
AWS
re:Invent

BLD201

Testing software and systems at Amazon

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AWS

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Testing software and systems at Amazon

What's different about Amazon?

It's still Day 1

Economics of automation and risk

Asking the right questions

Scaling experiments



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What's different about Amazon?



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What’s different about Amazon?

Scale

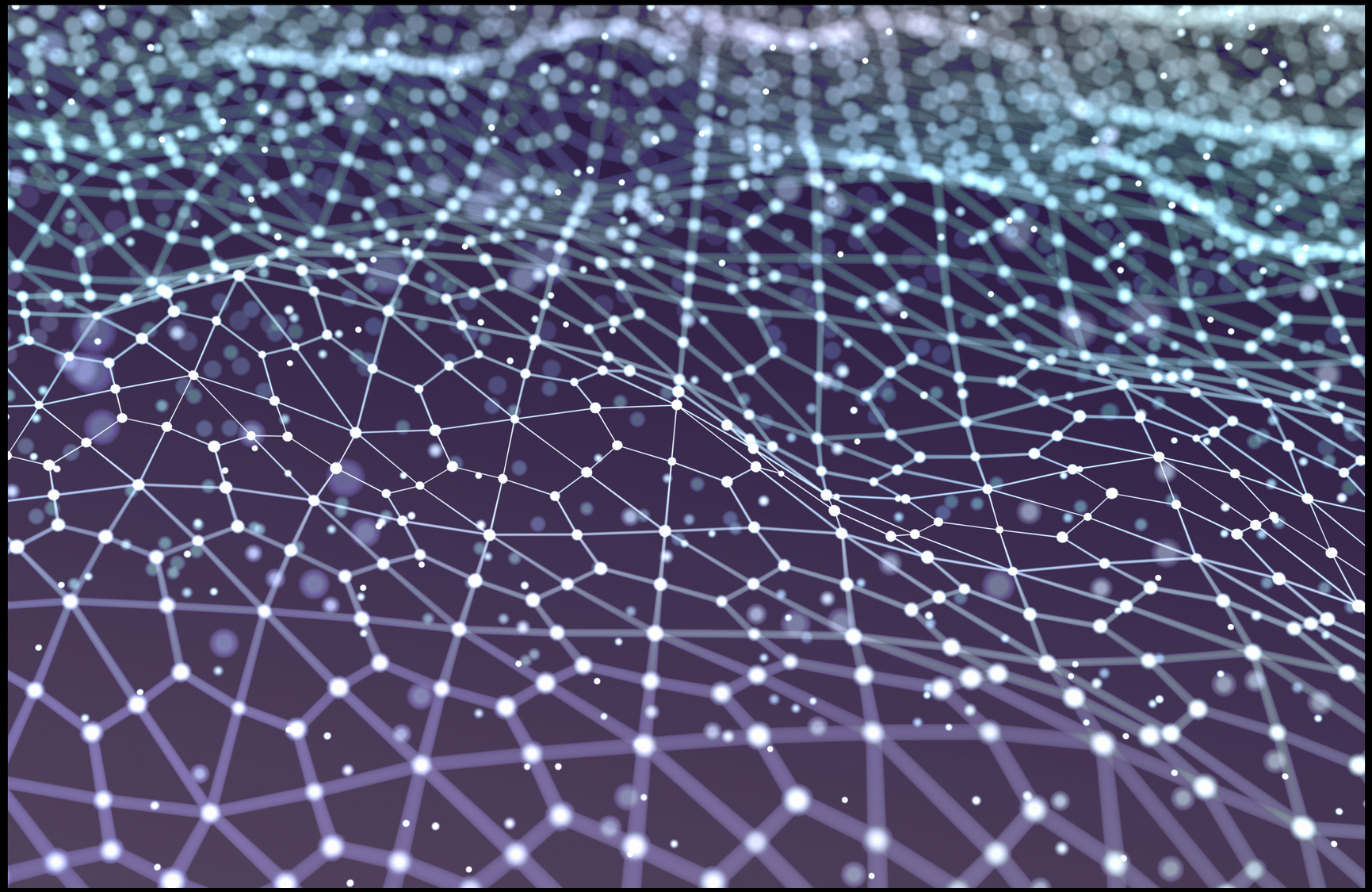
