

The logo consists of a solid purple square. Inside the square, the word "zühlke" is written in a white, lowercase, sans-serif font. Below it, the tagline "empowering ideas" is written in a smaller, white, lowercase, sans-serif font.

zühlke
empowering ideas

How to architect for continuous delivery?

Romano Roth | 30.11.2023 | Conf42 DevSecOps 2023

My passion is helping companies bringing people, processes and technology together so that they can deliver continuously value to their customers



Romano Roth

Chief of DevOps & Partner

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🏠 <https://www.romanoroth.com/>

🐦 [@RomanoRoth](https://twitter.com/RomanoRoth)

🌐 [Romanoroth](https://www.linkedin.com/in/Romanoroth)

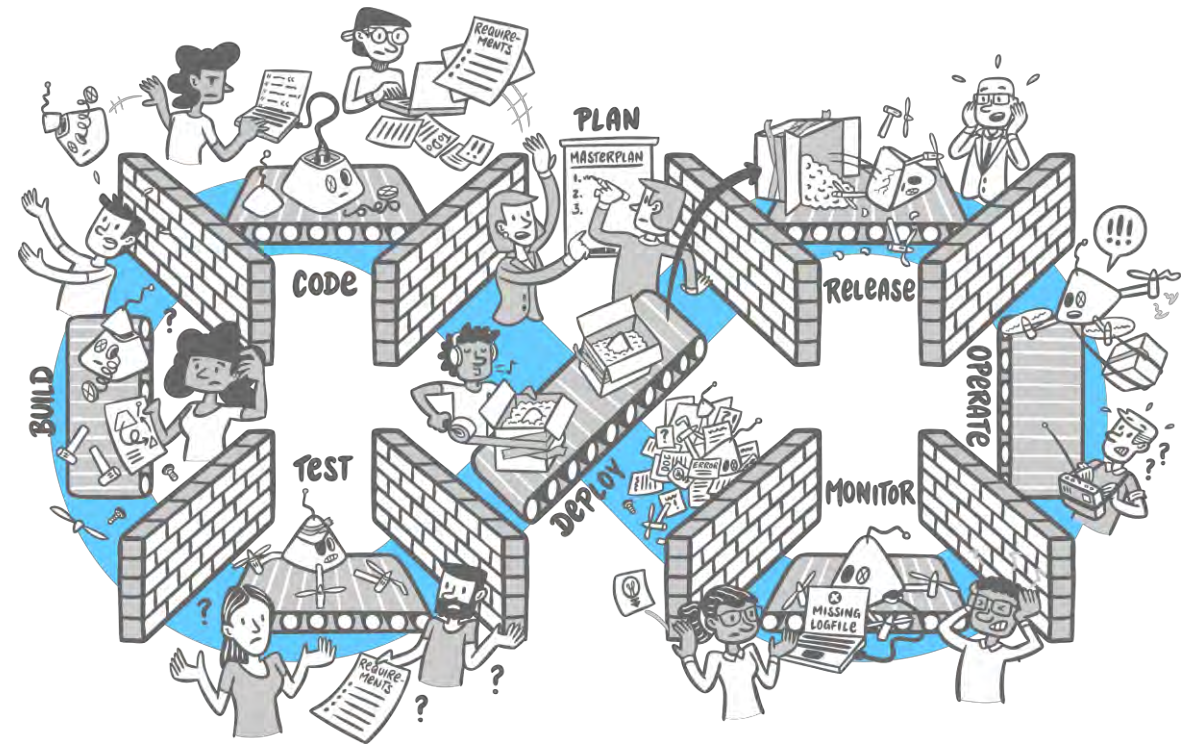
📺 [RomanoRoth](https://www.youtube.com/channel/UCRomanoRoth)

📍 [DevOps Meetup Zürich](#)

🧠 [DevOpsDays Zürich](#)

