6 CORE ELEMENTS OF CONTINUOUS TESTING

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SAUCELABS

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HIGHLIGHTS

WHY AM I HERE?

You are wondering what Continuous Testing is

- I will provide a precise definition of what I believe it is

You want to implement Continuous Testing, but not sure where to start

- I will outline 6 steps you can take to begin affecting change

You're not sure Continuous Testing is even a real thing!

- I will provide real world stories of teams that are achieving success with Continuous Testing right now!

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INTRO

WHO IS THIS LADY?

Product Marketing Manager at Sauce Labs

- Focused specifically on community enablement

I LOVE going to conferences

- Recovering Events Manager

- Meet new people, learn new trends, understand problems

I used to play a lot of softball

- Stanford University, NPF, Team USA

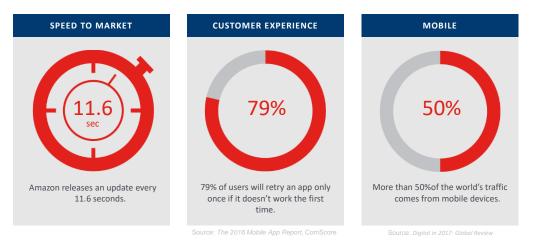- Big believer in team mentality, building CULTure

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THE SHIFT TO CI/CD

SPEED TO MARKET	CUSTOMER EXPERIENCE	MOBILE
11.6 sec	**79%**	**50%**
Amazon releases an update every 11.6 seconds.	79% of users will retry an app only once if it doesn't work the first time.	More than 50%of the world's traffic comes from mobile devices.
	Source: *The 2016 Mobile App Report*, ComScore	Source: *Digital in 2017: Global Review*

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TESTING MUST TRANSFORM TO KEEP UP

LEGACY TESTING IS SLOW, EXPENSIVE AND LAGS DEV

CONTINUOUS
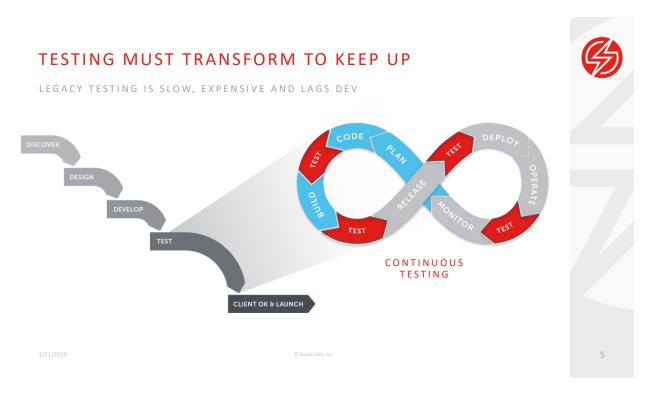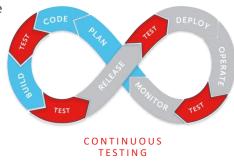TESTING

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WHAT IS CONTINUOUS TESTING?

Test.AllTheThings()

- Best practice approach of executing tests throughout the software development lifecycle

- Benefits

  - Real-time feedback

  - Earlier bug detection

  - Improved app quality

CONTINUOUS
TESTING

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ACHIEVING CONTINUOUS TESTING

6 CORE ELEMENTS

Commitment to Quality

Test at Every Stage

Use Expertise to Automate

Comprehensive Coverage

Scale On Demand

Visibility and Analytics

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CULTURAL COMMITMENT TO QUALITY

CONTINUOUS TESTING SUCCEEDS WHEN EVERYONE OWNS QUALITY

Dev/QA siloes > now working together

Test cases outlined before development begins

- Ensure code is optimized for test automation

Considerations

- Teams need to be trained to work together and adopt new practices
- Access to tools across distributed teams
- Visibility into pipeline
- Collaboration tools (e.g. Slack, HipChat etc.)

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WALMART LABS

QUALITY BECOMES A STRATEGIC ENABLER

Jeremy King (EVP & CTO) realized quality is imperative to achieving goals

- Create the world's leading retail platform

- Increase operating efficiencies while decreasing costs

- Ensure associates have access to secure digital solutions that empower them to excel

Quality tied directly to these business drivers – creation of central team

- Running 100,000 tests per day

- Improved app quality while saving 750,000+ hours in testing time
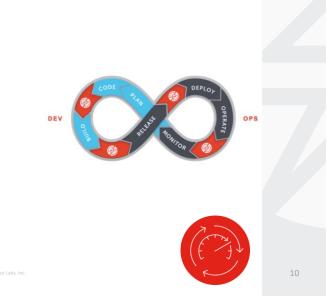
Walmart Labs

