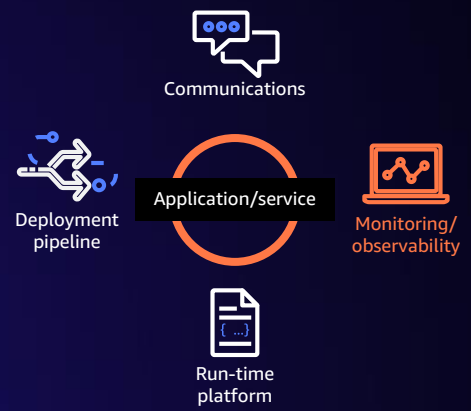

Amazon SQS


Amazon SNS


AWS Step Functions


AWS AppSync

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Myth:

“Monitoring is useful when stuff goes wrong.”

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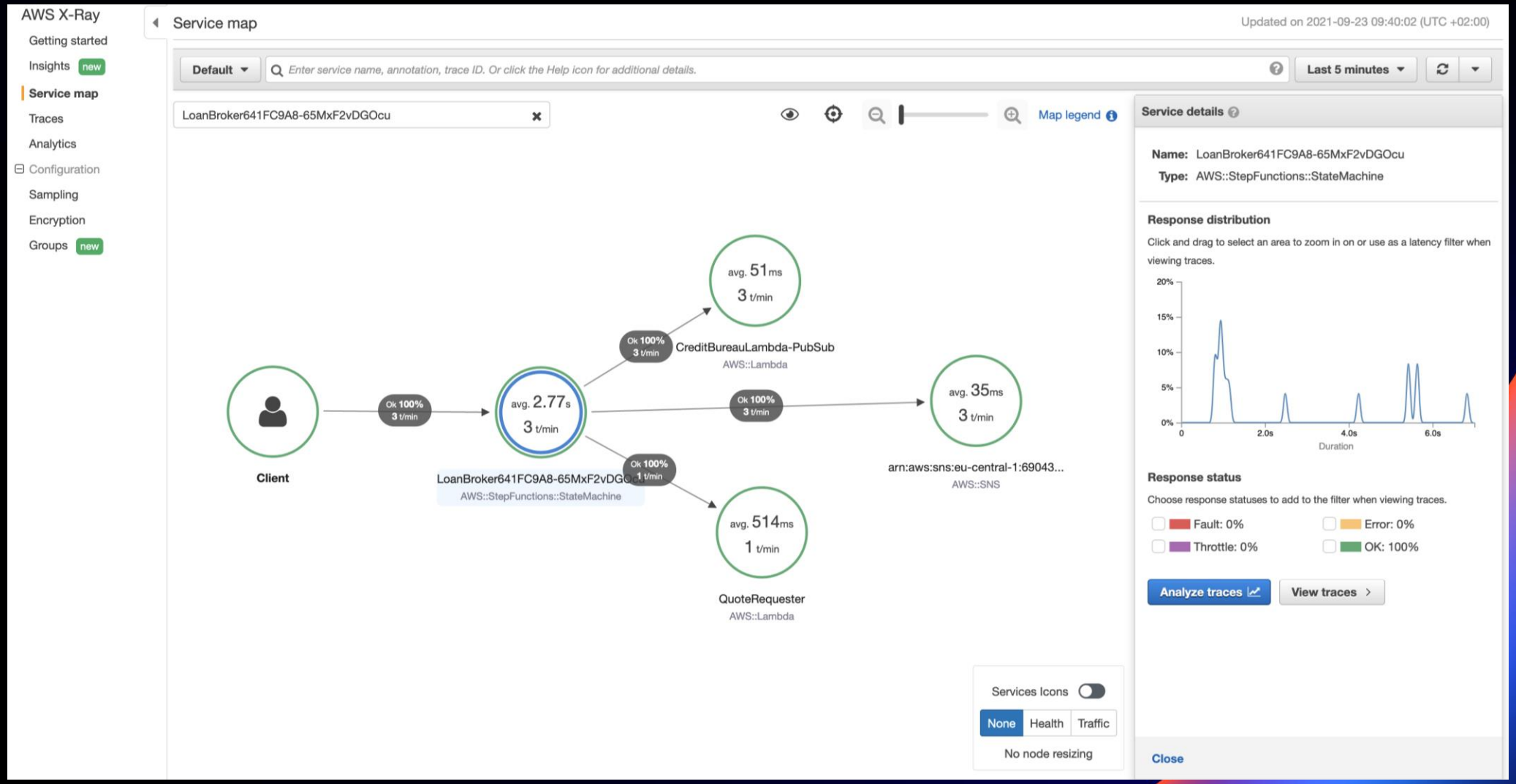
Injecting disturbance

Injecting Disturbance

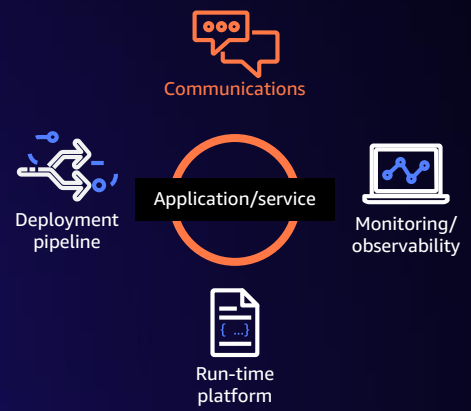


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System transparency with AWS X-Ray



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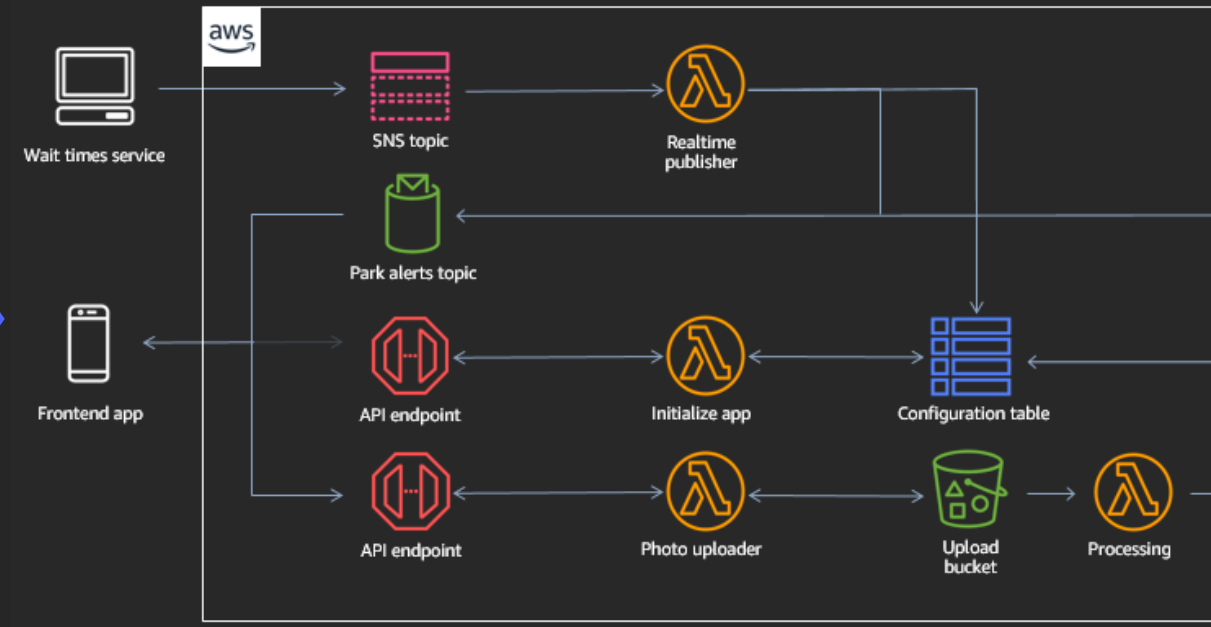
Myth:

“Integration is done once the application is built.”

