



BEYOND DEVOPS

Finding Value through Requirements

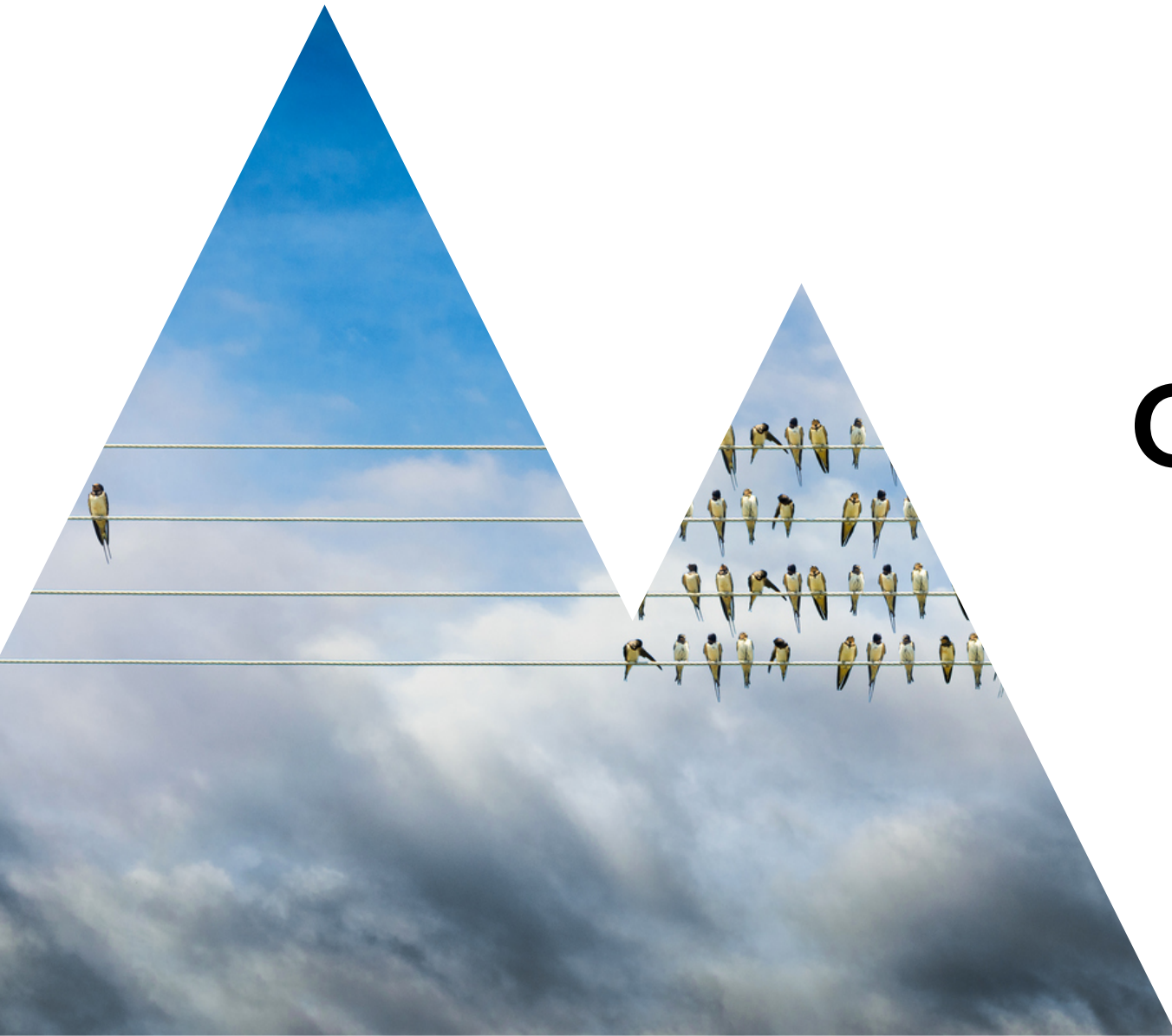
GAIL C. MURPHY
UNIVERSITY OF BRITISH COLUMBIA

@gail_murphy



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A more restrictive license has been selected
due to licenses on images



OUTSIDER

REALISM



THE MESSAGE

**DevOps
enables fast
delivery of
FEATURES**

**RE community
can enable fast
delivery of
VALUE**

VALUE

“the importance,
worth, or
usefulness
of something”

“a person’s
principle or
standards of
behaviour”

VALUE

“the importance,
worth, or
usefulness
of something”

“a person’s
principle or
standards of
behaviour”

PART01
DevOps Today

PART03
The Gap



PART02
Value Streams

PART04
RE Connection



DevOps Today

“A rosetta stone
for DevOps”

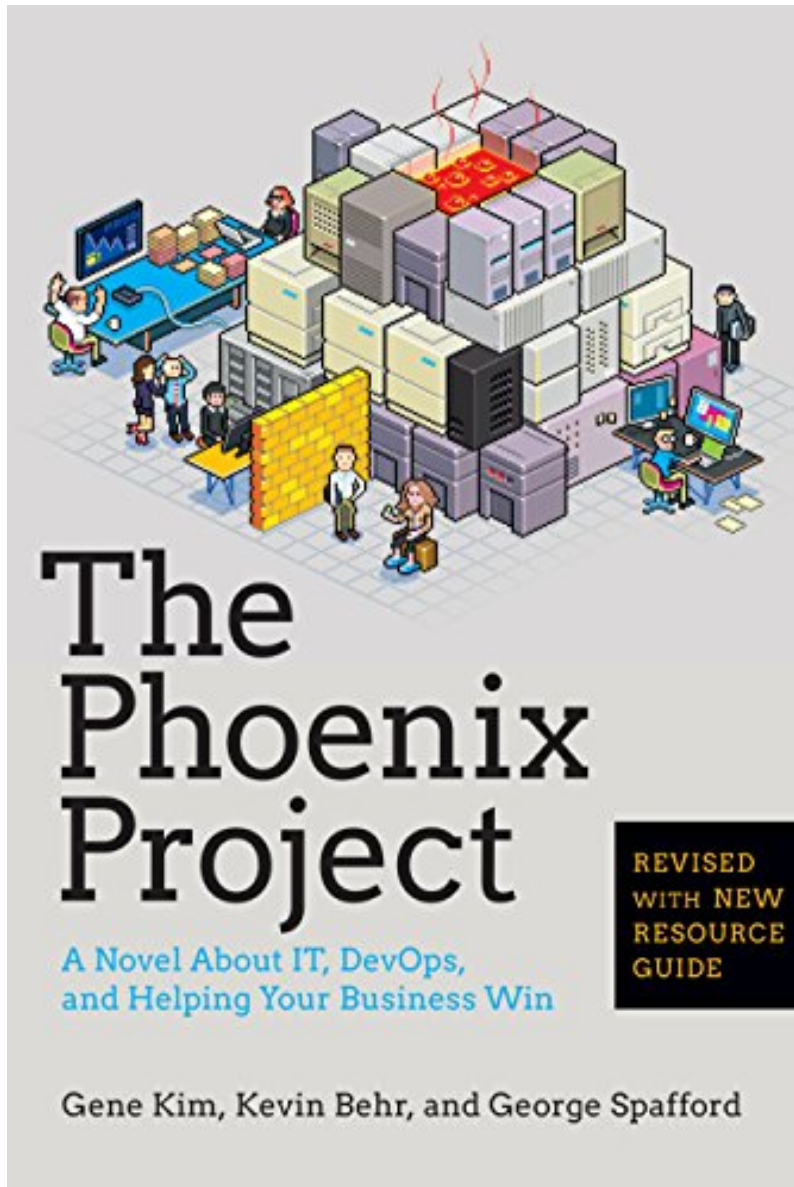
- G. Hutch, Amazon customer review

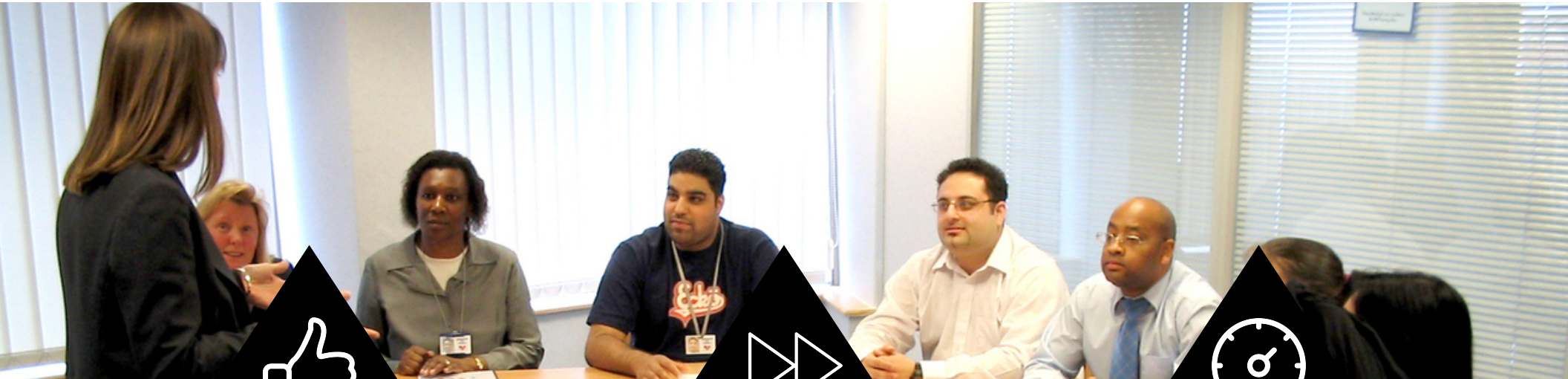
THE THREE WAYS

Flow

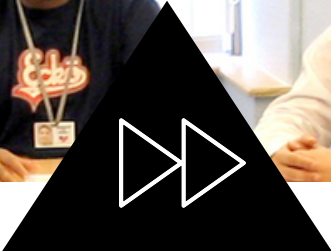
Feedback

Continual learning and experimentation





BETTER QUALITY
THROUGH TEST
AUTOMATION



FASTER RESPONSE
FOR BUG FIXES



HIGHER VELOCITY
OF DELIVERY

What companies say about DevOps...

