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Transforming Product Development

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AWS Enterprise Strategist

Motivators?

Hitting roadblocks trying to drive change

Best practices review

Development practices need a refresh

Reduce cost of failure and experimentation

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What we'll cover:

Modern product development toolkit

Achieving organizational flow

How the cloud is changing product development

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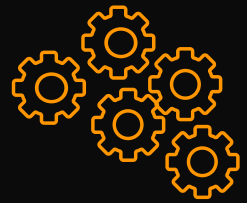
Methods and Principles of Modern Product Development

Design Thinking
Interface to customer and feedback loop

Agile Teaming
The organizational glue that keeps release cycle moving continuously



DevOps
Interface for getting stuff built and released

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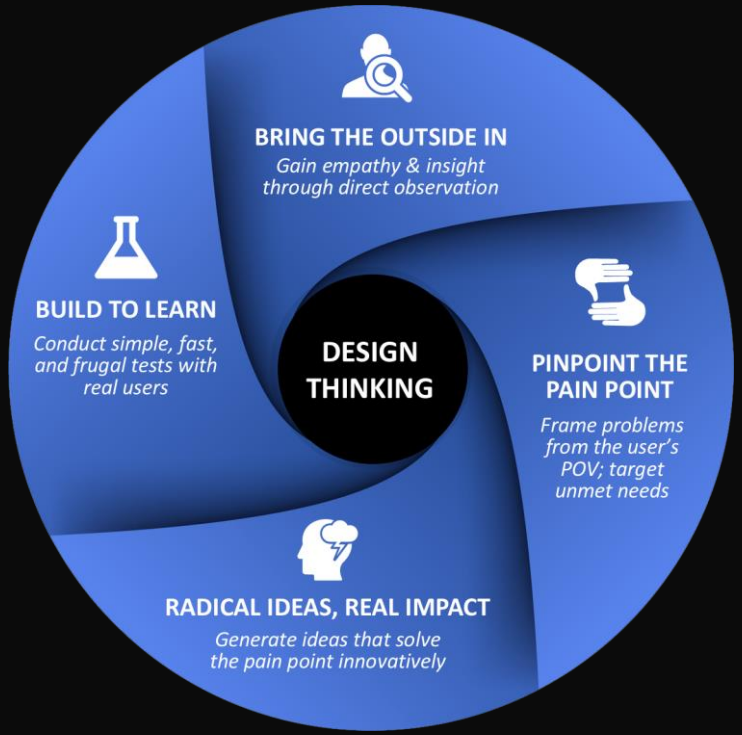
User Centered Design

Design Thinking is just…



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Practical Principles: Design Thinking

Bring the outside in

Pinpoint the pain point

Radical ideas, real impact

Build to learn

1. First gain empathy
2. Then frame the problems
3. Now you can ideate
4. Run simple, fast, frugal tests

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Agile Teaming

Focus: respond quickly to feedback

Agile Principle

Learning over following a plan

SCRUM

Continuously groomed backlog

No changes to work plan made during sprint

Product increment: must be completed, integrated and tested

Each Agile framework has a way of bringing feedback into its workstream

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Agile Teaming

Focus: respond quickly to feedback

Agile Principle

Learning over following a plan

KANBAN

Finish task and pull forward next work item

Uses work-in-progress (WIP) limits and cycle-time to manage flow of new development

Adapted from Toyota Production System

Each Agile framework has a way of bringing feedback into its workstream

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Agile Teaming

Focus: respond quickly to feedback

Agile Principle

Learning over following a plan

XP – Extreme Programming

Emphasizes technical excellence as a way to remain agile

Pair programming and code reviews are common methods

Frequent checkpoints - Allows for constant feedback on customer requirements

Each Agile framework has a way of bringing feedback into its workstream

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Practical Principles: Agile

Use release maps

Two pizza team model

Power of the demo

Find your agile center

1. Rip the Band-Aid off, but have mercy
2. Keeping it real…and small
3. Show something every sprint
4. Trap: Agile by the book

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DevOps

Focus: promote and enable fast feedback

DevOps Principles

Automate all things

○

Eliminate handoffs

○

Establish guardrails

All of these reduce cycle time and allow builders to focus on product, quickly deploying and collecting feedback

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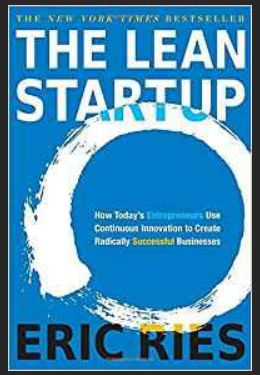
Putting the Pieces Together: Finding Organizational Flow

MVP

Minimum Viable Product: What is the smallest thing you can test to prove the unproven parts of your idea



Start with value hypothesis and growth hypothesis

Run small experiments to see if there is both value and demand

Bias towards many small tests vs. larger, extended ones

Persevere or pivot early based on results

"One accurate measurement is worth more than a thousand expert opinions."
-Admiral Grace Hopper

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Project, Product, or Business KPI?

