Not a DevOps talk
or, creating better software

May, 2018

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Pivotal

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451 Research

SOFTWARE DEFINED TALK

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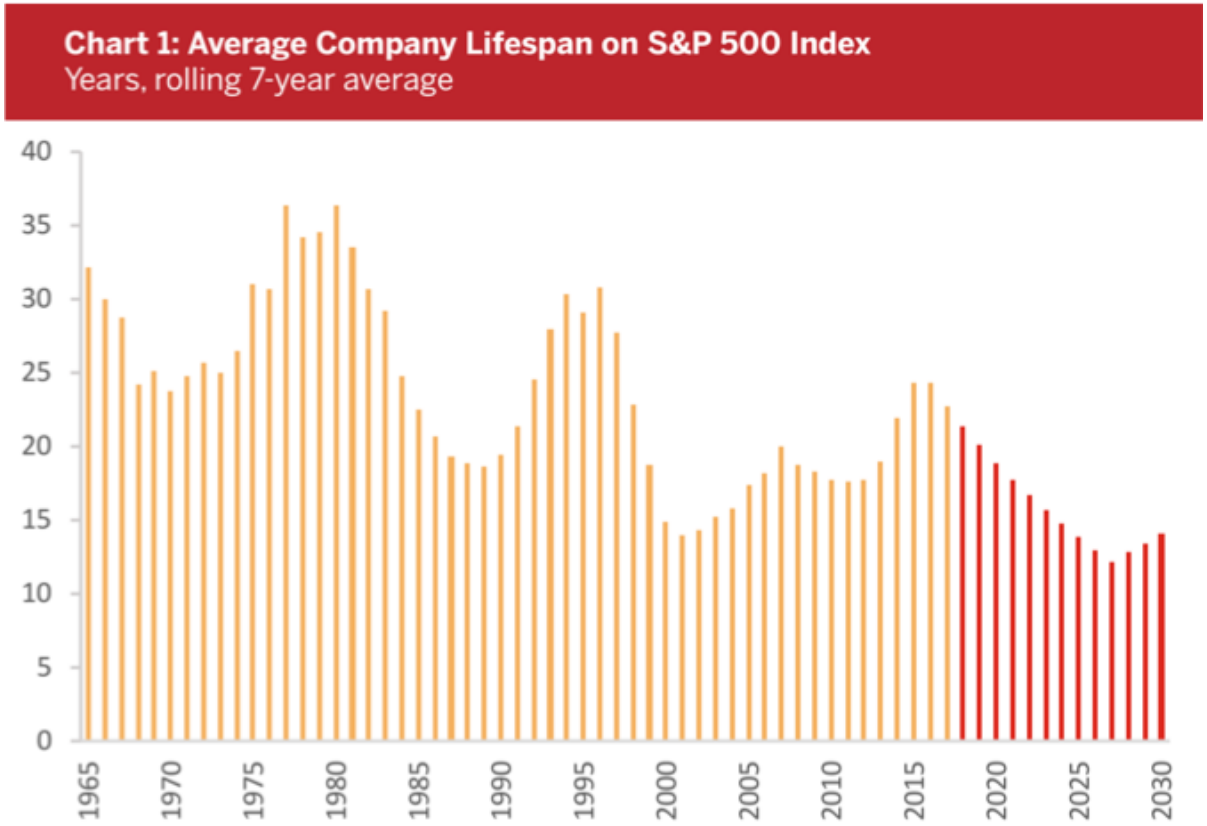
DELL

bmcsoftware

FundsXpress


What's in the box?
Digital transformation.

Strategy slowly shifted from competitive to transient advantage



“at the current churn rate, about half of S&P 500 companies will be replaced over the next ten years.”

Source: “2018 Corporate Longevity Forecast: Creative Destruction is Accelerating,” Scott D. Anthony, S. Patrick Viguerie, Evan I. Schwartz and John Van Landeghem, Innosight, Feb 2018. Also: "Transient Advantage," Rita Gunther McGrath, HBR, June, 2013. See also her book, *The End of Competitive Advantage*.

"DevOps is not about what you do, [it's about] outcomes"

40% policy strike rate, vs. 20% industry average...in 6 months.

Over 1,000 production releases a day, 600 in prod.

Increased revenue “10’s of millions, likely to grow to the 100’s of millions”

6 to 8 person agile teams, delivering weekly on a cloud platform

Saving $214k/day of fuel; 124 day avg. first release vs. 5 years

MVP, cloud platform, pairing, agile, weekly deploys

Sources: "Leap of Agile Faith," Mojgan Lefebvre, Liberty Mutual, June, 2017; "Crossing the CI/CD/DevOps Chasm," Miranda LeBlanc, Dec 2017; "Allstate Technology Chief Develops The Uber Of Roadside Assistance," Perer High, Oct, 2017; "How Insurance Giant Allstate Is Using Cloud Tech to Build New Businesses," Barb Darrow, June, 2017; "Cost of Delay - How PCF Helped Demonstrate the DoD Can't Afford Business as Usual," Capt. Bryon Kroger & Tory Galvin, USAF, April, 2018. Gene Kim quoted in *Start and Scaling DevOps in the Enterprise*.


ROI: +10,700 steaks/day

"We're in the technology business. Our product happens to be banking, but largely that's delivered through technology."

Brian Porter, CEO, Scotiabank

Pivotal

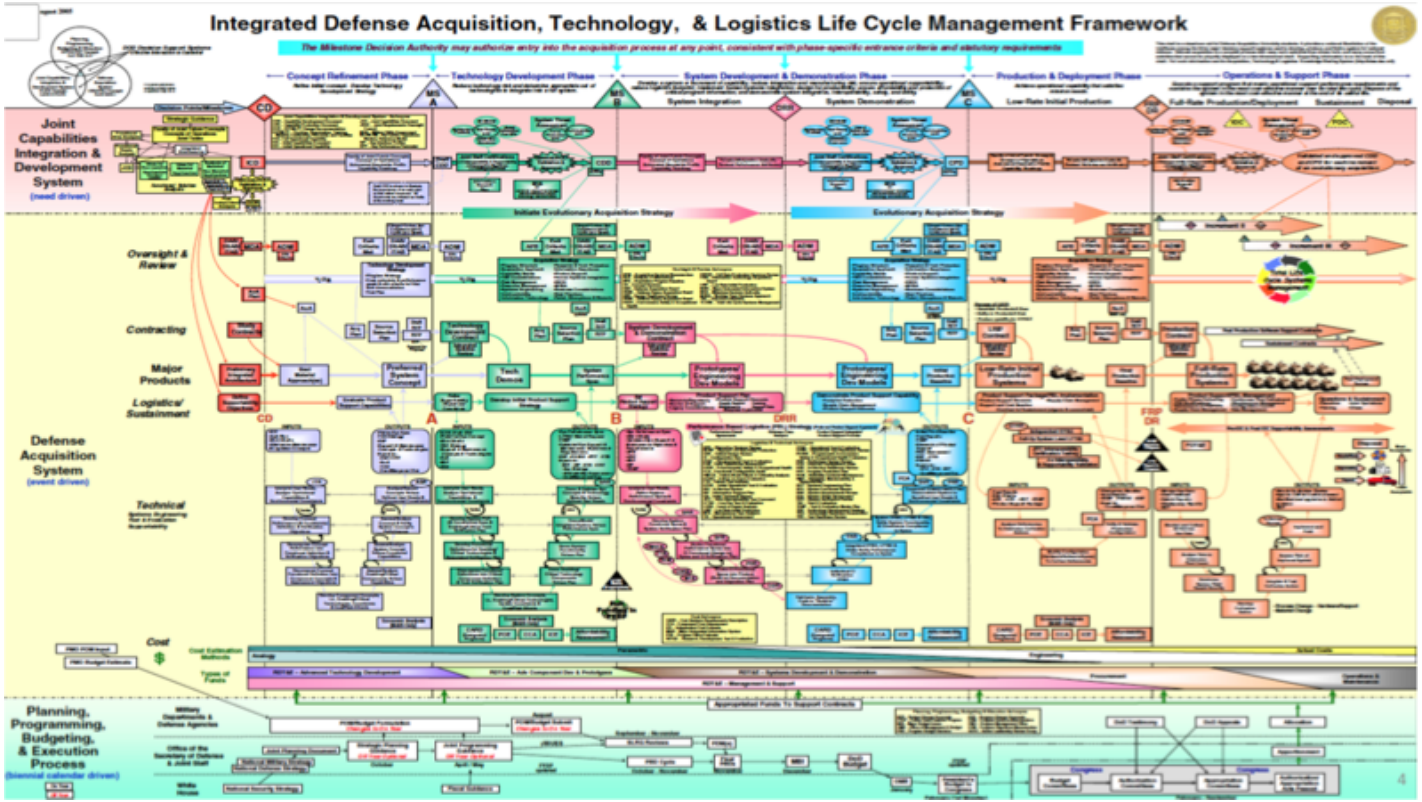
Source: "Shaking up Scotiabank: Three exclusive insights into CEO Brian Porter's revolution," David Berman & Tim Kiladze, *The Global Mail*, April, 2015.

“In order to grow Citi, we first have to grow our own perspective, skills and capabilities… Our curiosity, our openness to learning and trying new things, our ability to adjust and adapt quickly and our willingness to fail fast and fail small are the essence of a culture that innovates and exposes new value to our clients in real time.”

Stephen Bird, CEO Citi Global Consumer Group

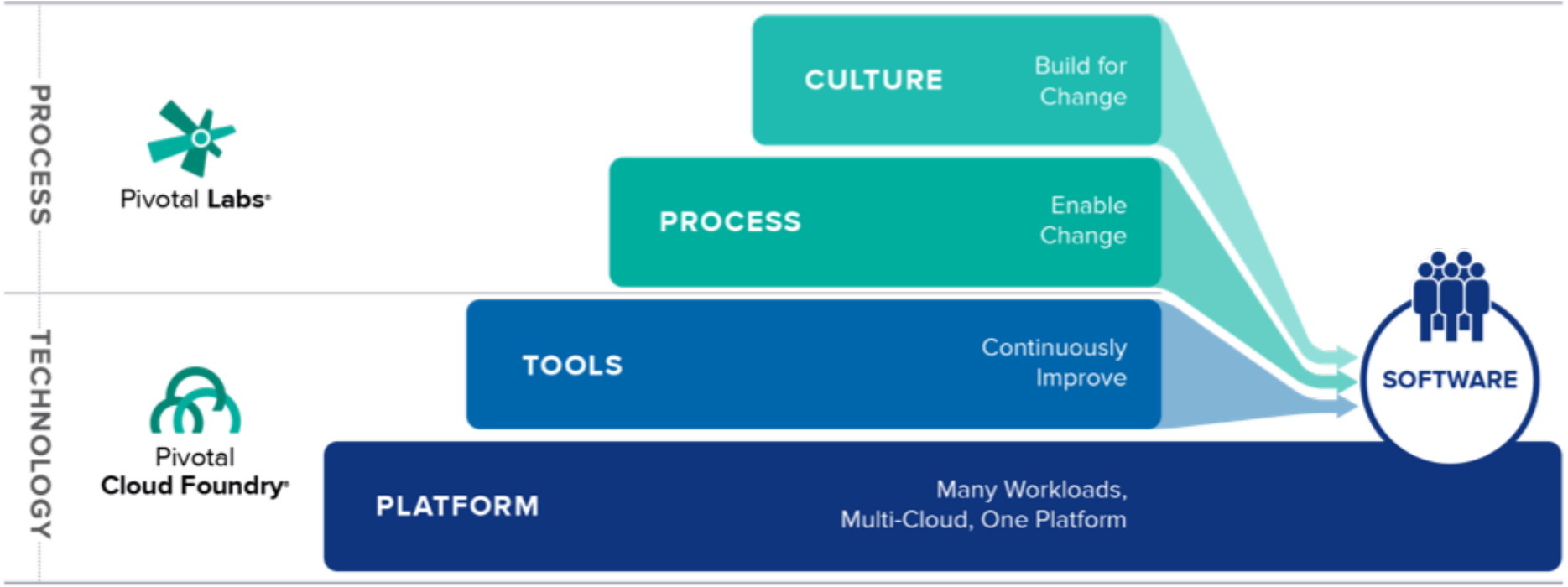
Source: “A Transformation Journey,” Brad Miller, 2016.