<https://dzone.com/articles/real-world-problems-solved-by-devops>
Icon credit: <https://www.flaticon.com/authors/gregor-cresnar>
<https://www.flaticon.com/authors/smashicons>
<https://www.flaticon.com/authors/freepik>

Benefits “of DevOps go beyond financial results”

KEY FINDINGS

Faster throughput and better stability

DevOps applies to all organizations

Automation is a huge boon

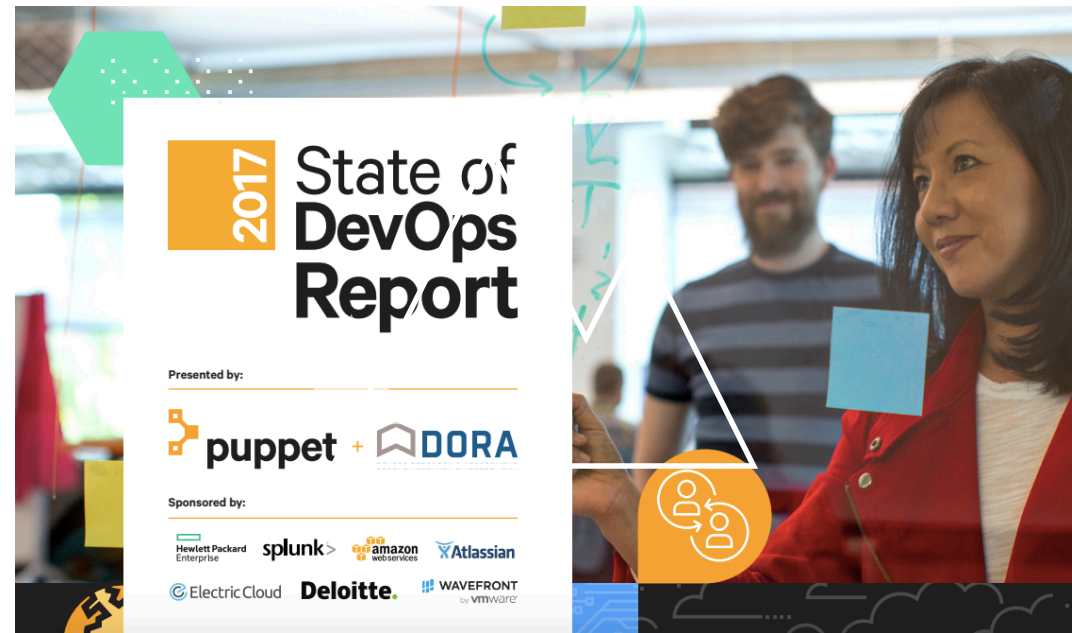


Table 2: 2017 IT performance by cluster

Survey questions	High IT performers	Medium IT performers	Low IT performers
<p>Deployment frequency For the primary application or service you work on, how often does your organization deploy code?</p>	On demand (multiple deploys per day)	Between once per week and once per month	Between once per week and once per month*
<p>Lead time for changes 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 commit to code successfully running in production)?</p>	Less than one hour	Between one week and one month	Between one week and one month*
<p>Mean time to recover (MTTR) For the primary application or service you work on, how long does it generally take to restore service when a service incident occurs (e.g., unplanned outage, service impairment)?</p>	Less than one hour	Less than one day	Between one day and one week
<p>Change failure rate For the primary application or service you work on, what percentage of changes results either in degraded service or subsequently requires remediation (e.g., leads to service impairment, service outage, requires a hotfix, rollback, fix forward, patch)?</p>	0-15%	0-15%	31-45%

How we deploy 300 times a day

Zack Bloom, HubSpot



Small teams and projects
Libraries
Automated Builds
Versioning

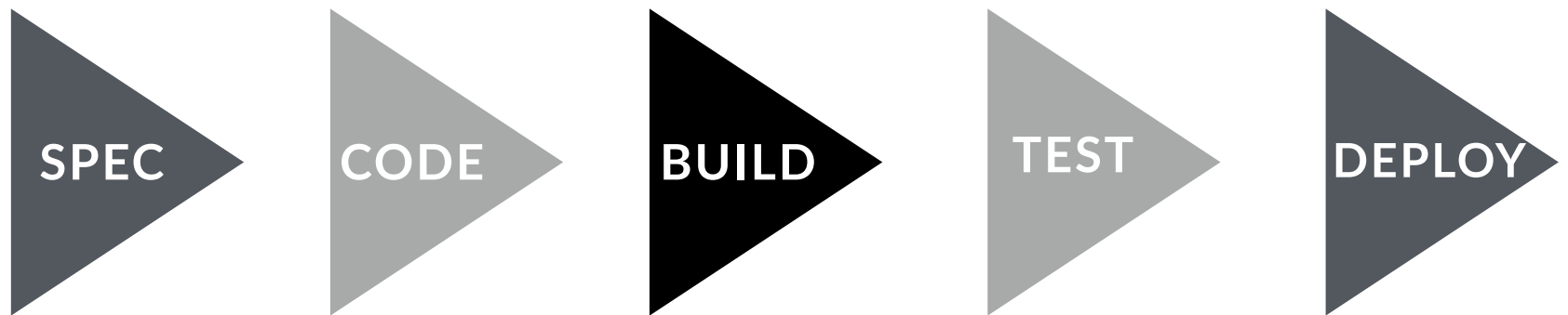
Black box deploys
Gates
Notifications
Testing
Pull Requests

Integrations
Configuration
Metrics
Processes

<https://product.hubspot.com/blog/how-we-deploy-300-times-a-day>

Nov 18, 2013

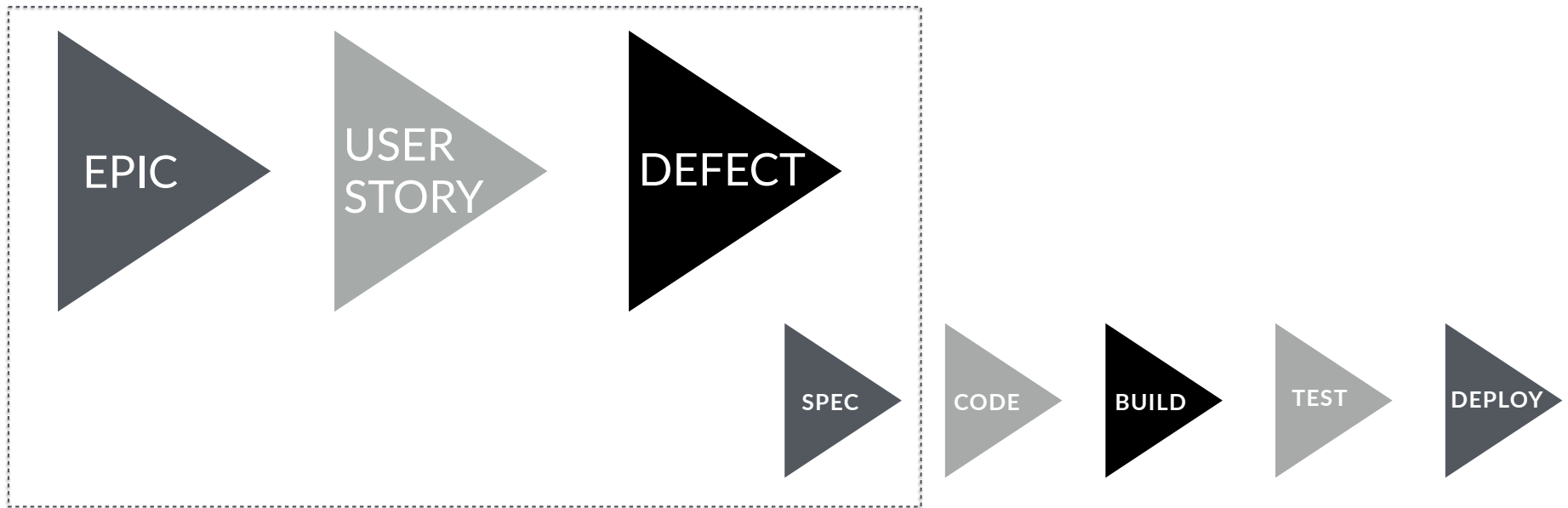
EMPHASIS IS ON BACK END



| Continuous Integration || Continuous Delivery |

| Time from check-in to deployment |

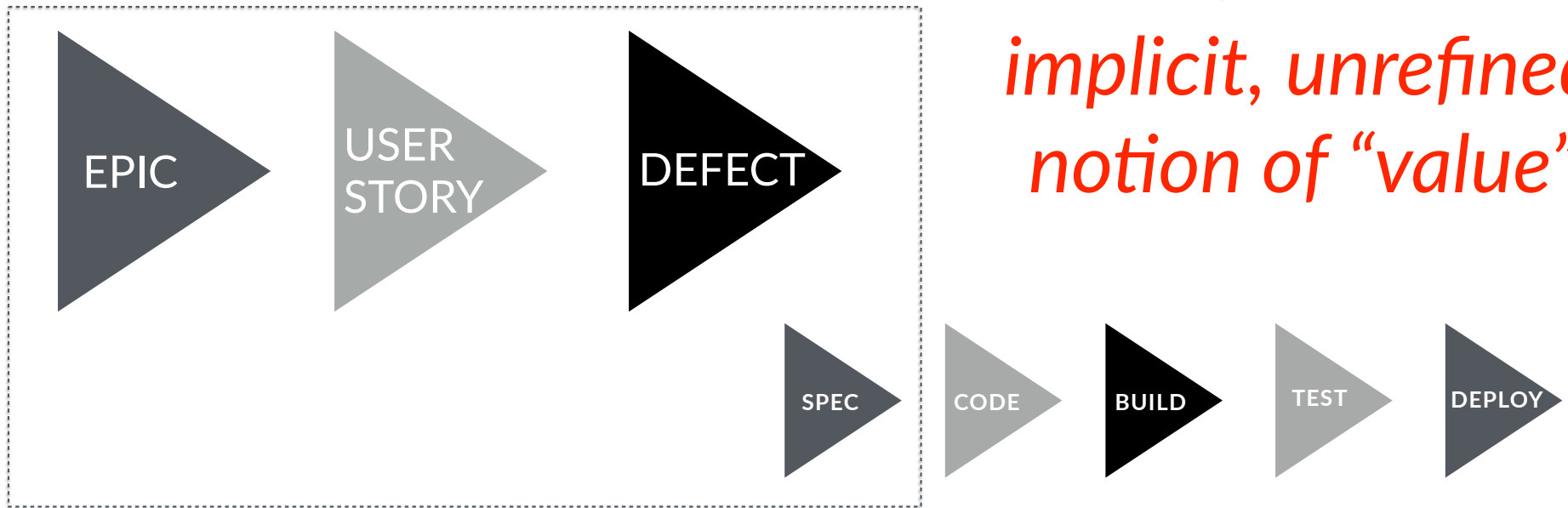
FRONT-END: LEAN & AGILE



“Lean product management practices help teams ship features that customers actually want, more frequently. This faster delivery cycle lets teams experiment, creating a feedback loop with customers.”