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Small pieces, loosely joined

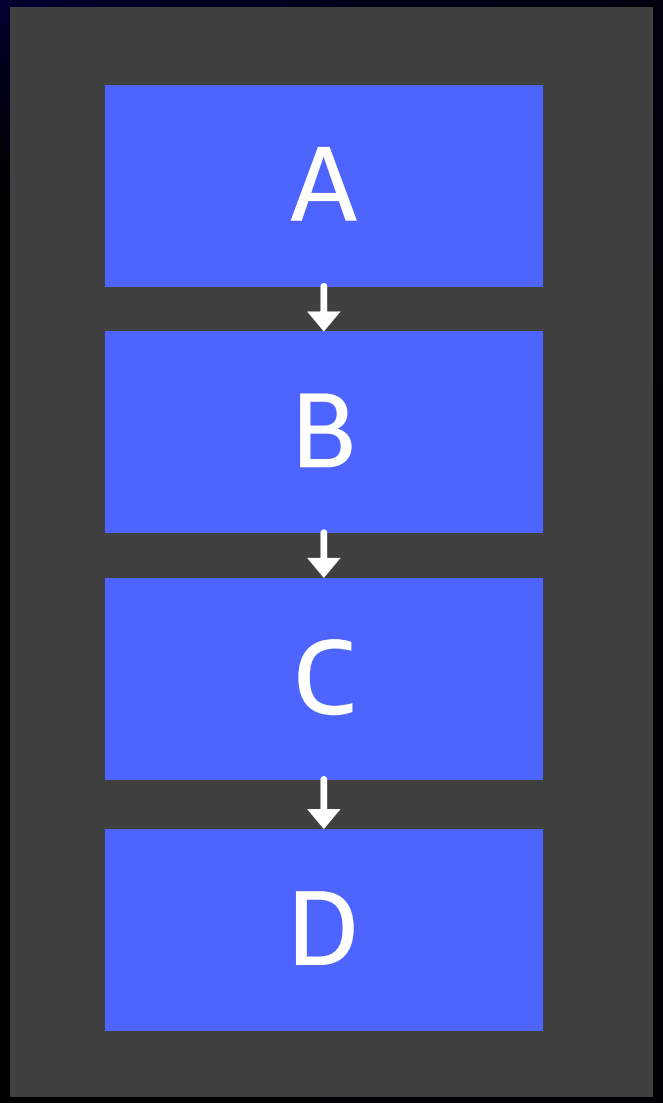


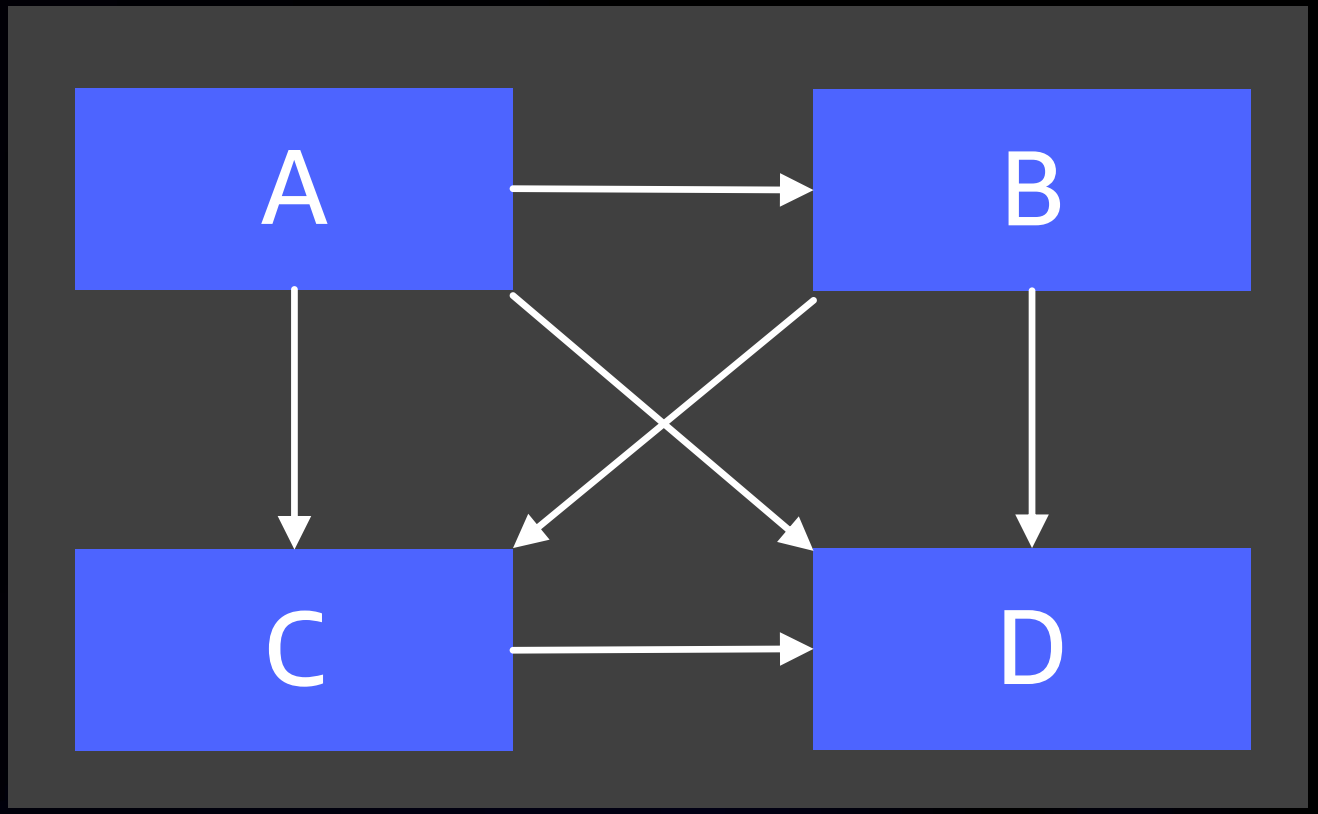


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Two system designs





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Serverless integration & networking



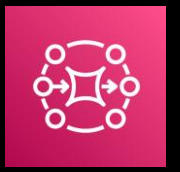
Amazon
EventBridge



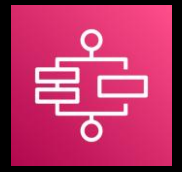
Amazon
SQS



Amazon
API Gateway



Amazon MQ



AWS
Step Functions



Amazon
SNS



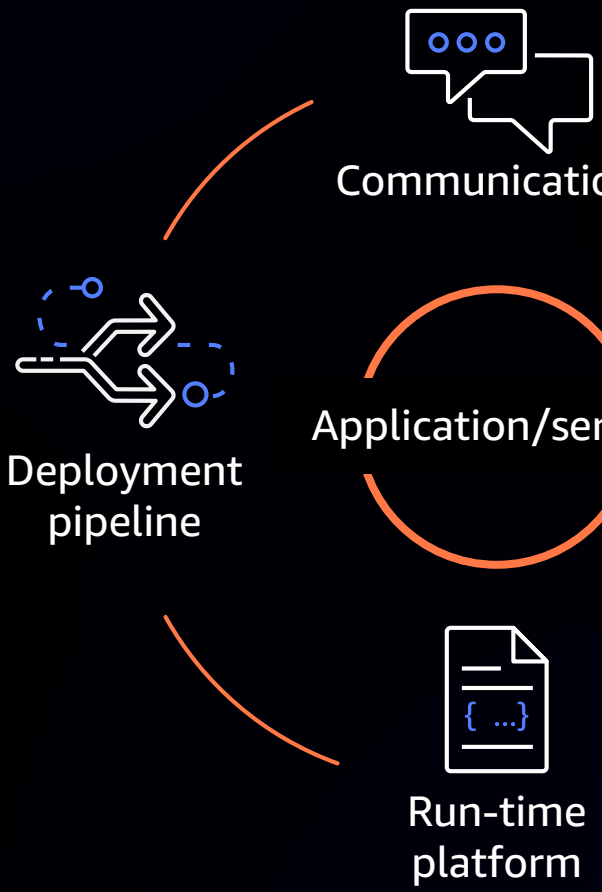
AWS
AppSync



AWS
AppMesh

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The application-centric cloud



- Amazon API Gateway
- Amazon EventBridge, AWS Step Functions
- Amazon SQS, SNS, Amazon MQ
- AWS App Mesh

- AWS CodeCommit
- AWS CodePipeline
- AWS CodeDeploy
- Amazon CodeGuru

- Amazon CloudWatch
- AWS Systems Manager
- AWS X-Ray
- AWS Cost Explorer

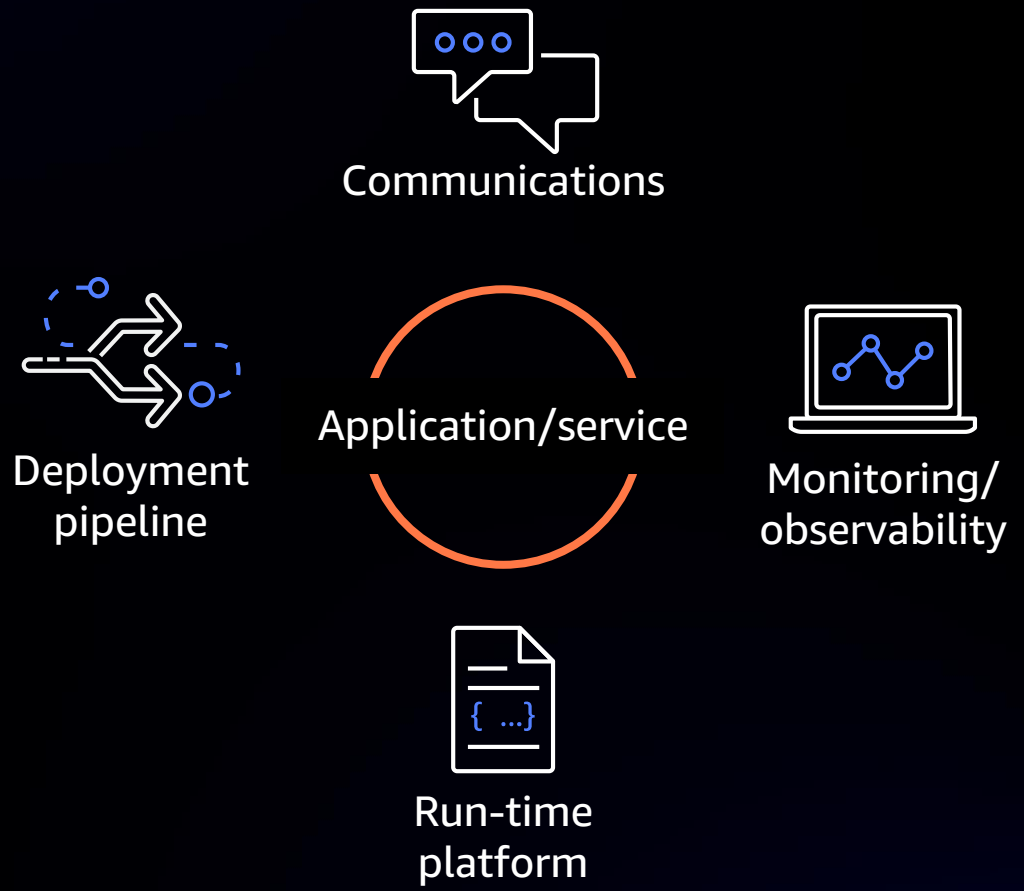
- Serverless (AWS Lambda)
- Container Orchestration (EKS, ECS)
- Virtual Machines (EC2)