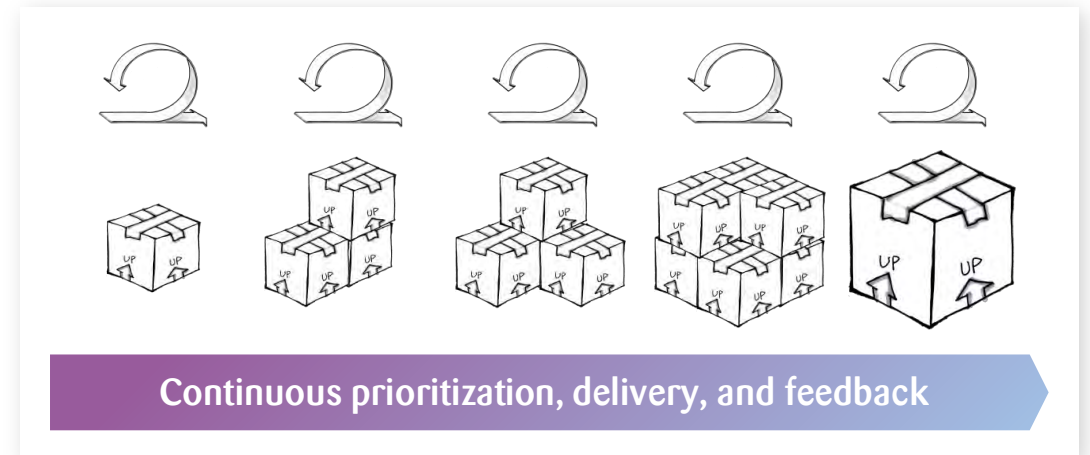
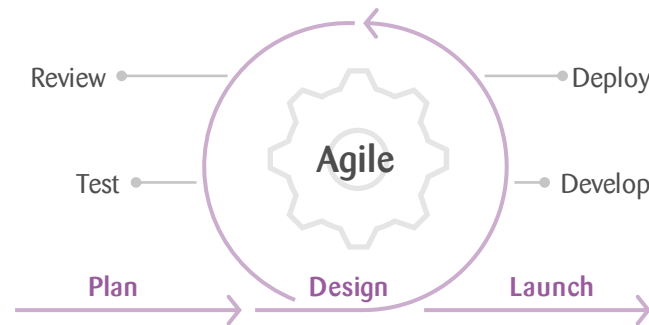
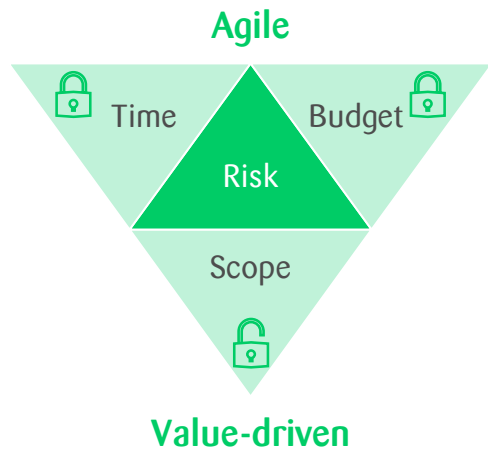
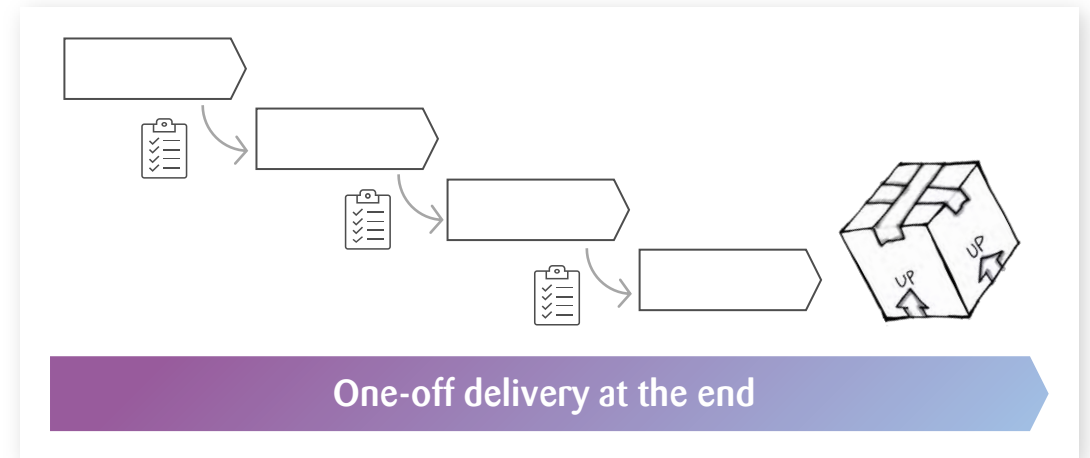
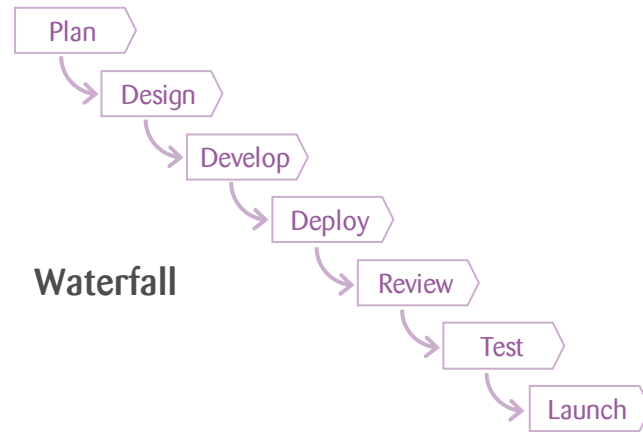
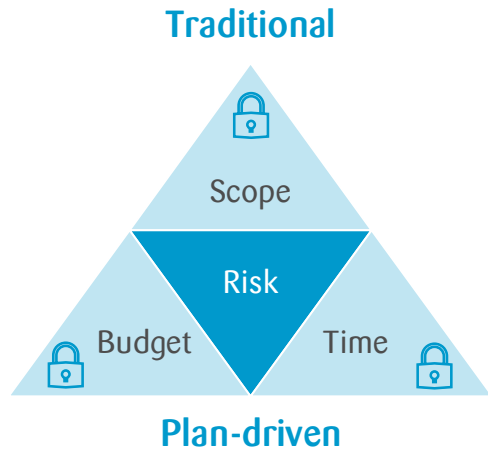
Today's challenges

- Silo Organization
- Legacy system, technology
- Inflexible and slow processes
- No alignment
- Security and quality is an aftermath
- Cultural resistance
- Regulatory and Compliance



Where do these challenges come from?