— State of DevOps Report 2017

FRONT-END: LEAN & AGILE



*Claim:
implicit, unrefined
notion of “value”*

“Lean product management practices help teams ship features that customers actually want, more frequently. This faster delivery cycle lets teams experiment, creating a feedback loop with customers.”

— State of DevOps Report

PART01
DevOps Today

PART03
The Gap



PART02
Value Streams

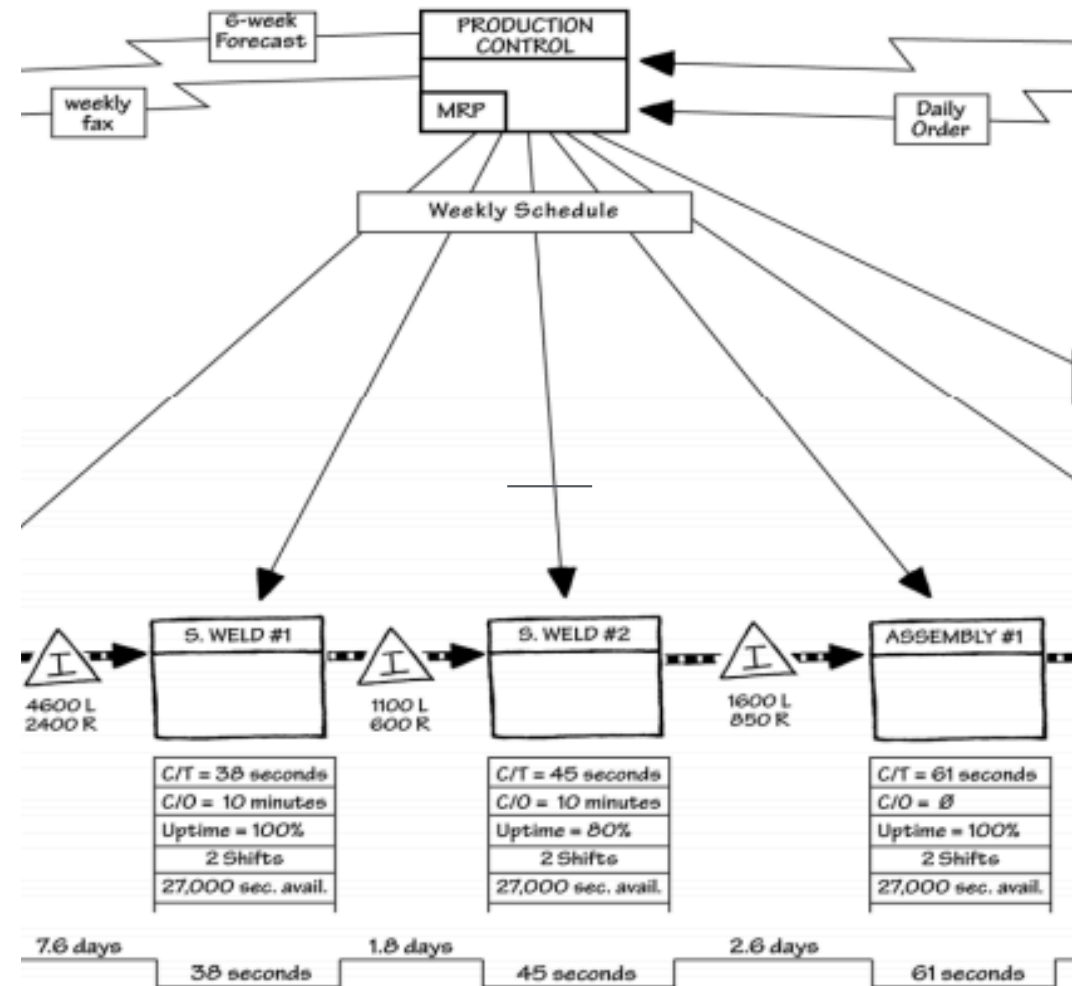
PART04
RE Connection



Value Streams

Value Stream Maps

Lean management method to optimize taking a product or service from beginning through to the customer



Value Stream Maps in SE



Poppendieck &
Poppendieck

Value Stream Maps in SE



Poppendieck &
Poppendieck

Need to analyze and visualize

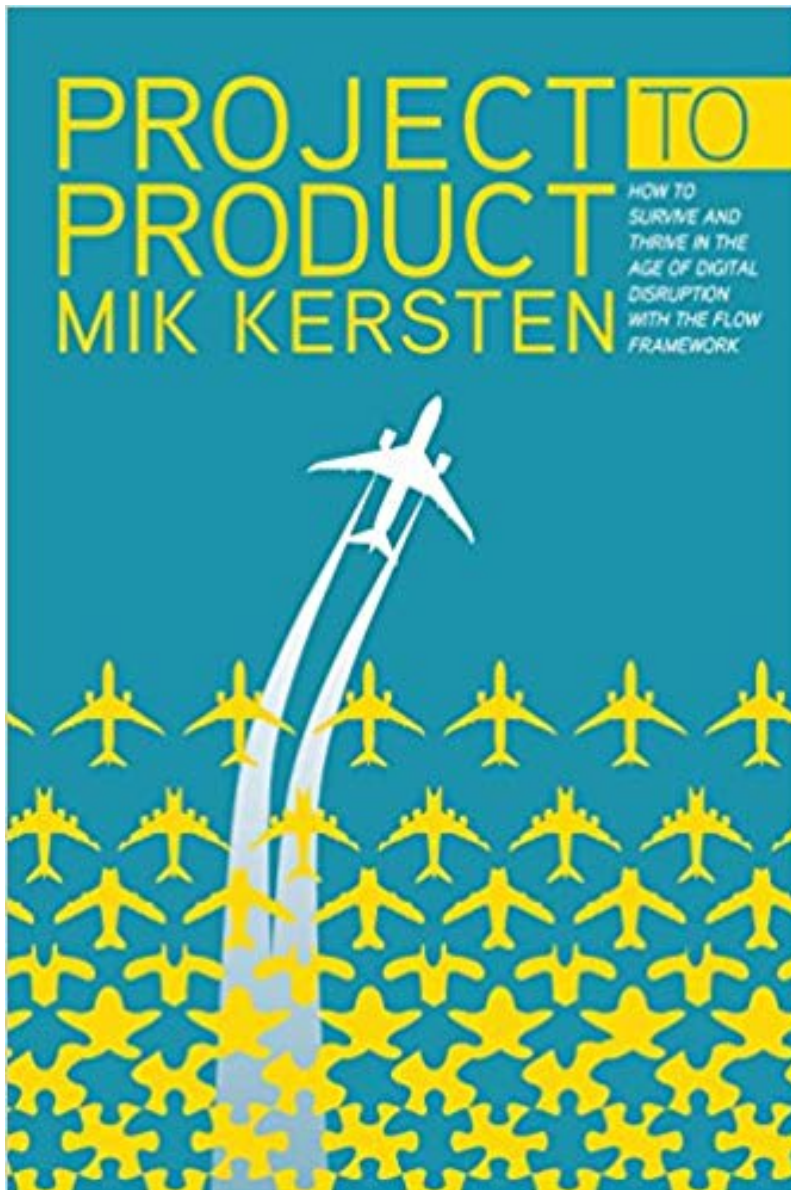
Need to connect real data

Need to capture information flow

FLOW-assisted value stream mapping in the early phases of software development

Nauman Bin Ali^{a,*}, Kai Petersen^a, Kurt Schneider^b

FLOW-assisted value stream mapping in the early phases of software development, JSS, 2016



surviving the “Turning Point of the Age of Software”

- M. Kersten

FLOW FRAMEWORK

Focus on end-to-end software value stream
flows to enable correlation
to business outcomes