Note: products are indicative examples from the AWS product portfolio

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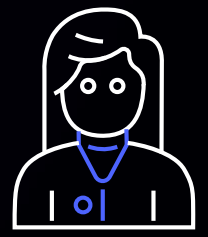
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The application-centric cloud



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The application-centric cloud



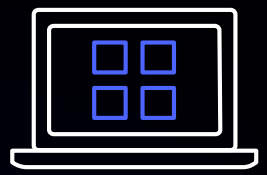
Customers

Shorten your path to value and generate learning cycles



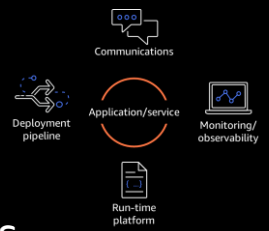
People

You have the right people—unleash their potential

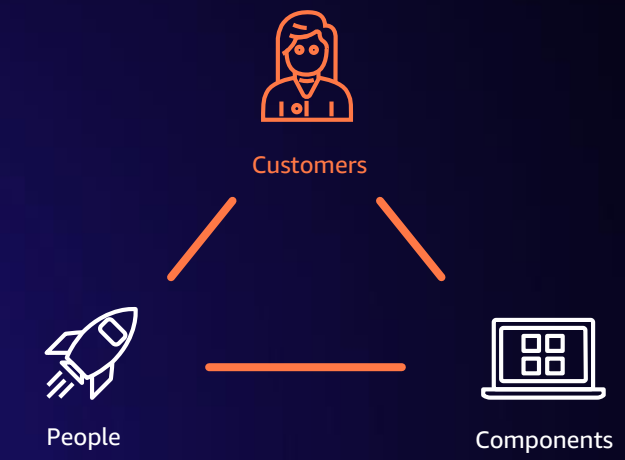


Components

Avoid premature optimization, shrink and refactor over time



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Myth:

“Product completeness drives customer adoption and value.”

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New currency: Learn at speed

Release Sooner



Shorter delivery cycles with done meaning released. **Decrease time to release.**

Learn Earlier



Gather feedback from every change. Nurture product usage. **Listen to customers.**

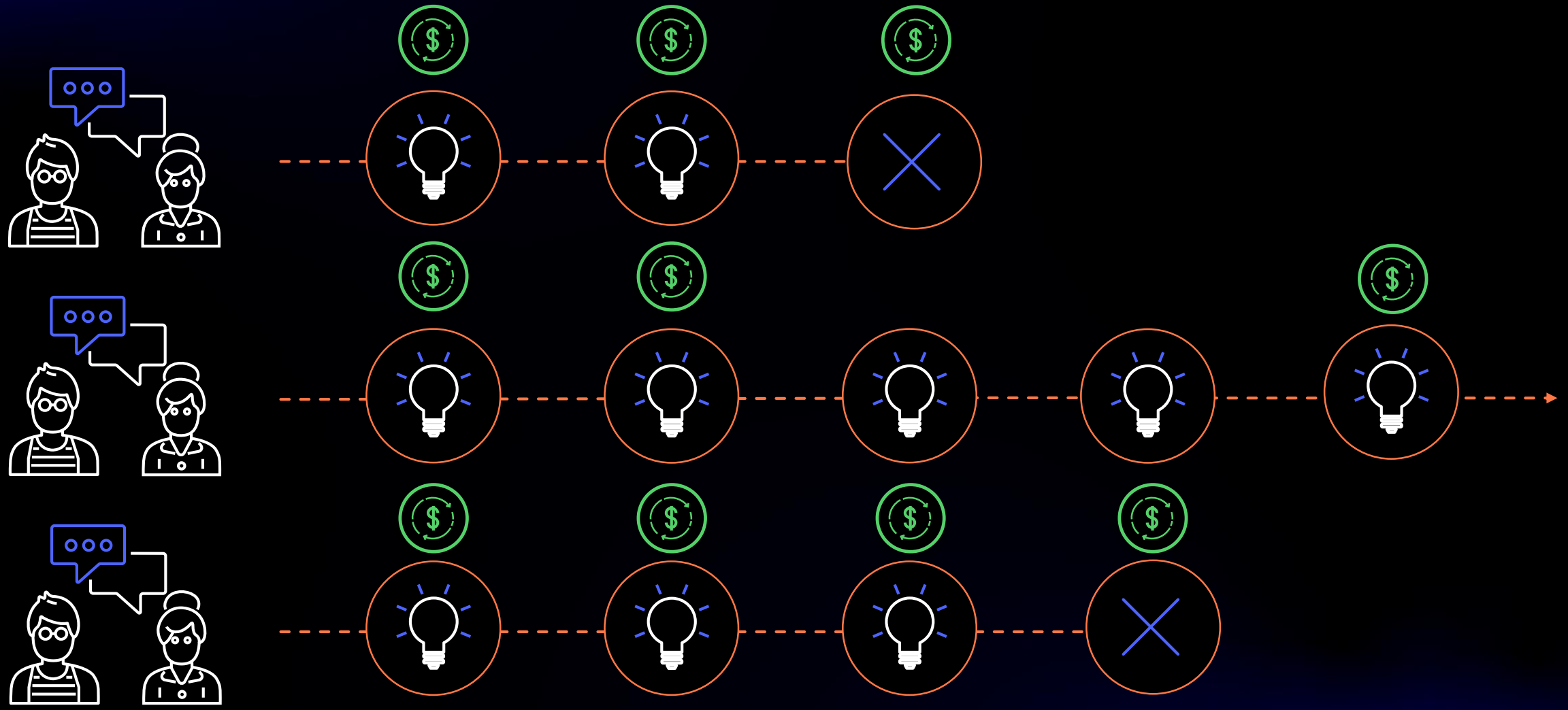
Improve Faster



Adjust your backlog and roadmap based on customer feedback and feature performance. **Use data.**

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Learning drives priority and investment



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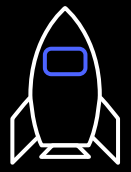
FICO™



Predictive analytics and **decision management** company delivering software and tools to **95%** of the largest financial institutions in the U.S.



On-premises software company for a long time, and sometimes it took years to **create and deliver solutions** to customers



Lacked the **agility** to quickly develop and deploy its solutions



Wanted to focus on **implementing software** instead of waiting for customers' IT organizations to **provision and build** the underlying infrastructure for their solutions

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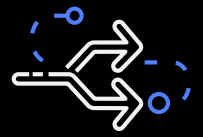
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FICO™

Needs



Cloud provider
experienced in financial-services compliance



Ability
to focus more on features and functionality

Choices

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AWS

EC2 + Lambda

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FICO™

FICO uses AWS to innovate faster, reduce costs, and expand global reach



Delivers software services in **1 day** instead of several weeks



Unlocks innovation for developers



Saw performance increase by **6x**



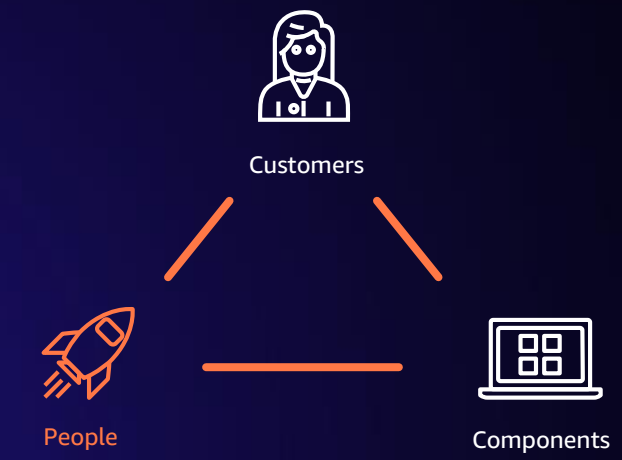
Improved delivery times by **10–15x**

"We have completely unblocked the potential for our developers to innovate. It's easier for them to try new things and push the boundaries of application design."

