

# **HONEYWELL CONNECTED ENTERPRISE**

## **WHO WE ARE**



**Connected  
Aerospace**



**Connected  
Industrial**



**Connected  
Building**



**Connected  
Cyber**

# **CONTEXT**

## **THE MISSION**

**10,000**

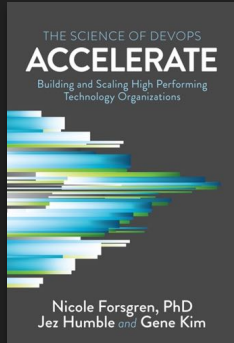
Honeywell  
Developers

**1,000**

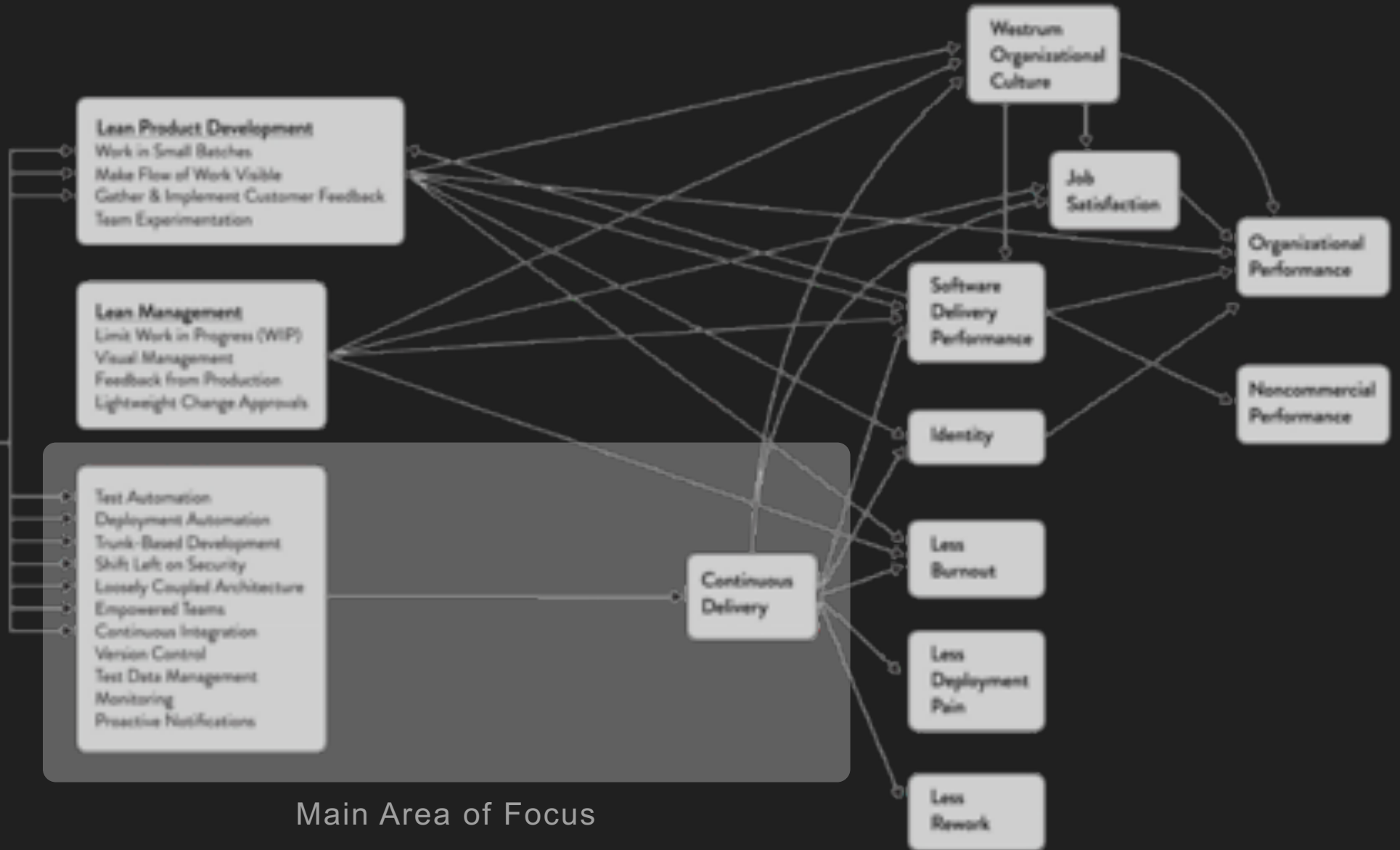
Connected  
Enterprise

**Bring DevOps to  
the Organisation**

# CONTEXT



**Transformational Leadership**  
Vision  
Intellectual Stimulation  
Inspirational Communication  
Supportive Leadership  
Personal Recognition



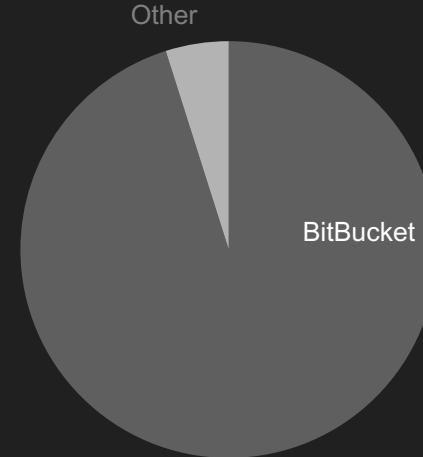
Main Area of Focus

# HOW BIG IS THE PROBLEM?

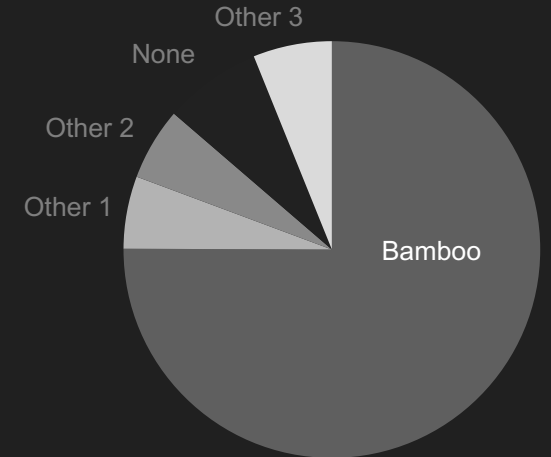
## EXISTING PIPELINES

- Researched 414 Pipelines
  - 649 combinations (Snowflakes)
- A lot of commonality, but also a lot of variance