Available Nov 2018

FLOW FRAMEWORK

End-to-end metrics
& business outcomes

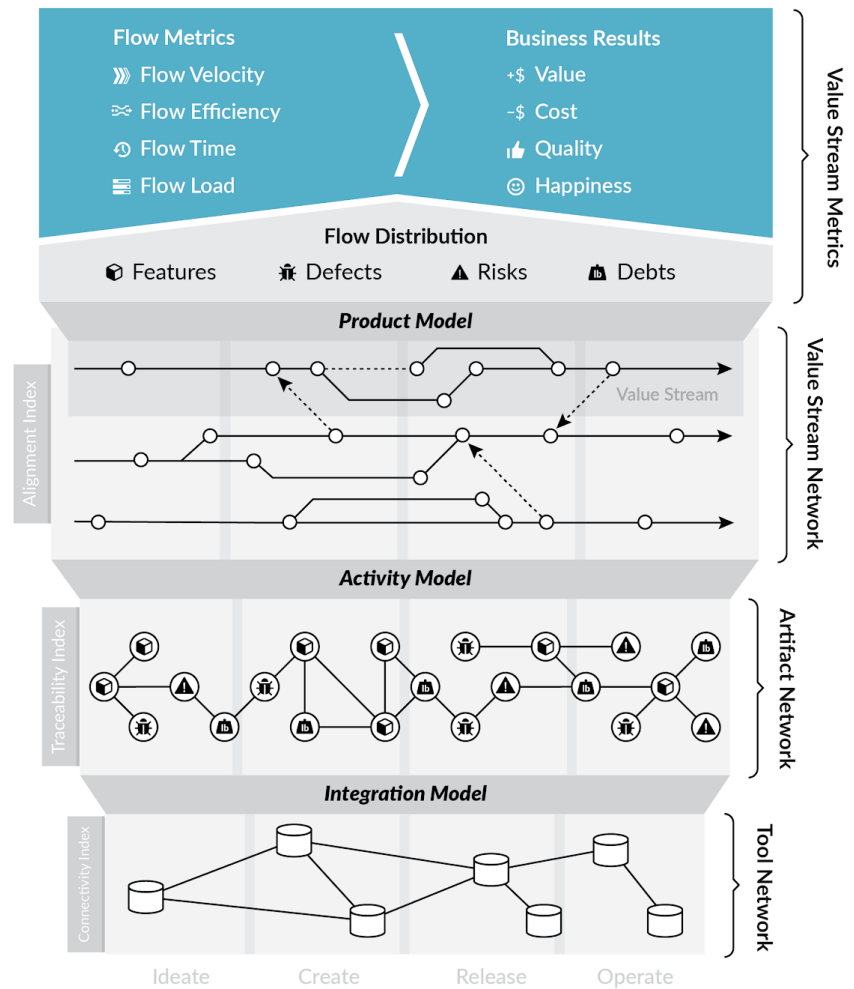
Product Model

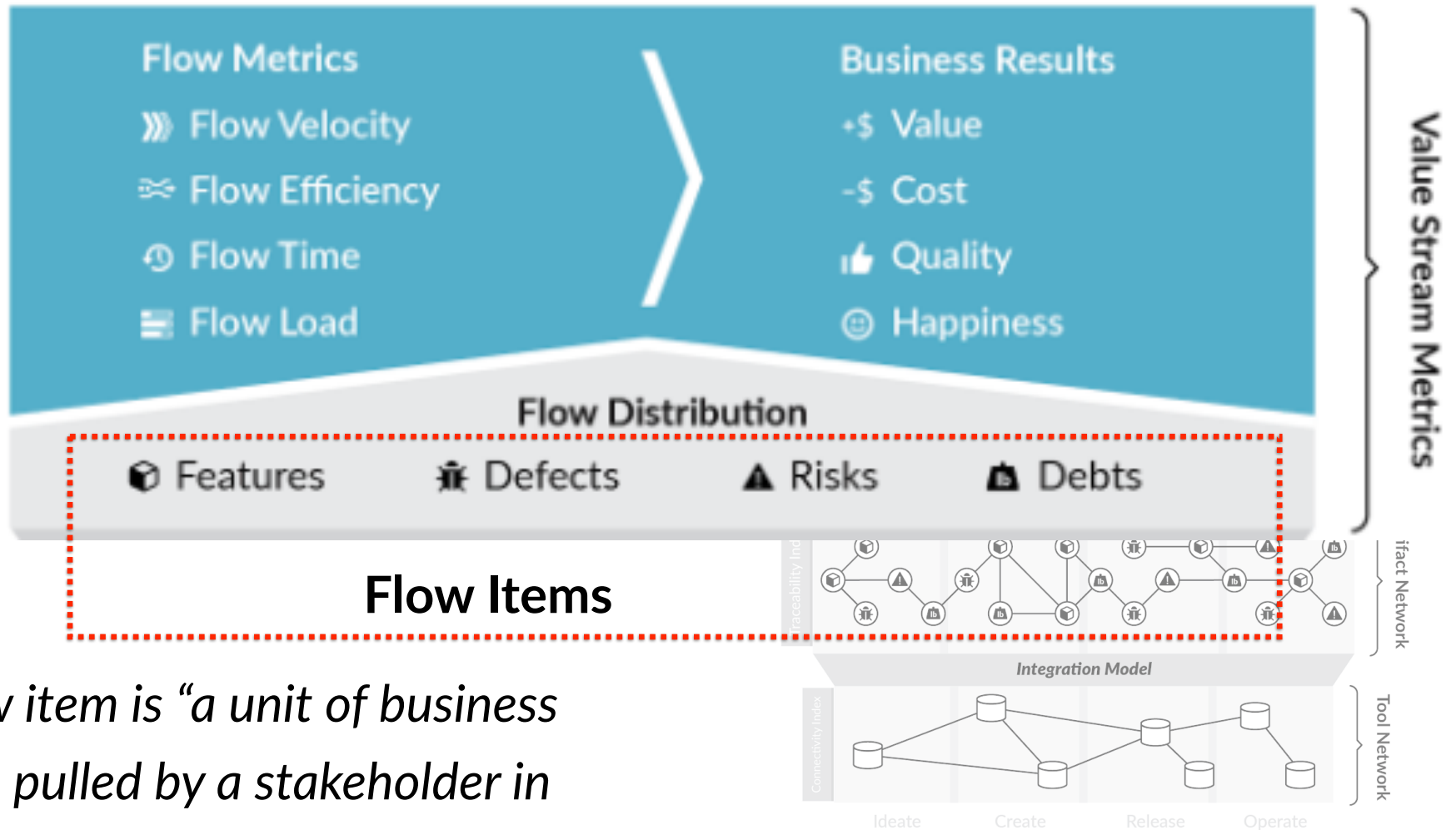
Activity Model

Integration Model

Flow Framework™

v0.9

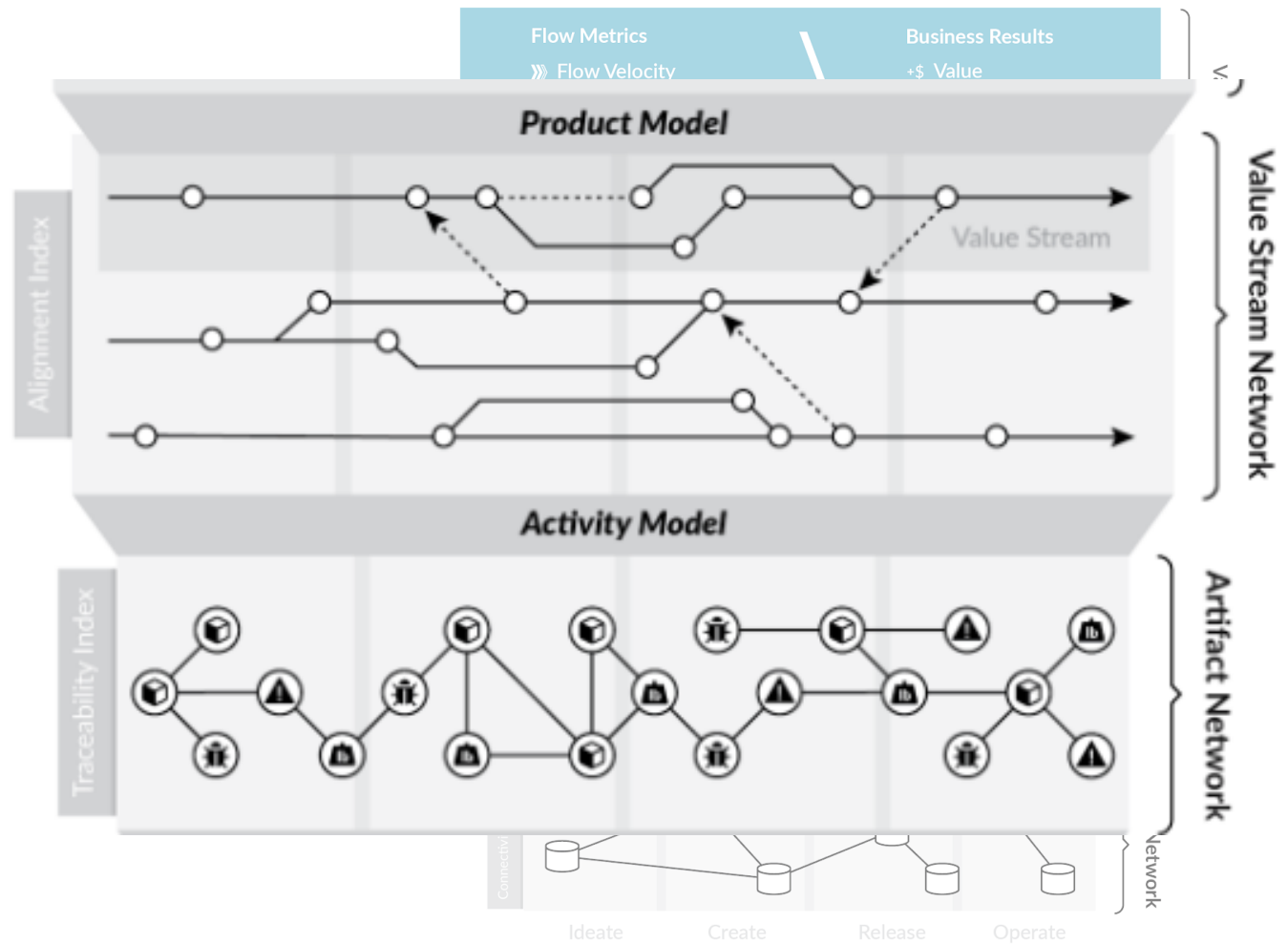




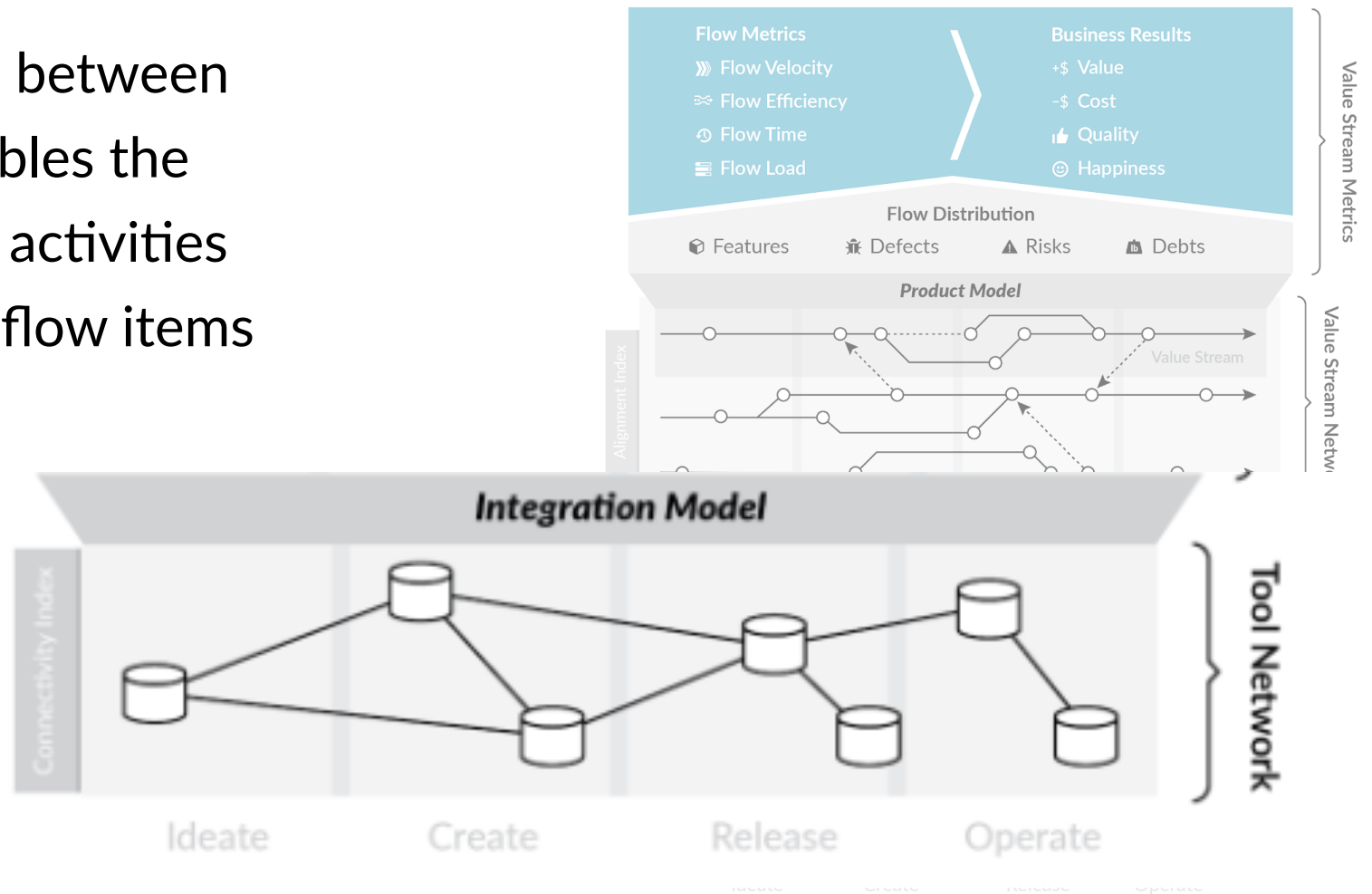
A flow item is “a unit of business value pulled by a stakeholder in the software delivery process.”