Product longevity

Innovation

Ownership



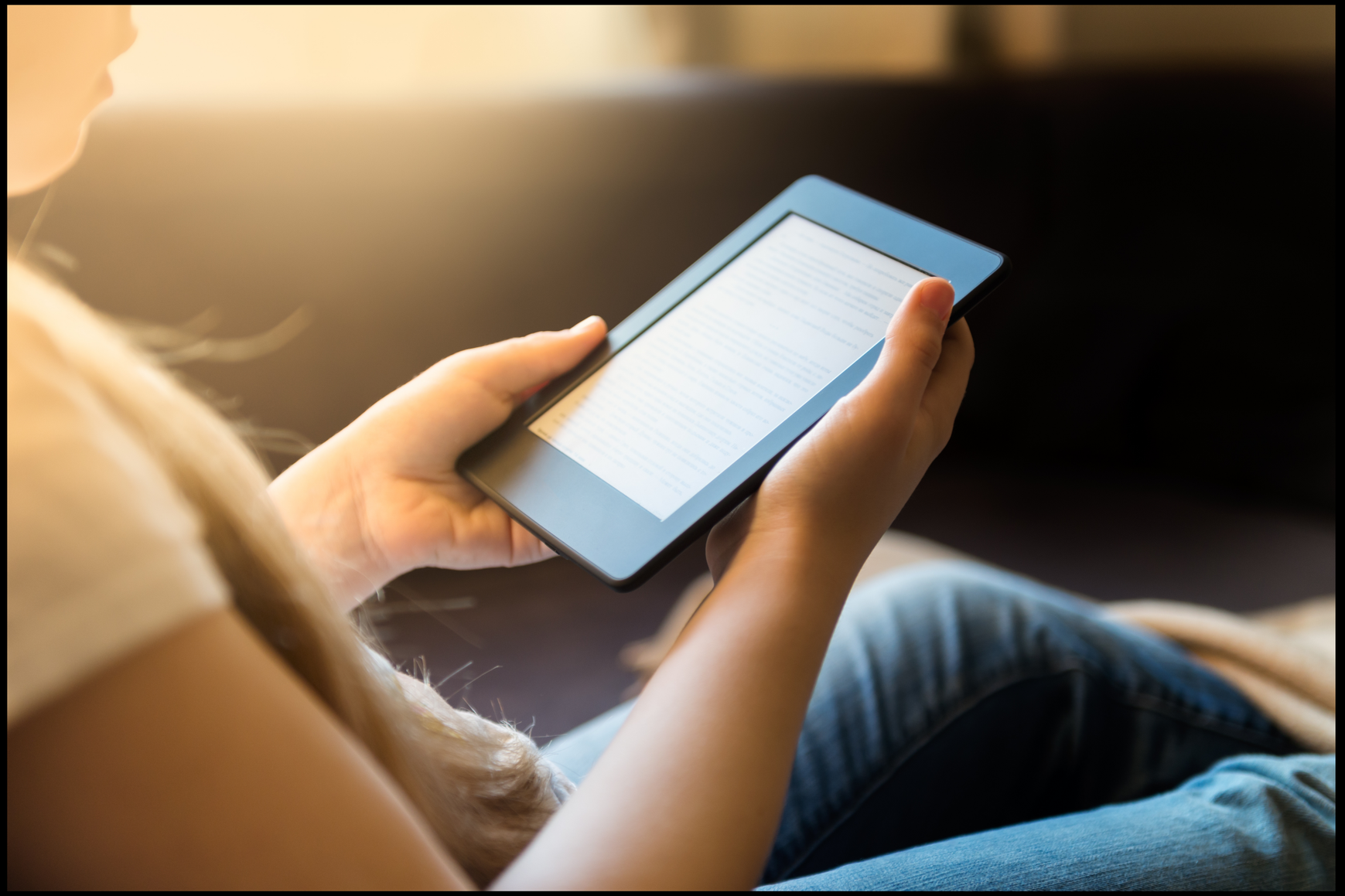
Scale



Product longevity



Innovation



Ownership



It’s still Day 1



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It’s still Day 1



It’s still Day 1

- Design phase for new product



It’s still Day 1

- Design phase for new product
- Feature releases



It’s still Day 1

- Design phase for new product
- Feature releases
- Operating and scaling



It’s still Day 1

- Design phase for new product
- Feature releases
- Operating and scaling
- Deprecating legacy system