—**Joshua Prismon**, Vice President of Product Development at FICO

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Myth:

“We’re agile. We’ve been doing it for years. Now we’re adopting [Dev/DevSec/Fin]Ops.”

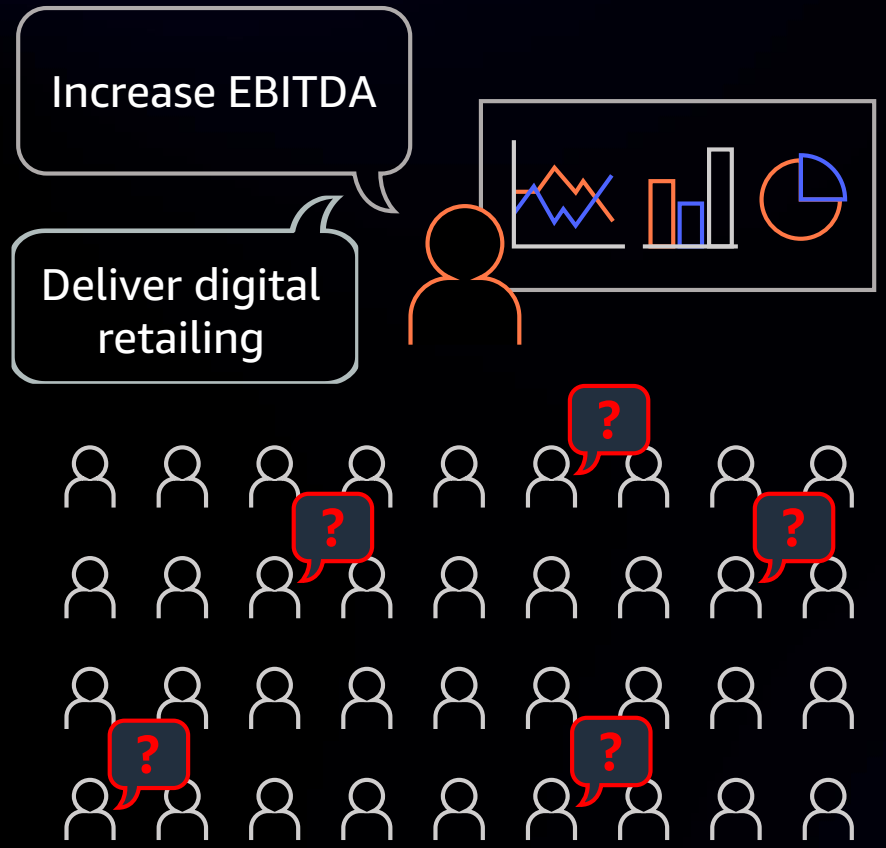
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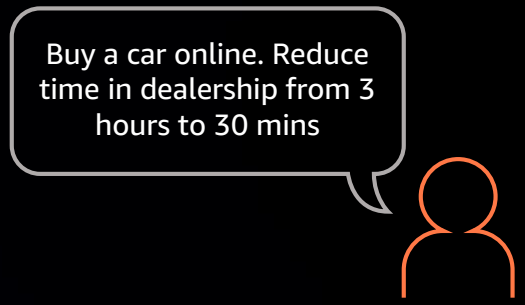
Agility comes from changes in roles and behaviors

Leader	Organization	Employees	Deliver
Autocratic	Activity	Order taker	Tasks
Democratic	Function	Participant	Projects
Servant	Team	Problem solver	Outcomes

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Clear, relevant, and connected outcomes

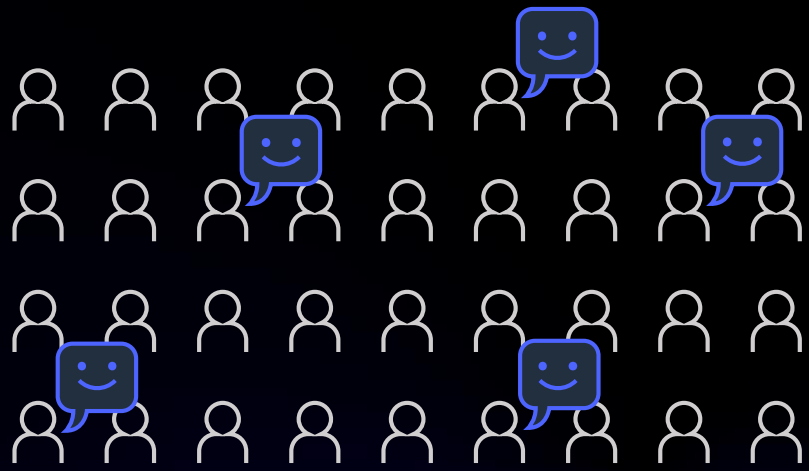




Specific

Measurable

Relevant



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Cox Automotive™

120-year-old
private, family-owned enterprise

50+ data centers
working across 15 locations

34,000
global team members with more than 20 brands through 40+ acquisitions

Growth
through acquisition over time, many over the past 10 years

Working with
IBM RPG on the iSeries, Oracle Exadata, IBM DataPower, Oracle Coherence, .Net, Java, and Python

Diverse
set of cultures, technologies, and techniques

Manheim · Autotrader · Kelley Blue Book KBB.COM The Trusted Resource · vAuto LIVE MARKET VIEW · Dealertrack · DEALER.COM

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COX AUTOMOTIVE™

Alignment

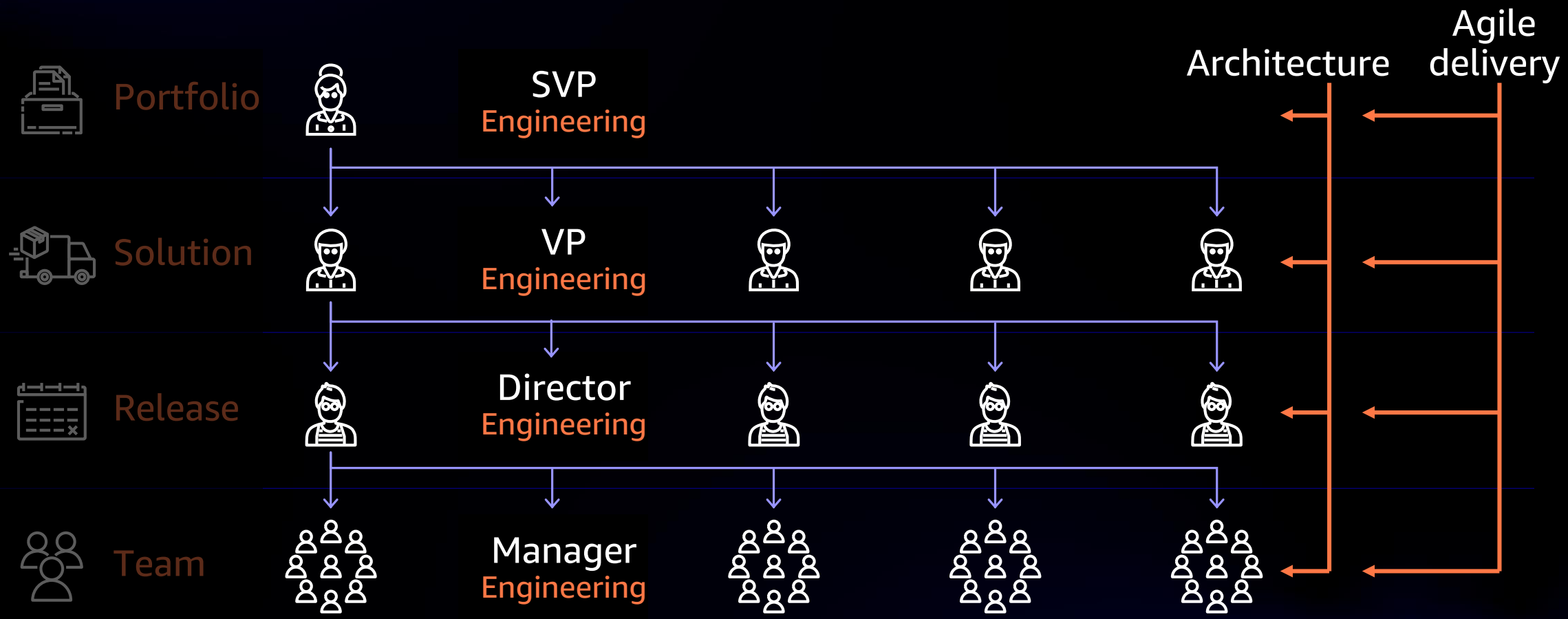
	Business	Product	Engineering	Architecture	
Portfolio					Line of business
Solution					Business unit
Release					Product line
Team					 Feature/ function

