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# Driving a Tech-led Reimagination of eBay through DevOps

October, 2021  
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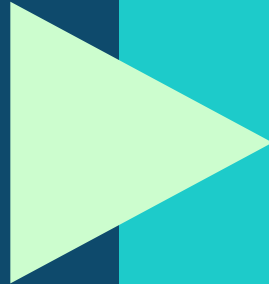


# Problem Statement

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*Our mission is to  
make eBay's  
software delivery  
velocity a key  
competitive  
advantage*

# Why We Are Here?

- 1 **Systemic challenges across the company**
- 2 **No single silver bullet; it involves people, process, and technology**
- 3 **Many companies have successfully navigated this journey**



# Intros

# Organization and Leadership

## VP Product Engineering

- Right hand to CPO
- Stores Product Team
- Mobile Fundamentals
- Planning team

## Chief Architect

- Platform and Dev Experience
- Stable of Enabling Architects
- Architecture Standards
- PMO

## Shamelessly Exploit Our Roles to

- Reframe and Reprioritize
- Connect and Unblock
- Encourage and Permit
- Suggest and Mandate



# Assessment

# Product Life Cycle: *Idea* $\Rightarrow$ *Customer Value*



Idea  $\Rightarrow$  Project

Project  $\Rightarrow$  Code

Code  $\Rightarrow$  Deploy

Deploy  $\Rightarrow$  Value



# Product Life Cycle: *Idea* $\Rightarrow$ *Customer Value*



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**Project  $\Rightarrow$  Code**

**Code  $\Rightarrow$  Deploy**

**Deploy  $\Rightarrow$  Value**

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- \* Dependencies
- \* Too Much WIP

# Product Life Cycle: *Idea* $\Rightarrow$ *Customer Value*



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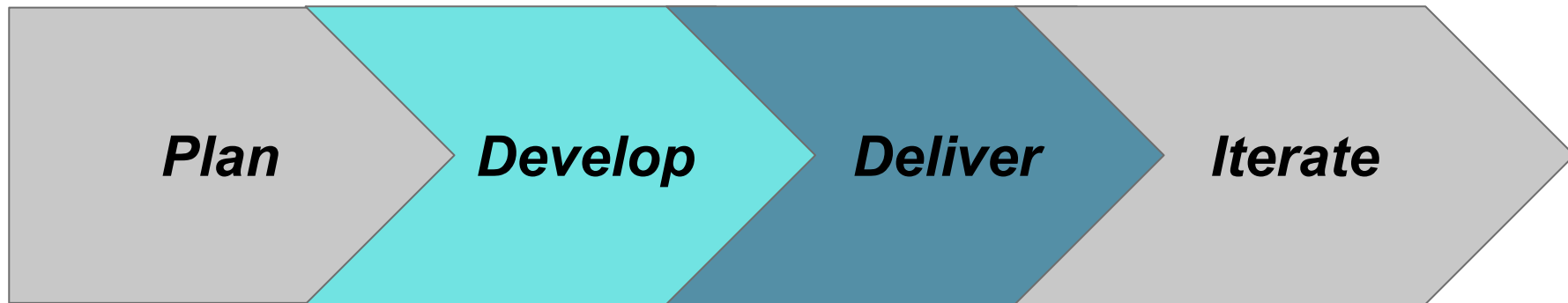
## **Project $\Rightarrow$ Code**

- \* Build and Test Time
- \* Context Switching and Wait States
- \* Coupled Architecture
- \* No Service Contracts
- \* Hidden Work