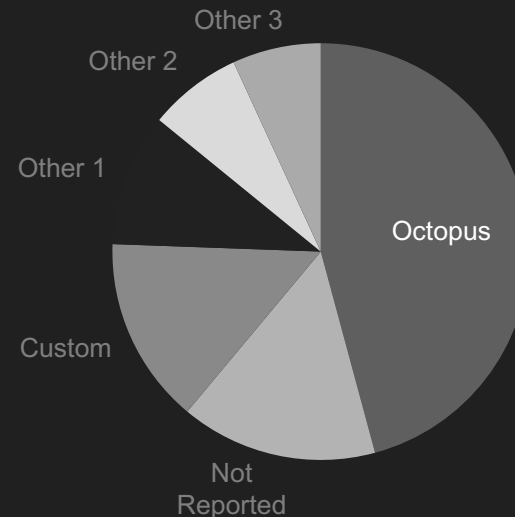
Version Control



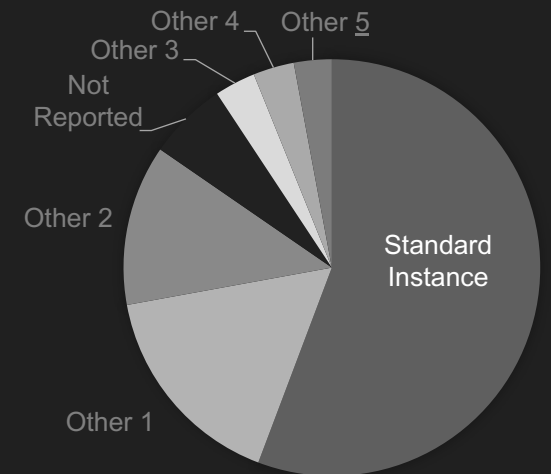
Build Tools



Deploy Tools



Tool Instances

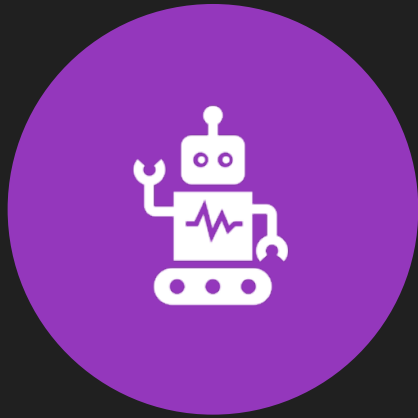


# HOW BIG IS THE PROBLEM?

## EXISTING CAPABILITIES (SUBSET)

	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6	Measure 7	Measure 8	Measure 9	Measure 10	Measure 11	Measure 12	Measure 13	
Product 1	100%	100%	0%	0%	0%	0%	0%	100%	100%	100%	0%	0%	0%	38%
Product 2	0%	0%	100%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	15%
Product 3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Product 4	100%	100%	100%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	31%
Product 5	100%	100%	100%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	31%
Product 6	100%	100%	100%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	31%
Product 7	100%	100%	0%	100%	0%	100%	100%	100%	100%	100%	0%	0%	100%	69%
Product 8	100%	100%	0%	0%	0%	100%	100%	0%	100%	0%	0%	0%	0%	38%
Product 9	0%	0%	0%	100%	0%	0%	0%	100%	0%	0%	0%	0%	100%	23%
Product 10	100%	100%	100%	100%	100%	100%	0%	100%	100%	0%	0%	0%	100%	69%
Product 11	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	8%
Product 12	100%	100%	0%	100%	0%	100%	100%	100%	100%	0%	0%	100%	100%	69%
Product 13	73%	100%	18%	73%	18%	64%	0%	18%	18%	18%	0%	0%	0%	31%
Product 14	82%	88%	0%	79%	81%	79%	0%	0%	18%	18%	0%	0%	0%	32%
Product 15	83%	83%	78%	78%	70%	76%	48%	97%	46%	0%	0%	58%	15%	58%
Product 16	100%	100%	0%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	62%
Product 17	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	100%	0%	77%
Product 18	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	15%
Product 19	100%	100%	100%	100%	100%	100%	50%	0%	100%	100%	0%	0%	0%	65%
Product 20	100%	100%	0%	100%	0%	100%	0%	0%	0%	0%	0%	0%	0%	31%
Product 21	100%	100%	0%	100%	100%	91%	84%	100%	94%	94%	0%	100%	100%	82%
Product 22	38%	38%	100%	25%	0%	0%	0%	38%	25%	25%	0%	0%	0%	22%
Product 23	62%	59%	100%	58%	58%	67%	33%	100%	59%	59%	0%	59%	59%	59%

# THE 3 PILLARS PLAN



Automation



Enablement



Measurement

# AUTOMATION PLAN

Automate all the tools and process  
to remove manual steps for  
CI/CD pipeline creation  
and execution

# MEASUREMENT PLAN

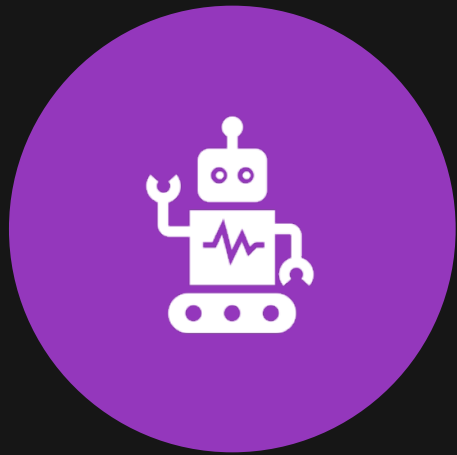
Measure key indicators to  
identify areas of improvement for  
the development teams and  
coaches



