



# Walmart Labs

CD: Solving the talent problem

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Save money. Live better.



**2.3 million**  
associates



**250 million**  
customers a  
week



**\$485.9 billion**  
sales



**11,000 stores**  
28 countries



**eCommerce**  
11 countries

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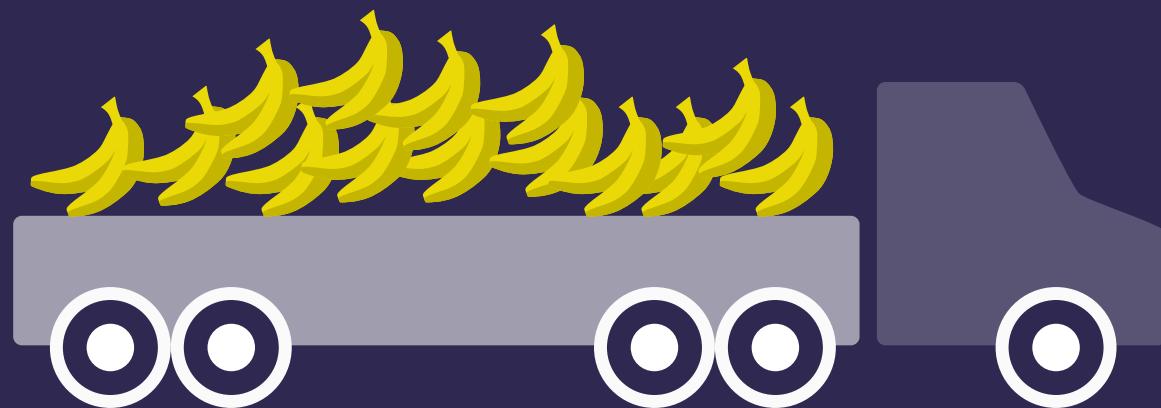
# Distribution Systems

200+ Distribution Centers

Over 3 million cases an hour



**1 billion lbs of bananas a year**



## Management Challenge

*We need to deploy every two weeks  
with no outages!*



2014

Multi-million line monolithic WMS

Infrequent releases

Long duration installs

Inconsistent deployment targets

Weeks to months to level changes

**Micro-service architecture**

**Deployable on demand**

**No outages for application changes**

**Containerized deployment**

**Leveling in hours**

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# Challenges we faced

01 Extended Cycle Times

02 Overwhelming Instability

03 Jenga Architecture

01

## Extended Cycle Times

Unable to respond quickly to business needs

Organizational silos



# Experiments

Purchased deployment tooling

Modernized product tech stack

Leveraged relationships to  
bypass silos



# What worked

~~Purchased deployment tooling~~

Modernized product tech stack

Leveraged relationships to bypass silos

CI as a lever for change

## Continuous Integration Working Agreement

- Master is always deployable
- We only push tested code
- All changes go to master daily
- Broken builds are highest priority
- We won't go home with a broken build



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## 01 Takeaways

Tools don't solve problems, they enable problem solvers

Define terms in *measurable* ways

Shorter cycles allow increased engagement with the users

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02

## Overwhelming Instability



Multiple paths to production

Timelines prioritized over quality

Support burden impacting feature delivery

# Experiments

Single, automated path to production

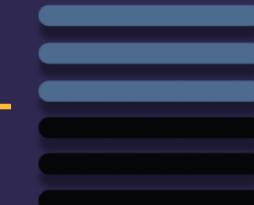
Custom:

Config management

Target management

Deploy tooling

Test coverage as the definition of quality



# What worked

Single, automated path to production

Custom:

