Pivotal

Putting the Dev back into DevOps, or, creating better software

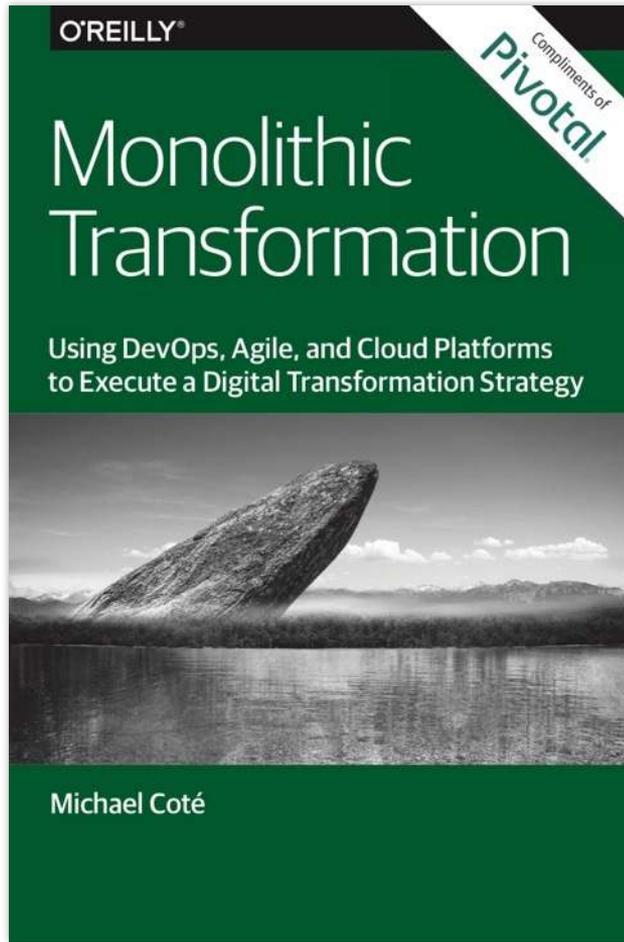**March, 2019**
Bologna
@cote

cote.coffee/bettersoftware

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O'REILLY®

Compliments of Pivotal

Monolithic Transformation

Using DevOps, Agile, and Cloud Platforms to Execute a Digital Transformation Strategy

Michael Coté

@cote

Pivotal™

SOFTWARE DEFINED TALK

RedMonk

The Register®

451 Research®

Pivotal

http://cote.coffee/bettersoftware/

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==Key principal:==

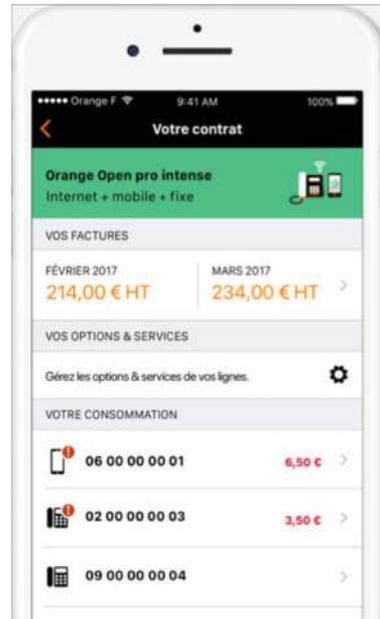Faster, more frequent release cycles make software better:

- More productive for users

- More resilient

- More efficient, less waste

- More secure

- More valuable to the business

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A new business app in ⅓ less time, used by 50% of customers

"Our developers are now totally focused on our customers and the user experience."