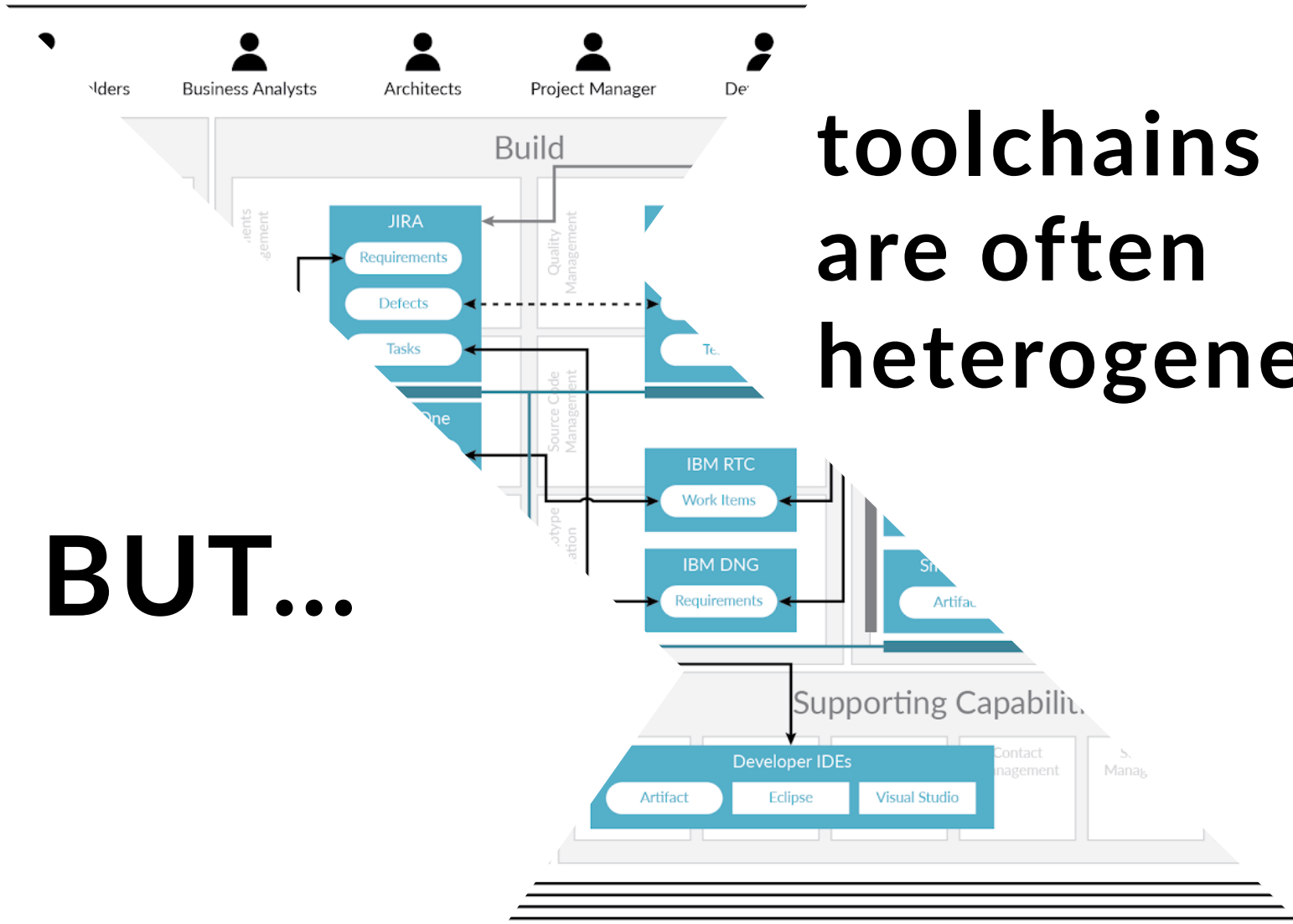
Products may be customer-facing, APIs, etc.

Actions by people and tools change artifacts



Integration between tools enables the tracking of activities and links to flow items





toolchains
are often
heterogeneous

BUT...