Methods to manage your product/technology portfolio

PROJECT

Pre-defined requirements scope and schedule

Deliver what was planned

Measured by output

PRODUCT

Continuous Development

Customer defines roadmap

Measured by output & outcomes

BUSINESS OBJECTIVE

Maximize a strategic KPI

Types of KPIs: Minimize waste, increase conversion

Measured by outcomes

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Project, Product, or Business KPI?

	Project Team	Product Team	Objective Team
Scope	Defined set of requirements	Ongoing creation / enhancement of product	Business objective
Success	Milestone adherence	User satisfaction, marketing objectives	KPI
Timeframe	Defined beginning and end	Ongoing	Continuous evaluation of business case
Involvement	Implement requirements	Gather, implement feedback	Test, measure, repoeat
Tools	Gantt Chart	Roadmap	Impact Map/Dashboards

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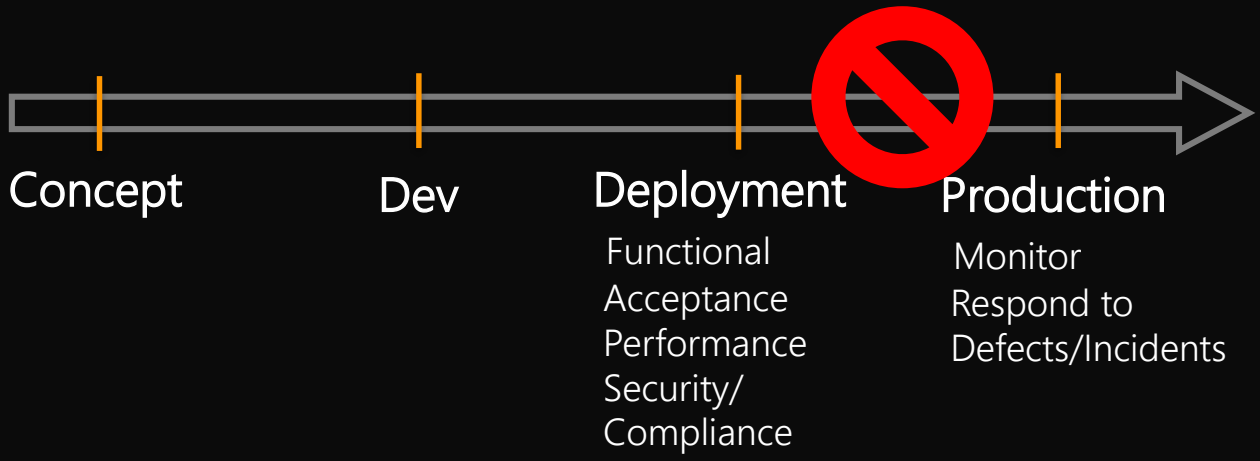
Typical Release Testing