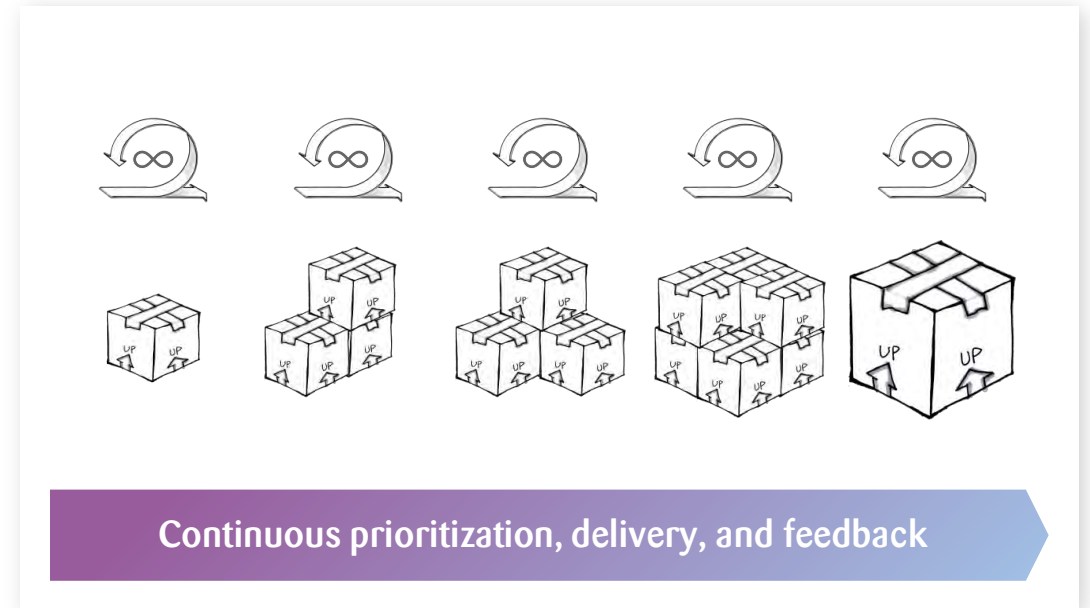
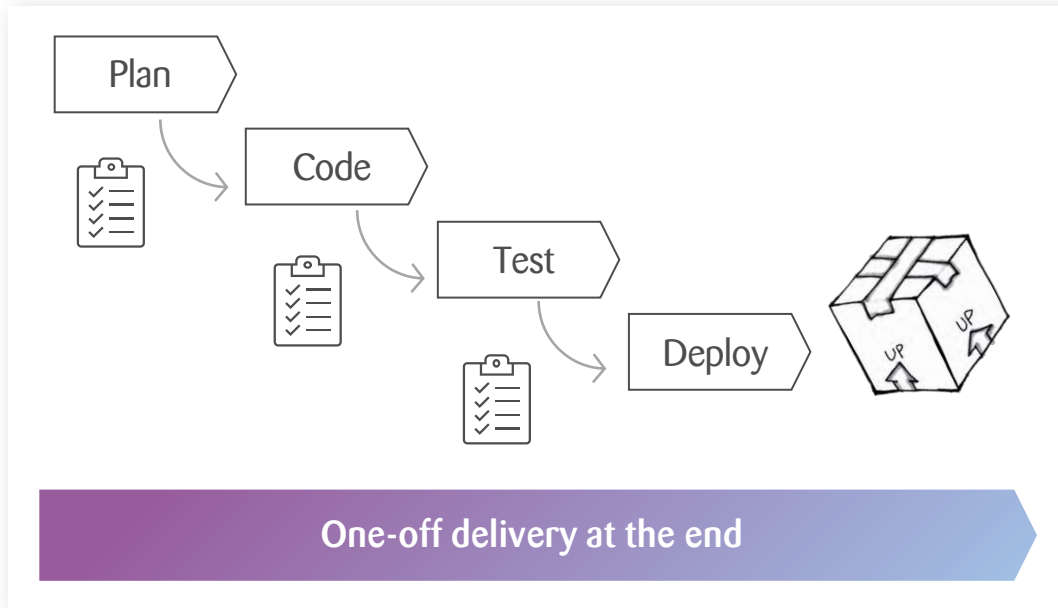
The move from projects to products



It's about products!

What does that mean?

Focus on outcome and NOT output



Project: Focus on output

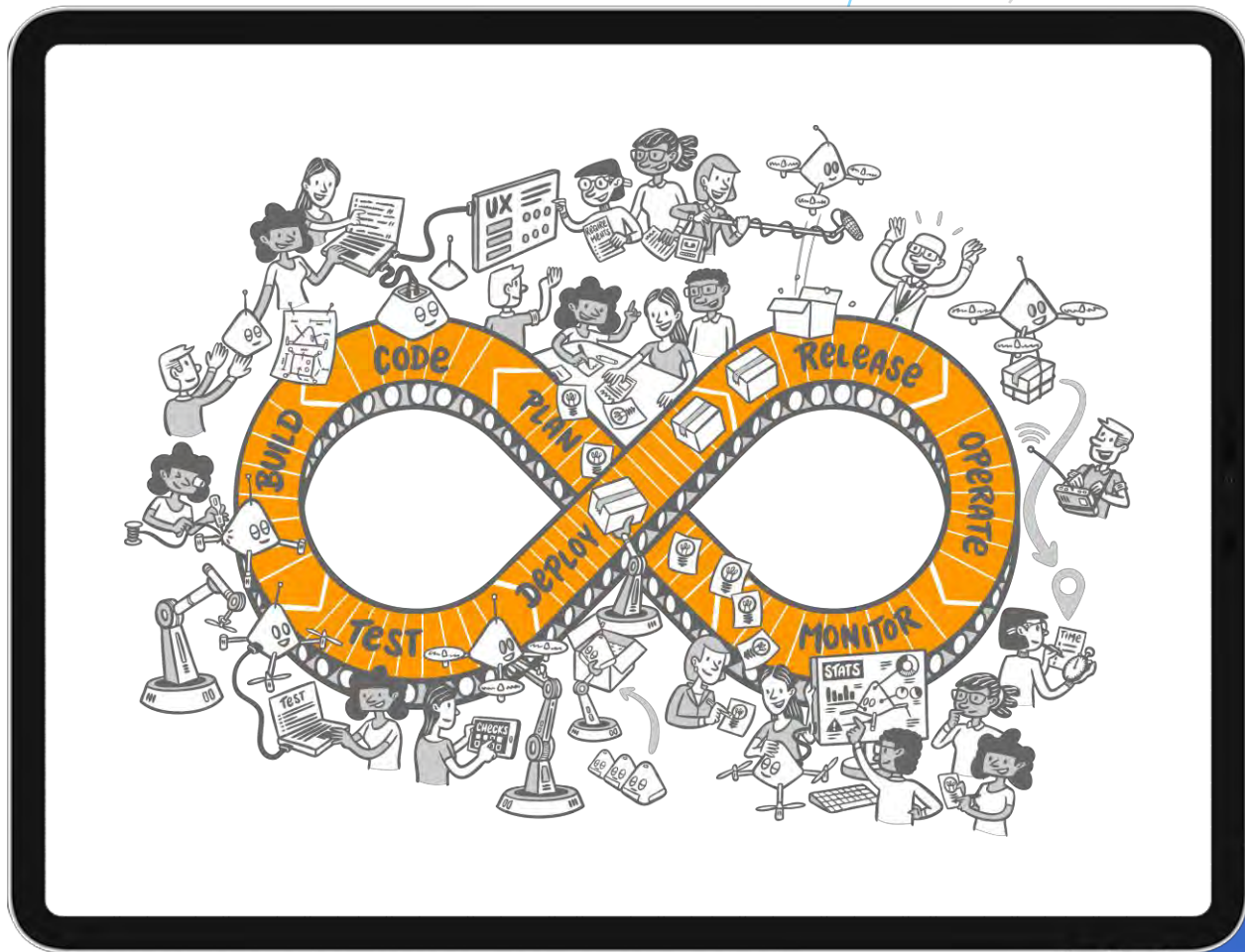
- Maximizing the number of “stuff” produced
- Feature/User stories/Tasks/Code