Xavier Perret, Orange France

Design Studio

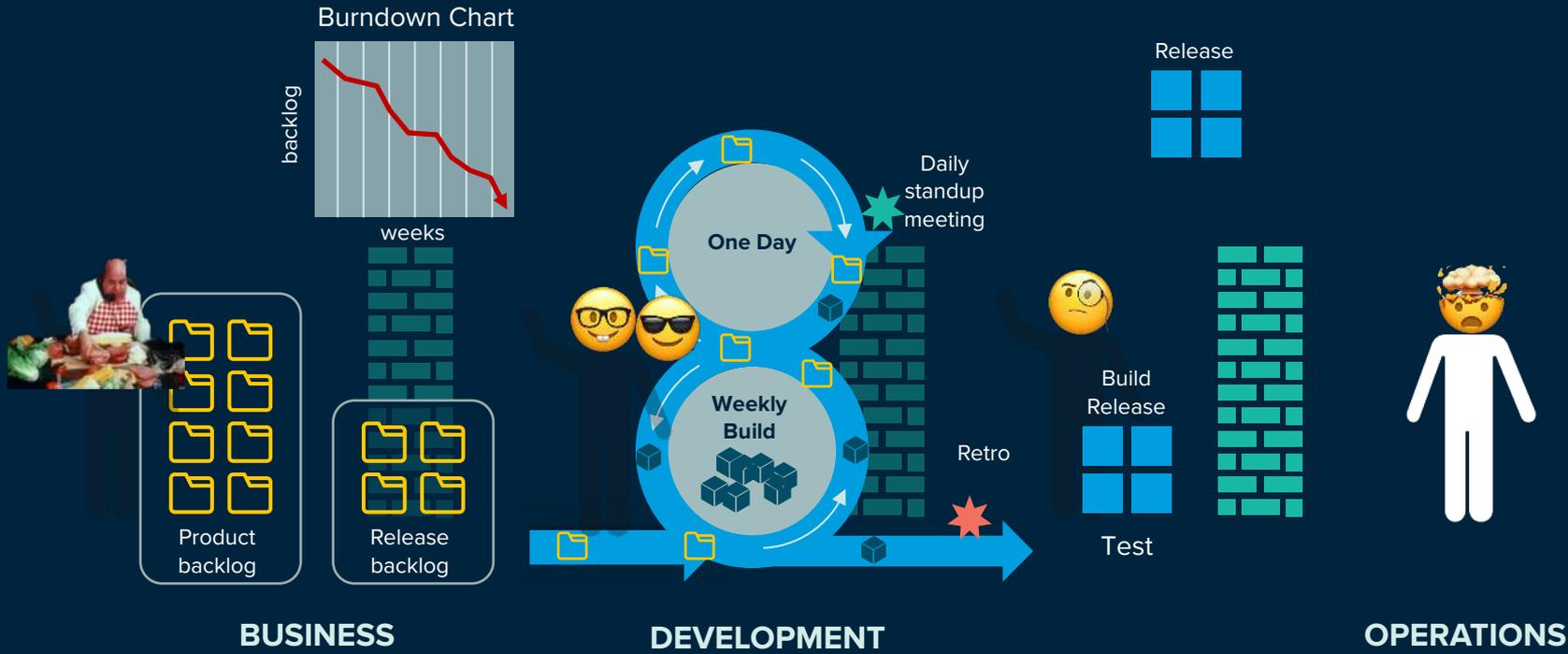Synthèse

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Source "Going Cloud-Native at Orange France," Pivotal Insights #53, 2018; "Transformation Digitale de la Direction Enterprise France," Philippe Benaben, Gan Zifroni, Nicolas Gilot, Orange France, July 2018

"How often does your team or teams release applications?"

Legend: 2018, 2017, 2016, 2015, 2014

Categories (x-axis): We average one release a year (or less frequently) · We average two releases a year · We average one release per quarter · We average one release a month · We average one release a week · We average a release a day · We release many times per day

Base (2018): 3,228 Developers
Base: 546-719 Developers who work for a software company, for internal IT, or in technology services
Source: Forrester Business Technographics Developer Survey, 2014-2018.