Most Tests Occur Late In Process



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Always
Be
Testing

Continuous Testing

Concept

Hypothesis
A/B
MVP

Development

Functional
Acceptance
Performance
Security/Compliance

Production

Prod Testing
Chaos Engineering
User Testing Feedback

Deployment

Functional
Acceptance
Performance
Security/Compliance
Canary

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How Amazon Achieves Flow

Working Backwards
From the customer

Two Pizza Teams
Run what you build

Microservices
Speed and agility

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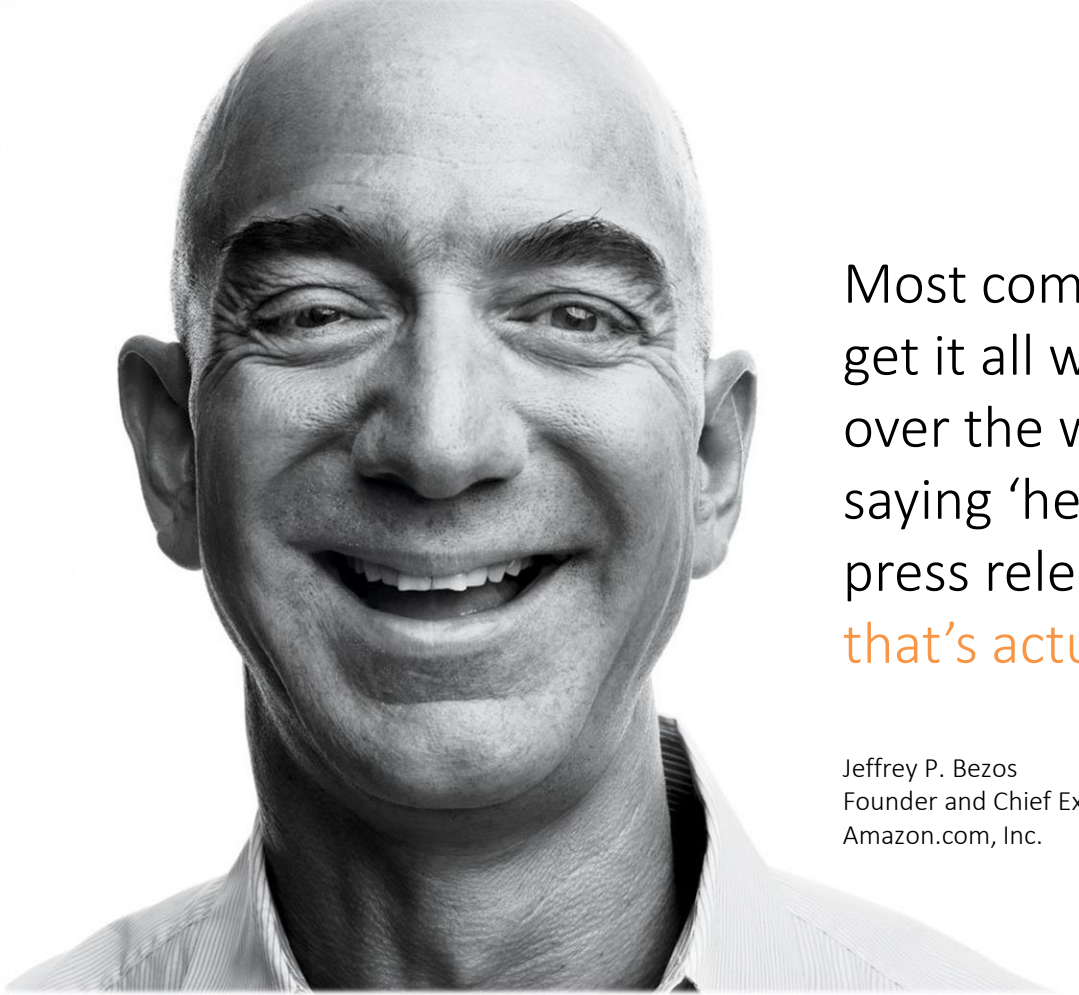
Working backwards from the customer

Write the Press Release: Think big and focus on the customer need

Write the FAQ: customer and internal stakeholder

Define the user interaction and write the manual



Most companies write the software, they get it all working, and then they throw it over the wall to the marketing department, saying ‘here is what we built, go write the press release.’ That process is the one that’s actually backwards.”

Jeffrey P. Bezos
Founder and Chief Executive Officer
Amazon.com, Inc.

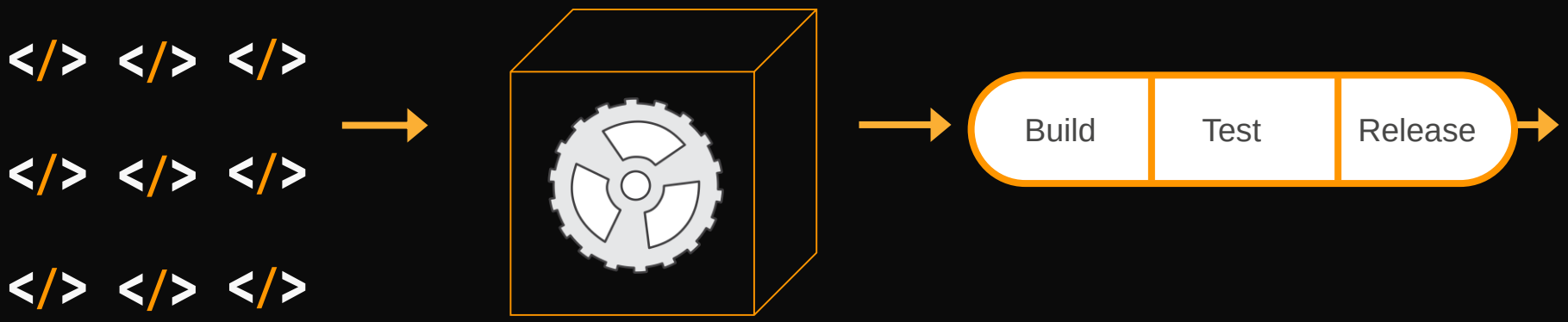
Amazon Achieves Speed and Agility with Two-Pizza Teams