Most organization favor governing software over delivering it



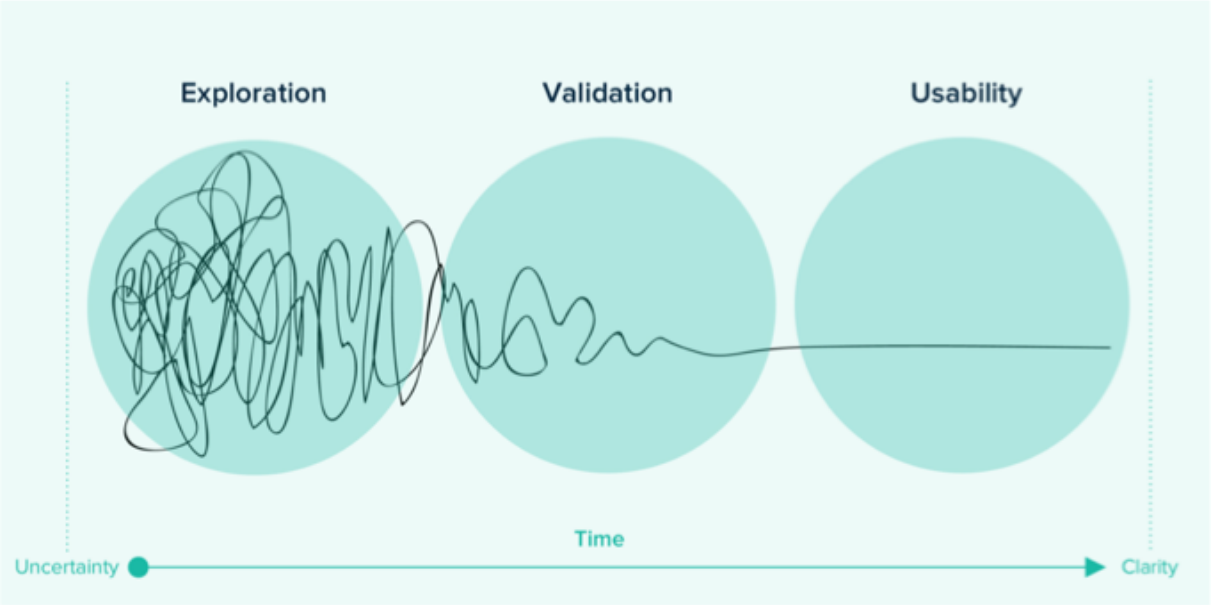
Source: "Cost of Delay - How PCF Helped Demonstrate the DoD Can't Afford Business as Usual," Capt. Bryon Kroger & Tory Galvin, United States Air Force, CF Summit NA 2018, April, 2018.

These organizations are transforming their software stack



User-centric

Moving from unknown chaos to the useful software



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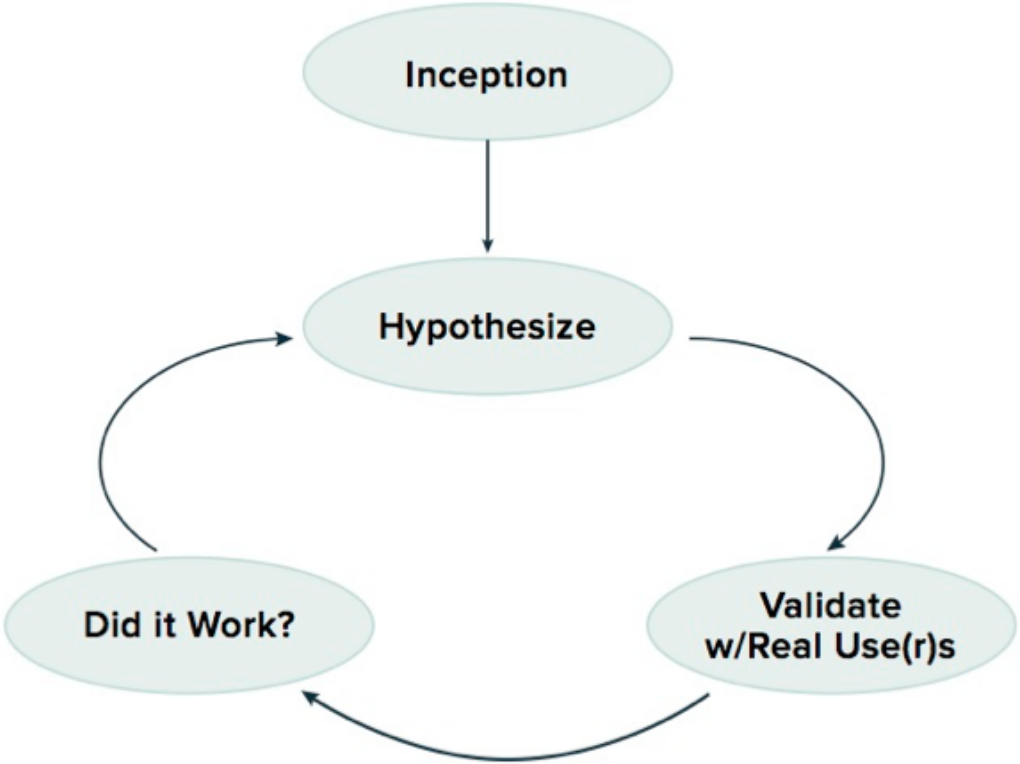
Deliver value, reliably with small batches



Sources: "Good Software is a Series of Little Failures," Coté, April 2016; *The Lean Startup*, Eric Ries, 2011. *The Lean Enterprise*, Barry O'Reilly, Jez Humble, and Joanne Molesky. See also overview of this approach at the IRS from Dec 2015. "Application Modernization, Service By Microservice," Kurt Bittner and Randy Heffner, Forrester, Dec 2015; "Best Practices For Agile-Plus- Architecture," Randy Heffner, Forrester February, 2015.

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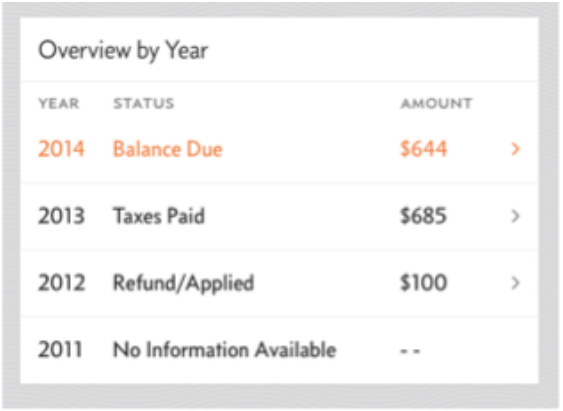
From 37% availability to $440m in back taxes

Before



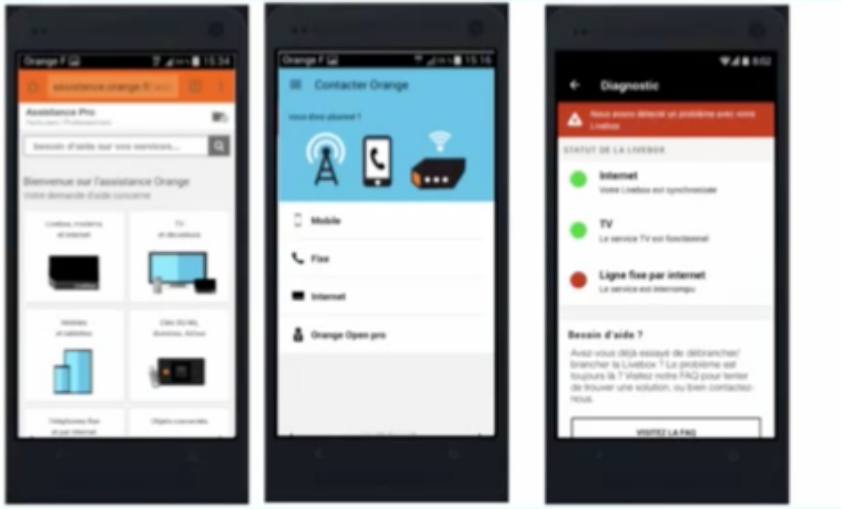
After

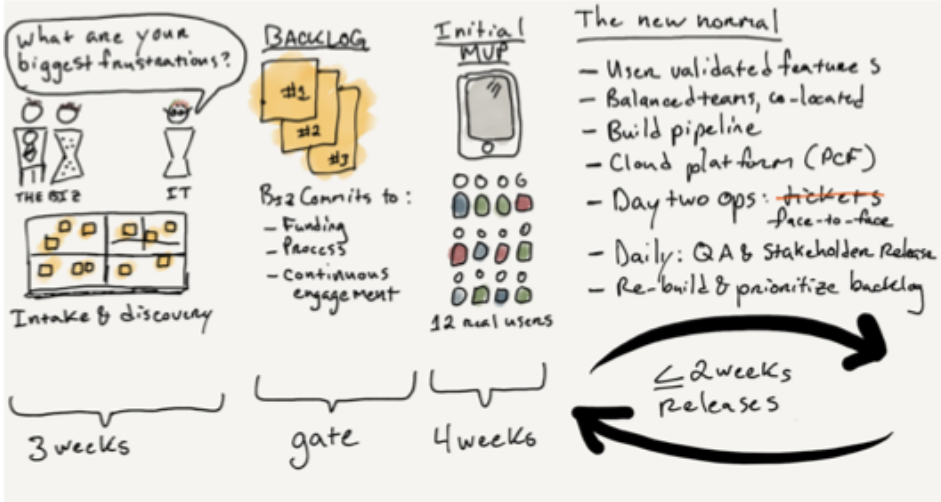
- Only 37% of calls answered, shrinking budgets
- From 2 year to 9 week releases
- 2m+ users paid $440m in taxes

Sources: "'Your IRS Wait Time is 3 Hours' - Is Lean Possible in Government?", Emily Price, Pivotal, April 2017; "Agile Transformation is Product Management," podcast, Oct 2017; "Minimum Viable Taxes: Lessons learned building an MVP inside the IRS," slides , Andrea Schneider & Lauren Gilchrist, 2015.

Pivotal

A small batch approach uses failure to find success





orange™

DUKE ENERGY®

Pivotal

Sources: "Lessons Learnt and Best Practices from Digital Transformaton at Orange," Xavier Perret, Chief Digital Officer at Orange, Oct, 2016; *Software Defined Interviews* episode with Duke's John Mitchell, March 2018.

"DevOps is not about what you do, [it's about] outcomes"

50% B2B customer engagement, shipped in 6 months vs. 18.

3+ week to 3 days, 50% reduction in incidents, 4 ops

Moved from a white-board to ~20 features a week, in 120 days

Delivered 3x features year/year

Ships to production 1,500 times a month.

40% policy strike rate, vs. 20% industry average

Sources: Gene Kim quoted in *Start and Scaling DevOps in the Enterprise*; *Crafting your cloud-native strategy*, Coté, 2017; Air Force story, Washington Post, July 2019; "Agile Transformation is Product Management," Oct 2017; Mojgan Lefebvre, Liberty Mutual, June, 2017; Interview with Orange's Xavier Perret, Pivotal Insights #53, 2017.