Day 1

Testing Strategy = Asking Questions



Economics of automation and risk



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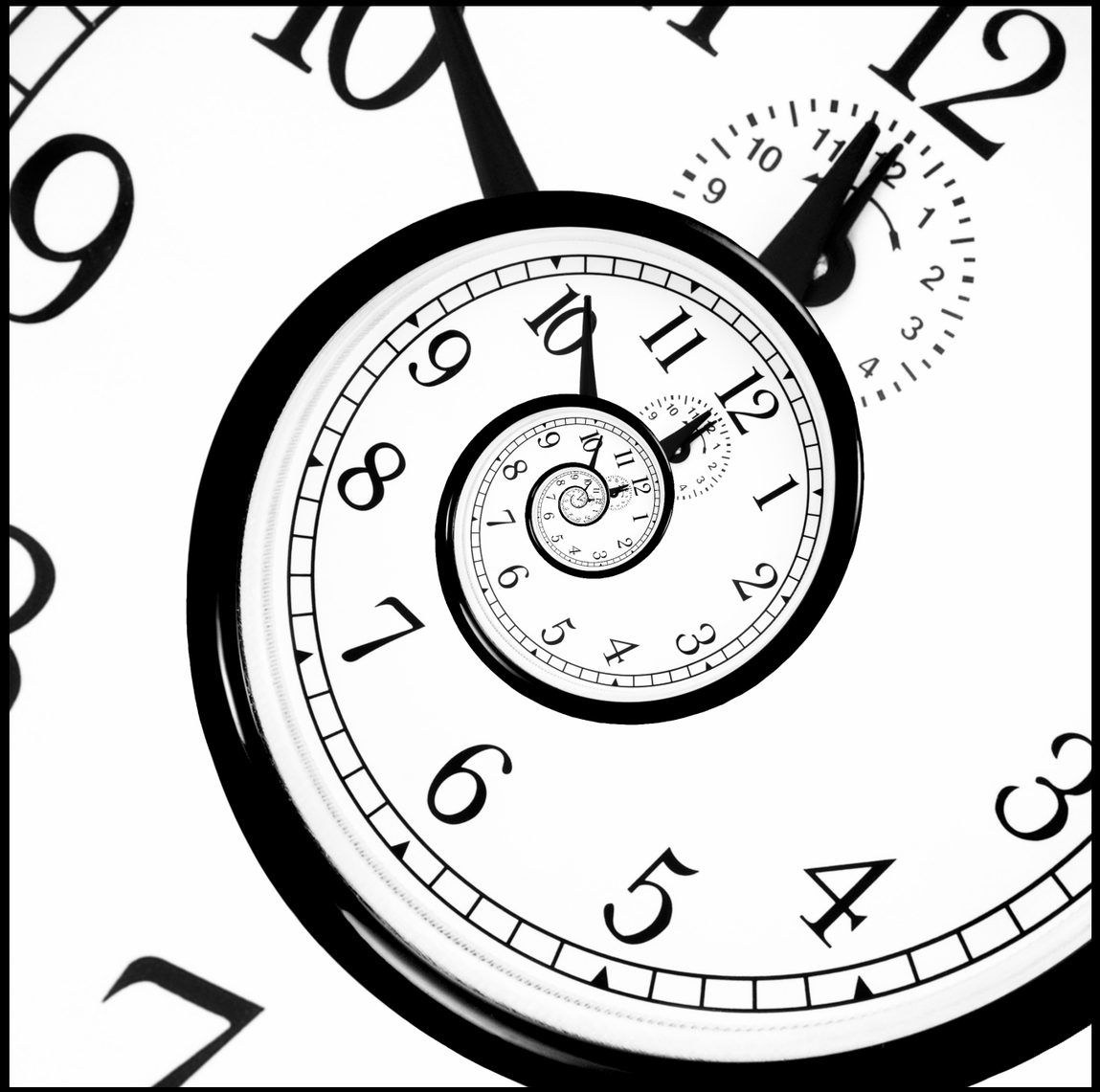
Economics of automation and risk



Money



Time



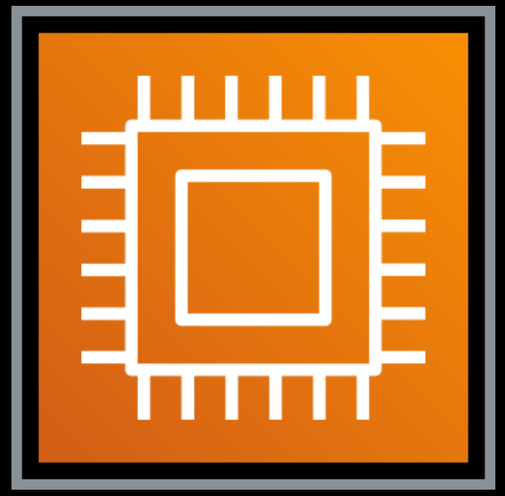
Humans



Customer trust



Less scarce



Compute



Networking



Storage

Testing goals

Fast feedback

Automatic execution

Repeatable

Cost of running tests approaches zero

Cost to find root causes of a defect approaches zero

Customer focused

Asking the right questions



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Developer environment





Developer environment

Are the unit tests effective?