# ENABLEMENT PLAN

Guide the establishment of  
DevOps culture, aided by the  
automation, informed by the  
measurements

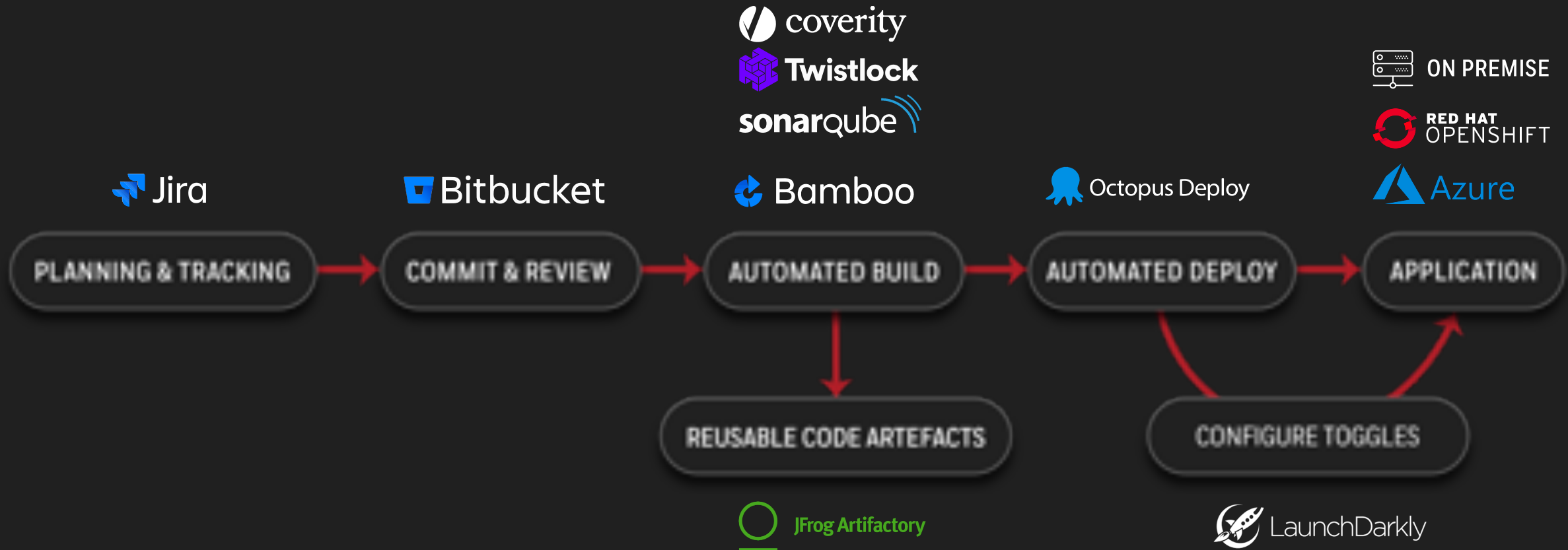
# THE 3 PILLARS PLAN AUTOMATION



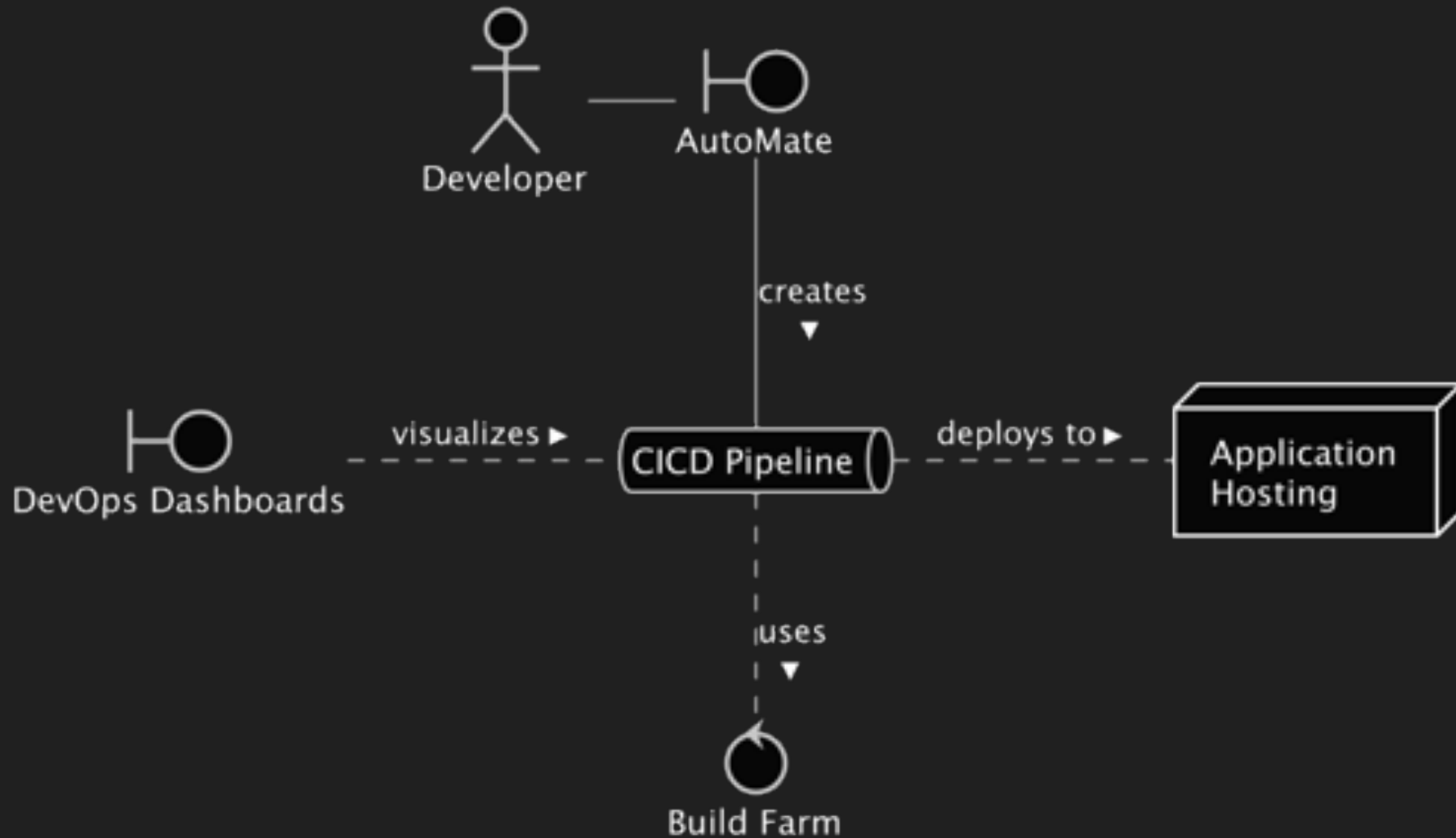
AutoMate  
Self Service CICD  
Pipeline Portal

```
354 }
355 Carousel.prototype.getItemForDirection = function (direction, active) {
356   this.$items = item.parent().children();
357   return this.$items.eq(this.$activeIndex + direction);
358 }
359
360 Carousel.prototype.getItemIndex = function (item) {
361   var delta = direction == 'prev' ? -1 : 1;
362   var activeIndex = this.$activeIndex;
363   var itemIndex = (activeIndex + delta) % this.$items.length;
364   return this.$items.eq(itemIndex);
365 }
366
367 Carousel.prototype.to = function (pos) {
368   var that = this;
369   var activeIndex = this.$activeIndex;
370   if (pos > (this.$items.length - 1) || pos < 0) return;
371   if (this.sliding) return this.$element.one('slid.bs.carousel', function () { that.to(pos); });
372   if (activeIndex == pos) return this.pause().cycle();
373   return this.slide(pos > activeIndex ? 'next' : 'prev', this.$items.eq(pos));
374 }
375
376 Carousel.prototype.pause = function (e) {
377   e || (this.paused = true);
378
379   if (this.$element.find('.next, .prev').length && $.support.transition) {
380     this.$element.trigger($.support.transition.end);
381     this.cycle(true);
382   }
383
384   this.interval = clearInterval(this.interval);
385
386   return this;
387 }
388
389 return this;
```