Business Stakeholders

Business Analysts

Architects

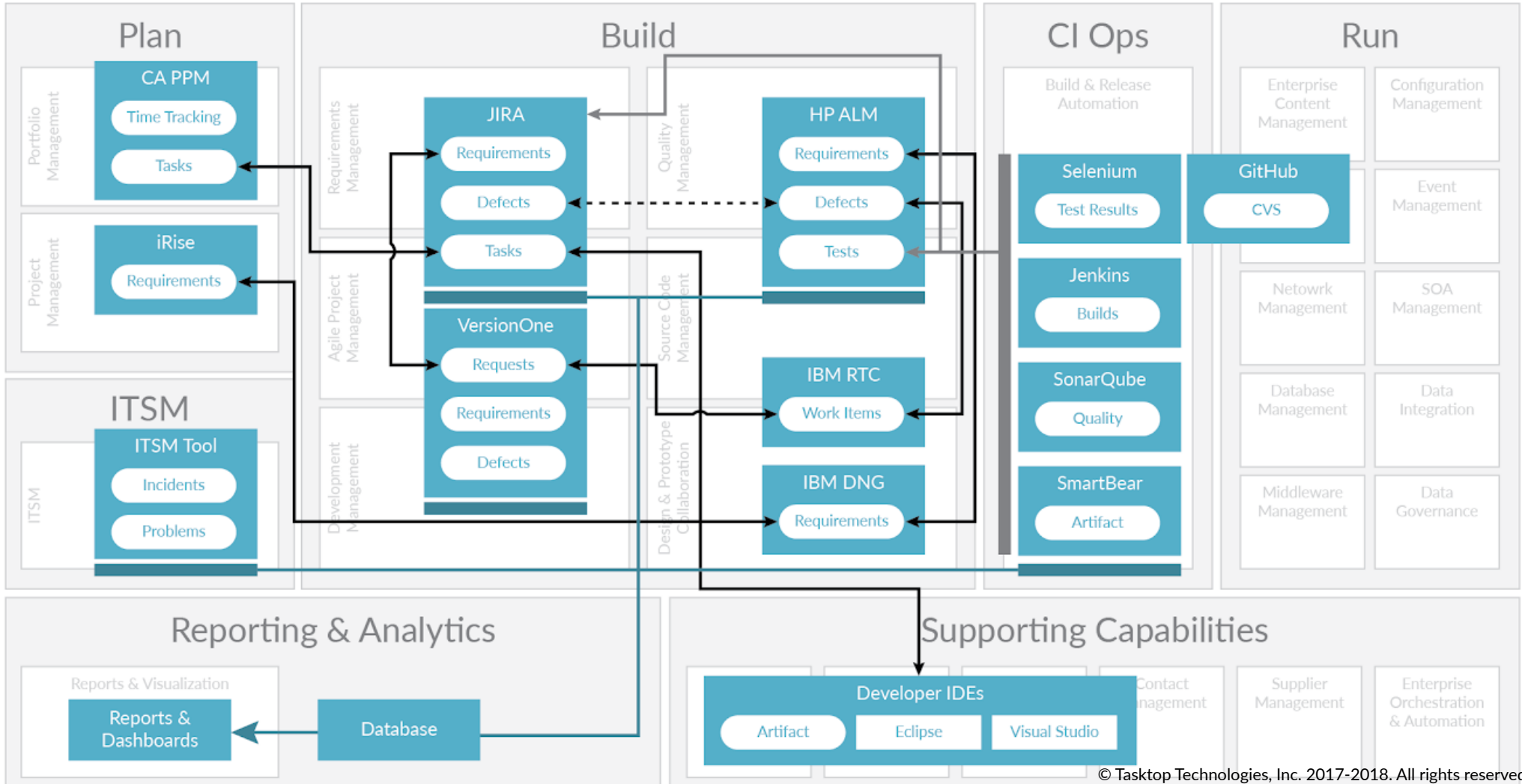
Project Manager

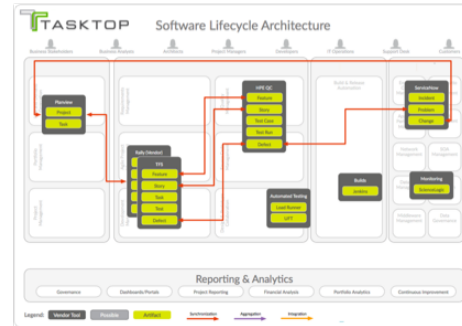
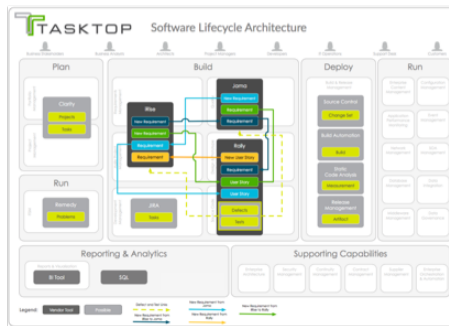
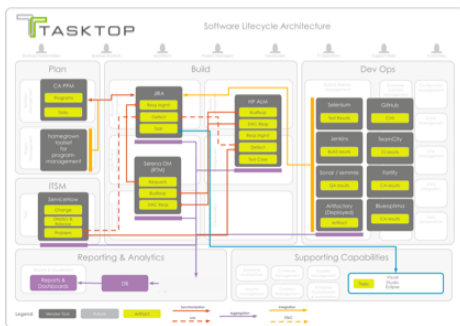
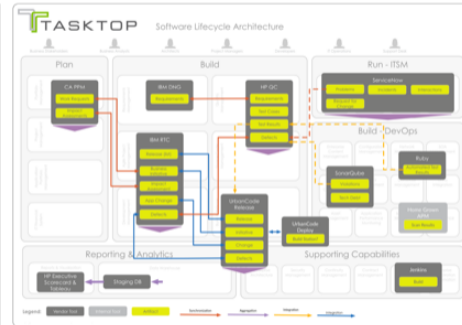
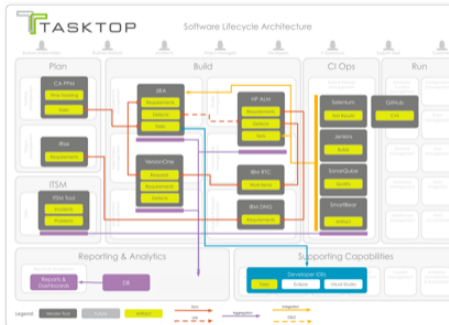
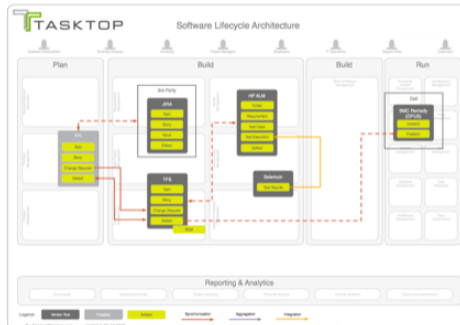
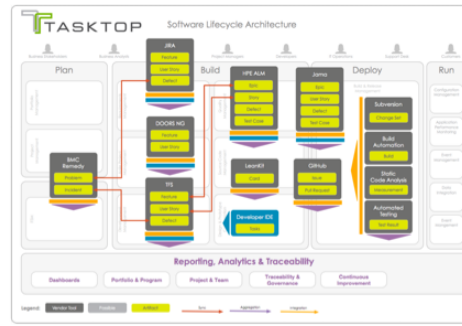
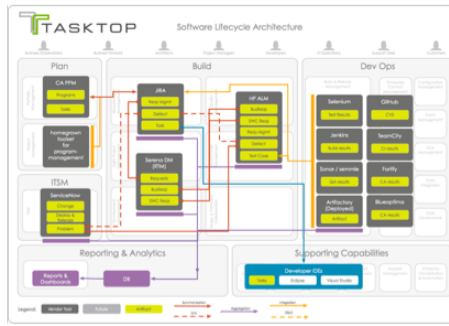
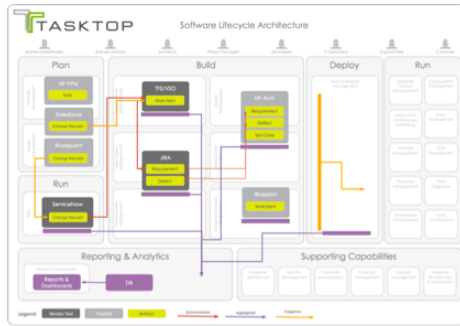
Developer

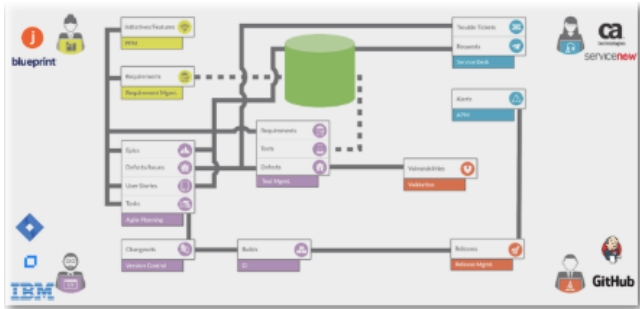
IT Operations

Support Desk

Customers

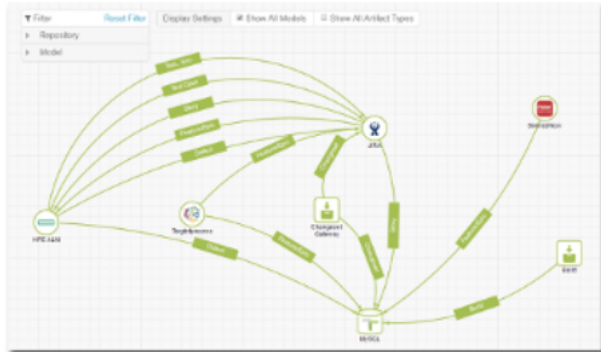




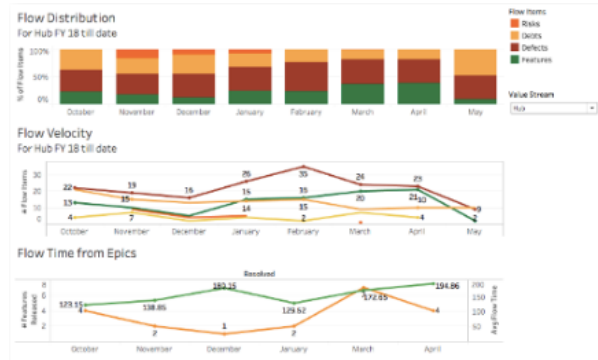


Connect

TASKTOP Integration Hub



Visualize



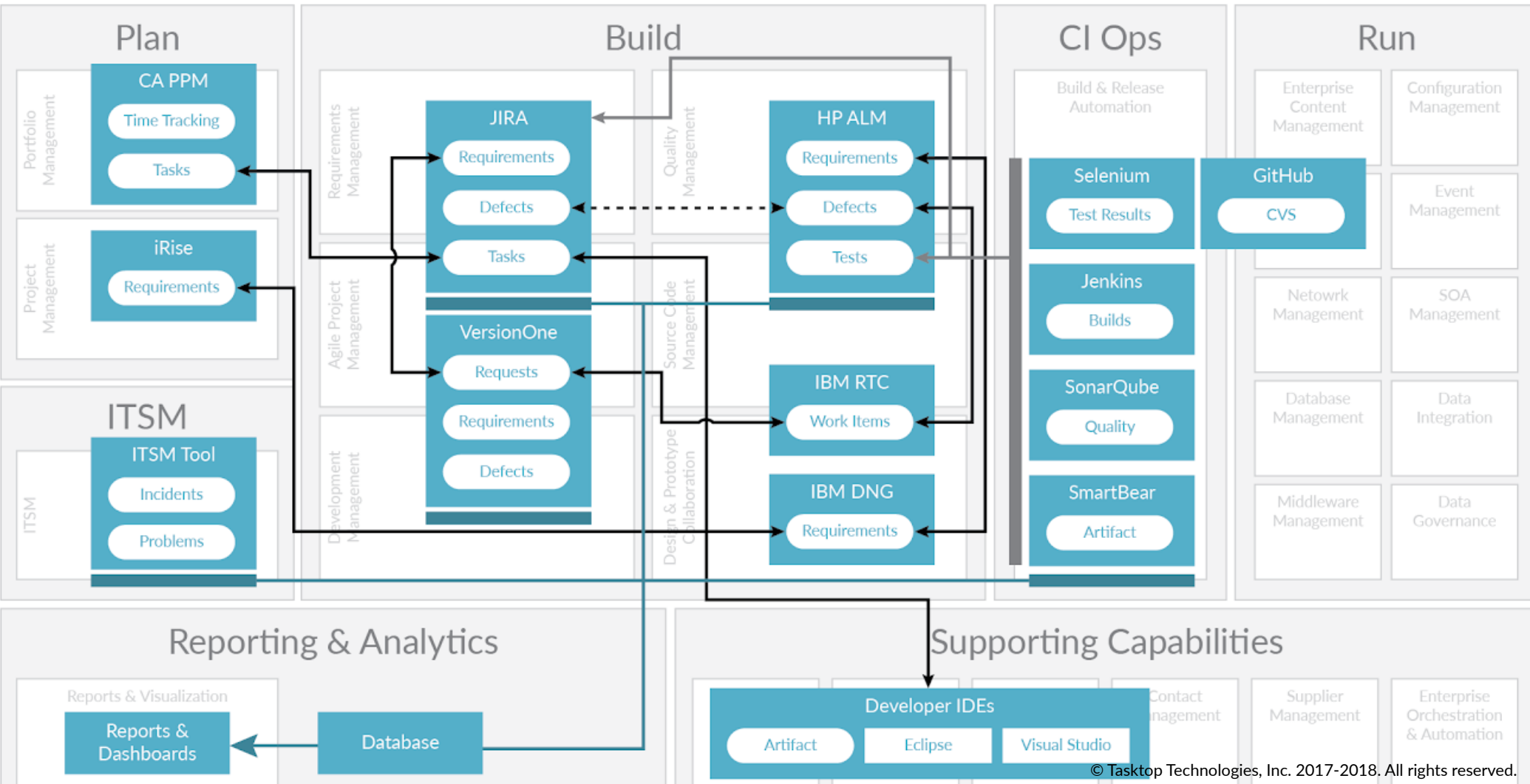
Measure



Visible Value Stream Metrics

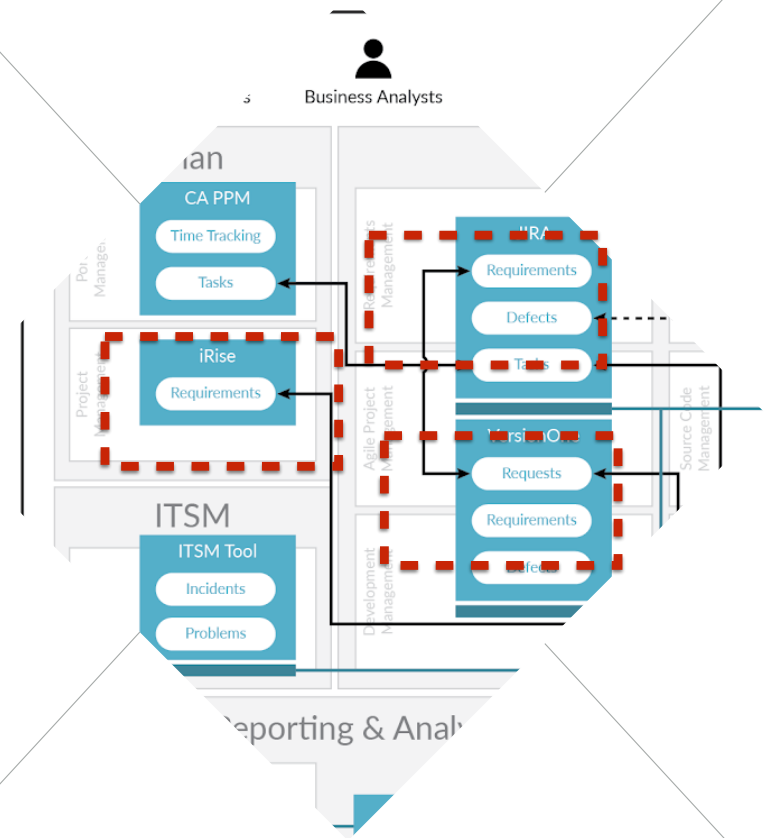


Business Stakeholders Business Analysts Architects Project Manager Developer IT Operations Support Desk Customers



Multiple different ways to record and manage requirements

How do the requirements relate to units of value?