Burndown Chart

backlog

weeks

Product backlog

Release backlog

One Day

Daily standup meeting

Weekly Build

Retro

Release

Build Release

Test

BUSINESS

DEVELOPMENT

OPERATIONS

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```yaml
apiVersion: v1
kind: Service
metadata:
  name: mysql
spec:
  ports:
    - port: 3306
      protocol: TCP
  selector:
    app: mysql


apiVersion:
extensions/v1beta1
kind: ReplicaSet
metadata:
  name: mysql
  labels:
    app: mysql
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mysql
  template:
    metadata:
      labels:
        app: mysql
    spec:
      containers:
```

```yaml
    - name: database
      image: mysql:5.6
      resources:
        requests:
          cpu: 1
          memory: 1Gi
      livenessProbe:
        tcpSocket:
          port: 3306
      ports:
      - containerPort: 3306
      env:
        - name: MYSQL_ROOT_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysqlsecret
              key: database.password
        - name: MYSQL_USER
          valueFrom:
            secretKeyRef:
              name: mysqlsecret
              key: database.username
        - name: MYSQL_PASSWORD
          valueFrom:
            secretKeyRef:
              name: mysqlsecret
              key: database.password
```

```yaml
        - name: MYSQL_DATABASE
          valueFrom:
            secretKeyRef:
              name: mysqlsecret
              key: database.name
      volumeMounts:
        - name: database
          mountPath: /var/lib/mysql
  volumes:
    - name: database
      persistentVolumeClaim:
        claimName: database