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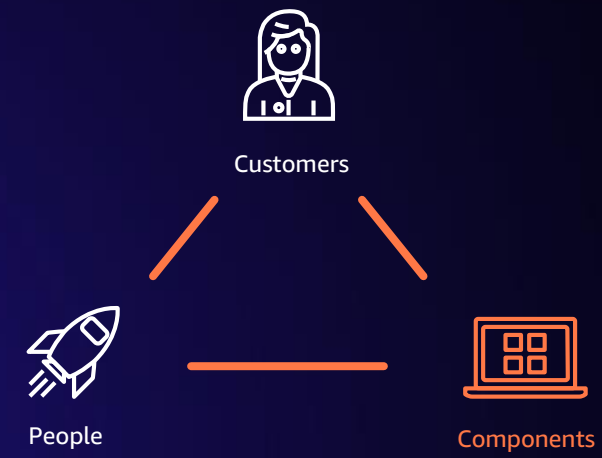
COX AUTOMOTIVE™

Accountability + Bar raising



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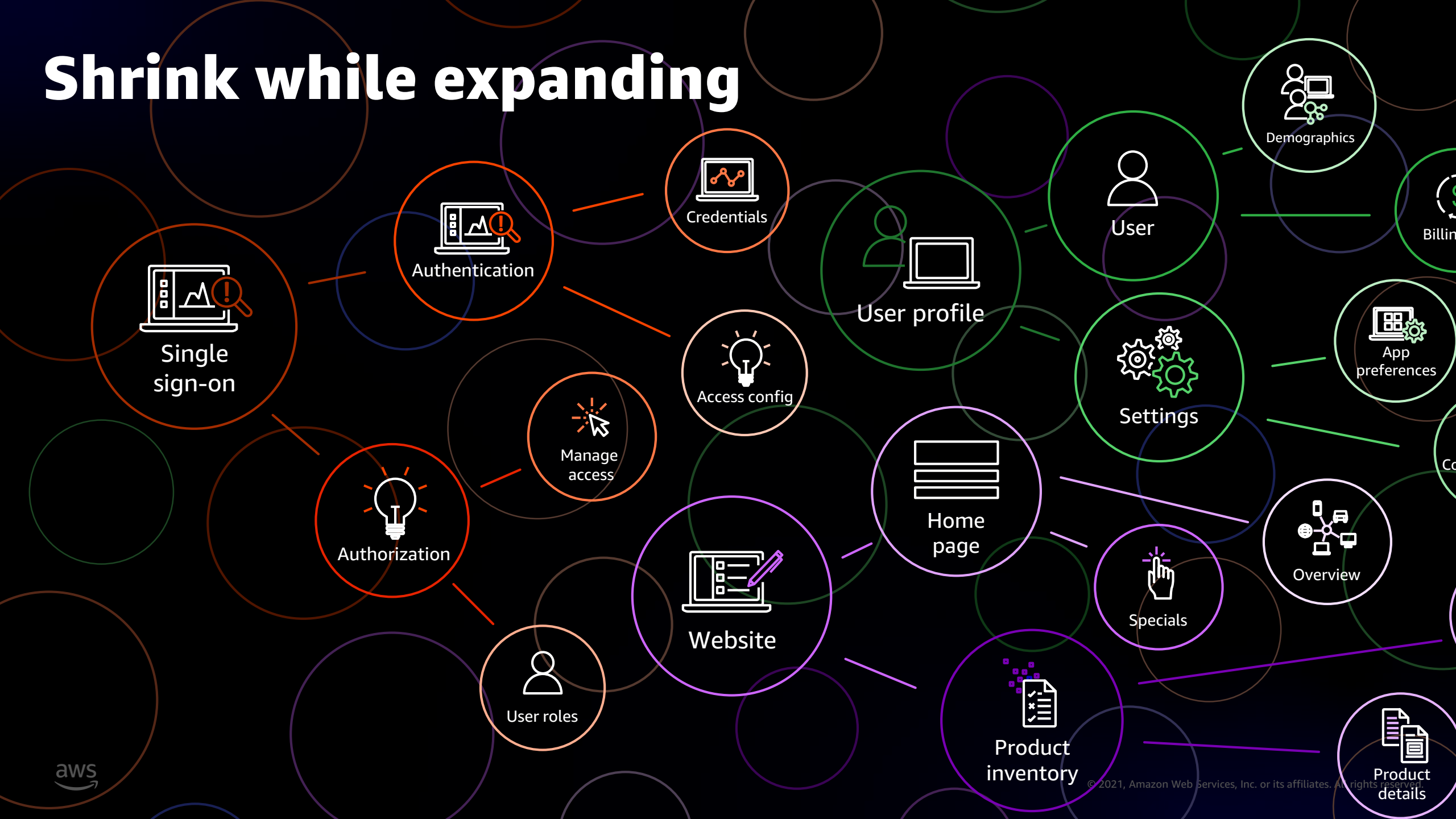


Myth:

“Smaller is better, we should start there.”

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Shrink while expanding



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Anticipate opportunities to improve

Complexity



Has complexity increased, making changes take longer to implement?

Scale



Have traffic and component usage grown unequally, making it harder to scale?

People



Is the pace of value delivery compared to team size declining?

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National UK retailer | bjss



Improve end-user experience

The existing e-commerce system had lengthy response times for large shopping baskets.



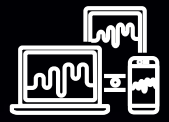
Realize the benefits of utility-based cloud computing

The on-premises hosting model was costly both in terms of capital expenditure and operational effort required to maintain the system.



Deliver new features rapidly

Infrequent deploys or new features due to waterfall delivery approach and quarterly releases.



Achieve all of this while minimizing change risk

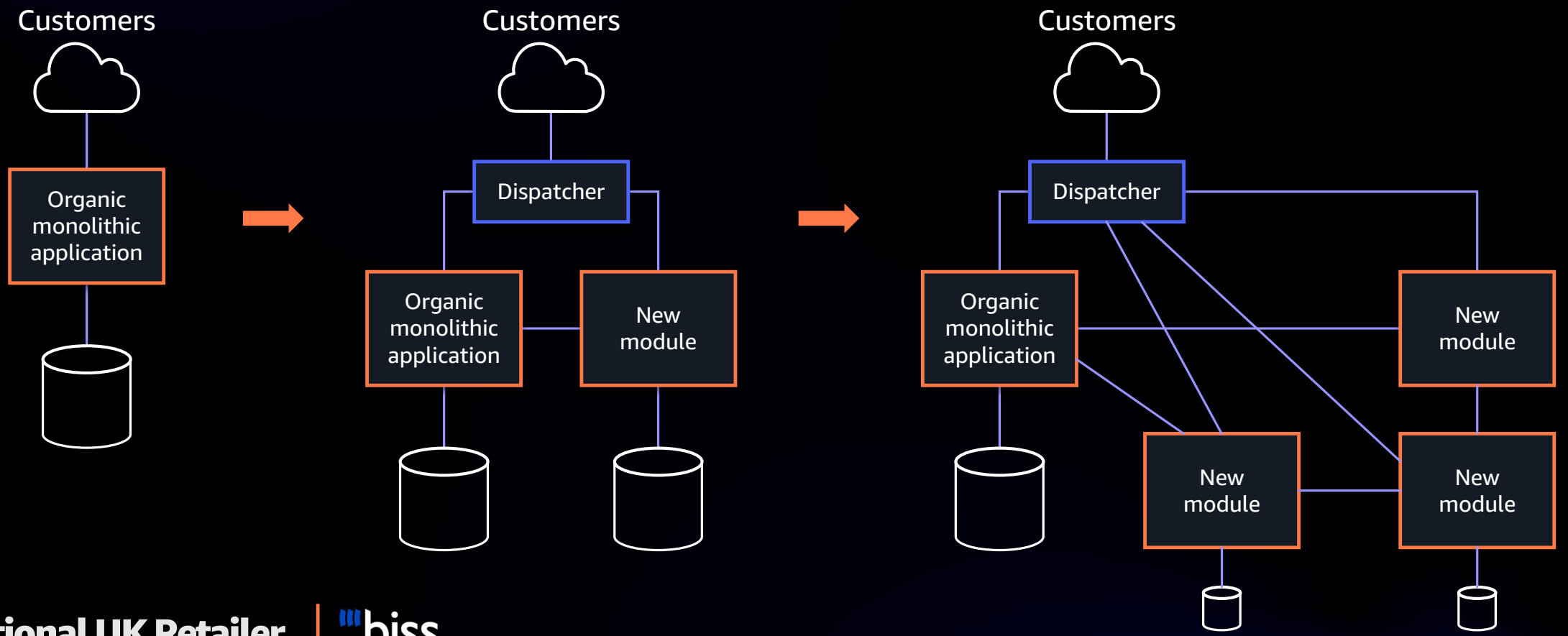
The approach to improving the e-commerce system was a core consideration.