Product: Focus on outcome

- Understand customer need
- Problem solved
- Customer adopt or change behaviour

DevOps is here to help

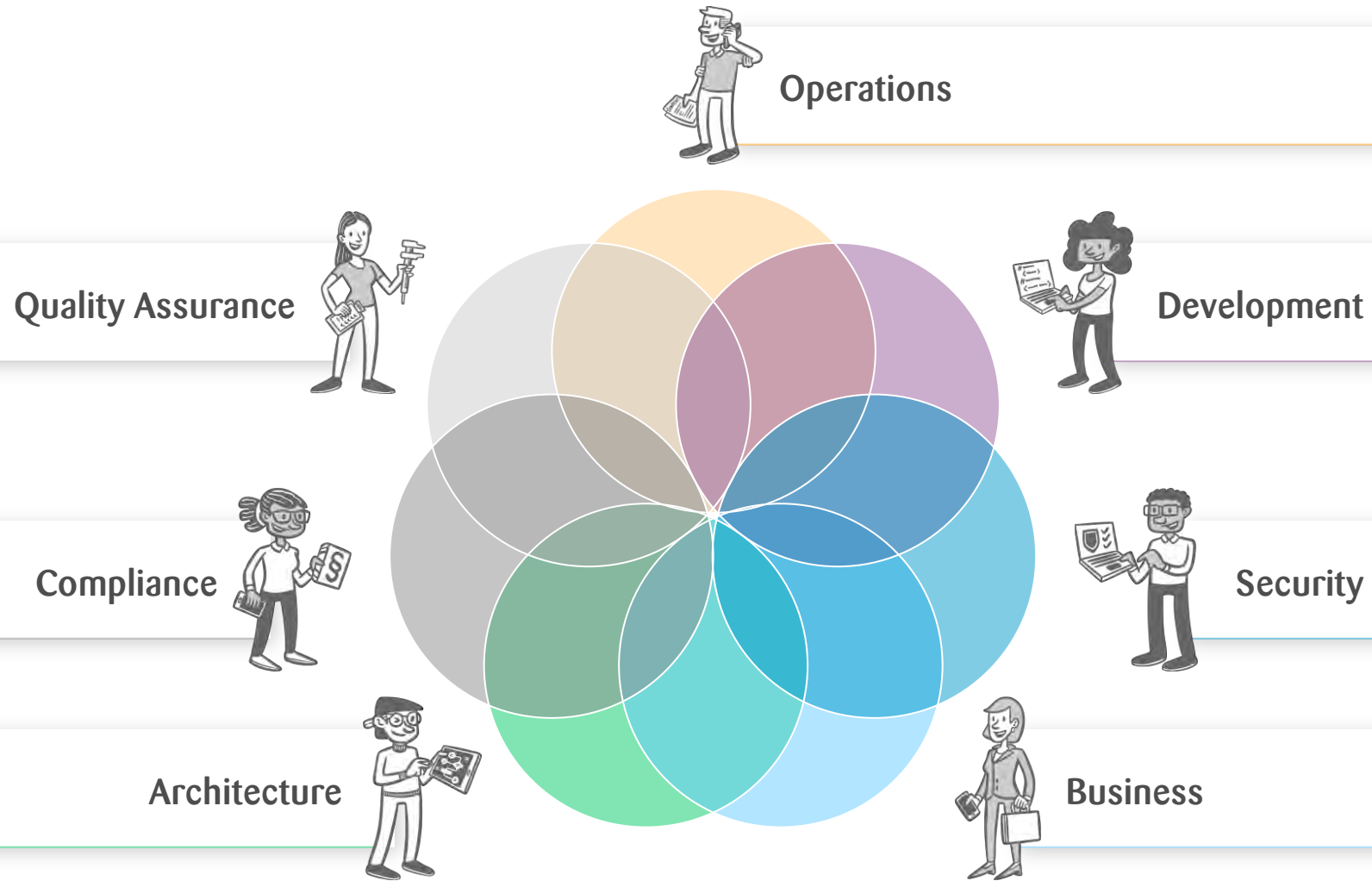
Continuously deliver value



DevOps is a **mindset**, a **culture**, and a set of technical **practices**. It provides communication, integration, automation, and close cooperation among all the people needed to plan, develop, test, deploy, release, and maintain a product.