Management

Creating the context for success

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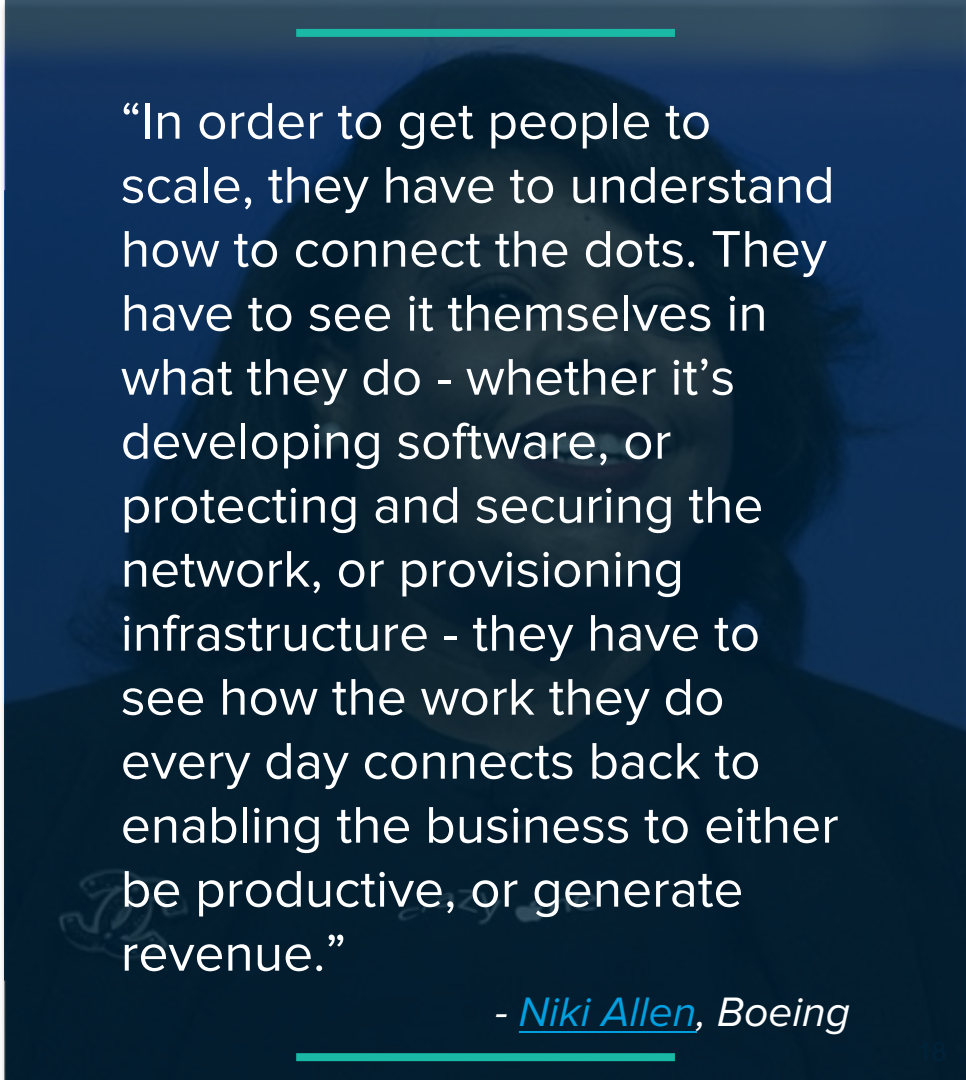
Small batch management

- Driving & explaining strategy
- Creating & championing teams
- Make structures compatible with vision
- Facilities & policy changes
- Align IT and HR to the vision
- Manage scaling change
- Fight Eeyores & corporate back-stabbers



"In order to get people to scale, they have to understand how to connect the dots. They have to see it themselves in what they do - whether it's developing software, or protecting and securing the network, or provisioning infrastructure - they have to see how the work they do every day connects back to enabling the business to either be productive, or generate revenue."

- Niki Allen, Boeing

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Source: *Leading Change*, John P. Kotter, 2012; "Navigating the Sea of 'No's,'" John Osborn, GAIC, Dec 2017.

It’s mostly just the same change management as always

- *Leading Change*, John Kotter
- Building coalitions
- Building on small, successes
- Holding back corporate sappers

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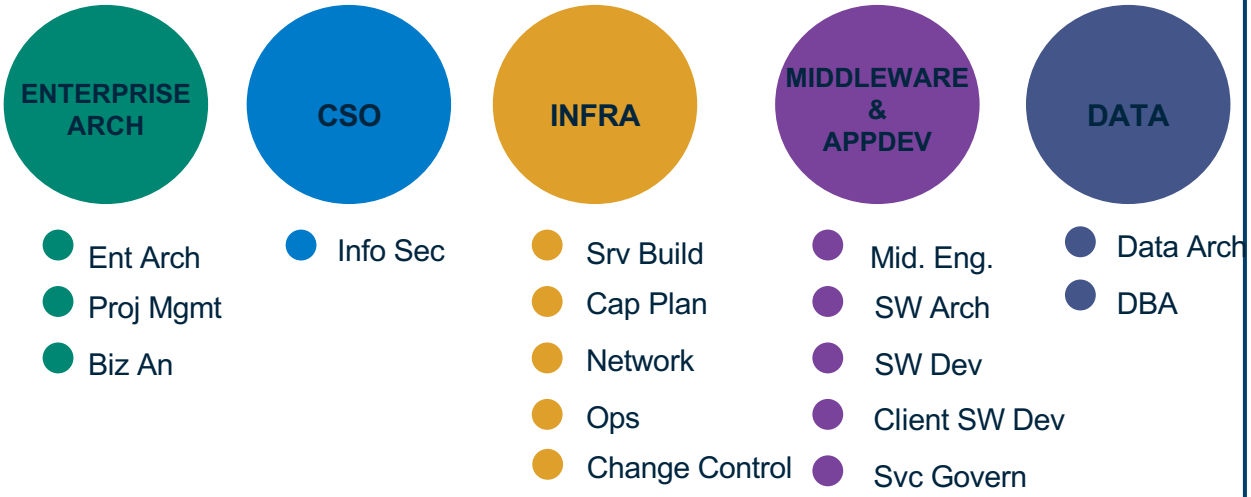
Source: *Leading Change*, John P. Kotter, 2012; "Disruption from Within,” Thomas Squeo, West Corporation, May, 2018.

Functional organizations are a poor fit



- Optimized for cost & repeatability
- Requires coordination overhead
- Locally optimized
- Elusive responsibly for final outcome

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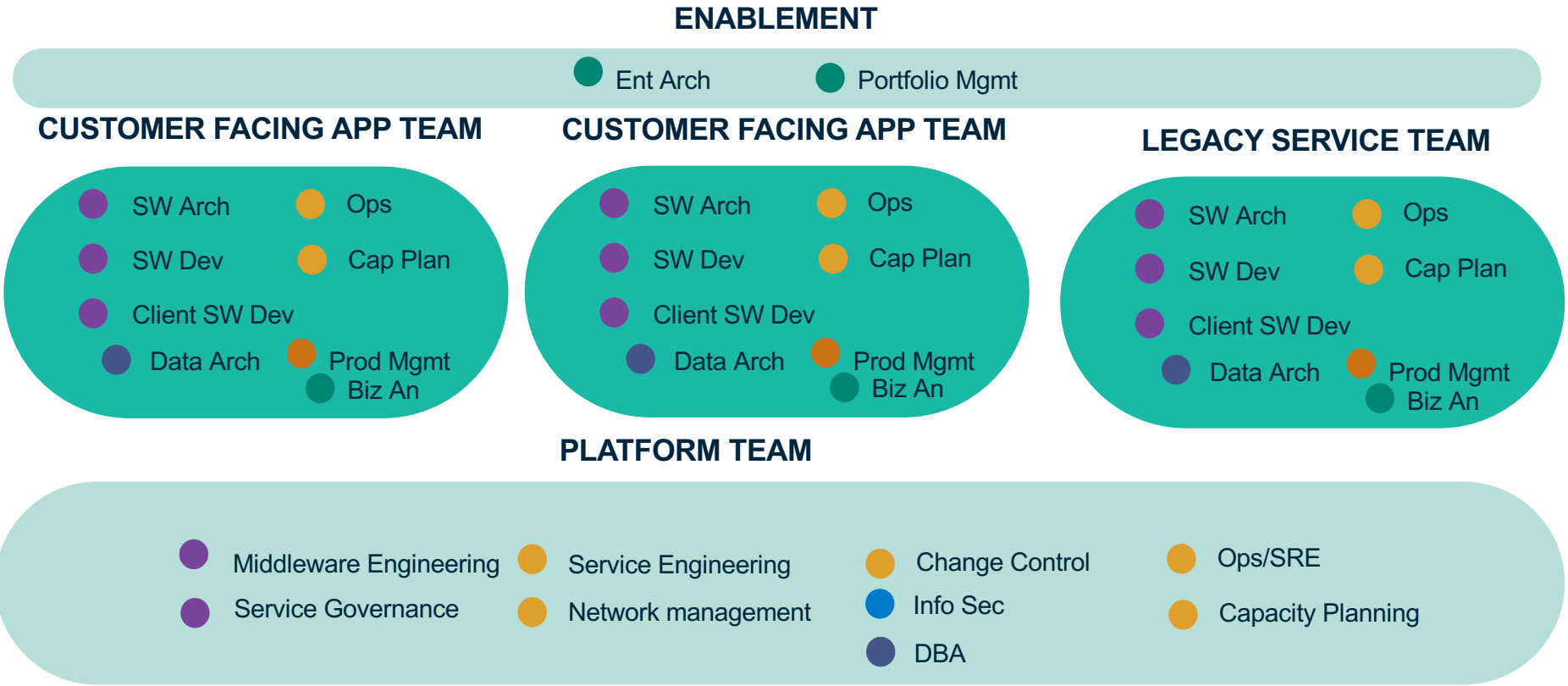
Source: "DevOps Who Does What," Cornelia Davis, June 2017.

The organization supports the agile teams



Source: "DevOps Who Does What," Cornelia Davis, June 2017.

Simplified reviews

Evaluating current projects

- Value delivered, in production
- Cost of value (time & money)
- Does it work (solves user problems, results in transactions, etc.)

Approving future projects

- Prediction of road-map's value
- Budget estimates

Actions & decisions

- Project has delivered value, re-allocate resources
- Add skills and staff if needed
- Remove barriers & impediments
- Invalidate design hypothesis – get a new one
- Adjust budget
- Provide frequent feedback

Sources: *A Seat at the Table*, Mark Schwartz, Sep 2017; conversations with customers.

Agile teams

Transforming from a functional, project-centric organization to product-centric teams

Pivotal

25+ years later, agile practices are still not standard

Source: "Survey Analysis: Agile Now at the Tipping Point - Here's How to Succeed," Mike West, Gartner, June 2017; Cf. "The 12th Annual State of Agile Report" for more optimistic numbers.

Eliminate big, upfront analysis by using frequent feedback

> “A [waterfall] mistake could cost $100 million, likely ending the career of anyone associated with that decision. A smaller mistake is less often a career-ender and thus encourages smart and informed risk-taking.”

> “With a more agile approach, we pick a place to start and get to a point where you can have an intelligent conversation… a point where the requirements are 80% done and the application is good enough.
>
> - *M. Wes Haga, US Air Force*

Sources: "How the US Air Force Made Its ISR Network Cheaper to Run and Easier to Upgrade," M. Wes Haga, Oct, 2017; “Air Force Intelligence Unit Goes Agile,” Charles Babcock, *Information Week*, June, 2017; “Limit upfront analysis by including frequent, real-world feedback from users,” Coté, Nov 2017.

From coding 20% of the time coding to coding 90% of the time

An agile methodology, proven over 25+ years:

- **Balanced teams w/all roles needed, dedicated to the product**
- **Paired programming, & beyond**
- **Test-driven Development**
- **Short iterations**
- **Continuous Integration & Continuous Delivery**

Source: [“Don’t Forget People and Process in Your Digital Transformation,”] Allstate case study, March, 2017; teams pictures from Scotiabank, Liberty Mutual, Comcast, WoCinTech.