Once the shopping basket reached 60–65 items, it could take up to 8 seconds to add further items

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Gradually shrink and refactor



National UK Retailer | bjss

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National UK retailer | bjss

Benefits



Minimize
area of impact



Performance improved
from 8 sec to 400 ms



Cost reduction
with reinvestment

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How do I get there from here?



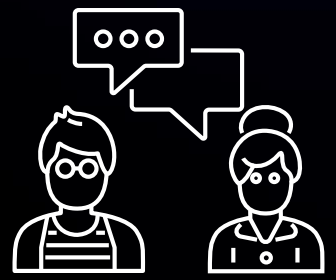
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Myth:

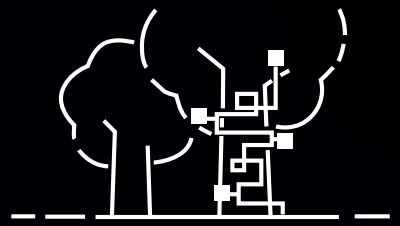
“Rewrites are easy, just replace what’s already there.”

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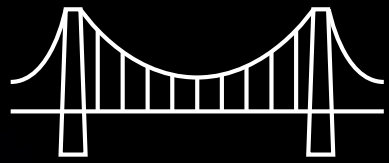
Patterns for decomposition



Event decoupling



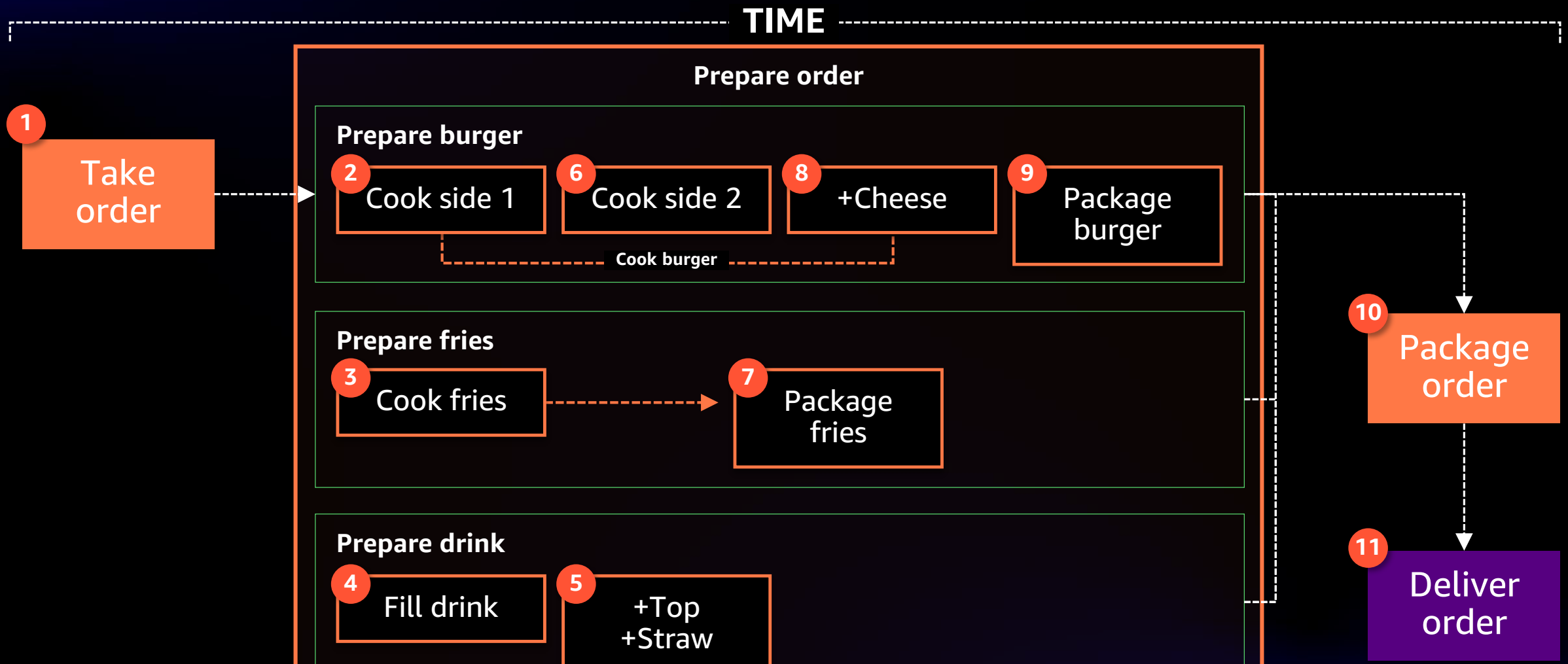
Strangler pattern



Domain-driven design

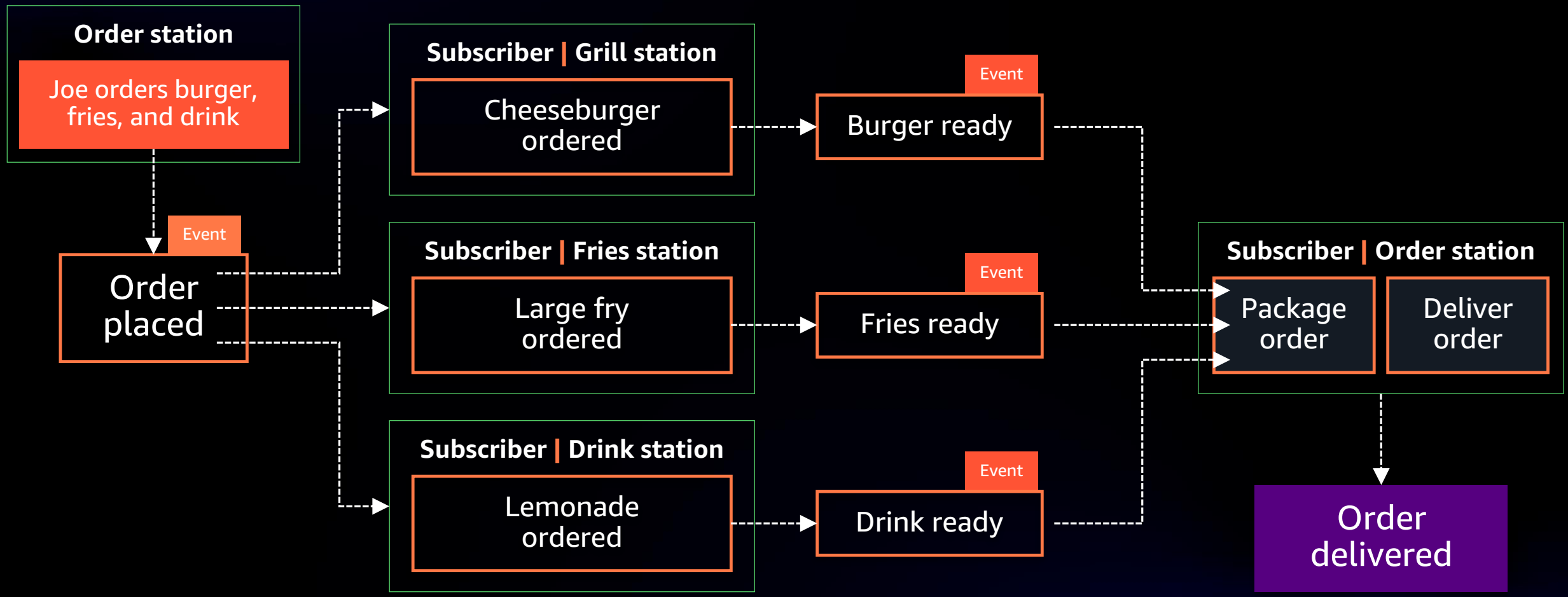
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Events as decouplers



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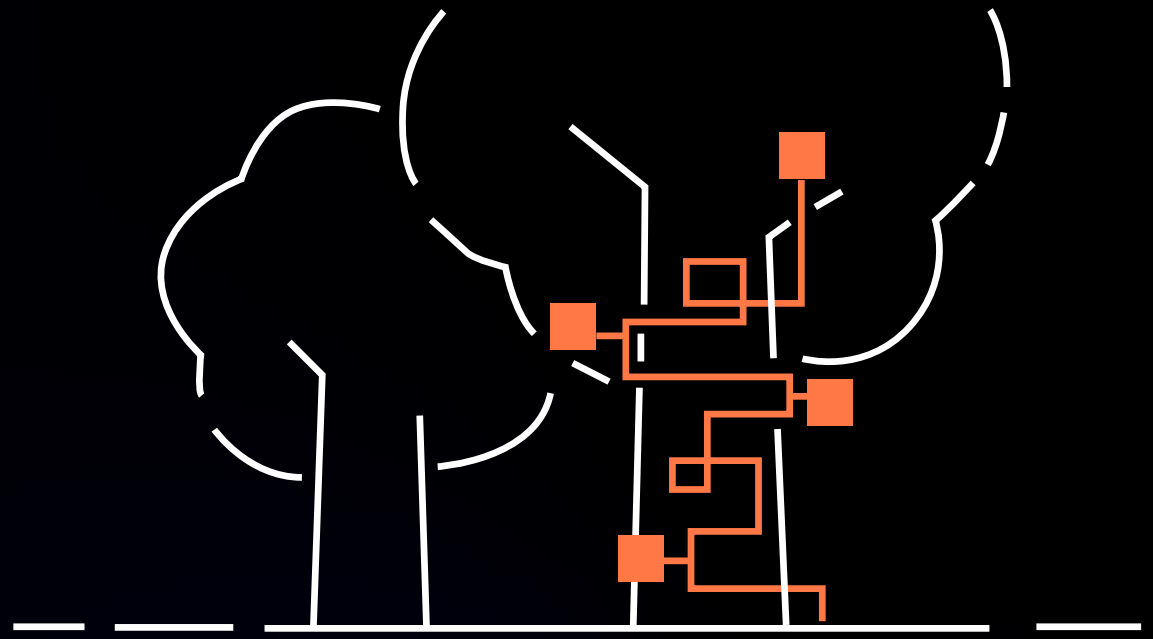
Events as decouplers