apiVersion: v1
kind: PersistentVolume
metadata:
  name: database
  labels:
    volume: mysqlvolume
spec:
  accessModes:
    - ReadWriteMany
  capacity:
    storage: 1Gi
  hostPath:
    path: /data/pv0002/
```

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See the interactive landscape at l.cncf.io

Burndown Chart

backlog

weeks

Product backlog

Release backlog

BUSINESS

One Day

Daily standup meeting

Weekly Build
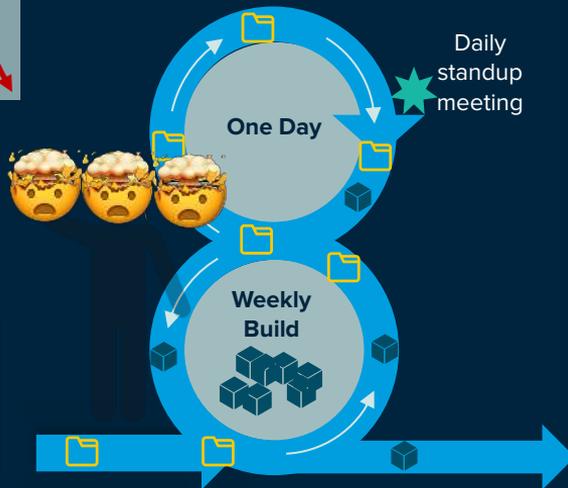
DEVELOPMENT

apiVersion: v1
kind: Service
metadata:
  name: mysql
spec:
  ports:
    - port: 3306
      protocol: TCP
  selector:
    app: mysql

apiVersion: extensions/v1beta1
kind: ReplicaSet
metadata:
  name: mysql
  labels:
    app: mysql
spec:
  replicas: 1
  selector:
    matchLabels:
      app: mysql
  template:
    metadata:
      labels:
        app: mysql
    spec:
      containers:

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"The Business"

Corporate strategy, revenue goals, mission, etc.

Leadership, EAs, etc.

Culture, process, methodology, governance, compensation, etc.
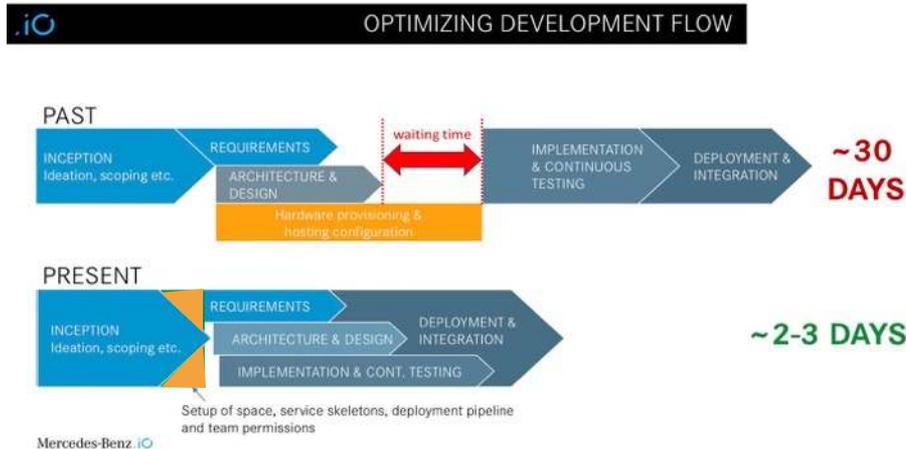
Product teams

Mobile payments	Mortgage application	Mortgage approval	Bill pay	Transfers

Platform Engineers