Rotating pairing

“If that crusty, old .Net developer can do it, anyone can,” transforming people

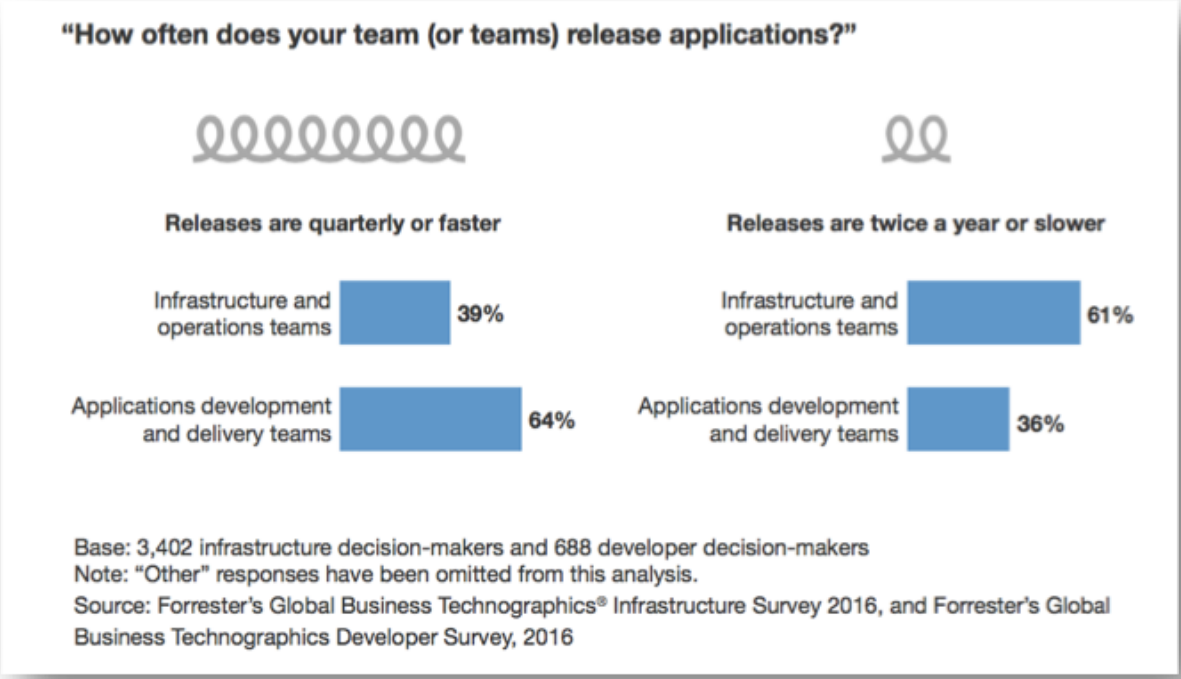
1. Most people are skeptical for good reasons
2. They enjoy doing IT if it’s rewarding
3. Volunteer based at first, building up peer-to-peer marketing
4. Also, there’s plenty of more comforting IT for grumpy people to work on

Pivotal

Source: “Navigating the Sea of ’No’s,’” John Osborn, GAIC, Dec 2017; Dealing with Grumps, Coté, May 2018.

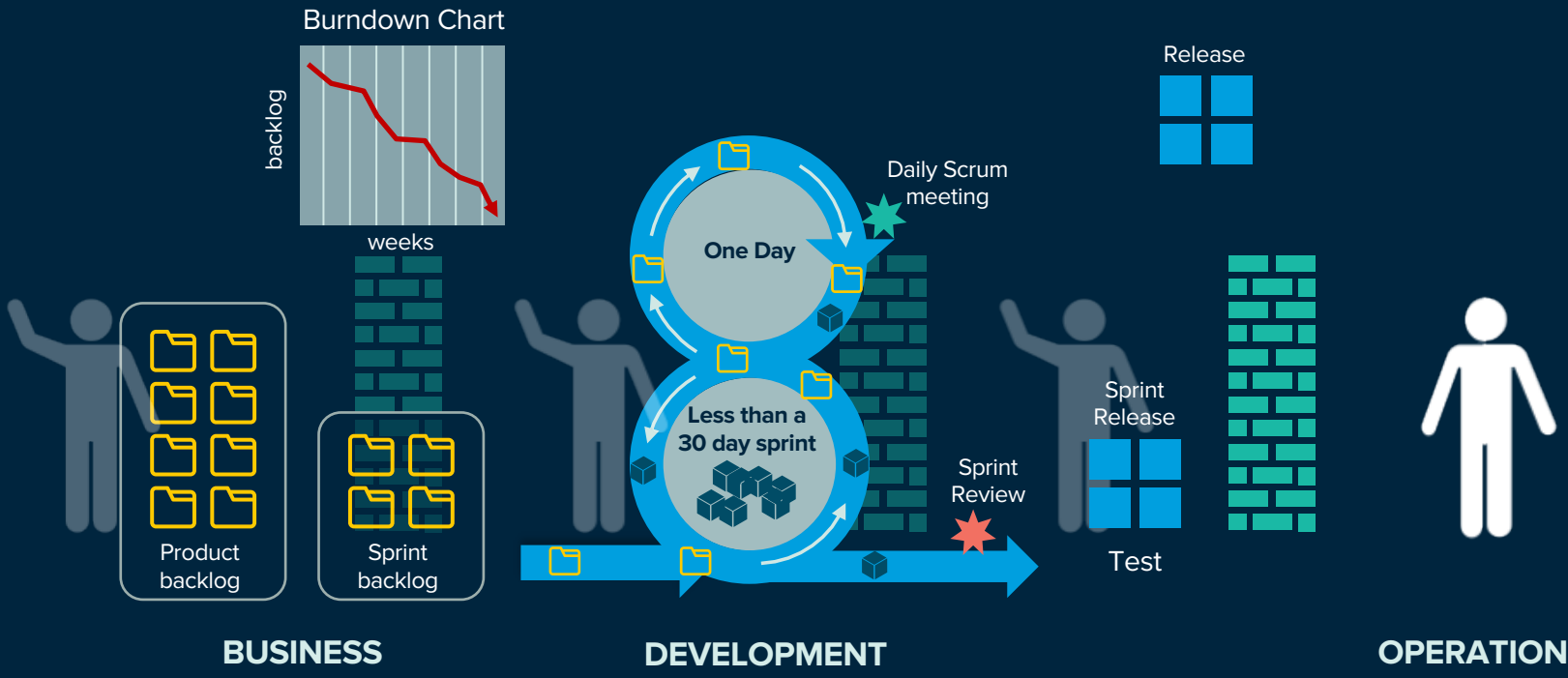
DevOps & Platforms

Release management is the bottleneck



Source: "The Need For Speed: Drive Velocity And Quality With DevOps," Robert Stroud & Eveline Oehrlich, Forrester, Feb 2017.

Agile adoption leaves one remaining barrier



Removing the wall speeds up the design feedback loop

T-Mobile goes from **7 months and 72 steps** to update software, to **same day deployments**.

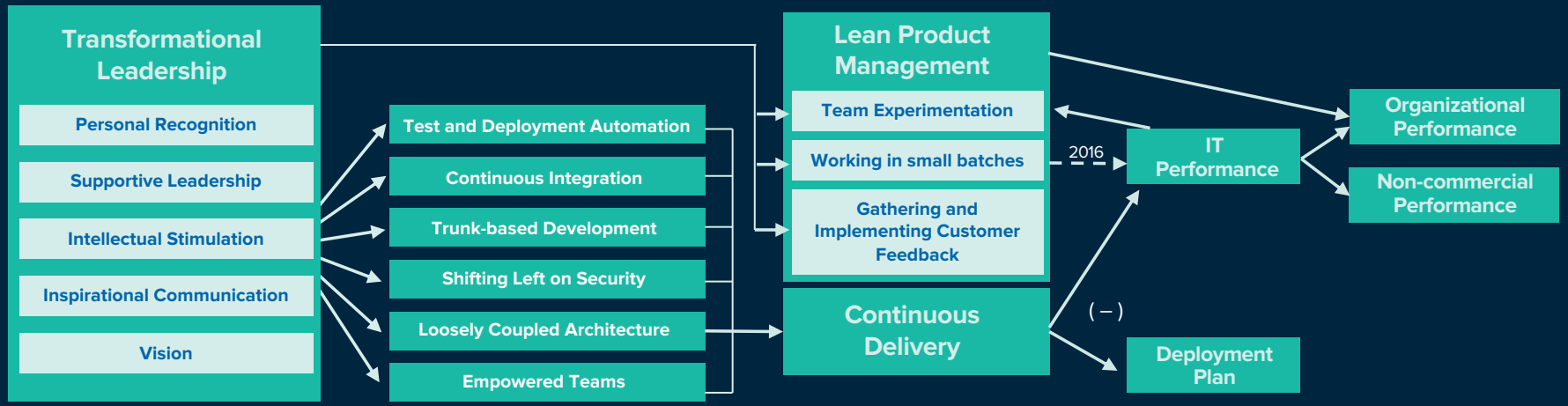
Liberty Mutual **builds and deploys an MVP in one month** and delivers revenue-generating version just hours later. Went from **22 days to deploy to just 1**.

The Home Depot **ships to production 1,500 times a month**, and 17,000 times a month to all environments.

Orange France now deploys customer facing apps up to 200 times a month.

Express Scripts went from **45 days** to patch one product in nine environments, to **five days**.

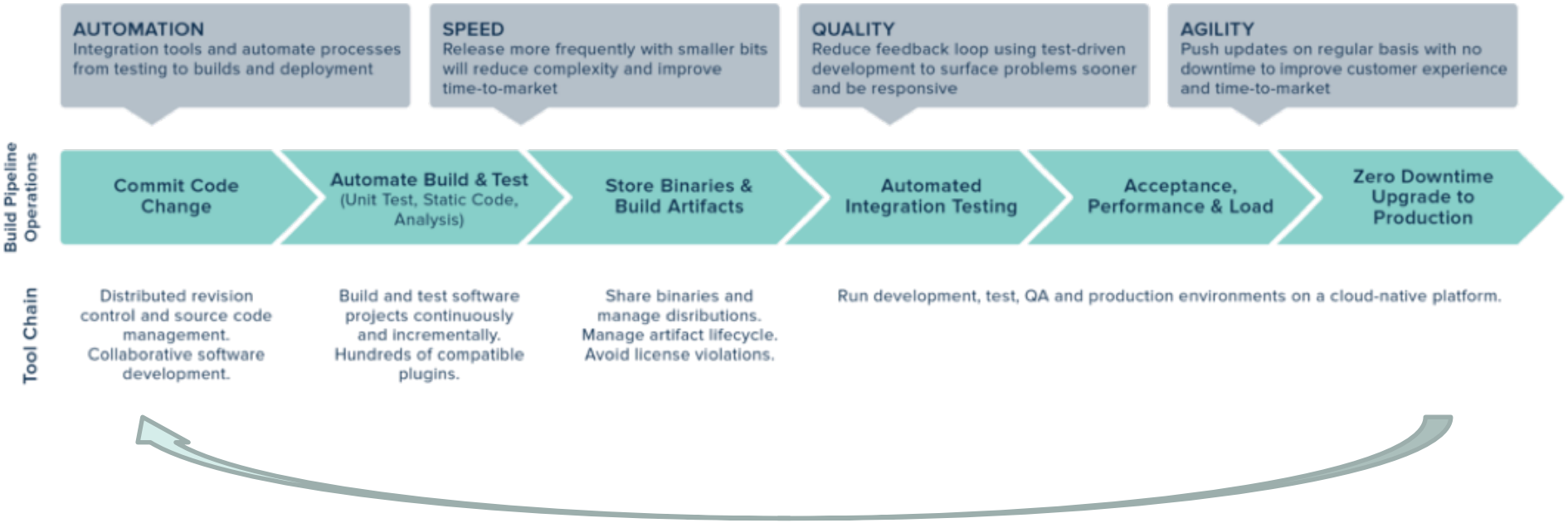
DevOps: culture, automation, lean, measurement, sharing



Be careful to look beyond just automation.
Keep the bigger focus on the entire software lifecycle.

Source: "2017 DevOps Report," Puppet, DORA, et.al., July, 2017.