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The strangler pattern

Moving **monolithic** applications to **microservices** by gradually creating events and **APIs** for various components of the legacy application



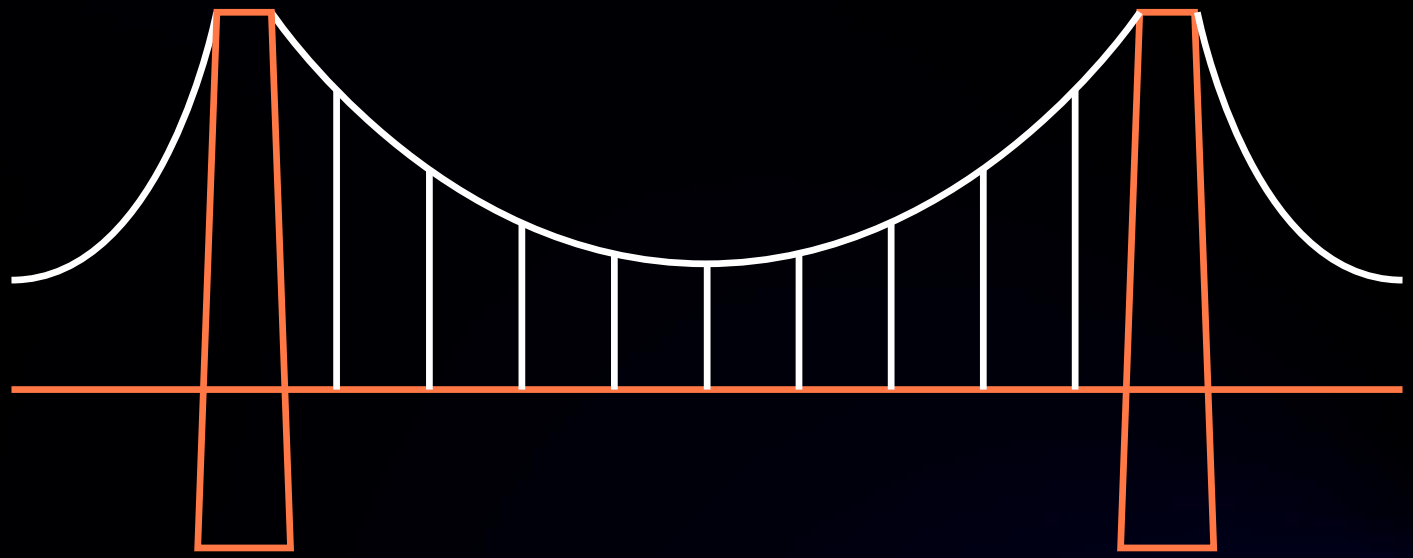
https://martinfowler.com/bliki/StranglerFigApplication.html

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Domain-driven design

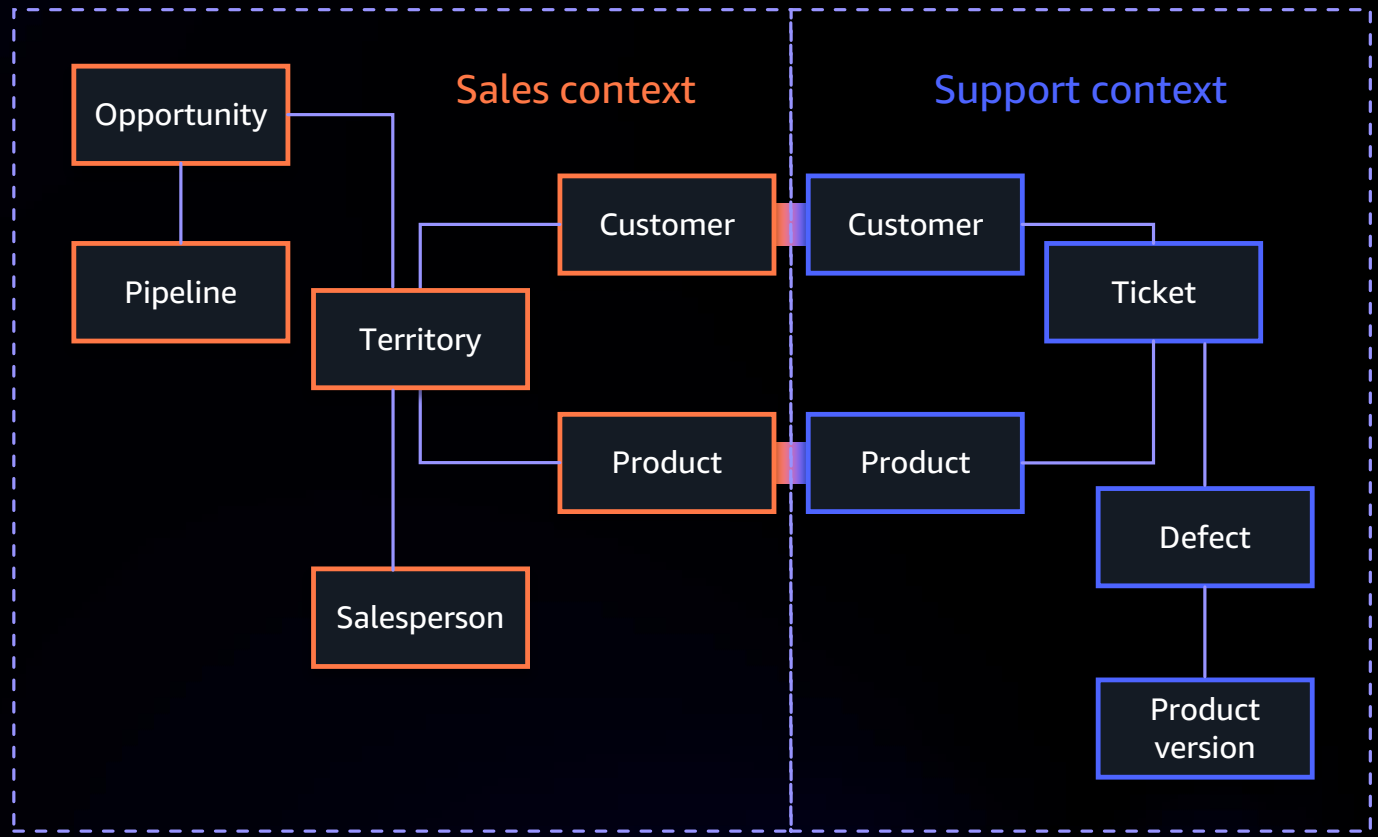
Domain-driven design (DDD) takes core business concepts and applies a framework to break down software systems and align them more closely to the business.



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Domain-driven design

Bounded contexts are used to simplify complex models and teams. Multiple bounded contexts results in smaller, easier to manage components.