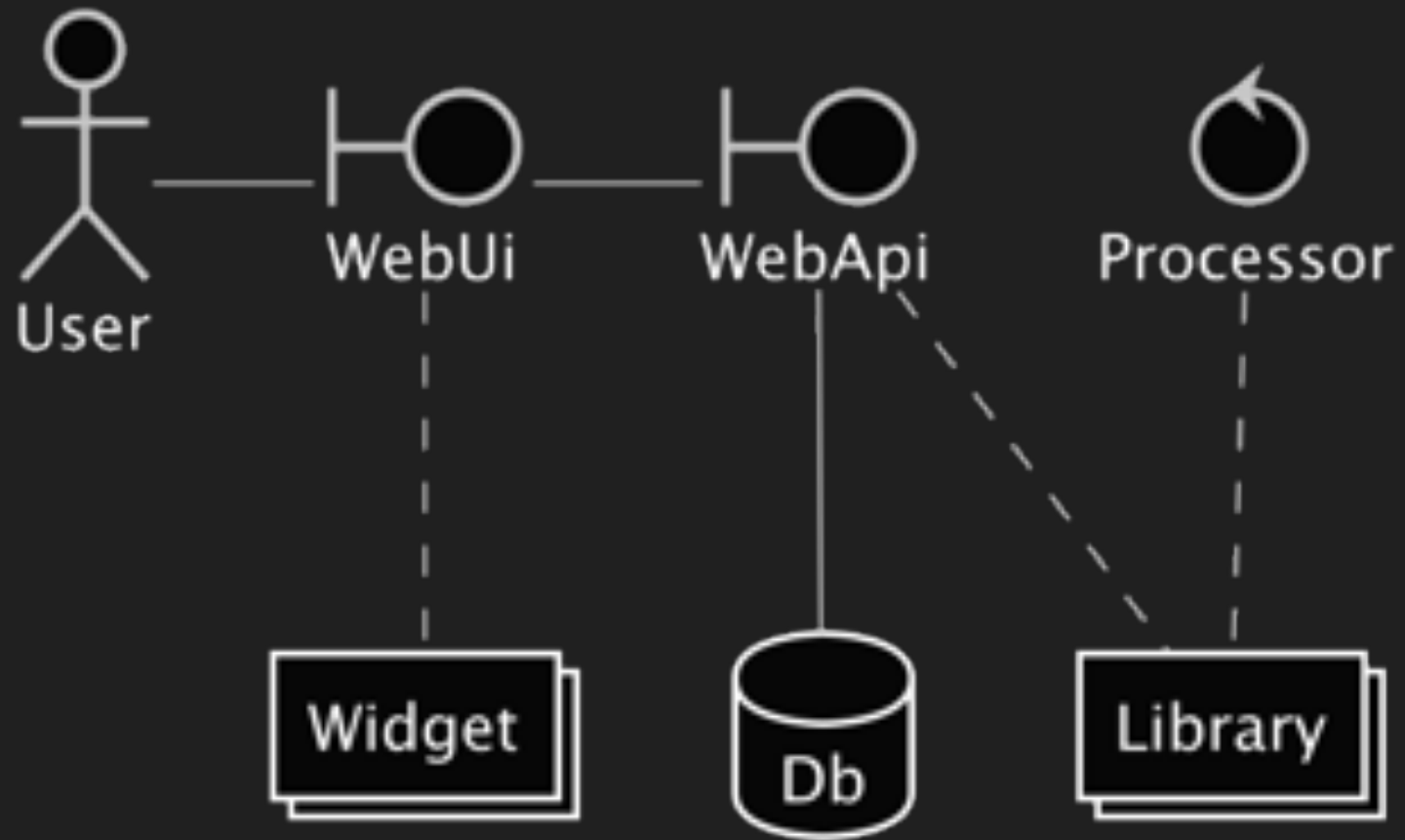
# AUTOMATION STANDARD PIPELINE



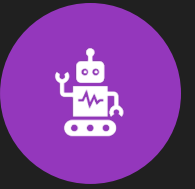
# AUTOMATION PIPELINES AS A SERVICE



# AUTOMATION TEMPLATE TYPES



# AUTOMATION TEMPLATES



## CODE

- Sample Code
- Multiple languages (C, C#, Java, Python)
- Multiple technologies (WebAPI, WebUI)
- Feature toggles
- Automated Testing
- Monitoring