Small, decentralized teams are nimble

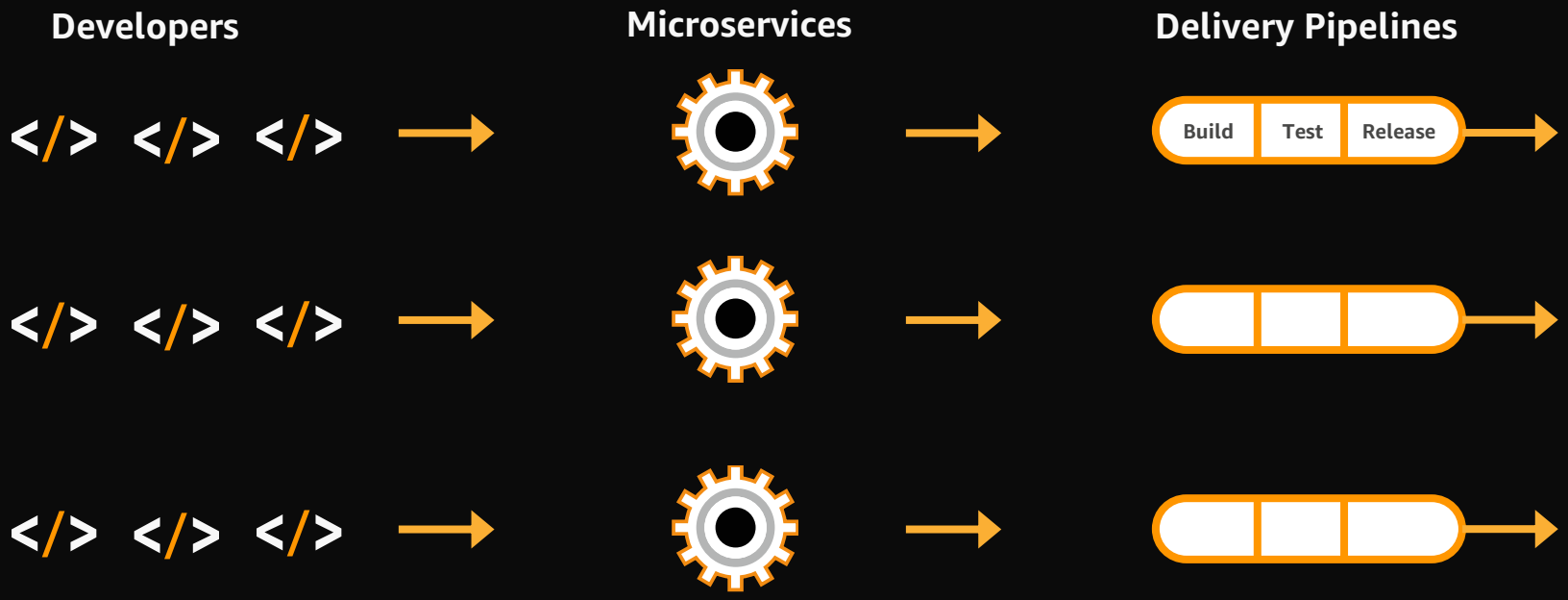
Own/run what you build

Monoliths: Slow and Rigid

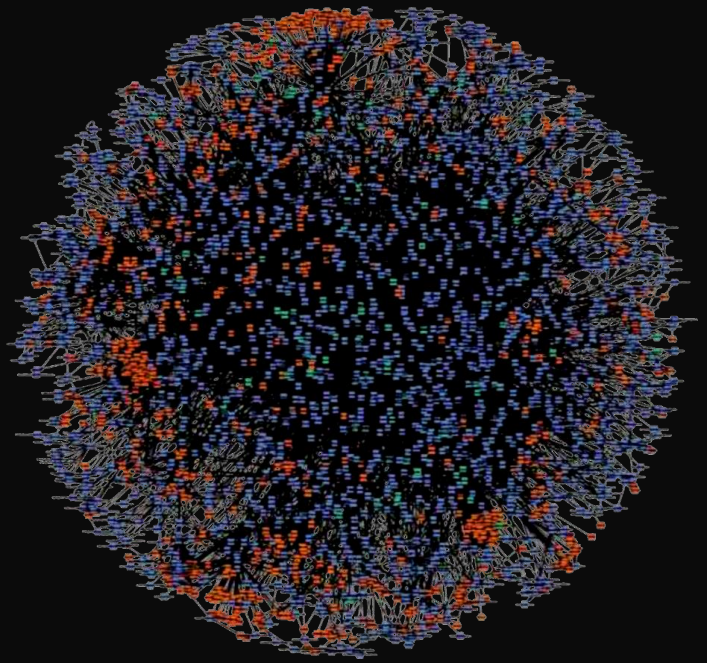
Developers **Monolithic Application** **Delivery Pipeline**



Microservices: Speed and Agility



Microservices Principles



Single Purpose

API-based

http://

Highly-decoupled

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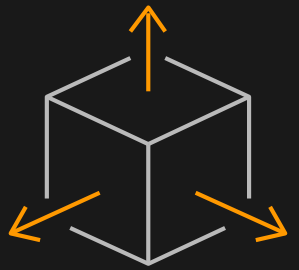
Impact of Cloud on Product Development

Reducing Cost of Failure

Rapid Adoption of New Capabilities



Quickly Scaling Winning Ideas

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Agero
Safe. Smart. Driven.

Reducing Time-to-Market for New Ideas

Agero created the MileUp app and used crash prediction models to speed up emergency response

Reducing Cost of Experimentation

Cloud enables quick testing of unproven concepts

Quick time to market: 8 weeks from conception to production

Continuous scale: seamlessly ramps up to peak traffic of 22K Concurrent Requests

Event driven architecture maximizes resource efficiency

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Devote More Resources to Customer Value