## **Code $\Rightarrow$ Deploy**

## **Deploy $\Rightarrow$ Value**

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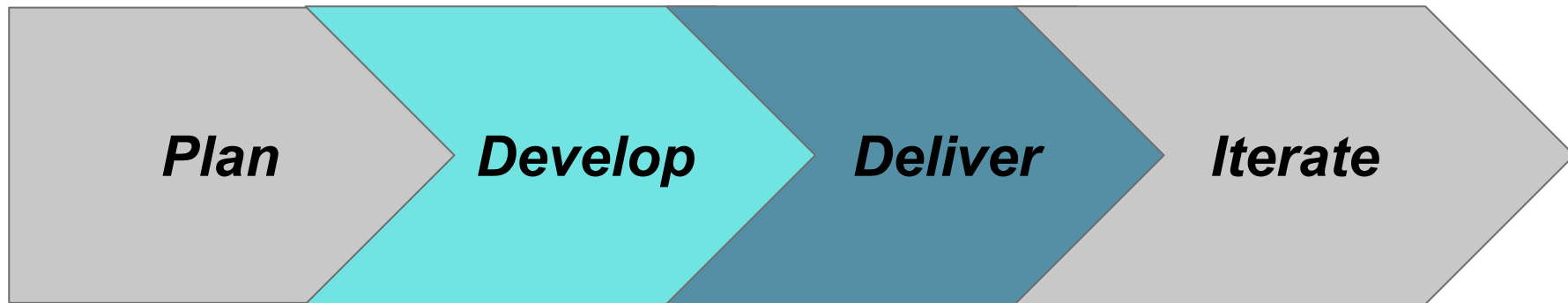
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- \* Staging issues
- \* Manual Testing
- \* No Automated Rollout
- \* No Canary Deploys
- \* Feature Flags

## **Deploy $\Rightarrow$ Value**

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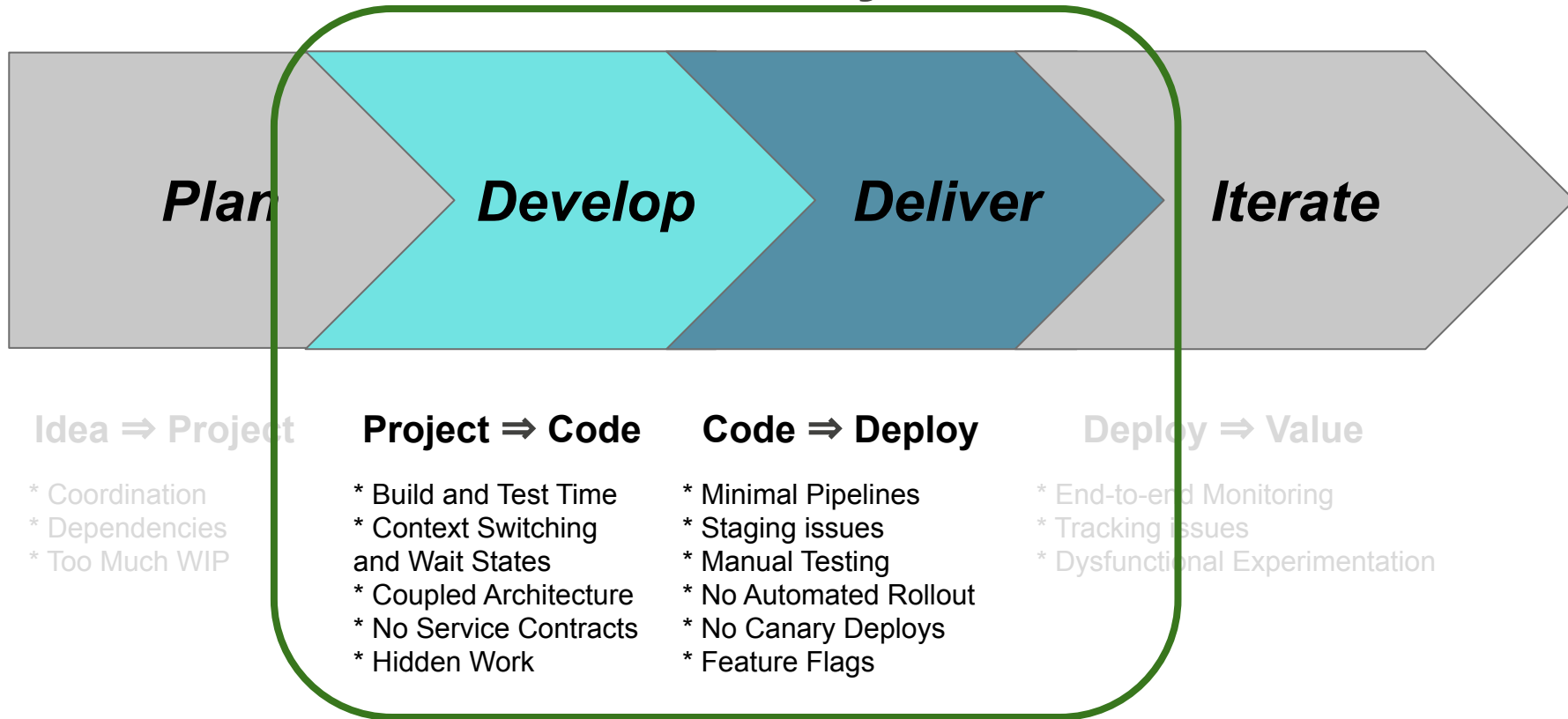
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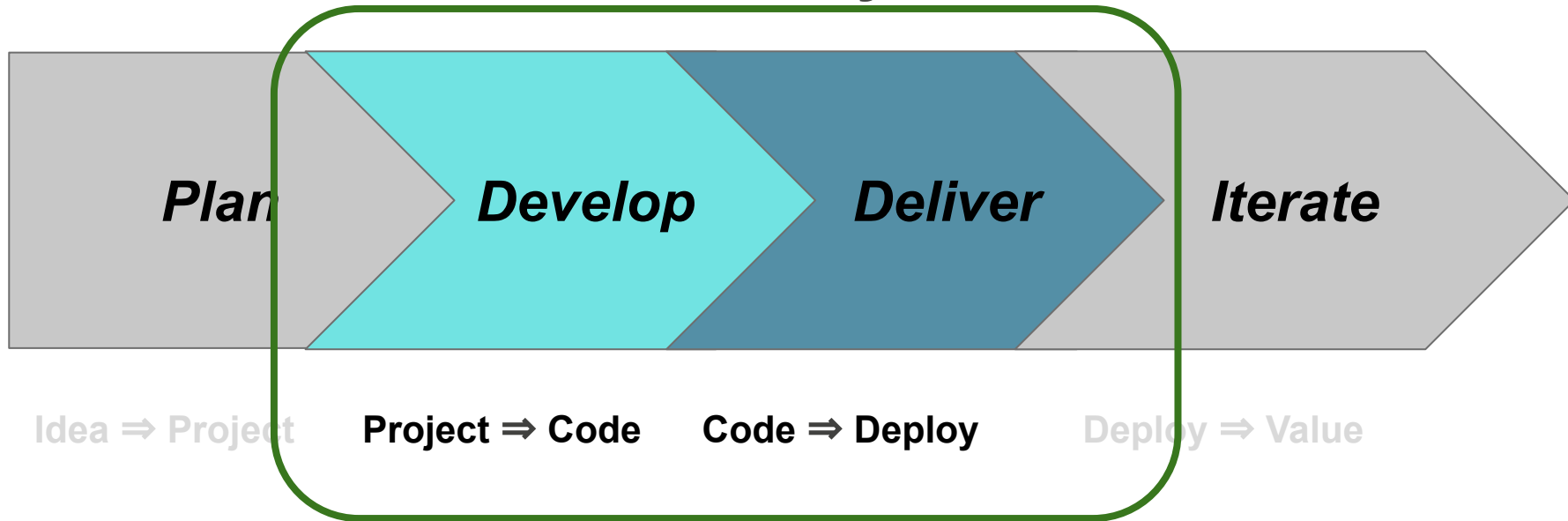
## **Deploy $\Rightarrow$ Value**