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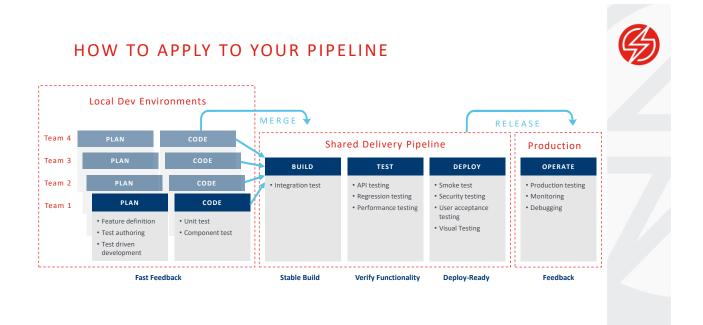# TESTING AT EVERY STAGE

TESTS ARE THE "GATES" OF DEVELOPMENT

Ensures code works when changes are introduced

Catches bugs sooner

Considerations

- Speed
- Reliable infrastructure
- Which tests acts as gates, and when?

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HOW TO APPLY TO YOUR PIPELINE

Local Dev Environments

	PLAN	CODE
Team 4	PLAN	CODE
Team 3	PLAN	CODE
Team 2	PLAN	CODE
Team 1	PLAN	CODE

MERGE

RELEASE

Shared Delivery Pipeline

Production

BUILD	TEST	DEPLOY	OPERATE
• Integration test	• API testing • Regression testing • Performance testing	• Smoke test • Security testing • User acceptance testing • Visual Testing	• Production testing • Monitoring • Debugging

Team 1 PLAN:
• Feature definition
• Test authoring
• Test driven development

Team 1 CODE:
• Unit test
• Component test

Fast Feedback — **Stable Build** — **Verify Functionality** — **Deploy-Ready** — **Feedback**

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CONTINUOUS TESTING ≠ AUTOMATED TESTING

- It's about applying the right level of automation

- Different parts of the pipeline require different types of testing

- Even manual testing has a place in CT practices

- Automation makes sense in places where developers/testers waste the most time

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UNIT TESTING

- Test a single behavior in isolation

- Small tests, run on a few platforms

- Fast feedback on whether code works

- Any failures are isolated > easier to debug/fix

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INTEGRATION TESTING

- Merge single features into shared pipeline

- Ensure build stability

- Run on more platforms, often in parallel

- "Pull request tests"
    - Confirm new features work as expected
    - Doesn't break existing functionality

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AUTOMATED E2E REGRESSION TESTING

- Ensure entire system works as expected

- No dependencies or environment-related issues

- Full suite of tests, on all platforms, in parallel

- Deploy ready

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PRODUCTION TESTING

- Testing after release – monitor/debug

- Checking business critical features
    - Login
    - Checkout process

- Target relevant platforms

- Alert team to issues before they become major

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EXPLORATORY AND LIVE TESTING

Live (aka manual) still needed

Human creativity a requirement for good testing

- User experience testing
- Dream up ways to break your apps

Automation is best for tasks that are

- Well defined
- Repetitive

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USE EXPERTISE TO BUILD OUT AUTOMATION

AUTOMATED TESTING IS KEY TO CONTINUOUS TESTING

Legacy testing = slow, lags development

Just manual testing doesn't allow for scalability

- Wastes time on repetitive, parallel checks of expected behaviors

Organizations moving away from "automate the manual tests" approach

Automating from the outset is the future

- Leverage intelligent frameworks (Selenium, Appium, and others)

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RECORD AND PLAYBACK

IT'S A TRAP!

Easy way to get started
- Help team members feel productive

Simply not scalable
- Creates brittle tests
- Cannot scale as automation grows

Gaps must be filled in with training

Test automation = software development

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TEST EXECUTION PLATFORM WITH COMPREHENSIVE COVERAGE
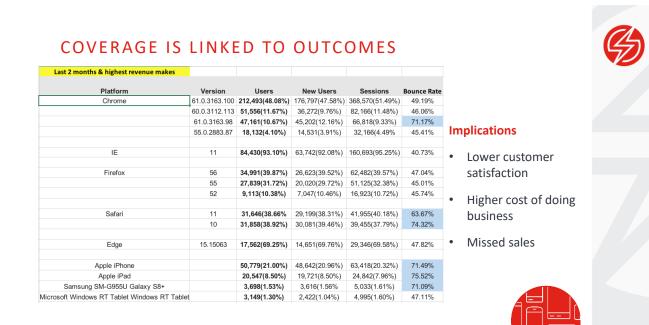
COVER EVERY BROWSER/OS/DEVICE

Ensure digital experience is the same for all of your users

Ability to reproduce bugs in any environment

Not only coverage, but flexibility
- Desktop
- Emulator/Simulator
- Real devices

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COVERAGE IS LINKED TO OUTCOMES