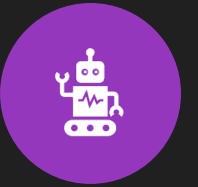
## SCRIPTS

- Multiple OS (Windows, Linux, Mac)
- Build
- Package
- Deploy
- Quality and Security Tools integration

## PROCESS

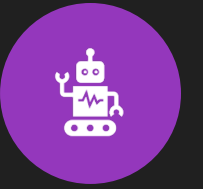
- Release management controls
- Measurement infrastructure
- Quality controls
- Security controls

# AUTOMATION CURRENT TEMPLATES



Web API	Processor	Library	UI	Mobile	Generic	Data Science	Embedded
DotNet Core	C++	DotNet Core	ReactJS	Native iOS	Deploy	Python Spark	IAR
DotNet Framework	Java	DotNet Framework	Angular (Build only)	Native Android	Kong API	Java Spark	Niagra
NodeJS		Javascript		React Native	Build Machine	Hive	System Test
Python		React			Infrastructure Container	Nifi	Performance
Java		Java			IaaS Deployment Terraform	AirFlow	Functional

# AUTOMATION EMBEDDED

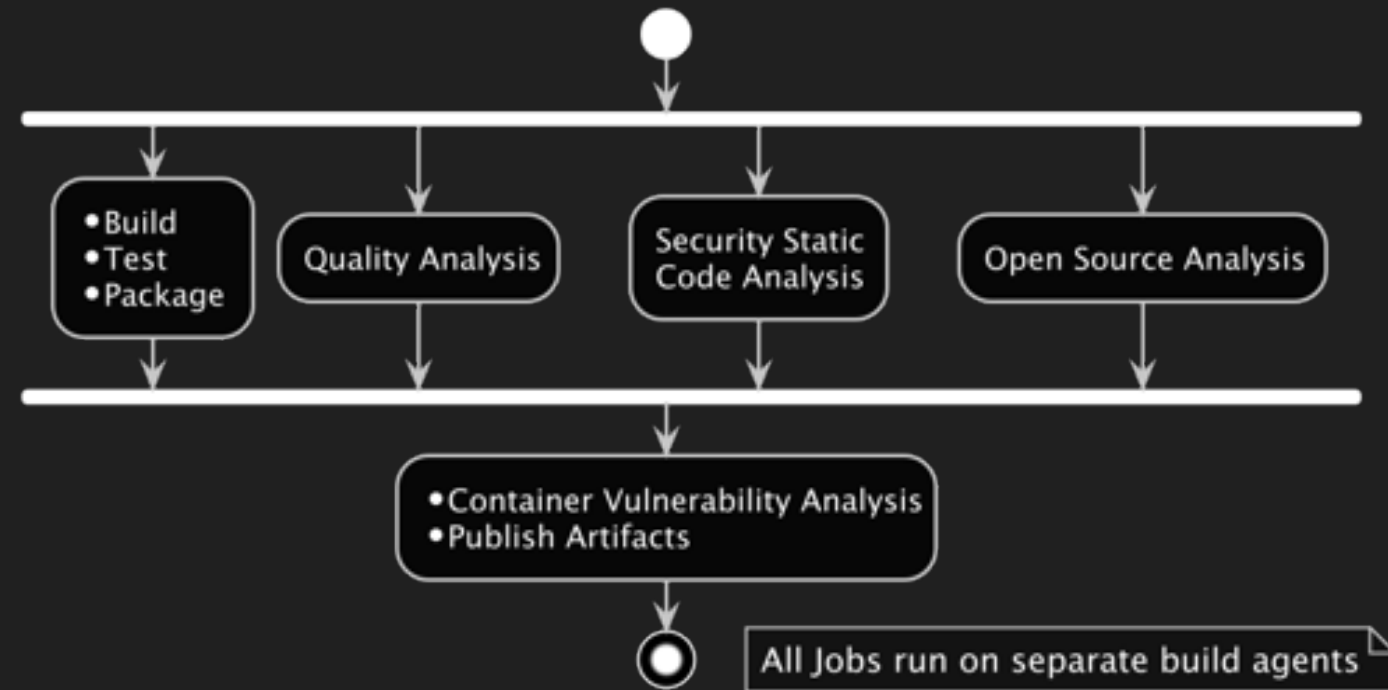




# AUTOMATION BUILD



- CAKE build system
- Build Farm
- Build Script Requirements
  - Minimal repository footprint
  - Run locally as well as on Build Machine



# AUTOMATION DEPLOY AND OPERATE



- Support multiple Environments
- Support multiple cloud technologies
- Automatically configured Monitoring