It’s likely that only 30% to 50% of organizations do CI/CD



(<= 5 days)

Sources: “Speed Thrills: How to Harness the Power of CI/CD for Your Development Team,” Ben Kamysz & Jared Ruckle, Pivotal, Aug 2017. CI/CD estimate based on the “The 12th Annual State of Agile Report” (2018) and “Survey Analysis: Agile Now at the Tipping Point - Here's How to Succeed,” Mike West, Gartner, June 2017, see also estimates from 2015.

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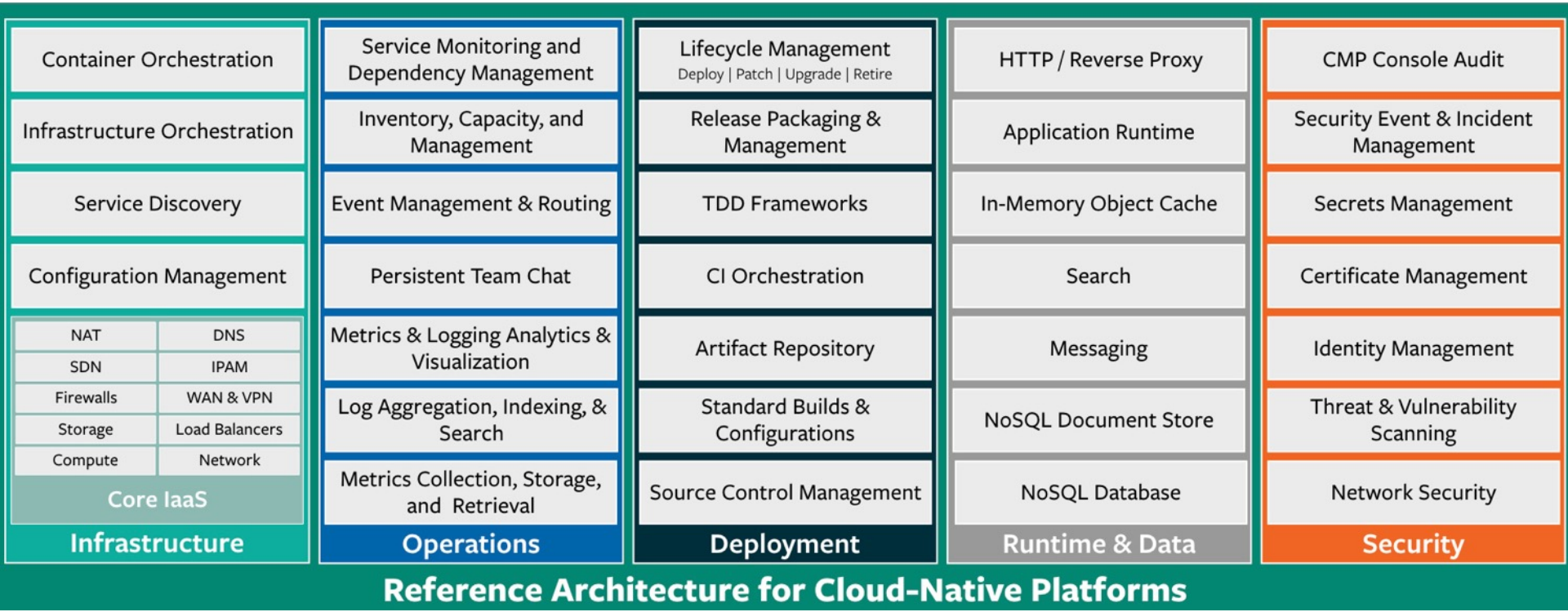
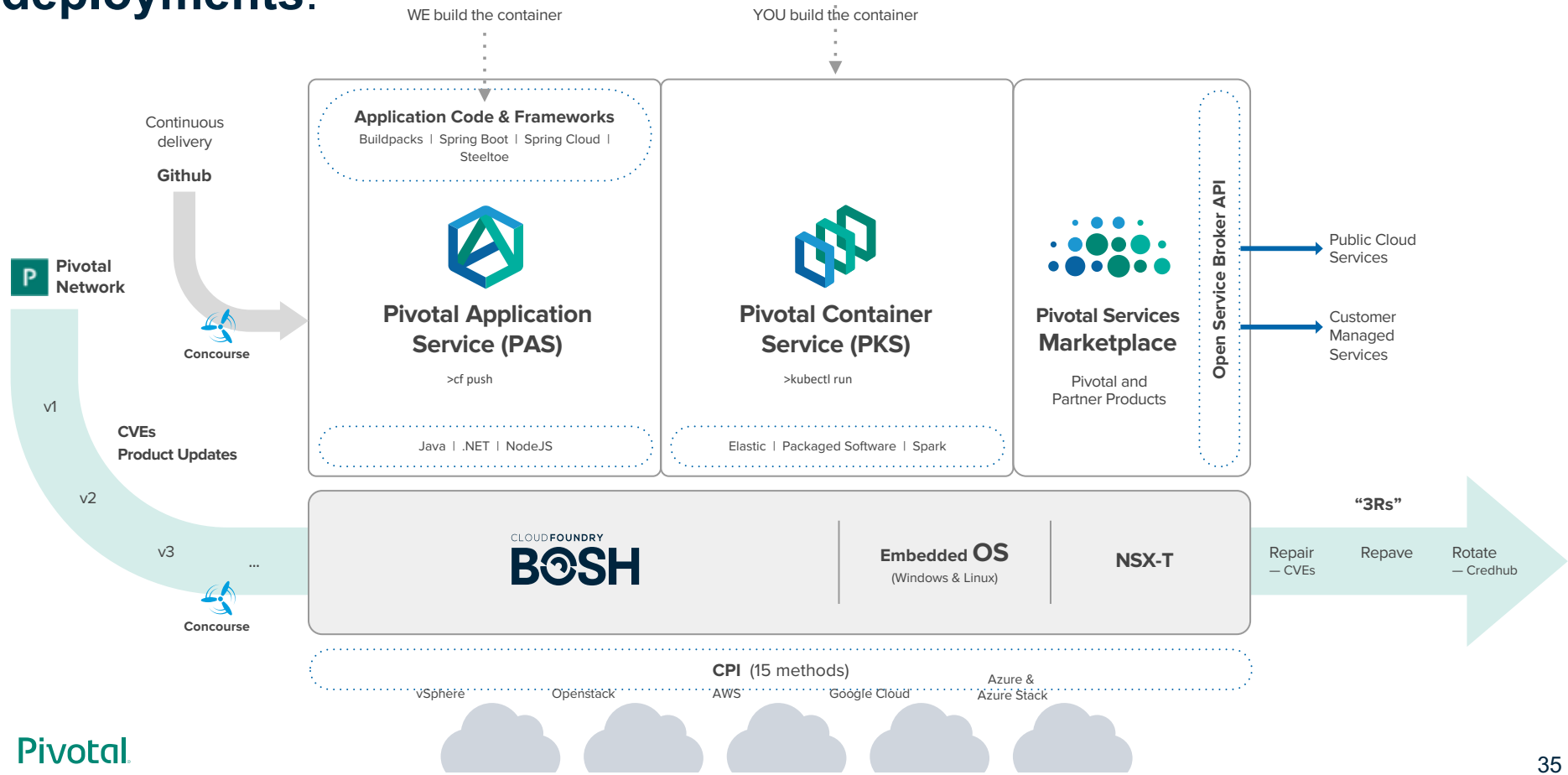
Standardize on a platform



Source: "The Upside-Down Economics of Building Your Own Platform," Jared Ruckle and Matt Walburn, 2017. Also, "DevOps Who Does What," Cornelia Davis, June, 2017; "How Platforms Work," Casey West, August, 2016.

How T-Mobile went from **7 months** to update software, to **same day deployments**.



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Unclogging a 15 month case backlog with a new platform

Before Pivotal Cloud Foundry			With Pivotal Cloud Foundry		
Step	Task	Time	Step	Task	Time
1	Application Intake Form Submitted	10 minutes	1	Application Intake Form Submitted	10 minutes
2	Setup GitHub Repository	<1 minute	2	Setup GitHub Repository	<1 minute
3	Register FQDN's	~1 day	3	Register FQDN's	<1 minute
4	Request SSL Cert	~1 week		Request SSL Cert	<1 minute
5	Request ICAM Cert	~1 week		Request ICAM Cert	~1 week
6	Provisioning Production Servers	~3 weeks		Provisioning Production Servers	<1 minute
7	Install certs on test & stage load balancers	~3 days		Install certs on test & stage load balancers	<1 minute
8	Secrets vault for Test/Stage/Prod	~3 days		Secrets valut for Test/Stage/Prod	<1 minute
9	DB password vault for Test & Stage	~ 3 days		DB password vault for Test & Stage	<1 minute
10	Create encrypted data bags	~3 days		Create encrypted data bags	<1 minute
11	Write Jenkins Job	~2 days	4	Write Jenkins Job	~2 days
12	Write Chef deployment script	~2 days	5	Test CI & deployment	2 days
13	Test CI & deployment	~2 days			
	Total	~60 days		Total	~4 days

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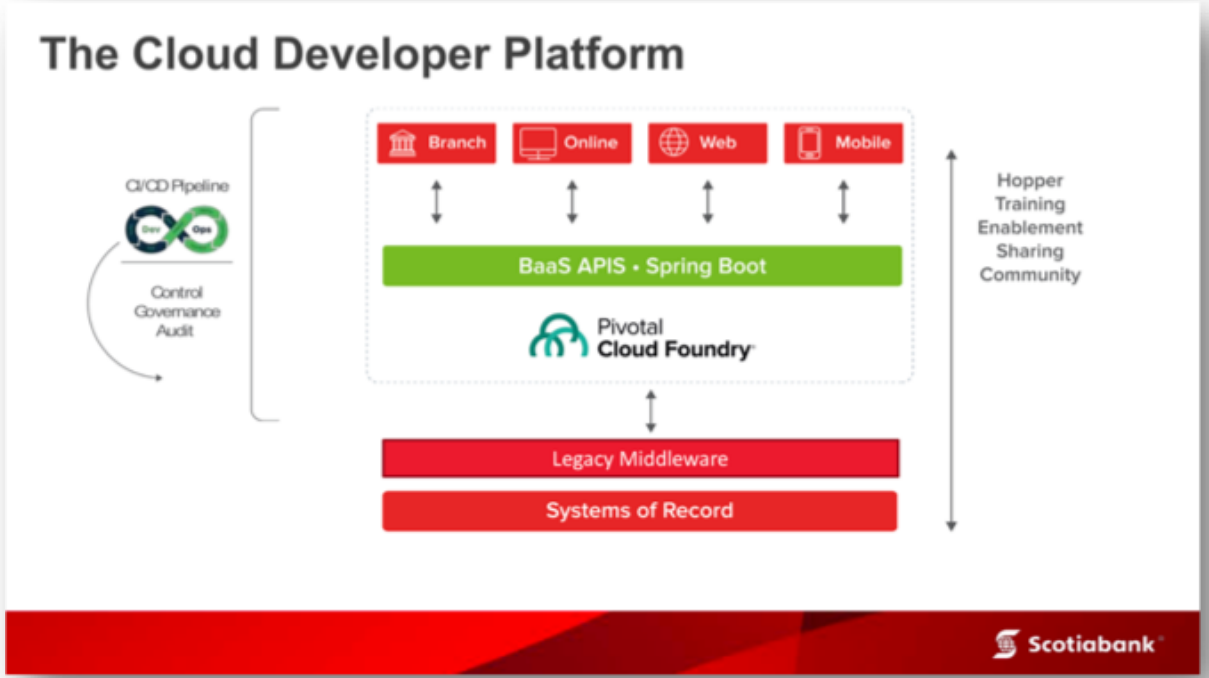
Source: Pivotal government customer.