- \* End-to-end Monitoring
- \* Tracking issues
- \* Dysfunctional Experimentation

# Focus on Software Delivery



# Focus on Software Delivery



*Improving Software Delivery makes everything else possible by **enabling faster change and reducing cost of change***



# Measuring Success

# The Four Key Metrics: eBay

Aspect of Software Delivery Performance*	Elite	High	Medium	Low
<b>Deployment frequency</b> For the primary application or service you work on, how often does your organization deploy code to production or release it to end users?	On-demand (multiple deploys per day)	Between once per day and once per week	Between once per week and once per month	Between once per month and once every six months
<b>Lead time for changes</b> For the primary application or service you work on, what is your lead time for changes (i.e., how long does it take to go from code committed to code successfully running in production)?	Less than one day	Between one day and one week	Between one week and one month	Between one month and six months
<b>Time to restore service</b> For the primary application or service you work on, how long does it generally take to restore service when a service incident or a defect that impacts users occurs (e.g., unplanned outage or service impairment)?	Less than one hour	Less than one day <sup>a</sup>	Less than one day <sup>a</sup>	Between one week and one month
<b>Change failure rate</b> For the primary application or service you work on, what percentage of changes to production or released to users result in degraded service (e.g., lead to service impairment or service outage) and subsequently require remediation (e.g., require a hotfix, rollback, fix forward, patch)?	0-15% <sup>b,c</sup>	0-15% <sup>b,d</sup>	0-15% <sup>c,d</sup>	46-60%