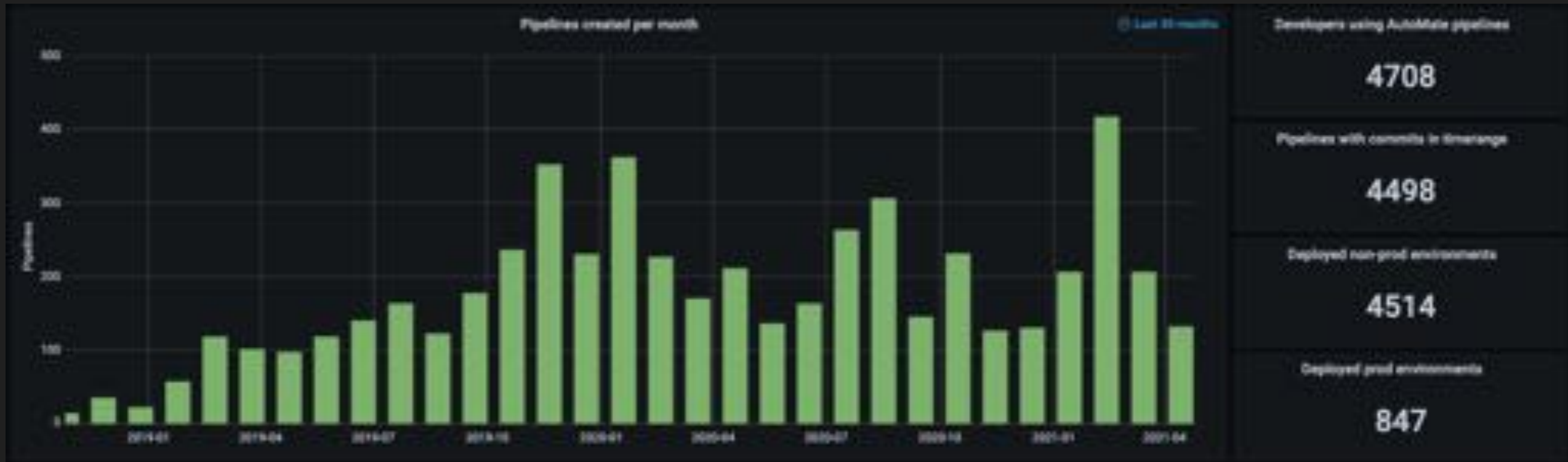
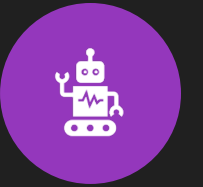


## **AUTOMATION** **PROGRESS SO FAR**



Each pipeline created with  
AutoMate saves 6 weeks initial  
effort plus ongoing savings