Building a Banking as a Service platform at Scotiabank

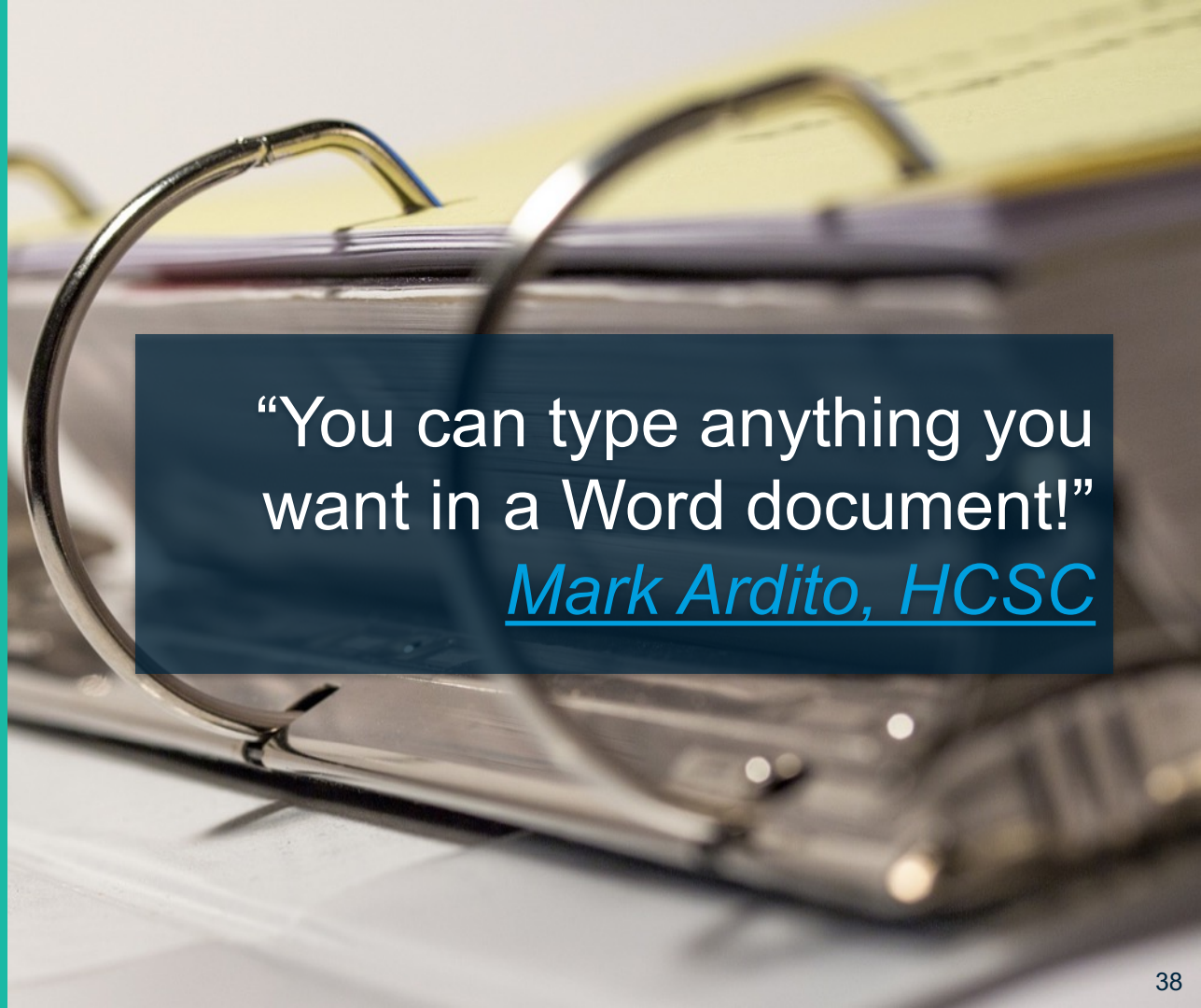


- "At the center of that platform is Pivotal Cloud Platform"
- 29 teams, with 21 in production
- Used in 4 countries
- 3,000+ deploys a month

Pivotal Source: Ranji Narine at SpringOne Platform 2017, Dec 2017.

Compliance, controls, security

Platforms remove chaos, introduce ATO stability



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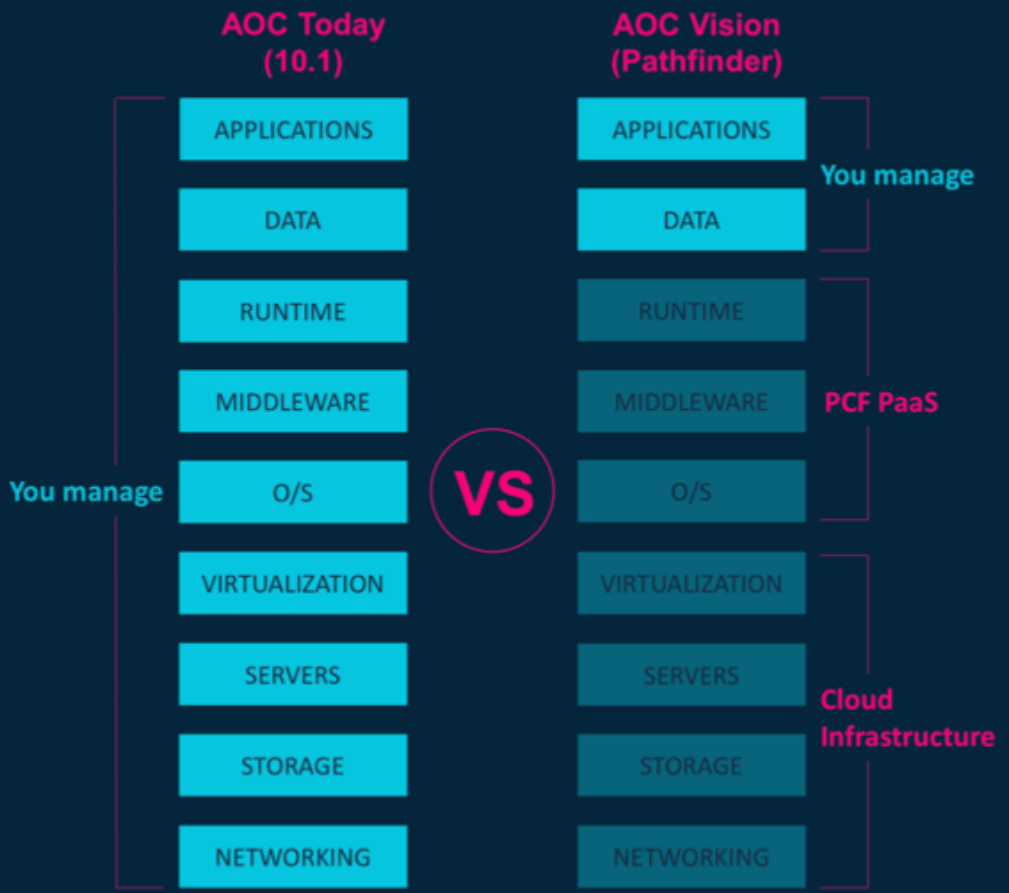
automategrc

- 80-90% of Risk Management Framework controls inherited via IaaS/PaaS
- Cut Authority-to-Operate process from ~10 months to <1 week for ~40 remaining controls at application layer



Source: "Cost of Delay - How PCF Helped Demonstrate the DoD Can't Afford Business as Usual," Capt. Bryon Kroger & Tory Galvin, United States Air Force, April, 2018.

Security – reduce risk by going faster & automating, & acting

- Repair
- Repave
- Rotate
- Pre-ATO'ed
- RBAC
- BOSH enforcement
- Encryption, data, network
- Zero-trust model
- Isolation segments
- CredHub
- Trusted auditing a-plenty
- Distributed tracing & microservices ops

Source: "Security & Compliance with Pivotal Cloud Foundry," Ben Bertka, Sujit Mohanty, and Jared Ruckle, Oct, 2017. "The Three Rs of Enterprise Security: Rotate, Repave, and Repair," Justin Smith, April 2016; "Understanding Cloud Foundry Security," Pivotal docs;

Also: the software actually works.

Metrics

Measuring transformation

“You can't even compare the work they're doing anymore because the way the stories are written and with agile the way you're responding to the business: it's really tough to compare to the way things you used to do.”

***Mike Barber*, SVP, Customer Systems and Technology**
Synchrony Financial

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Select the metrics that track & support outcomes

Core Product Metrics

- Validated/invalidated learning – “cycle time to learn”
- Working software delivered– stories, features, etc., that work
- Business value – cash-money, customer churn/growth, case management time, NPS, etc

Process Performance

- Time-to-deliver
- Deployment frequency
- Change volume
- Success rate

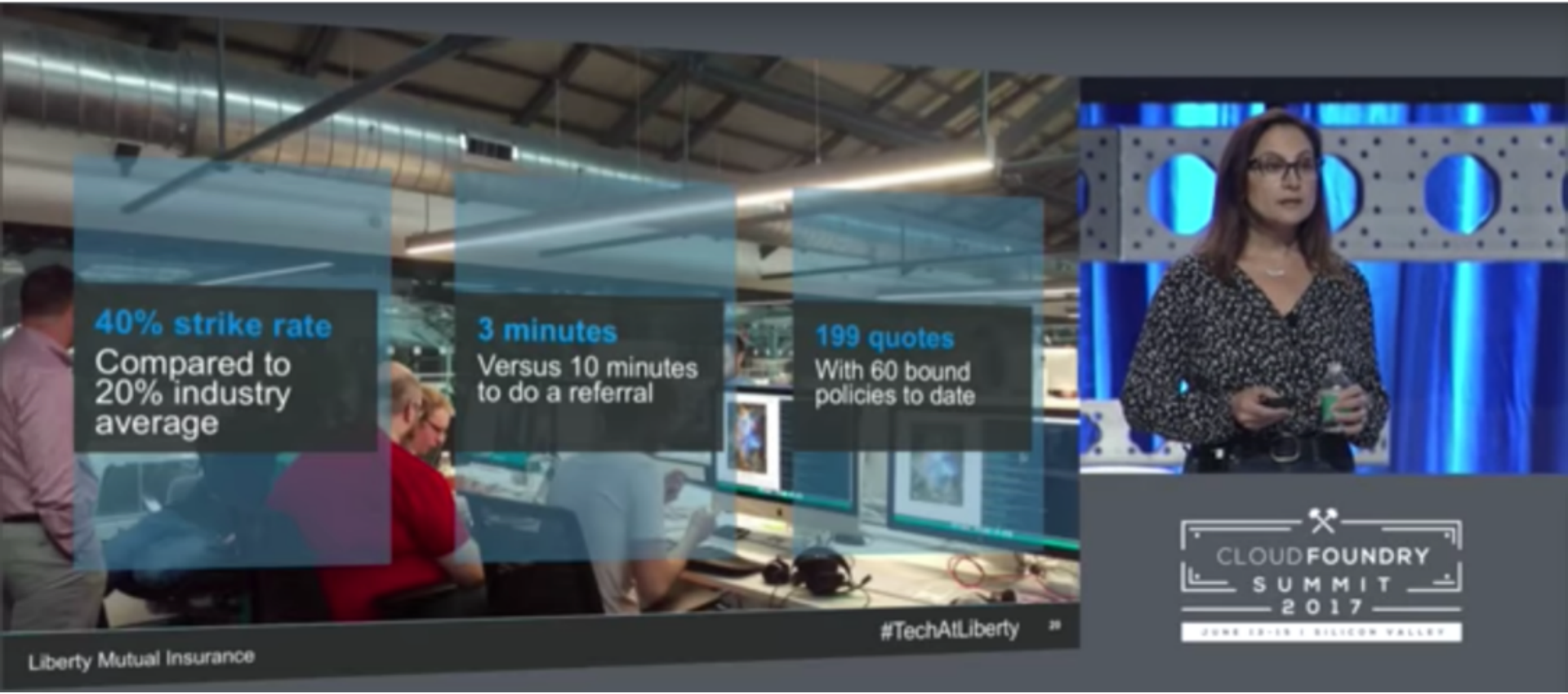
Technical Performance

- MTTR & friends
- Roll-back speed
- Capacity & performance for planning
- Errors, uptime, SLA, SKO

Pivotal

Sources: Pivotal Labs; Pivotal CSR organization; "Metrics for DevOps Initiatives," 2015; “The Need For Speed: Drive Velocity And Quality With DevOps,” Robert Stroud & Eveline Oehrlich, Forrester, Feb 2017. Note: these are just samples, not compressive or exclusive.