Who is DevOps

Everyone contributing to the value stream

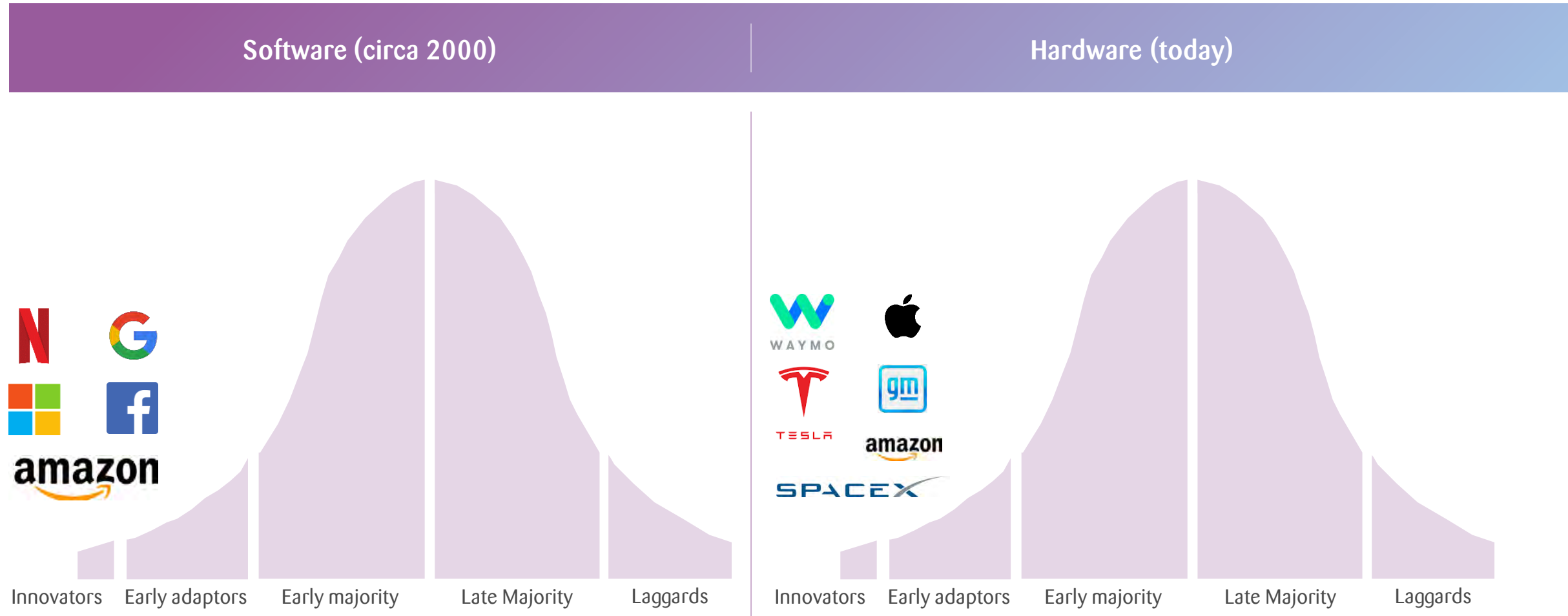


DevOps:

**Bringing People, Process
and Technology together to
continuously deliver value!**

Why is this important for you?

Early adopters in software discovered their own ways of working and now dominate their respective markets .
Organizations are now applying them to hardware



Example?

Elon Musk [@elonmusk](#) · 7. Okt. 2021
FSD Beta 10.2 rolls out Friday midnight to ~1000 owners with perfect 100/100 safety scores.
Rollouts will hold for several days after that to see how it goes.
If that looks good, beta will gradually begin rolling out to 99 scores & below.
20.338 6.495 80.305

Elon Musk [@elonmusk](#) · 9. Okt. 2021
A few last minute concerns about this build. Release likely on Sunday or Monday. Sorry for the delay.
3.473 1.341 24.404

Elon Musk [@elonmusk](#) · 11. Okt. 2021
Beta 10.2 now rolling out to cars with 100/100 safety score over 100 miles
2.597 1.412 26.515

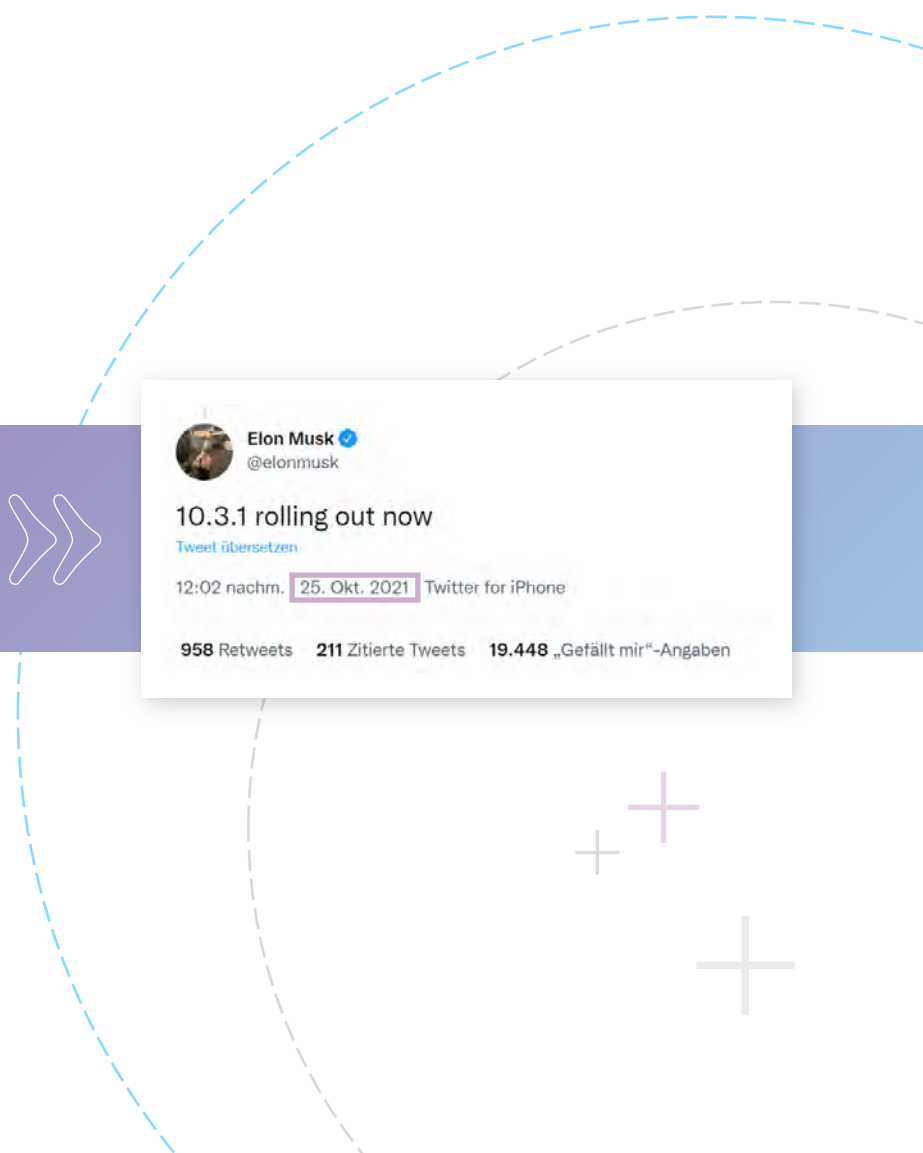
Elon Musk [@elonmusk](#)
Beta 10.3 releasing Friday next week to all cars with 99/100 safety score
5:18 vorm. 15. Okt. 2021
1.270 Retweets 244 Zitierte Tweets 25.127 „Gefällt mir“-Angaben



Elon Musk [@elonmusk](#)
Seeing some issues with 10.3, so rolling back to 10.2 temporarily.
Please note, this is to be expected with beta software. It is impossible to test all hardware configs in all conditions with internal QA, hence public beta.
8:44 nachm. 24. Okt. 2021
1.049 Retweets 420 Zitierte Tweets 23.502 „Gefällt mir“-Angaben