# AUTOMATION PROGRESS SO FAR

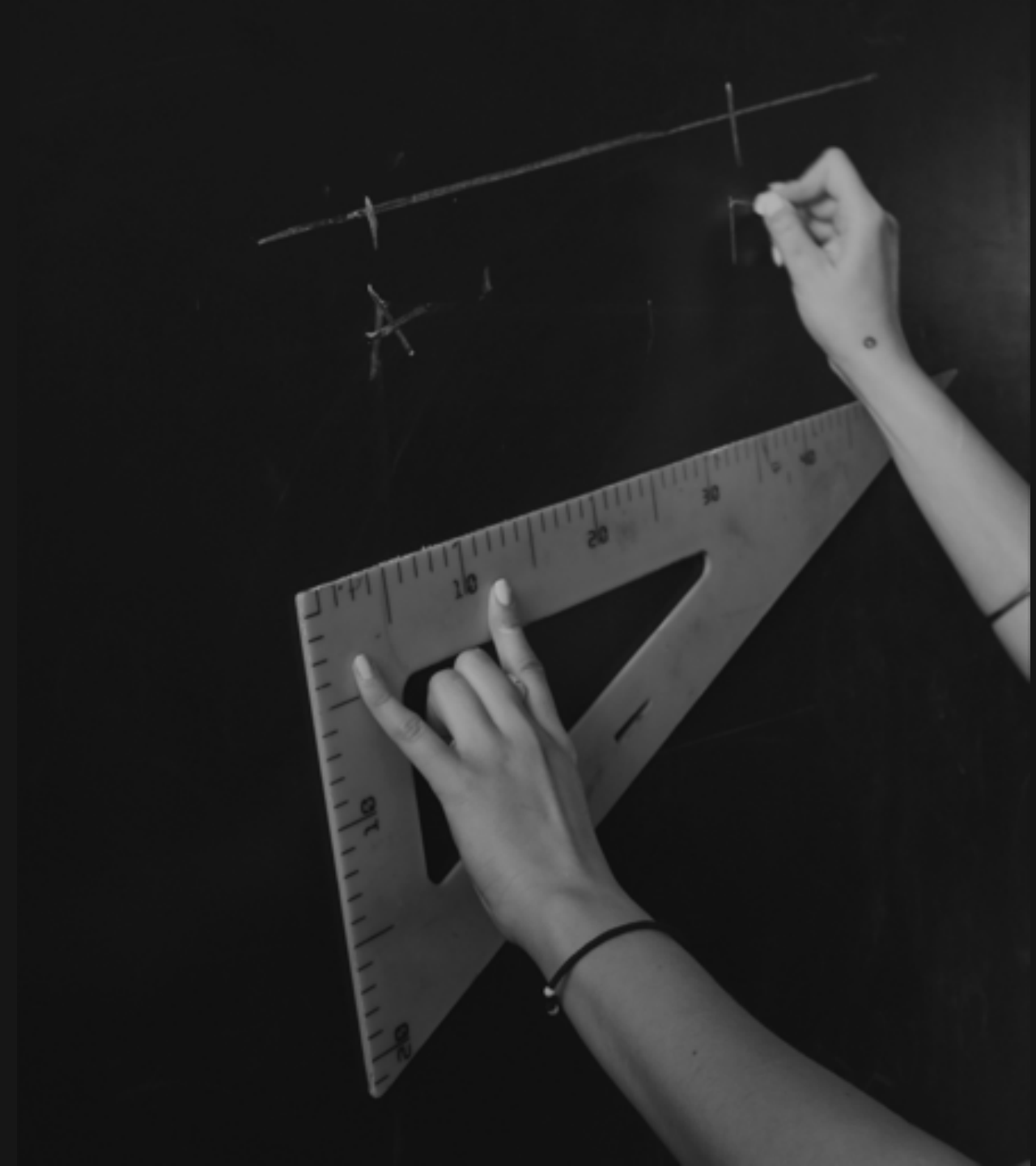


# AUTOMATION HURDLES

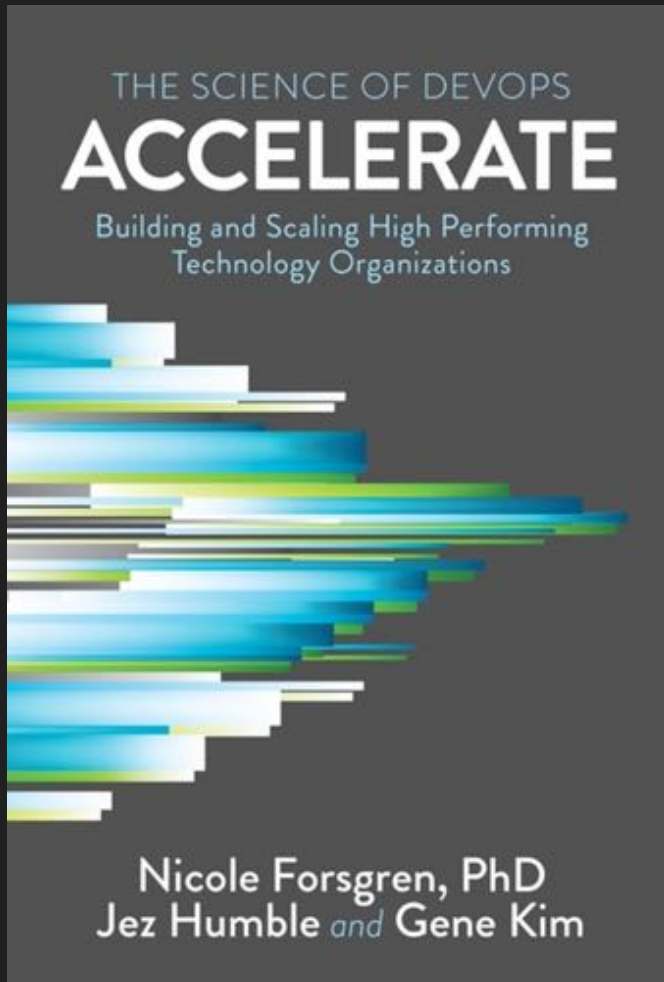


- Tools that don't support Continuous Integration
- Manual Processes before Release
- Contribution Model

# THE 3 PILLARS PLAN MEASUREMENT



# MEASUREMENT KEY METRICS



Honeywell

## STABILITY

Change Failure Percentage

Mean time to Restore

## THROUGHPUT

Deployment Frequency

Delivery Lead Time

High Performers → Safely & Quickly

# MEASUREMENT PIPELINE DASHBOARD





# MEASUREMENT PERFORMANCE DASHBOARD



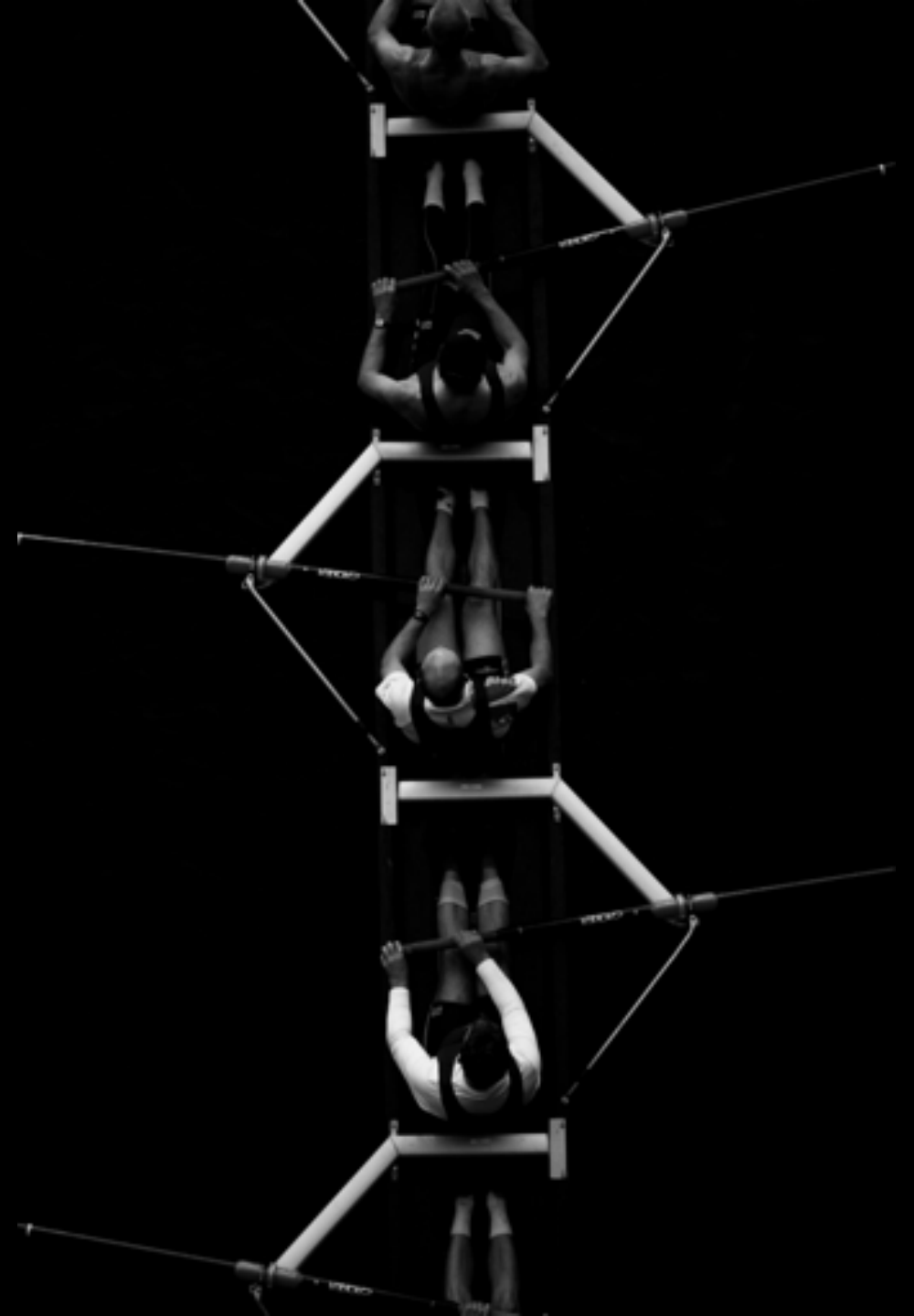
# MEASUREMENT HURDLES



- Some measures harder to collect
  - Change Failure Rate
  - Mean Time To Restore
- Visualizing Structured data