Focus on business value delivered, bottlenecks removed



Source: "Leap of Agile Faith," Mojgan Lefebvre, SVP & Chief Information Officer, Global Specialty, Liberty Mutual Insurance, June, 2017.

Built to Adapt
Benchmark.

Common cloud native tracking metrics

Indicators

Speed

Customer Feedback Frequency

How often you collect feedback from the end users of your software products.

Responsiveness to Feedback

The elapsed time between user feedback to deployment of change in software.

Frequency of Product Deploys

How often you deploy software (i.e. continuously, hourly, weekly, monthly, quarterly).

Feature Development Time

How long it takes to launch a feature from idea to deployment (time to value).

Team Integration/Distribution of Skills

If you rely on a small number of star developers, or if the skills of your developers are evenly distributed (i.e. teams able to rapidly onboard, unblock, and deliver consumer value).

Lead Times

How long it takes to move a new business-critical application from deployment to production.

Stability

Mean Time to Recovery

The amount of time it takes to restore service when a failure or service interruption occurs.

Change Failure Rate

Percent of software launches/upgrades delayed due to defects.

Scalability

Cloud-Native Applications

Percent of applications running in the cloud (native or refactored).

Investment Ratios

Spend developing and/or refactoring software vs. operating and maintaining IT systems.

Scalability and Disruption of Services

The level of disruption to existing business services and applications when doubling workloads.

Scalability of Infrastructure

If doubling workloads on existing architecture requires minimal structural changes vs. a complete redesign of architecture.

Security

Security

Number of disruptions or suspensions due to security concerns.

Savings

Operator to Developer Ratio

The number of software developers to each operations staff in the organization.

Product to Developer Ratio

Number of applications per developer in an organization.

Budget Flexibility

Degree to which the IT budget is fully committed at the beginning of each budget year or highly flexible to make initiating new projects easy.

Strategic Planned vs. Unplanned Work

Fraction of developer time spend writing code and delivering value vs developing infrastructure.

Automation

Degree of automation for infrastructure provisioning, software build, software testing, change approval governance, software deployment, and performance monitoring.

Developer Time Allocation

Fraction of developer time spent writingcode and delivering value vs. maintaining old code.

More: https://benchmark.builttoadapt.io/

Use cost of delay to demonstrate the benefits of faster deploys

tankerplanning

Spent $1.5M @ MVP

MVP yielded $214k/day in fuel savings
x 5 years to deploy tool w/ waterfall method (generous)
= **$391,000,000 Cost of Delay**

New methodology allowed the USAF to avoid $391M in opportunity cost—we can't afford waterfall

Source: "Cost of Delay - How PCF Helped Demonstrate the DoD Can't Afford Business as Usual," Capt. Bryon Kroger & Tory Galvin, United States Air Force, April, 2018.

Tracking how well the agile organization is delivering

Speed

60 Days
Avg Lead Time

10%
Apps on a CD Pipeline to Prod

500
Stories per week

20
Releases in last month

Stability & Security

15ms
Avg Response Time YTD

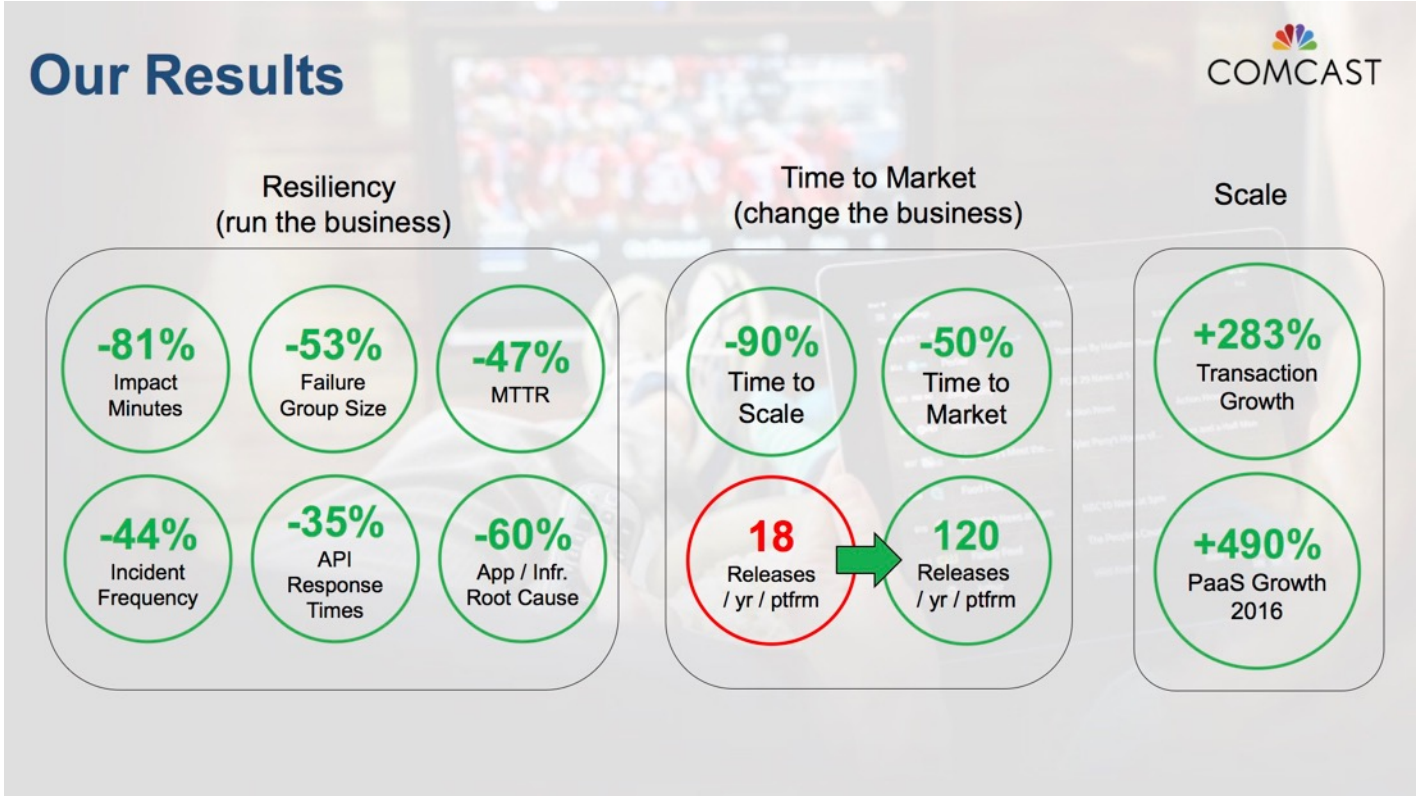
60 Mins
MTTR YTD

20%
% of Systems Patched YTD

125 Mins
Total Impacted User Minutes YTD

Pivotal Source: Richard Seroter, Pivotal.

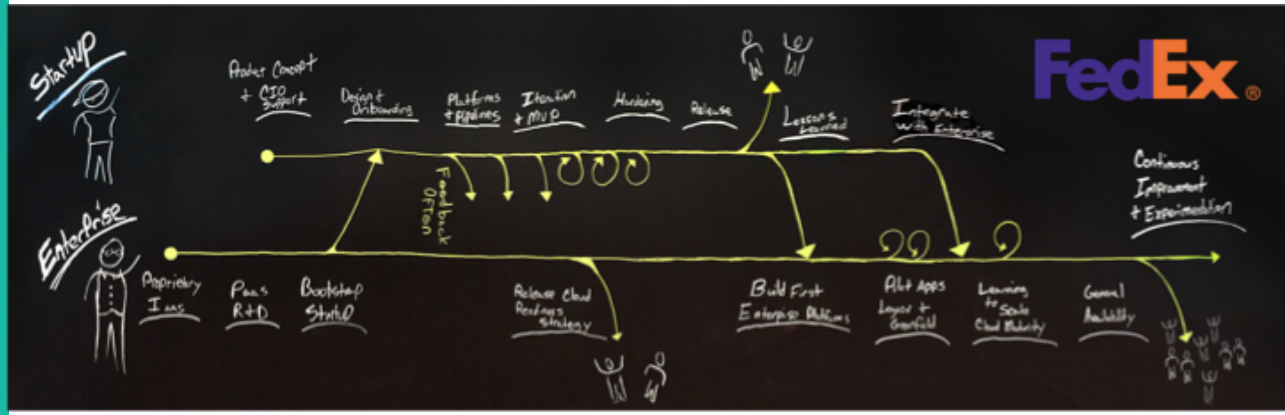
Comcast's metrics



Source: Comcast SpringOne talk, Dec 2017; "Comcast Cloud Foundry Journey," Greg Otto, Comcast, June 2013.

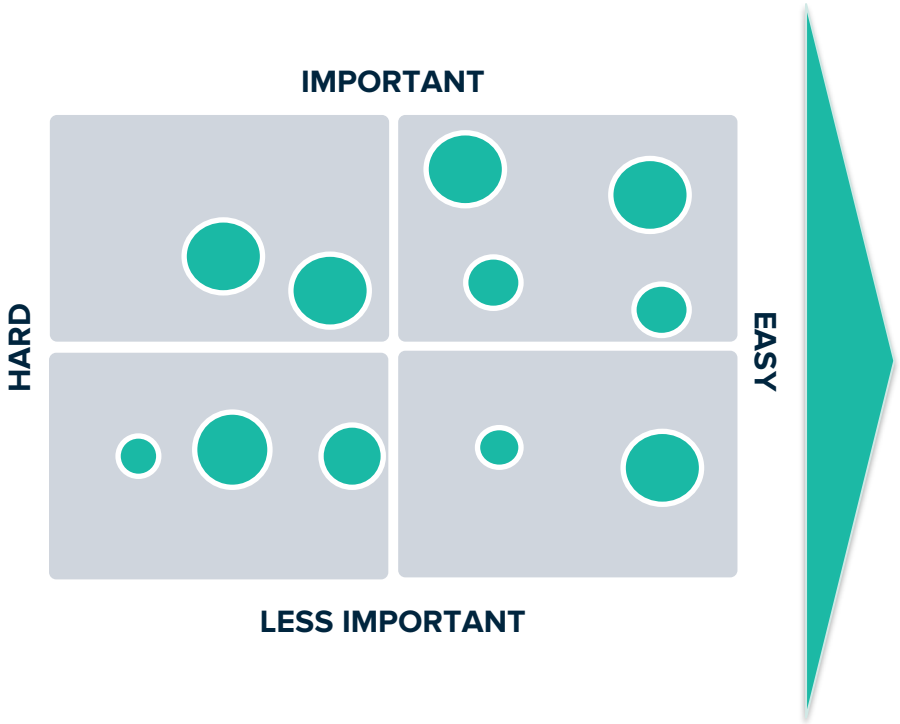
Scaling tactics

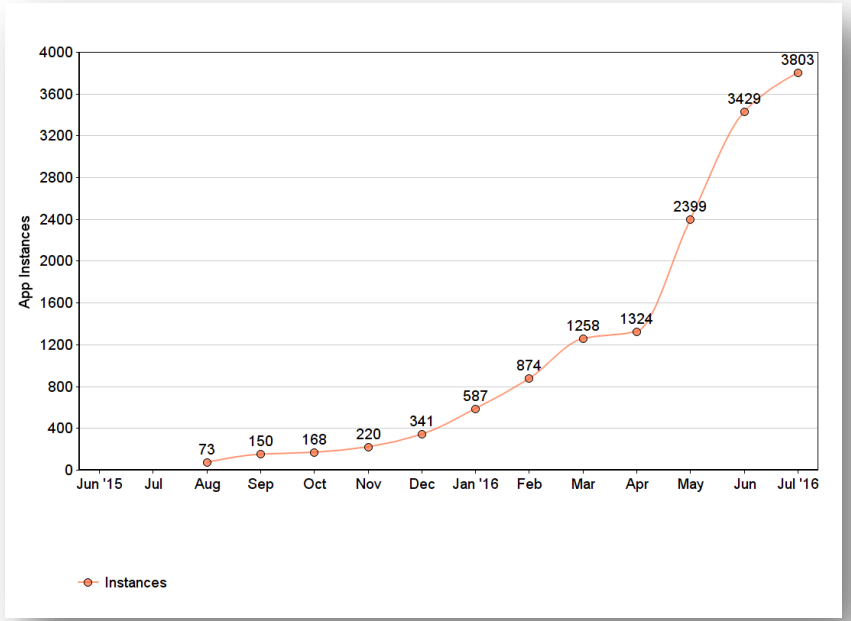
Scaling the change to your organization – small batch it!