Elon Musk [@elonmusk](#)
10.3.1 rolling out now
12:02 nachm. 25. Okt. 2021
958 Retweets 211 Zitierte Tweets 19.448 „Gefällt mir“-Angaben



The 24 key capabilities that drive improvements in software delivery performance

The capabilities for how to architect for continuous delivery



CONTINUOUS DELIVERY CAPABILITIES

- Version control
- Deployment automation
- Continuous integration
- Trunk-based development
- Test automation
- Test data management
- Shift left on security
- Continuous delivery (CD)

ARCHITECTURE CAPABILITIES

- Loosely coupled architecture
- Empowered teams

LEAN MANAGEMENT AND MONITORING CAPABILITIES

- No Change approval processes
- Monitoring
- Proactive notification
- WIP limits
- Visualizing work

PRODUCT AND PROCESS CAPABILITIES

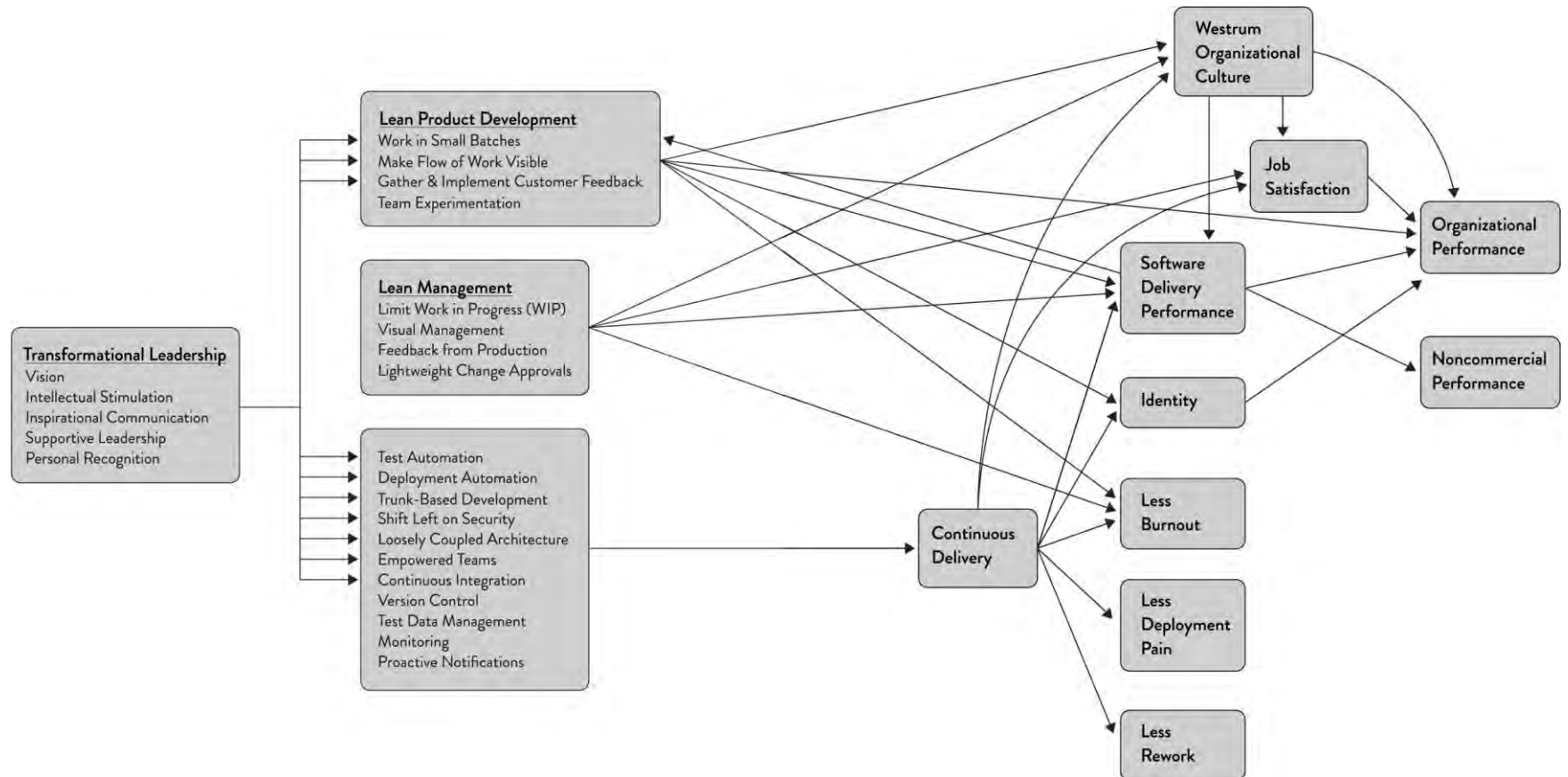
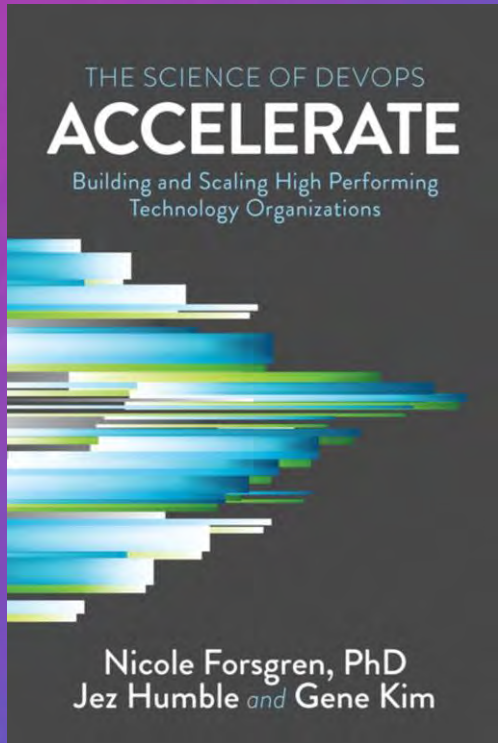
- Customer feedback
- Value stream
- Working in small batches
- Team experimentation

CULTURAL CAPABILITIES

- Westrum organizational culture
- Supporting learning
- Collaboration among teams
- Job satisfaction
- Transformational leadership