Pivotal Cloud Foundry

Private or public IaaS

Pivotal
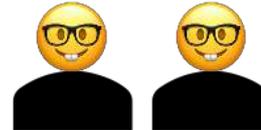
Platform as a Product by removing toil

OPTIMIZING DEVELOPMENT FLOW

PAST

INCEPTION Ideation, scoping etc. → REQUIREMENTS → ARCHITECTURE & DESIGN → Hardware provisioning & hosting configuration → *waiting time* → IMPLEMENTATION & CONTINUOUS TESTING → DEPLOYMENT & INTEGRATION → ~30 DAYS

PRESENT

INCEPTION Ideation, scoping etc. → REQUIREMENTS → ARCHITECTURE & DESIGN → IMPLEMENTATION & CONT. TESTING → DEPLOYMENT & INTEGRATION → ~2-3 DAYS

Setup of space, service skeletons, deployment pipeline and team permissions

Mercedes-Benz.iO

DAIMLER

Functions

- Removes toil with automation & programming

- Stands up & manages the platform

- Creates shared services/middleware/etc.

- Consults with initial projects

Insane staff efficiency

- T-Mobile USA: 8 ops to 300 developers, 11k containers

- Dick's Sporting Goods: 6 ops to 120 devs.

Pivotal   Source: "Adopting PCF At An Automobile Manufacturer," Thomas Seibert and Gregor Zurowski, s1p 2017.

Standardize on a platform

Infrastructure	Operations	Deployment	Backing Services	Security