PART01
DevOps Today

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The Gap



PART02
Value Streams

PART04
RE Connection



The Gap



kubernetes



**Three
Examples**

FIRST EXAMPLE

KUBERNETES

Open source system for
automating deployment, scaling and
management of containerized
applications

68,000 commits	1,760 contributors
33 branches	2,200 open issues
415 releases	



KUBERNETES

188 labels in use

kind of item
(e.g, feature, bug, api)

priority

area of system

...

v1.12

No due date 49% complete

🔔 35 Open ✓ 34 Closed

- 🔗 Synchronous & unbatched audit log writes ✖ cncf-cla: yes kind/bug priority/important-soon
release-note-none sig/auth size/L
#67223 opened 3 days ago by talclair
- 🔔 Fix batching log audit backend area/audit kind/bug priority/important-soon sig/auth
#61932 opened on Mar 30 by crassirostris
- 🔔 Advanced Auditing 1.12 umbrella bug area/audit kind/feature priority/important-soon
status/approved-for-milestone
#65266 opened on Jun 20 by x13n 2 of 11
- 🔗 authn: extend authenticator.Token to support audience validation ✖ cncf-cla: yes
kind/api-change kind/feature priority/important-soon release-note-none sig/auth sig/schedule
status/approved-for-milestone
#62692 opened on Apr 16 by mikedanese
- 🔗 svcacct: pass pod information in user.Info.Extra() when available ✖ approved-for-milestone
kind/api-change release-note sig/auth size/L status/approved-for-milestone
#61858 opened on Mar 28 by mikedanese
- 🔗 [hold] Runtimeclass API ✖ cncf-cla: yes do-not-merge/hold kind/api-change kind/feature
priority/important-soon release-note sig/node size/XXL
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#66906 opened 10 days ago by tozicka

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KUBERNETES

Version (Closed issues)	v1.8 (1,059)	v1.9 (616)	v1.10 (606)
bug	118	41	104
feature	24	6	17
technical debt	5	1	0
area/security	6	6	3

THE GAP

Feature Designation

Challenges

KUBERNETES

Labelling

Largely manual;
Value implicit and
inconsistent

SECOND EXAMPLE

MOODLE

Open source learning platform



90,002 commits

24 branches

303 releases

447 contributors

8,990 open issues










MOODLE

134 open epics

1095 open features

no clear links between
epics and features

multiple mechanisms
to choose work, including
user association makes
proposals and votes
on priority

-  Bug
-  Epic
-  Improvement
-  MoodleCloud Bug
-  New Feature
-  Release Test
-  Review
-  Story
-  Task

THE GAP

Feature Designation

Challenges

KUBERNETES

Labelling

Largely manual;
Value implicit and inconsistent

MOODLE

Issue structure and prioritization

Multiple approaches;
Value implicit and inconsistent

THIRD EXAMPLE

FIREFOX



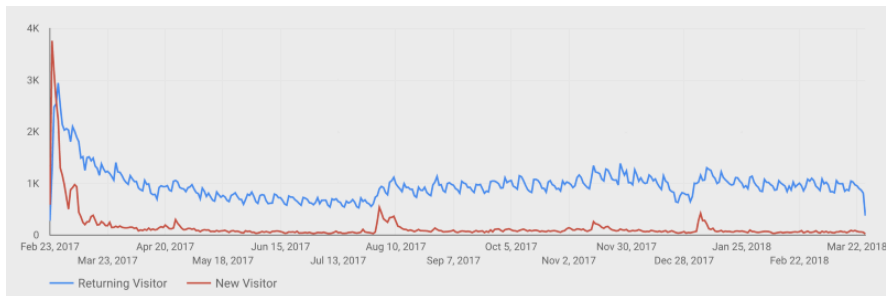
Open source web browser
that needs no introduction

It's big

FIREFOX

choose experiments you want to help test

e.g., Snooze Tabs



58,000 users; 400K sessions

THE GAP

Feature Designation

Challenges

KUBERNETES

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MOODLE

Issue structure and prioritization

Multiple approaches;
Value implicit and inconsistent

FIREFOX

(Testpilot)
Unclear how relates to feature tracking

Multiple approaches;
Value implicit and inconsistent

THE GAP

We lack:

consistency in “feature”
ability to track features

or risk or defect or debt...

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RE Connection

these are not new ideas

ACM SIGSOFT

Software Engineering Notes vol 28 no 2

March 2003 Page 1

Value-Based Software Engineering

Barry Boehm

University of Southern California

boehm@sunset.usc.edu

“Much of current software engineering practice and research is done in a value-neutral setting, in which every requirement, use case, object, and defect is treated as equally important”

these are not new ideas

2009 17th IEEE International Requirements Engineering Conference

From Feature Development to Customer Value Creation

Marjo Kauppinen¹, Juha Savolainen², Laura Lehtola¹, Marko Komssi¹, Harri Töhönen¹, Al Davis³
Helsinki University of Technology¹, Nokia², University of Colorado at Colorado Springs³
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“Key Finding 1: Product features are seen as the core of value creation.”

“Focusing on features and launching them as fast as possible can cause problems from the perspective of customer value.”

these are not new ideas

REFSQ 2016

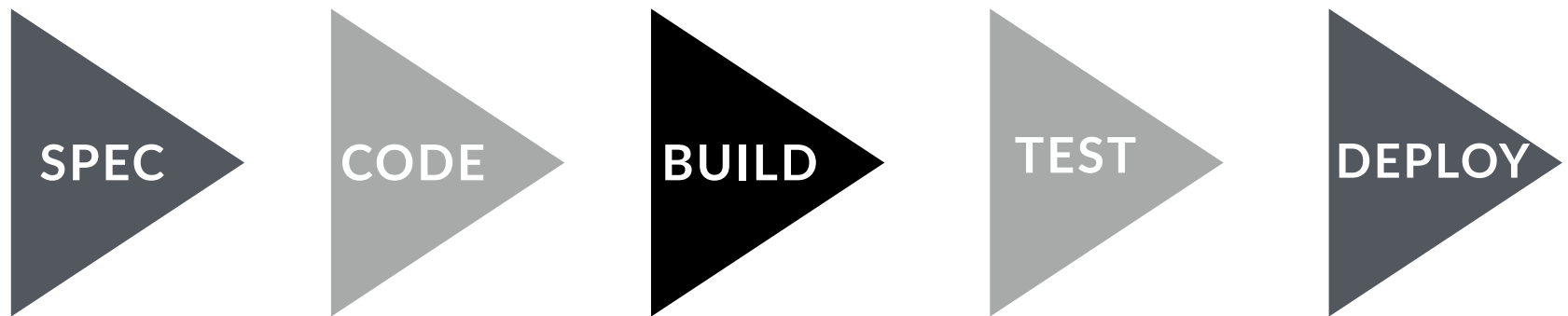
**Customer Involvement in Continuous
Deployment: A Systematic Literature Review**

Sezin Gizem Yaman^{1(✉)}, Tanja Sauvola², Leah Riungu-Kalliosaari¹,
Laura Hokkanen³, Pasi Kuvaja², Markku Oivo², and Tomi Männistö¹

*“the life cycle of customer data—collection, analysis and
return to the customer if needed—poses a number of
difficulties”*

R E n e e d s t o p l a y a c r u c i a l r o l e

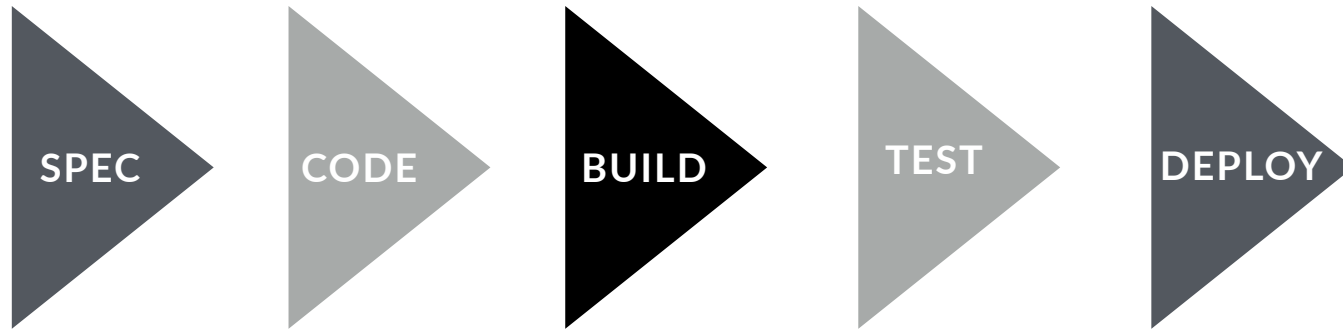
EMPHASIS IS ON BACK END



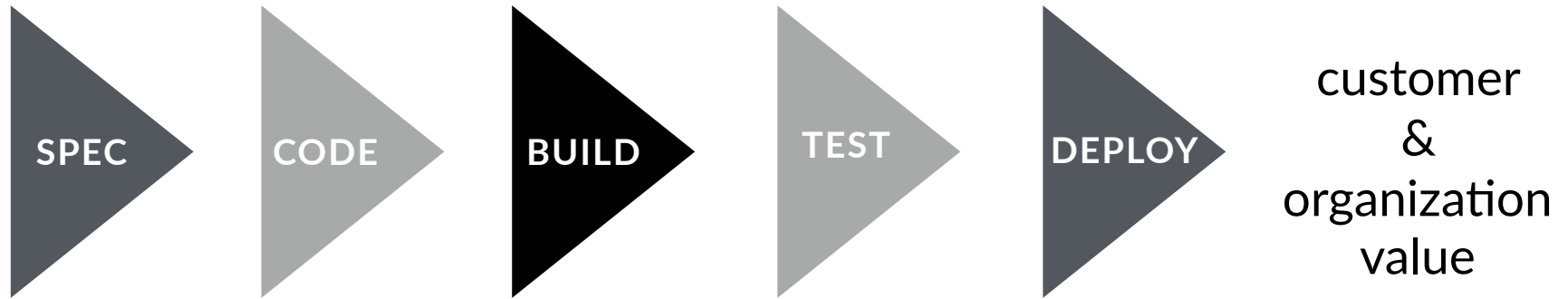
| Continuous Integration || Continuous Delivery |

| Time from check-in to deployment |

EMPHASIS NEEDS TO BE ON VALUE FLOW

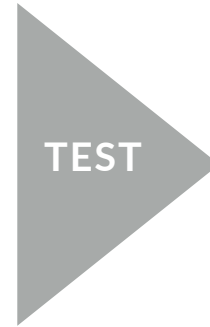
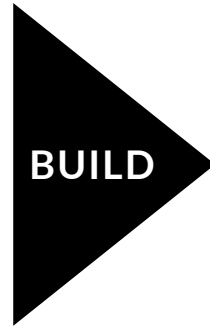
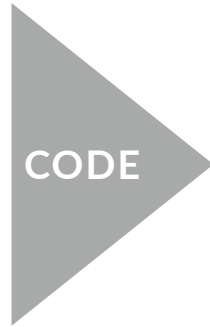