The science behind DevOps

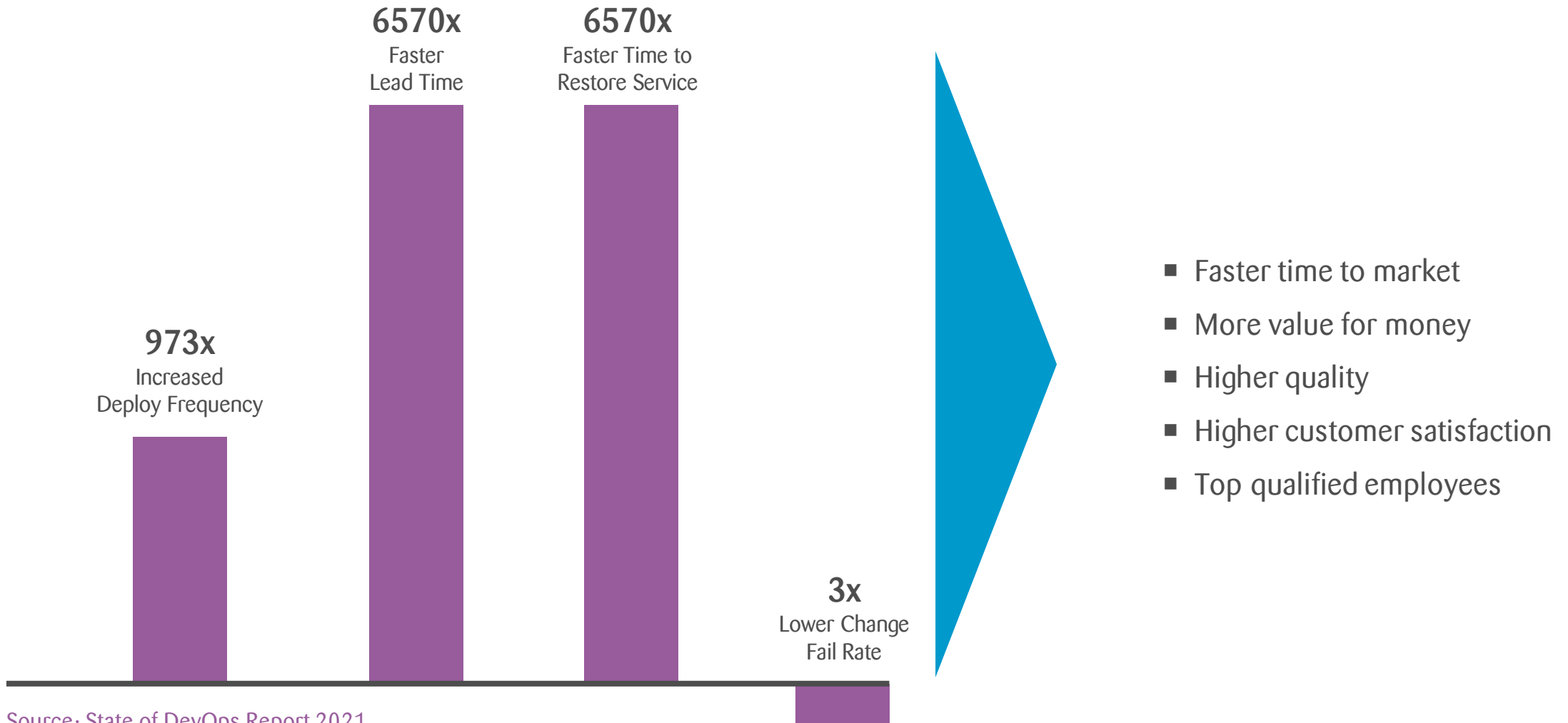
The capabilities for how to architect for continuous delivery



Source: Nicole Forsgren, Jez Humble, Gene Kim, Accelerate: The Science of Lean Software and DevOps Building and Scaling High Performing Technology Organizations, IT Revolution Press, March 2018