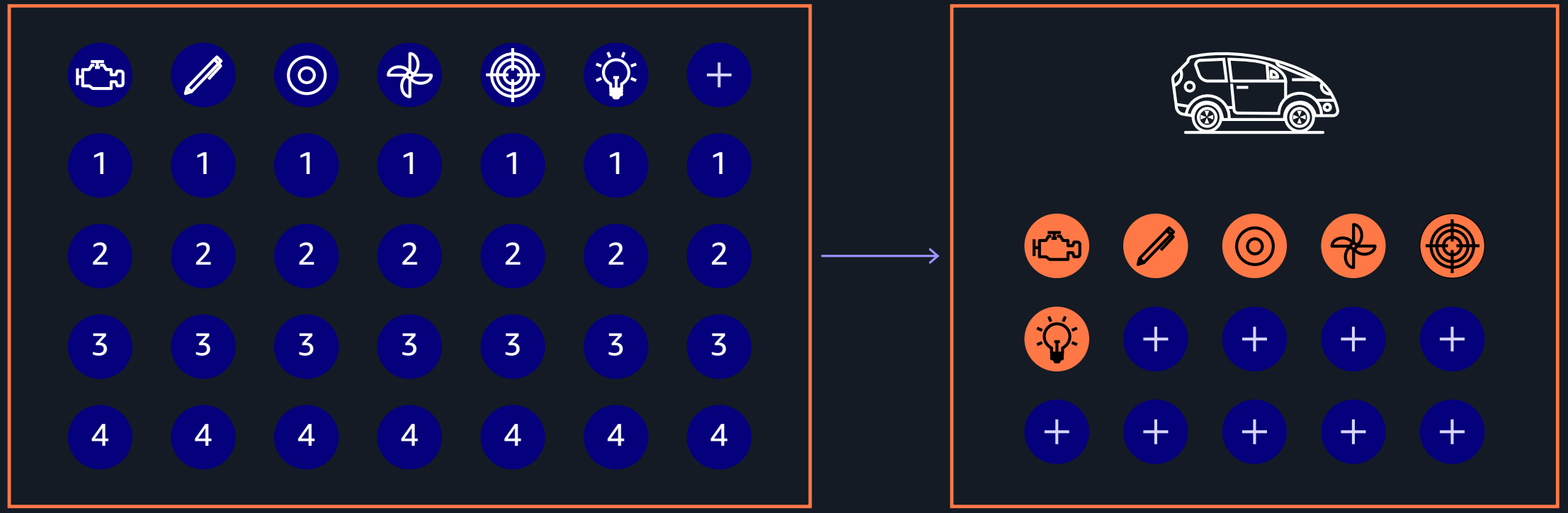


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THE NEXT 100 YEARS

Many possibilities to configure your car

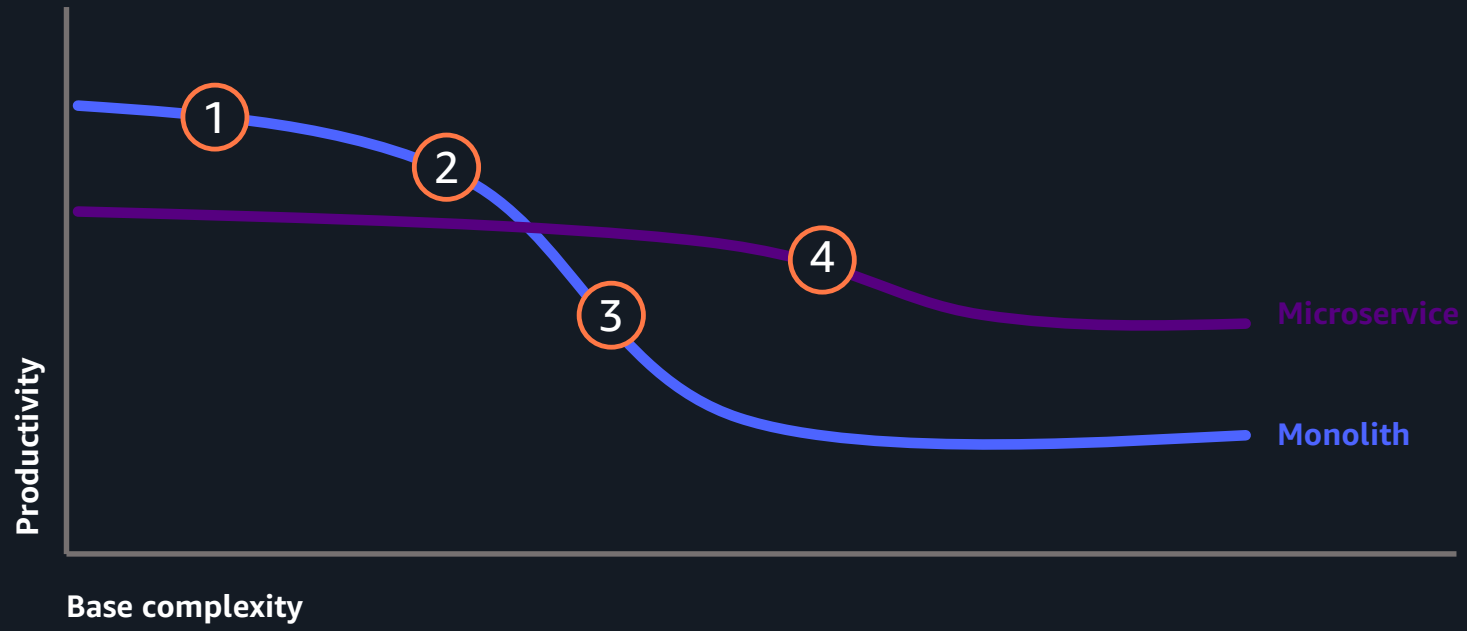


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Complexity drives change

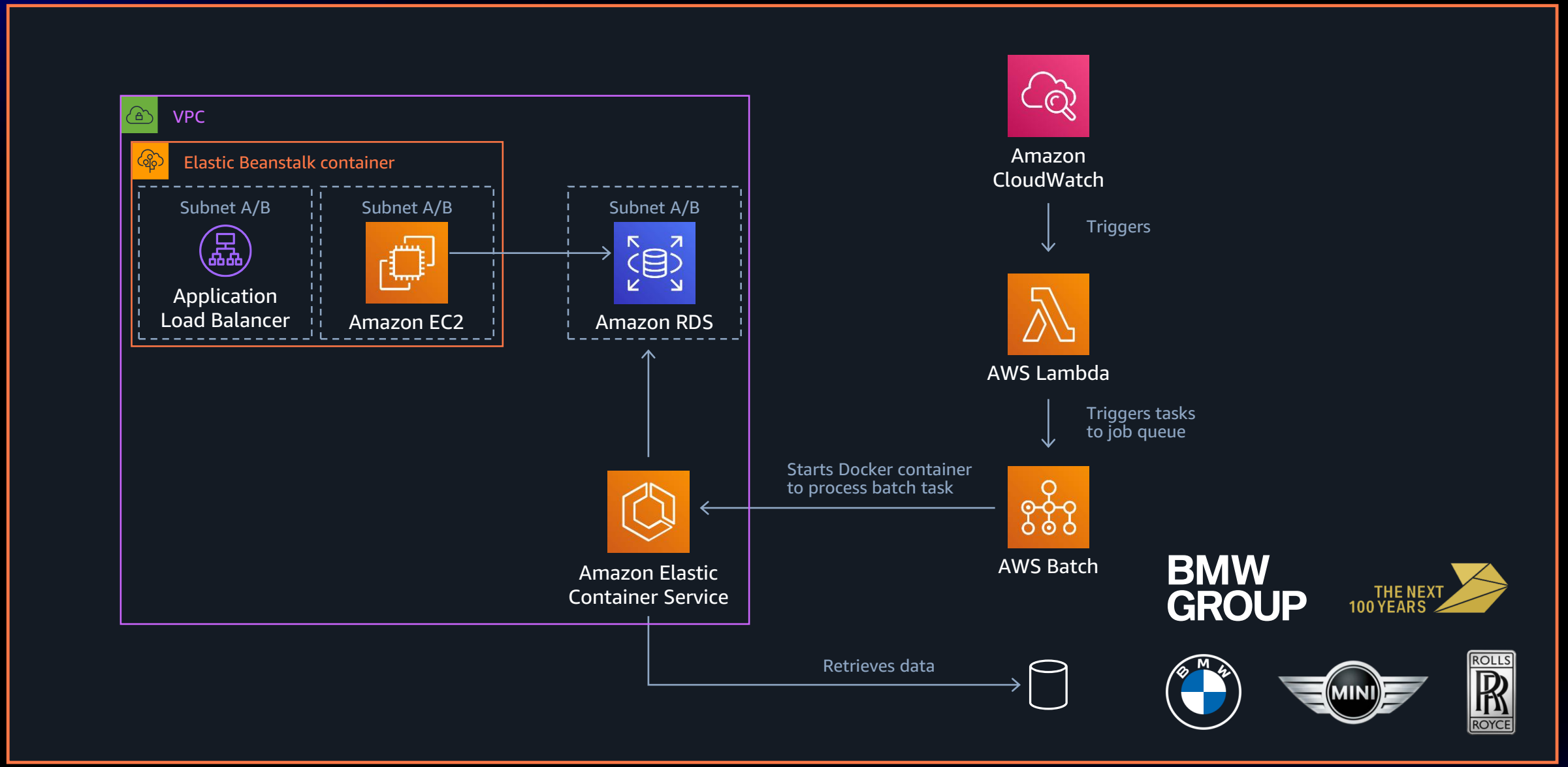


Source: https://martinfowler.com/bliki/MicroservicePremium.html

1. **Initial development was fast** and focused on the MVP
2. Over time, **high dependencies developed** and the overall **complexity increased**
3. Development speed became **slower and slower.** Minor changes led to **large refactorings**
4. The software was divided into **small self-contained** and independent **"microservices"**

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BMW gamedays



"The gameday showed that it's a great opportunity to deepen the transferred knowledge in a fun way and to gain hands-on experience through simulated incidents for the operation work."

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Success hinges not only on the new things you do,

but also, what you leave behind

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"Remember, this is a journey and starting is the hardest part. Start by choosing something **impactful** and **specific** and work to **decompose** it and **iterate.**"

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Thank you!

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