EMPHASIS NEEDS TO BE ON VALUE FLOW



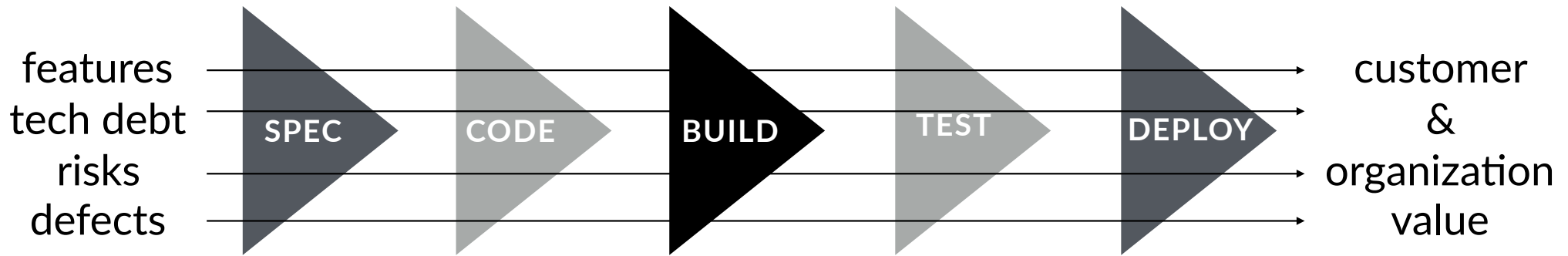
EMPHASIS NEEDS TO BE ON VALUE FLOW

features
tech debt
risks
defects

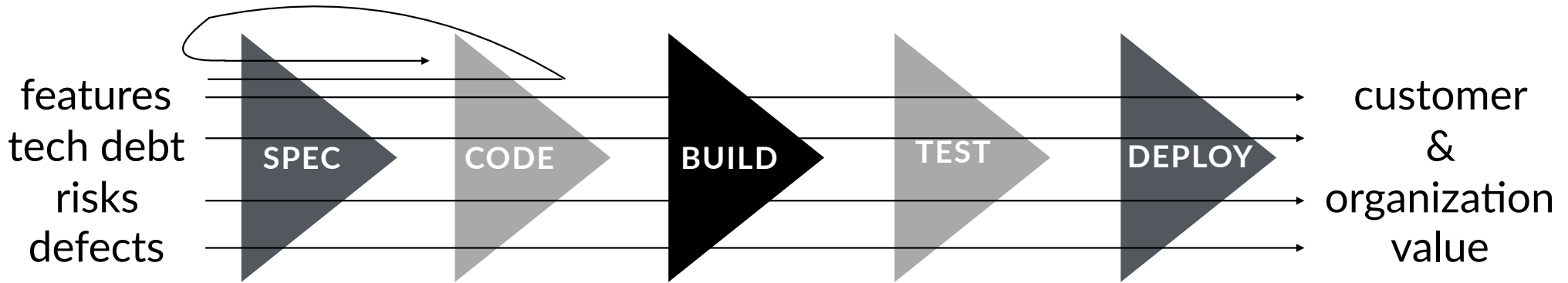


customer
&
organization
value

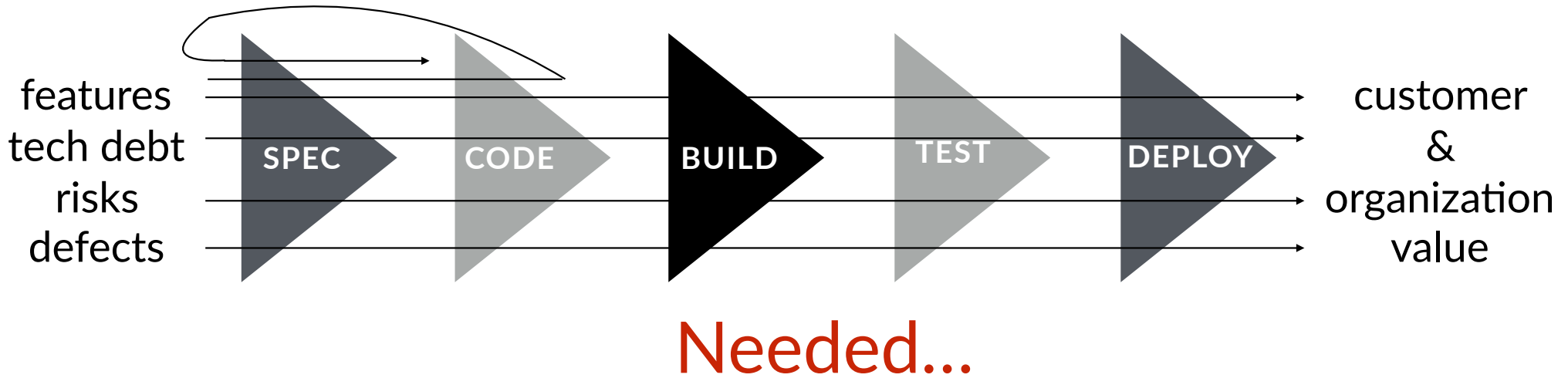
EMPHASIS NEEDS TO BE ON VALUE FLOW



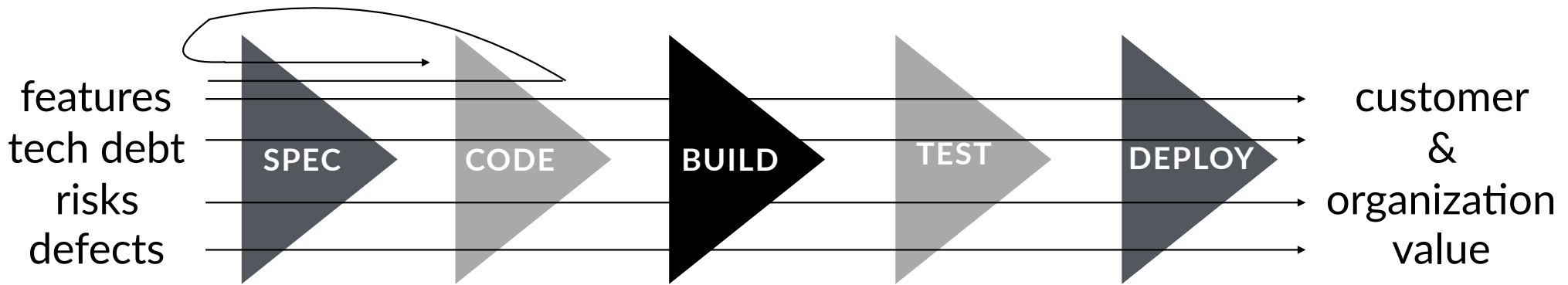
EMPHASIS NEEDS TO BE ON VALUE FLOW



EMPHASIS NEEDS TO BE ON VALUE FLOW



EMPHASIS NEEDS TO BE ON VALUE FLOW



Needed...

Automatically identify work categories

Ability to track work through development

Connect work to value (telemetry, focus groups, etc)

Predict/negotiate value

Predict/connect value to effort

MOODLE



Moodle / MDL-63106

Add statistical functionality to datasets for calculated and calculated simple question types



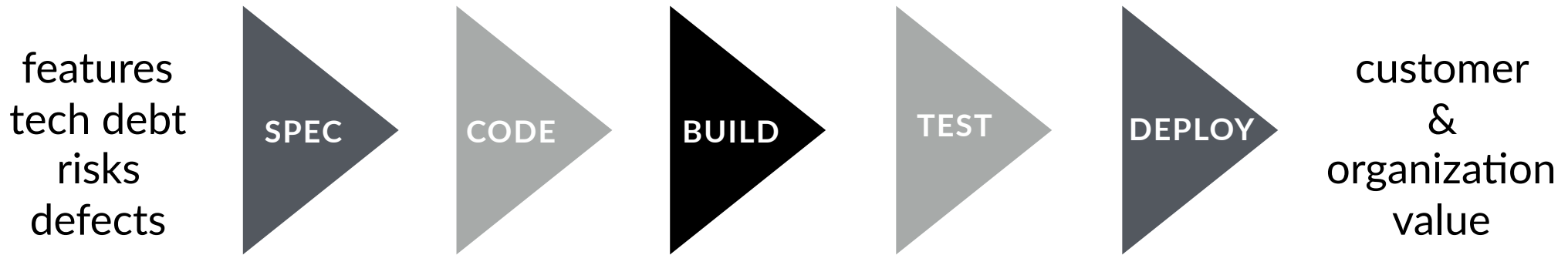
Moodle / MDL-63123

New element type smart select

What if we could...

validate that these are all features
(semi-)automatically assign them a representation of value
assess whether value is delivered by tracking usage
periodically re-assess if value continues or delete feature

EMPHASIS NEEDS TO BE ON VALUE FLOW



RE is key to identifying, linking and tracking features to customer value

or risk or defect or debt

PART01
DevOps Today

PART03
The Gap



PART02
Value Streams

PART04
RE Connection

**THANKS
TO...**

Mik Kersten and the
great minds at Tasktop

awesome grad students

organizers of RE
2018

THE MESSAGE

**DevOps
enables fast
delivery of
FEATURES**

**RE community
can enable fast
delivery of
VALUE**


BEYOND DEVOPS: Finding Value in Requirements

DevOps
enables fast
delivery of
FEATURES

RE community
can enable fast
delivery of
VALUE

There is work to do....

Connecting features to value
Predicting and negotiating value
Tracking value delivery
Reassessing delivered value

@gail_murphy 
August 2018