Mapbox adds location services to any application with mapping, navigation, and location search SDKs

Reducing Cost of New Development

Cloud reduces undifferentiated infrastructure focus

Productivity: Allowed developers to focus more on runtime functionality and less on infrastructure management

Cleaner separation of logging, metrics and security infrastructure from application code base

Cost: Spot instances and containers cut EC2 cost in half

C-SPAN

Cloud Native Architectures

Accelerates adoption and innovation of new capabilities

Rapid Adoption of New Capabilities

Rekognition use case: automated footage tagging

API access to advanced service capabilities

Built in three weeks

Index against 99,000 people

Saving 9,000 hours a year in labor

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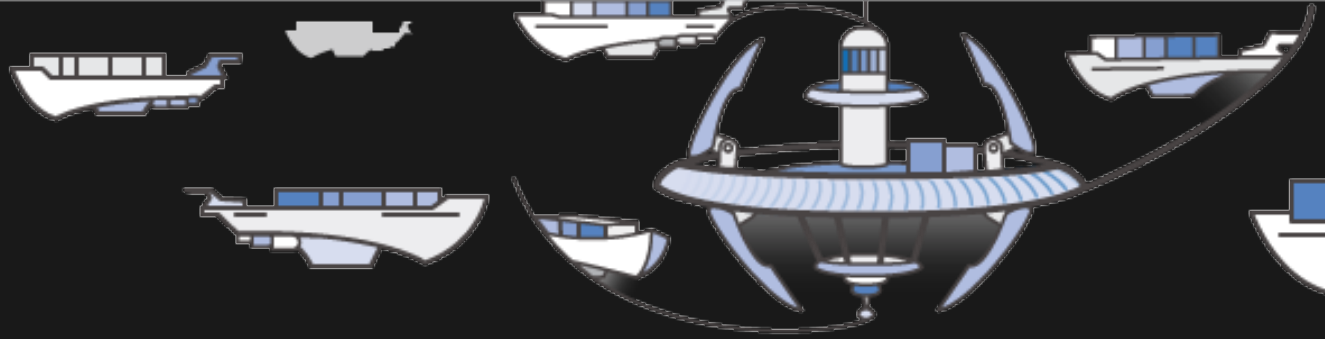

edmunds

App Container
Failure Prediction

Outcomes:
*Improved user experience
*95% reduction in on-call

Bad State Predictor Model

- Indicates which containers should be removed before failure
- App and system logs used to train model
- Developed by cloud team with no ML/DL experience