Last 2 months & highest revenue makes					
Platform	**Version**	**Users**	**New Users**	**Sessions**	**Bounce Rate**
Chrome	61.0.3163.100	212,493(48.08%)	176,797(47.58%)	368,570(51.49%)	49.19%
	60.0.3112.113	51,556(11.67%)	36,272(9.76%)	82,166(11.48%)	46.06%
	61.0.3163.98	47,161(10.67%)	45,202(12.16%)	66,818(9.33%)	71.17%
	55.0.2883.87	18,132(4.10%)	14,531(3.91%)	32,166(4.49%)	45.41%
IE	11	84,430(93.10%)	63,742(92.08%)	160,693(95.25%)	40.73%
Firefox	56	34,991(39.87%)	26,623(39.52%)	62,482(39.57%)	47.04%
	55	27,839(31.72%)	20,020(29.72%)	51,125(32.38%)	45.01%
	52	9,113(10.38%)	7,047(10.46%)	16,923(10.72%)	45.74%
Safari	11	31,646(38.66%)	29,199(38.31%)	41,955(40.18%)	63.67%
	10	31,858(38.92%)	30,081(39.46%)	39,455(37.79%)	74.32%
Edge	15.15063	17,562(69.25%)	14,651(69.76%)	29,346(69.58%)	47.82%
Apple iPhone		50,779(21.00%)	48,642(20.96%)	63,418(20.32%)	71.49%
Apple iPad		20,547(8.50%)	19,721(8.50%)	24,842(7.96%)	75.52%
Samsung SM-G955U Galaxy S8+		3,698(1.53%)	3,616(1.56%)	5,033(1.61%)	71.09%
Microsoft Windows RT Tablet Windows RT Tablet		3,149(1.30%)	2,422(1.04%)	4,995(1.60%)	47.11%

Implications

- Lower customer satisfaction
- Higher cost of doing business
- Missed sales

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SCALE INFRASTRUCTURE INSTANTLY

INCREASE RELEASE VELOCITY

As testing/automation increases across the pipeline, infrastructure must scale with it

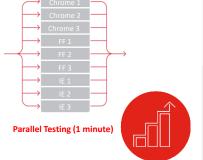Internal reasons

- Building out automation
- Adding new features

External reasons

- Peak season (i.e. Black Friday)
- Increasing coverage for new OS, browser, etc.

Speed testing cycles with parallel testing

- Increases velocity on average by 10x

Serial Testing (9 minutes)

Parallel Testing (1 minute)

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CAMPUS EXPLORER

INCREASE PRODUCTIVITY, REDUCE COSTS

Serial testing done at end of SLDC > 72 hour test run time!

Automating tests with Selenium allowed for parallel testing

- Running tests across 70 virtual machines (various browsers/OSs)

- Test run time = 72 minutes (98% time savings)

- Enabled to run tests multiple times/day, throughout the SLDC

- Higher ROI on developer productivity, trust in automation, job satisfaction

CAMPUS EXPLORER

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VISIBILITY AND ANALYTICS

TO GET WHERE YOU GOING, SEE WHERE YOU'VE BEEN

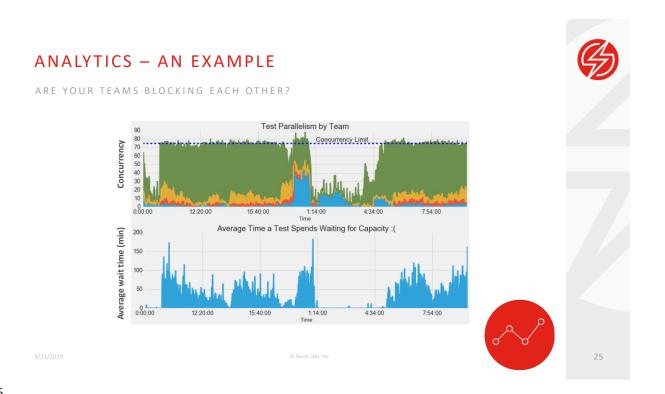Understand how tests are performing at every level
- Identify bottlenecks
- Understand trends
- Catch issues faster
- Share best practices across teams

Make data driven decisions to increase quality and speed releases

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ANALYTICS – AN EXAMPLE

ARE YOUR TEAMS BLOCKING EACH OTHER?

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ACHIEVING CONTINUOUS TESTING

RECAP

Commitment to Quality

Test at Every Stage

Use Expertise to Automate

Comprehensive Coverage

Scale On Demand

Visibility and Analytics

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THE AMAZON EXAMPLE

EVERY 11 SECONDS?!

- How they do it
    - Buy in from all teams on the importance of testing
    - Test all integration points
    - Automate testing of production code
- Starting with core elements, results are achievable

11.6 sec

Amazon releases an update every 11.6 seconds.

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THANK YOU

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