Container Orchestration	Service Monitoring and Dependency Management	Lifecycle Management Deploy | Patch | Upgrade | Retire	HTTP / Reverse Proxy	Control Plane Audit & Compliance
Infrastructure Orchestration	Inventory, Capacity, and Management	Release Packaging, Management & Deployment	Application Runtime	Security Event & Incident Management
Service Discovery	Event Management and Routing	CI/CD Orchestration	In-Memory Object Cache	Secrets Management
Configuration Management	Persistent Team Chat	TDD Frameworks	Search	Certificate Management
Core IaaS	Metrics & Logging Analytics & Visualization	Container Registry/Artifact Repository	Messaging	Identity Management
NAT / DNS	Log Aggregation, Indexing & Search	Standard Builds & Configurations	NoSQL Document Store	Threat & Vulnerability Scanning
SDN / IPAM				
Firewalls / WAN & VPN				
Storage / Load Balancers	Metrics Collection, Storage & Retrieval	Source Control Management	NoSQL Key/Value Store	Network Security
Compute / Network				

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A consistent, trusted platform automates waste, focusing on product support

"Cost of Delay - How PCF Helped Demonstrate the DoD Can't Afford Business as Usual,"

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"The Business"

Corporate strategy, revenue goals, mission, etc.

Leadership, EAs, etc.

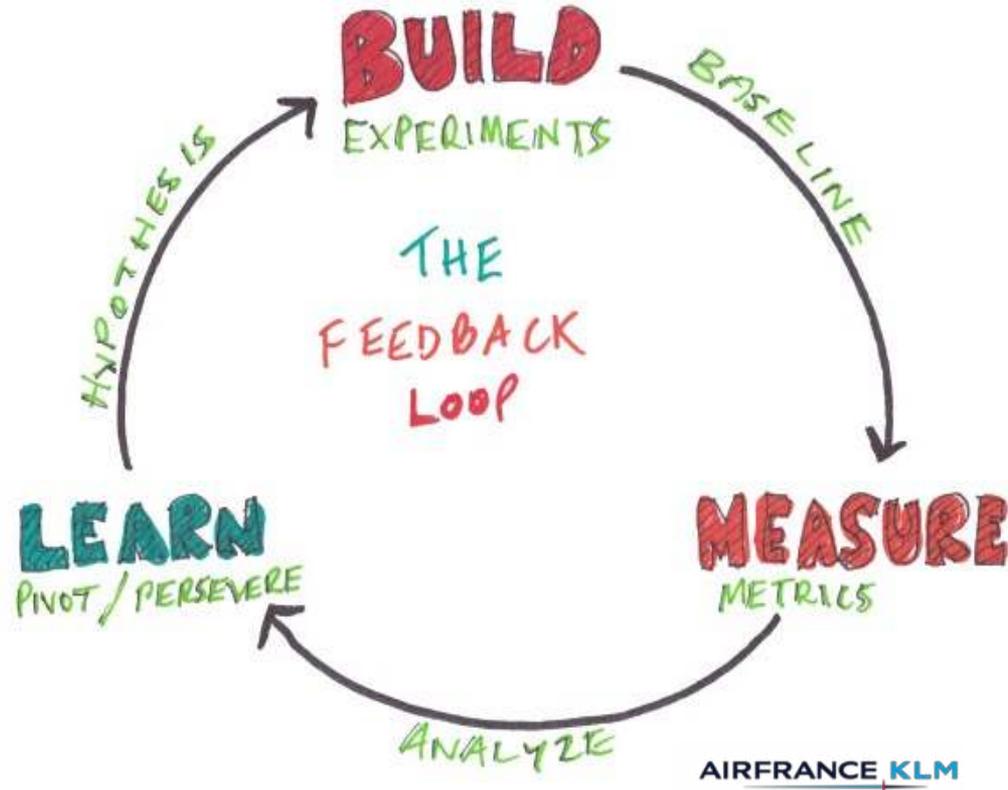Culture, process, methodology, governance, compensation, etc.

Product teams

| Mobile payments | Mortgage application | Mortgage approval | Bill pay | Transfers |

Pivotal Cloud Foundry

Platform Engineers

Private or public IaaS

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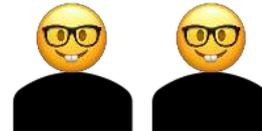
A consistent product process

From 37% availability to $440m in back taxes

Before

Overview by Year

YEAR	STATUS	AMOUNT	
2014	Balance Due	$644	›
2013	Taxes Paid	$685	›
2012	Refund/Applied	$100	›
2011	No Information Available	--	

After

Overview by Year

YEAR	BALANCE DUE	
2014	$644.00	›
2013	$0.00	
2012	$0.00	
2011	No Return on File	›

- **User-centric, small batch**

- **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. See another write-up.

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Product centric, balanced teams

Source: "Developer & Culture Transformation," Jason Williams, Dick's Sporting Goods, s1p 2018.

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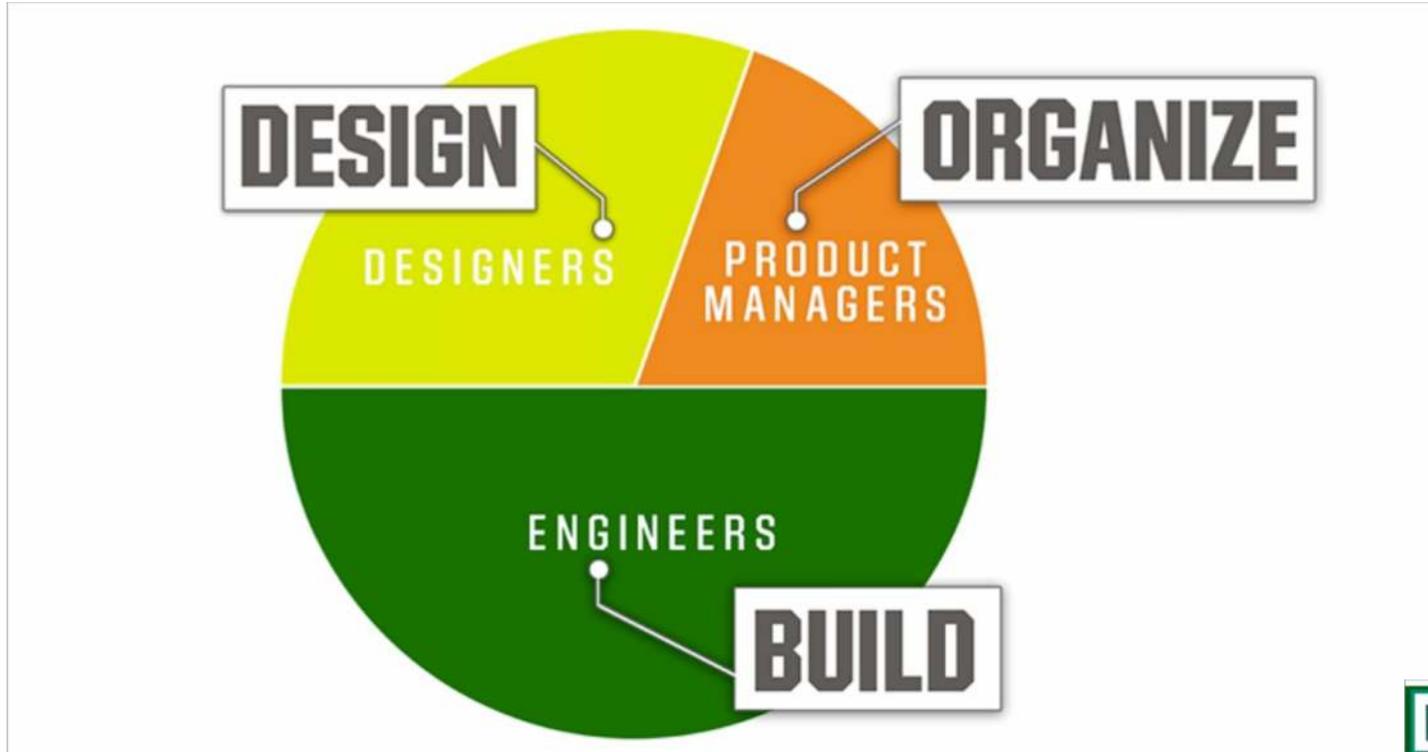
From coding 20% of the time coding to coding 90% of the time