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Enterprises Are Achieving Massive Scale with Cloud Native Architectures

THOMSON REUTERS

processes **4,000 requests** per second

HEARST

reduced the time to ingest and process data for its analytics pipeline by **97%**

vevo

can handle spikes of **80x normal traffic**

processes **half a trillion** validations of stock trades daily

triggers **1.2 billion Lambda requests** each month

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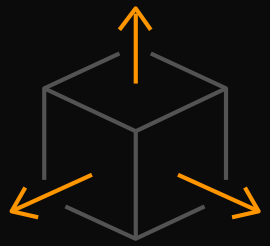
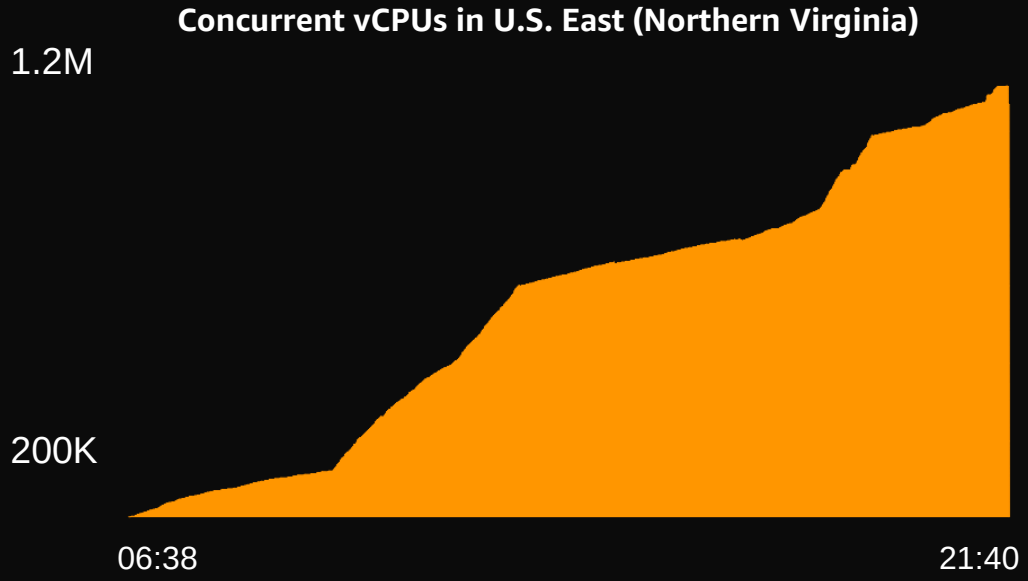


Develop New Ideas Without Limits

CLEMSON UNIVERSITY



Natural Language Processing on **1.1 million concurrent vCPUs** using EC2 Spot instances

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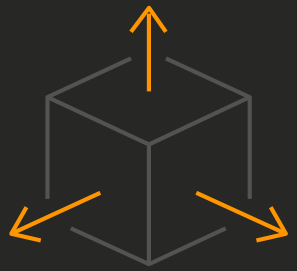
edico genome

FPGA World Record Genome Analysis



Quickly Scaling Winning Ideas

Cloud enables the massive scaling of big ideas

Immediate access to programmable hardware-acceleration using FPGAs at cloud scale

Utilized AWS Batch to provision and orchestrate compute jobs across 1,000 Amazon EC2 F1 instances

Compute infrastructure cost to analyze genome reduced to staggeringly low ~$3 per whole human genome

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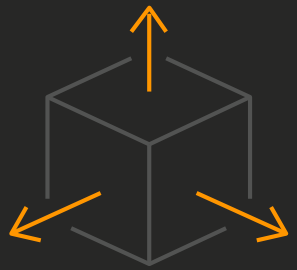
FICO™

Achieving Massive Scale Not Massive Cost

AWS Lambda serverless architecture enables the FICO Decision Management Suite (DMS) to perform computations on machine learning models quickly, cheaply, and efficiently



Quickly Scaling Winning Ideas

Serverless enables quick and agile product development

>95% decrease in overall deployment and operational costs

Scales up or down for variation in customer request volume

Migrating tasks to Lambda took only a few weeks

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Thank You!