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# Velocity Initiative

# Think Big, Start Small, Learn Fast



## Focus on select

- Pilot Domains
- Pilot Applications
- Platform Tracks



**Deliver short term wins  
and long term  
capabilities**



## Drive improvements in

- Developer Productivity
- Software Delivery
- Instrumentation and Monitoring



**Re-architect critical  
areas like View Item and  
Mobile**

# Platform Tracks and Pilot Domains

## Platform Tracks

- Measuring Velocity
- Developer Productivity
- Build and Startup Time
- Local Testing
- Continuous Integration
- Staging Environment
- Traffic Mirroring
- Deployment Automation
- Training and Workshops

## Pilot Domains

- Selling
- Structured Data
- View Item
- Search
- Payments
- Shipping
- Stores
- Ads
- Mobile

# How We Work

## Collaborate

- Cross-functional Leadership
- Embedding model
- Platform and Pilot teams work together

## Communicate

- Daily leadership standups
- Weekly Team-of-Teams meeting
- Weekly Deep Dives with teams
- Monthly Operating Review

## Measure

- Dashboard with Four Key Metrics
- Granular pipeline visibility
- Input Metrics for each Track

## Iterate

- Remove impediments to flow
- Tight *Plan-Do-Check-Act* cycles
- Stop effort if no improvement

## Educate

- Training and Workshops

# Velocity Initiative - Q3 2021 Results

## Doubled Productivity of Velocity Pilot Teams

*Holding team size constant, teams report they deliver >2x the features*

- Pilot teams are 10% of actively-developed apps
- Deployment Frequency improved 3x
- Lead Time improved 2.5x
- Change Failure Rate improved 3x

## What We Did

- Accelerate metrics for every app
- Focused on removing bottlenecks
- Reduced build, startup and PR validation times
- Invested heavily in Staging
- Automated upgrades, testing, deployment, Site Speed, etc.
- Streamlined team processes, code reviews, “Partner Signoffs”
- Moved to weekly mobile releases

# Culture and Behavior (“*Second-Order Effects*”)

## Excitement and Fun

- Regular weekly progress on input metrics
- Teams inspiring each other to improve
- Teams have forced their way in (!)

## Collaboration

- Psychologically safe to highlight impediments outside team
- Partner with Security, SOX, Accessibility, Localization, etc.

## Community and Sharing

- Teams automating their own workflows (performance testing, “Partner Signoffs”)
- Sharing tools and learnings with each other

## Executive Support and Engagement

- CEO highlights at All-Hands, exec meetings
- *“The most important initiative at the company. Go faster!”*

# Current Challenges

## Program Outcomes

- Improving team-level outputs, not overall eBay outcomes

## Initiative Team

- Under-resourced platform teams
- Ensuring product team resource commitments
- Led by QE, not Development
- Overtaxed individual leaders

## VPs and Directors

- Arguing about the metrics instead of improving the practices
  - *“Adding new apps makes the metrics worse”*
- Fear of failure and consequences
  - *“Going too fast caused this bug”*
- Lack of belief in program approach
  - *“Validating quality slows us down; let’s stop doing that”*





# Future

# Product Life Cycle: *Future State*



## **Idea ⇒ Project**

- \* Rolling Planning
- \* Many small, cheap experiments
- \* Double down with big projects

## **Project ⇒ Code**

- \* Small batch sizes
- \* Fast build and test iteration
- \* Daily merge / deploy
- \* Decoupled arch

## **Code ⇒ Deploy**

- \* 1 hour commit to deploy
- \* Fully automated test and deployment pipeline
- \* Iterate in production with Feature Flags

## **Deploy ⇒ Value**

- \* End-to-end Monitoring
- \* Tracking everywhere
- \* Many small, cheap experiments
- \* Rapid feedback on results

The image features the eBay logo centered on a large blue square. The background is a grid of various colored squares in shades of pink, red, orange, yellow, green, and purple. The eBay logo is white and consists of the word "ebay" in a lowercase, sans-serif font, with a small registered trademark symbol (®) at the end.

ebay®