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. Sources: VW.
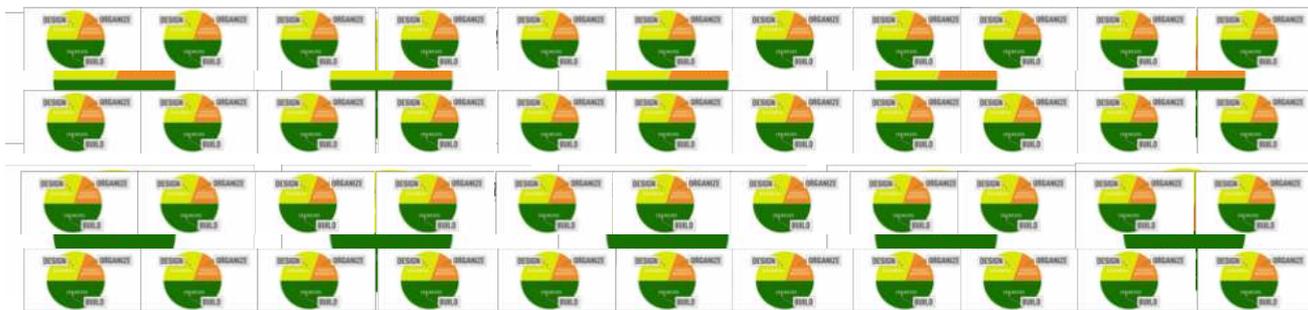
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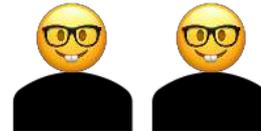
Enterprise architects are key to scaling

Leadership, EAs, etc.

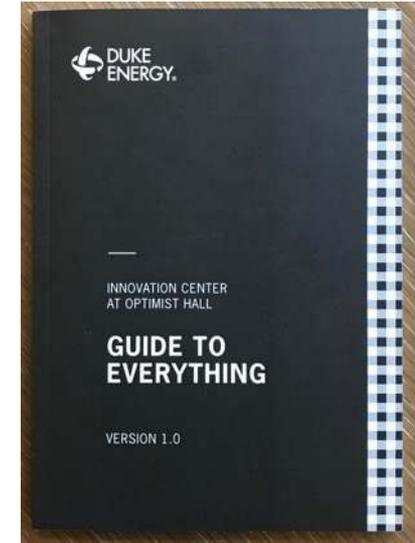Culture, process, methodology, governance, compensation, etc.

Product teams

Pivotal Cloud Foundry®

Platform Engineers
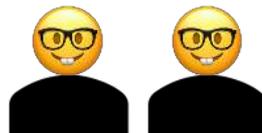
Private or public IaaS

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Changing is often too hard, so create a new organization
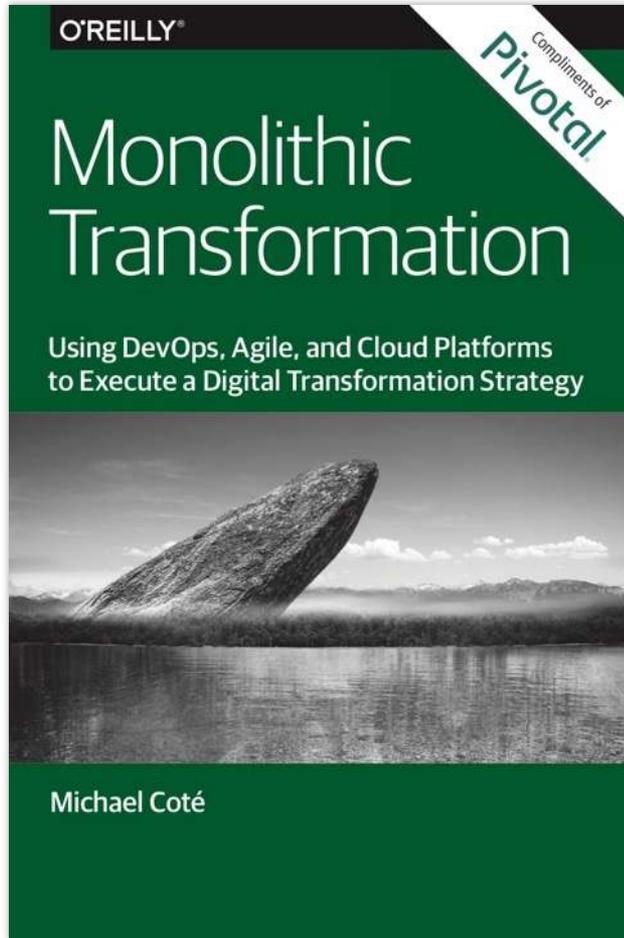
Internal marketing, branding, etc.

Sources: Talanx; Duke Energy; Allstate; "Take DevOps to 11 and Sprinkle Cloud on it with Rainbows and Unicorns," Matt Curry, s1p 2017; customer discussions.

A new business in 6 months, doubling avg. sales rate

40% strike rate
Compared to 20% industry average

3 minutes
Versus 10 minutes to do a referral

199 quotes
With 60 bound policies to date
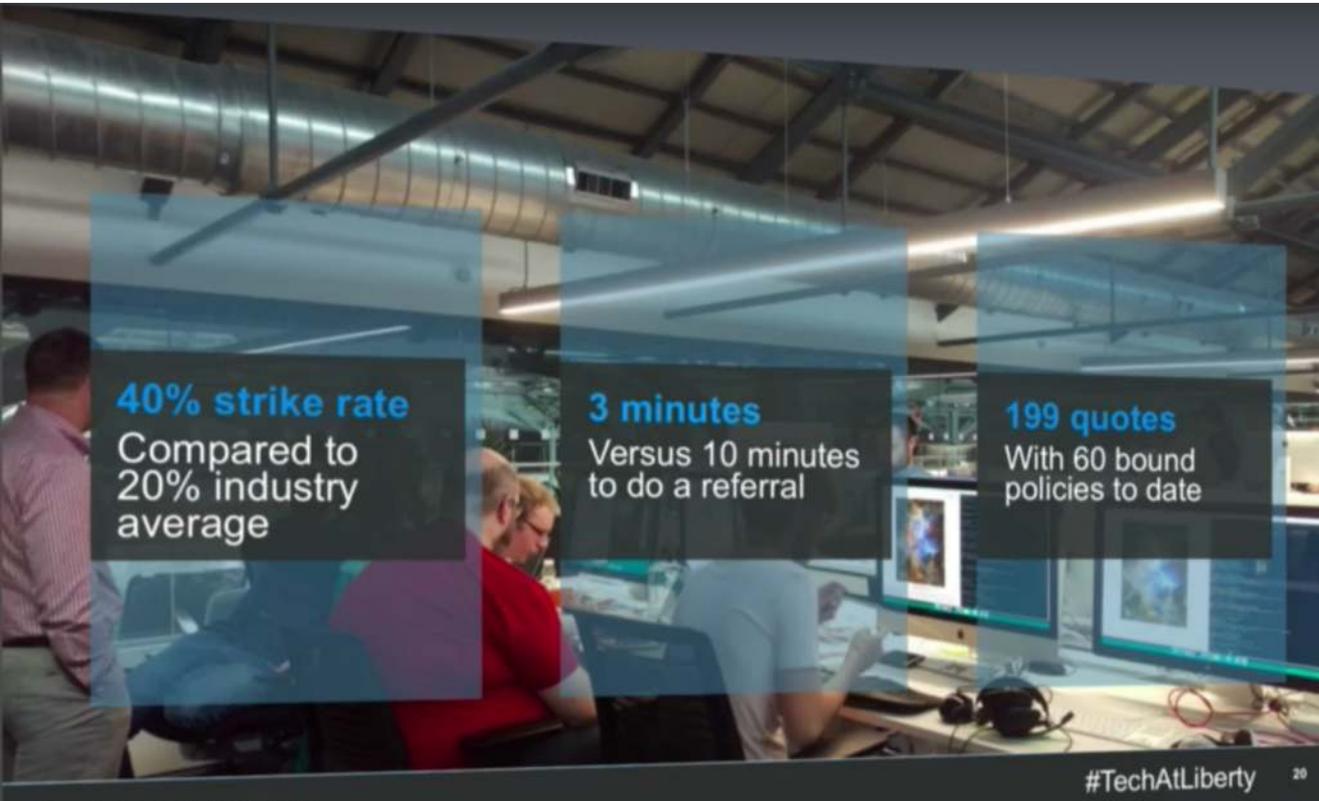
#TechAtLiberty 20

Liberty Mutual Insurance

CLOUD FOUNDRY
SUMMIT
2017
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