Source: [“Scaling from Startup Mode to Enterprise Mode - Accelerating FedEx's Cloud-Native Transformation,”](#) Stephen Byers, Chris Bochman, Dec, 2017.

Starting: “pilot low-risk apps, and ramp-up.”





Sources: Home Depot meetup, Oct 2015; Humana at CF Summit 2015; EU payday loan company; Pivotal Labs on large auto company; “Getting started,” Coté, Oct 2016; Comcast’s Christopher Tretina at SP1 2016; “Cloud-Native at Home Depot, With Tony McCulley,” Number of AI’s equates to ~130 apps composed on ~900 services.

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Managing the change: pace yourself

- Scotia Bank after 10 months, 29 teams, 21 apps in production in 4 countries, and 3k deploys/month
- Liberty Mutual 10 (simple) apps in 10 weeks
- Allstate 16 apps in a year
- THD ~130 apps in a year
- Auto manufacture ~115 after two years

- BUT! If you don't start, you'll suffer analysis paralysis

Sources: "Cloud-Native at Home Depot, With Tony McCulley"; "Don't Forget People and Process in Your Digital Transformation," *The New Stack*, March, 2017; Pivotal customer analysis, cases, and conferences.

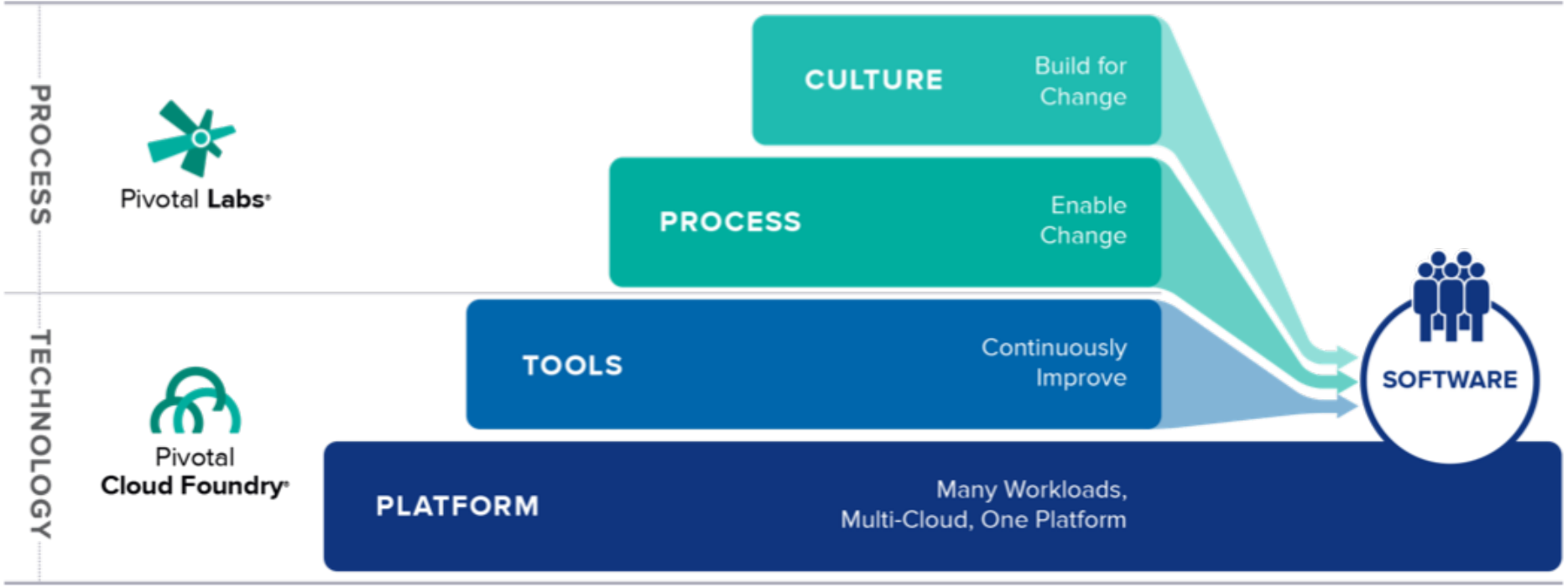
Internal marketing: Everything, frequently

Sources: Pivotal customers; "The Need For Speed: Drive Velocity And Quality With DevOps," Robert Stroud & Eveline Oehrlich, Forrester, Feb 2017

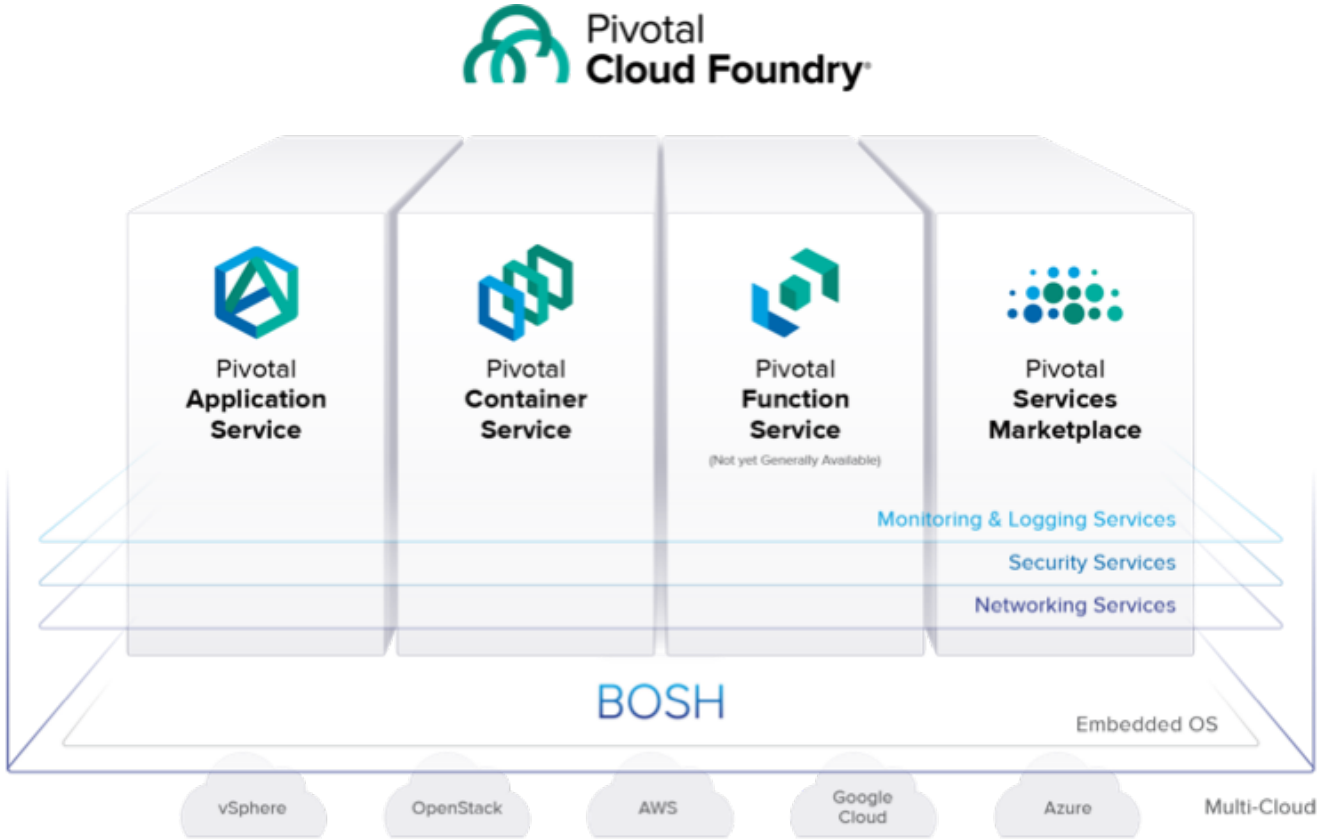
Pivotal

How Pivotal fits in to and helps with all this.

These organizations are transforming their software stack



How T-Mobile went from **7 months** to update software, **to same day deployments**



Engineering

Extreme Programming

Building working software at a consistent speed and quality in the face of changing requirements.

PRACTICES

- Pair Programming
- Test-Driven Development
- Short iterations
- Continuous Integration / Continuous Deployment

Design

User Centered Design

Ensuring the software solves a real problem for real users in a desirable and usable product.

PRACTICES

- User Interviews
- Ethnographic studies
- Persona definition
- Prototype creation

Product Management

Lean

Reducing the risk of building the wrong thing while comfortably changing direction.

PRACTICES

- Minimum Viable Product (MVP) definition
- Lean experiments
- Identify & test assumptions
- Data driven decisions

Data Science

Data Driven

Informed decision making through data to improve the viability of the product

PRACTICES

- Artificial Intelligence
- Data discovery
- Preventative analytics
- Personalisation
- Natural language analysis

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These transformations are real, across many organizations

Learn from peers

Hear more of cases & tactics like these, plus nerd stuff.

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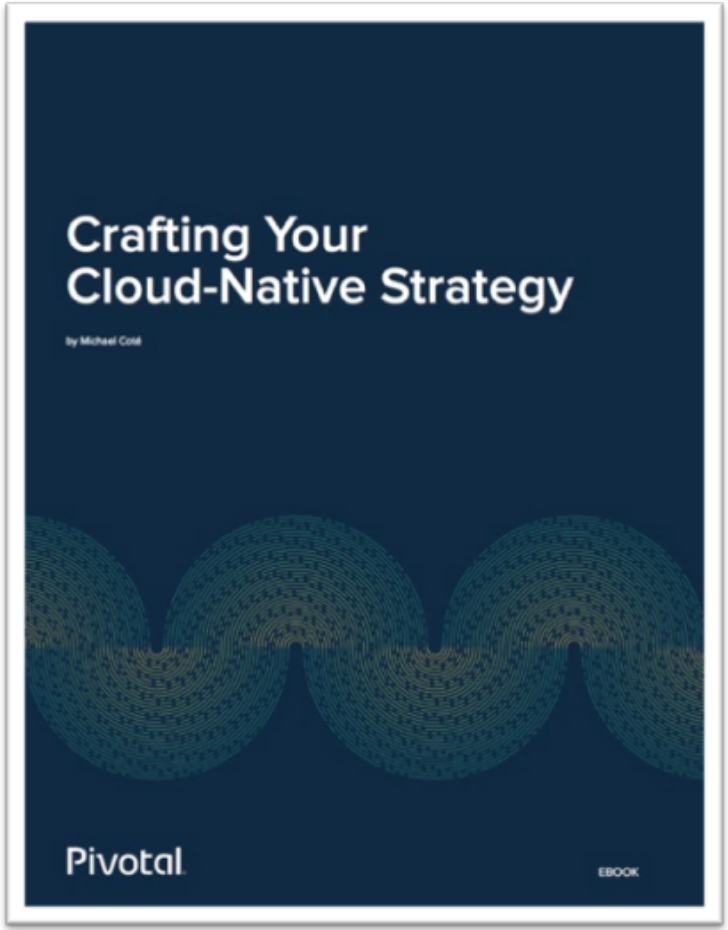

CRAFTING YOUR CLOUD-NATIVE STRATEGY EBOOK 2

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http://cote.io/cloud2

“We are uncovering better ways of developing software by doing it and helping others do it.”

- *The Agile Manifesto*, 2001

Thanks!

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