# THE 3 PILLARS PLAN

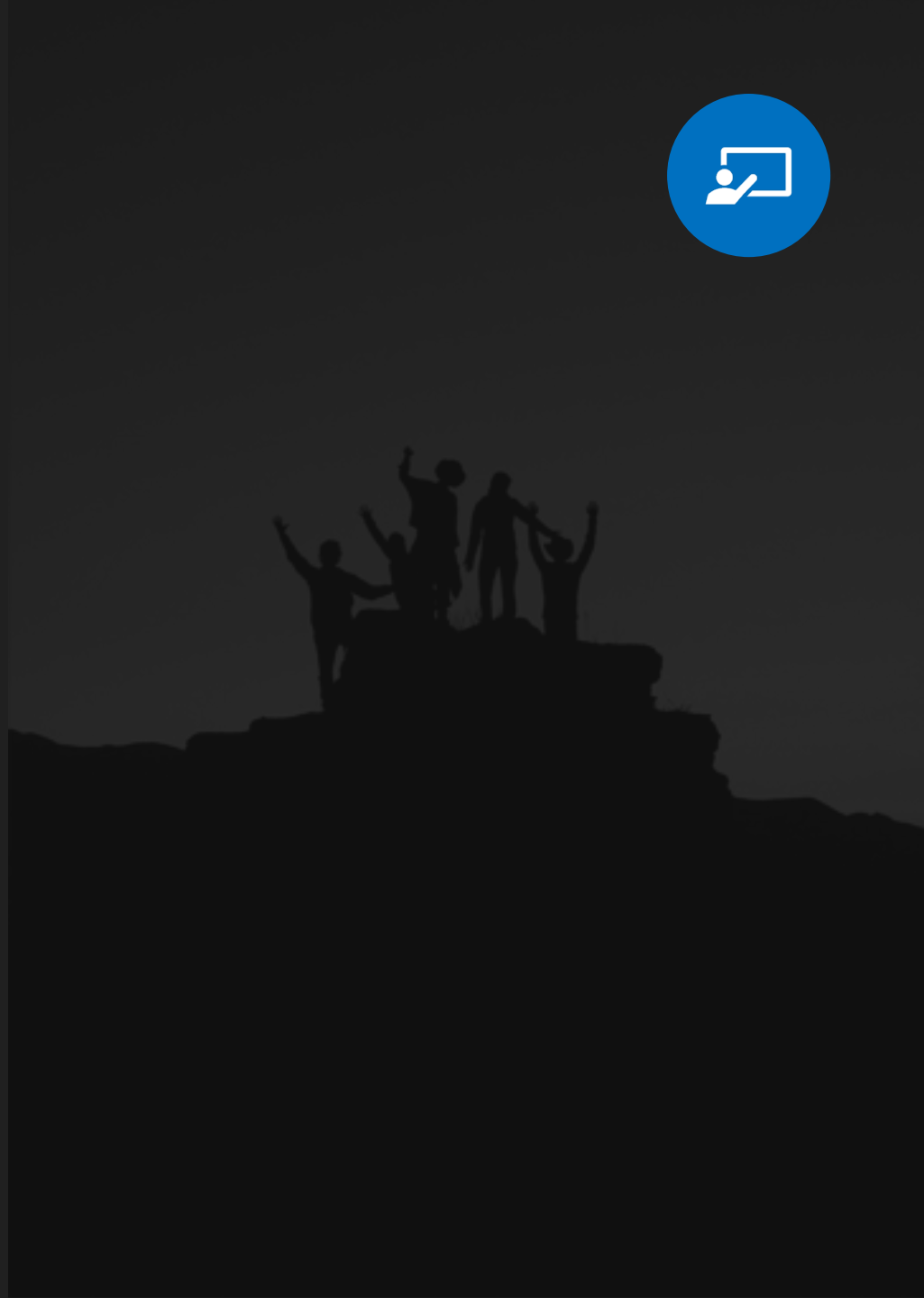
## ENABLEMENT



# ENABLEMENT PLAN



- Drive cultural change
- Small team of coaches
- Spotify like guilds
- Leverage existing communities of practice
- Utilize measurements to improve team's performance



# ENABLEMENT TRAINING



- Monthly Jump Starts
- Weekly Open Hours
- Quarterly Product Deep Dive

# ENABLEMENT ONLINE SUPPORT



- Not in the original plan
- Organic
- AutoMate developers are the front line
- Questions are varied in complexity and detail

# ENABLEMENT ONLINE HURDLES




*user*> "Can someone help me here, there are no changes to repo"

*team*> "Can you specify what you need help with?"

# ENABLEMENT ONLINE HURDLES - SOLUTIONS




 4:09 pm

## Run Quality Tools failure in bamboo

TemplateSupportBot start

→ Collapse all

 TemplateSupportBot 4:09 pm Updated

### Question

Where is the build broken?

Build and Package Job	Security Job
OSS or BlackDuck Hub Job	Quality Job
Publish Job	Other



# ENABLEMENT HURDLES



- Hiring coaches was very difficult
- Organizational Inertia
- Pockets of excellence

# THE 3 PILLARS PLAN

## OVERALL LEARNINGS

- Provide a lot of capabilities to teams
  - Yet to realize the full potential
- Successful Automation roll-out
- Moderately successful Measurement
- Enablement still has a long way to go

# QUESTIONS?