Config management

Target management

Deploy tooling

~~Test coverage as the definition of quality~~

Testing as a culture



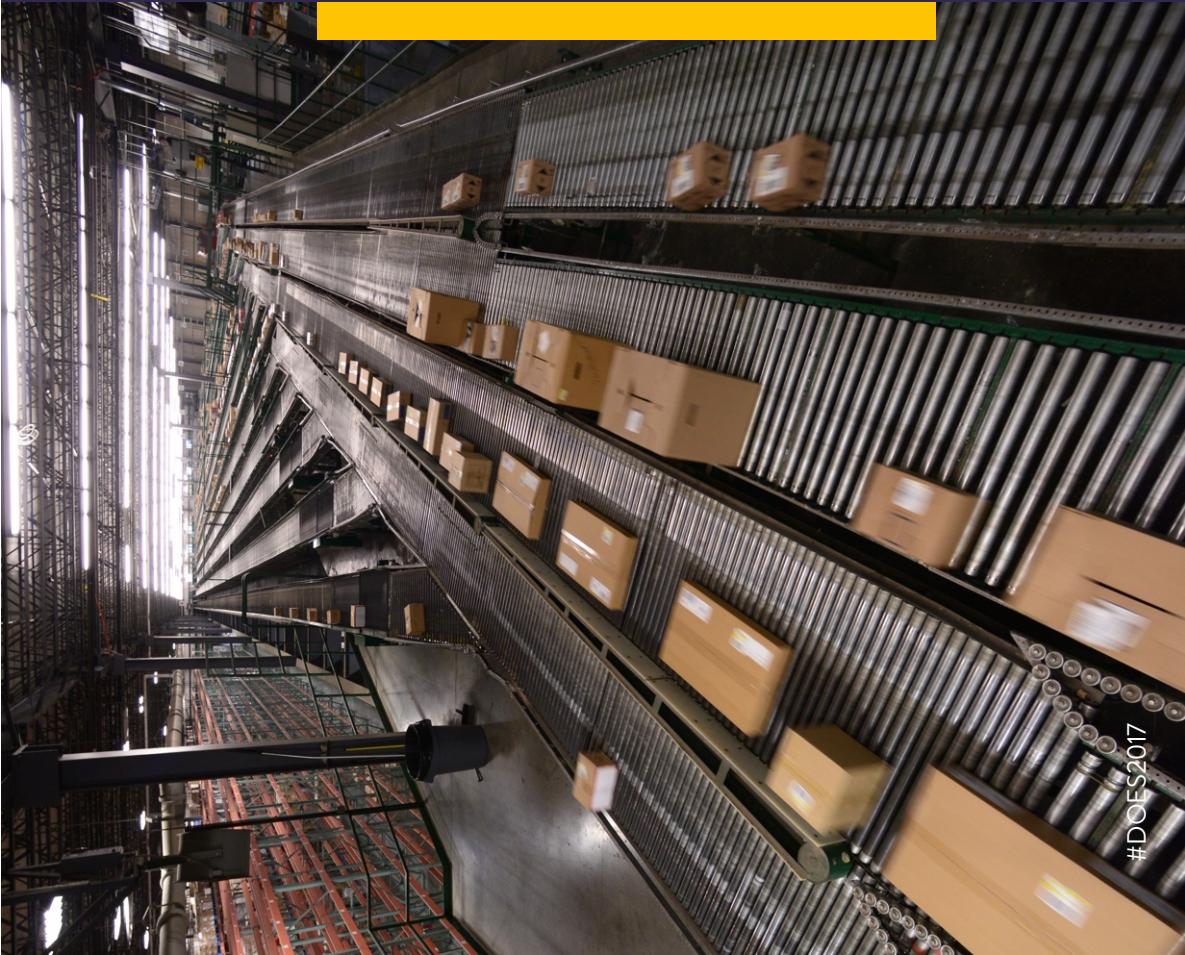
# 02 Takeaways

Quality is complex and should be measured accordingly

- Coverage trends
- Deploys/Days/Developer
- Defect penetration
- MTTR

Sell and teach the benefits of testing

Automation creates guardrails around innovation; injects **FUN**



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# 03 Jenga Architecture



Massively entangled monolith

No logical separation of business capabilities

Changes caused unexpected outcomes in unrelated capabilities

# Experiments

Domain driven design

Teams aligned to product domains

Application architects on product teams



Audit



Invoicing



Planning



Order  
Filling



Inventory



Receiving



Merchandise  
Movement



Order  
Processing



Loading



## 03 Takeaways

Domain refactoring is a way of life

Build to split

Product mindset creates a sense of pride

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# What does this have to do with talent?



## What we found

We stopped dreading modifying our code

We started solving bigger problems

We weren't afraid of production

We believed in what we were doing

We were happier

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We love development again

# Shout Out



ABOUT US

code better

TOPICS ▾ EVENTS

Walmart Will Manage 200-Plus Distribution Centers With OneOps, Jenkins, Nexus and Kubernetes

f t in s

BY: PATRICK DOLAN AND SUYOG BARVE  
October 26, 2016

 developer's corner

One of the key competitive advantages of Walmart Logistics over the decades has been keeping its distribution centers running as efficiently and autonomously as possible. That autonomy extends to the very hardware and software infrastructure running within these facilities — more than 200 worldwide — as each location contains what could be viewed as

Kubernetes  
@kubernetesio

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Push through the pain!



Problems we're still trying to figure out...



## Stakeholder alignment

# Presentation Collaborators



**Brent**

R & D, Dev



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Chief Slack Reaction  
Officer, Dev



**Bryan**

App Architecture, Dev



**Nathan**

Automation, Dev