Try mutation testing!

- Stryker
- PIT
- MutPy



Developer environment

Is local data representative?

- Data shape
- Size
- Feature utilization



Developer environment

What is the perceived performance?

- Use your eyes
- Beyond latency
- Video processing



Continuous integration / deployment

Are there enough stages?

- Stability tests first
- Add stages as complexity grows
- Slower tests to the end
- Flow toward higher confidence and less risk



Continuous integration / deployment

How fast to find root causes of test failure?

- Test a small number of commits
- Test when dependencies change
- Fewer workflow tests



Continuous integration / deployment

Do stages model production?

- Higher fidelity when approaching production
- Production dependencies
- Data size and shape
- Configuration



Continuous integration / deployment

What tooling can I use?

- AWS CodePipeline

Testing in production

Can I find a system failure faster than my customers?

- Continuously modeling customers
- Alarm if behavior changes



Testing in production

Will my system scale successfully?

- Production is reality
- Choose the time for system risk



Testing in production

Is my system resilient to unexpected events?

- Know what is likely to fail
- Model and inject
- Validate recovery strategy



Scaling experiments



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Scaling experiments

How will my system behave during this event / release?

How is my mental model different from my peers'?

Are runbooks, dashboards, and alarms effective?

The 3 AM test!



Scaling experiments

Model your customers

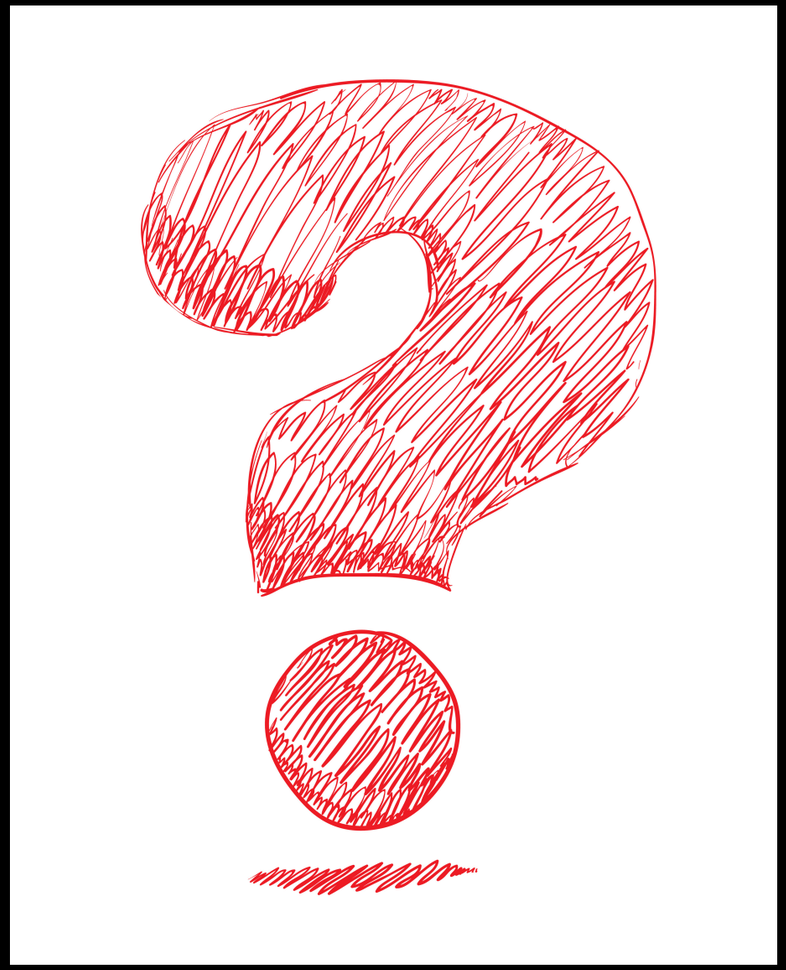
- Behavior (new features)
- Engagement
- Volume



Scaling experiments

Create hypotheses

- Be specific
- Verifiable
- It’s ok to be wrong
- Different mental models appear



Scaling experiments

How often were we wrong?



Scaling experiments

How often were we wrong?

40%

Scaling experiments

How to run an experiment

- Gather as a team
- Use your operational tooling
- Your product is constantly changing

Testing software and systems at Amazon

What questions are you trying to answer?



Thank you!

Charlie Roberts

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