The benefits of the DevOps

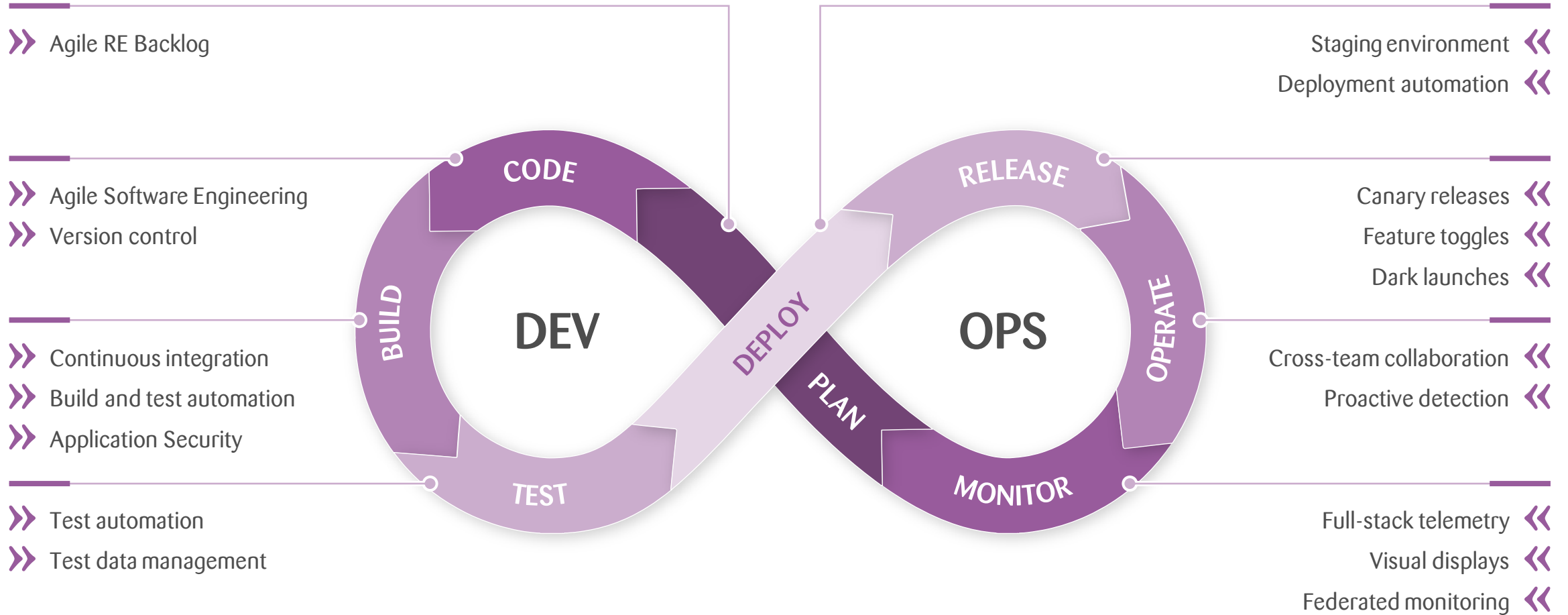
Comparing highest to lowest performers



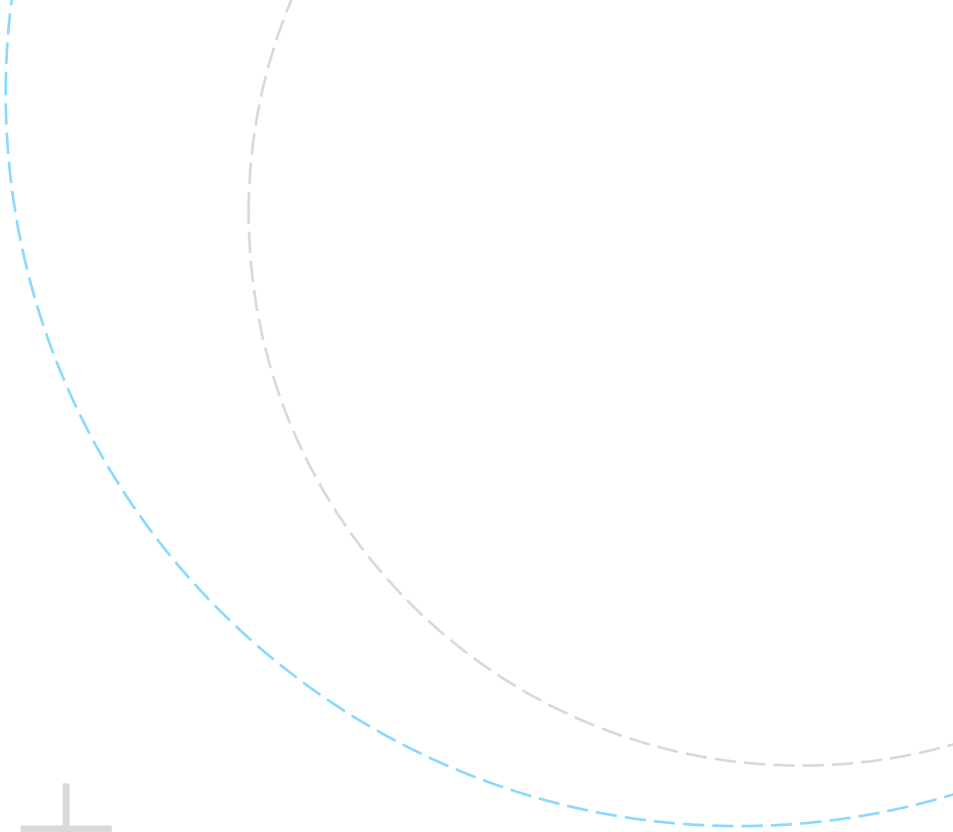
[Source: State of DevOps Report 2021](#)

Product Development

Modern Software Development is a continuous process across the value stream



» Built-in
quality



» 50% of the money a Musk company is investing in a new product is in automated testing.

Musk companies: SpaceX, Tesla, Neuralink, The Boring Company, xAI and X

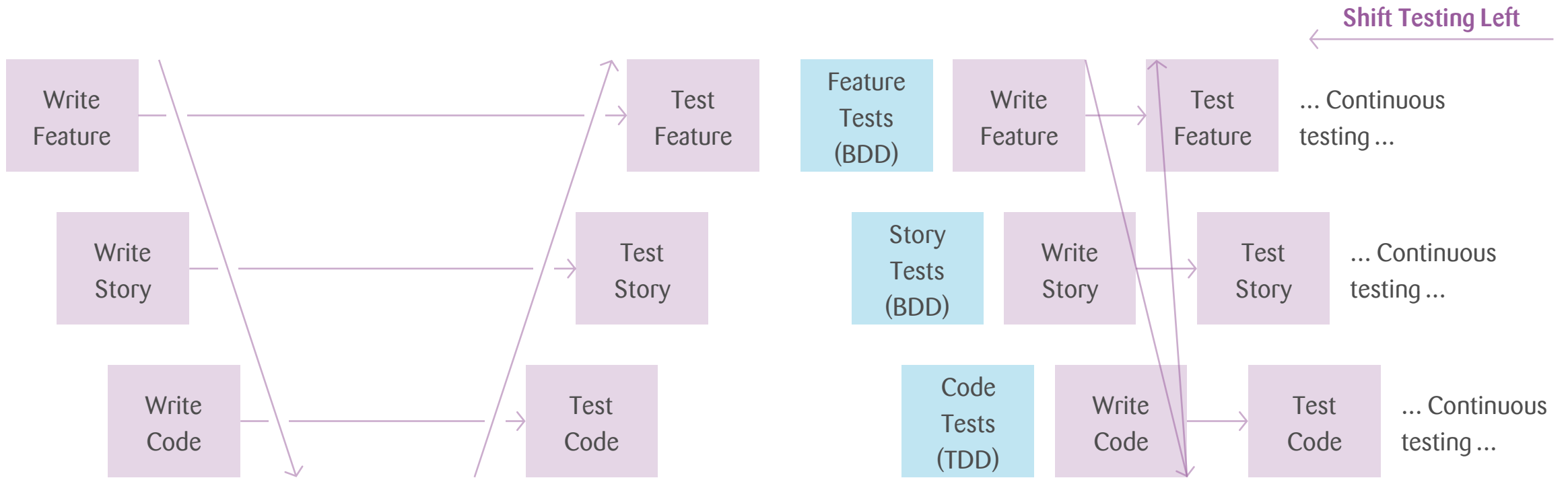
Joe Justice
Agile Coach
Ex. Tesla Employee

Test fast for continuous feedback

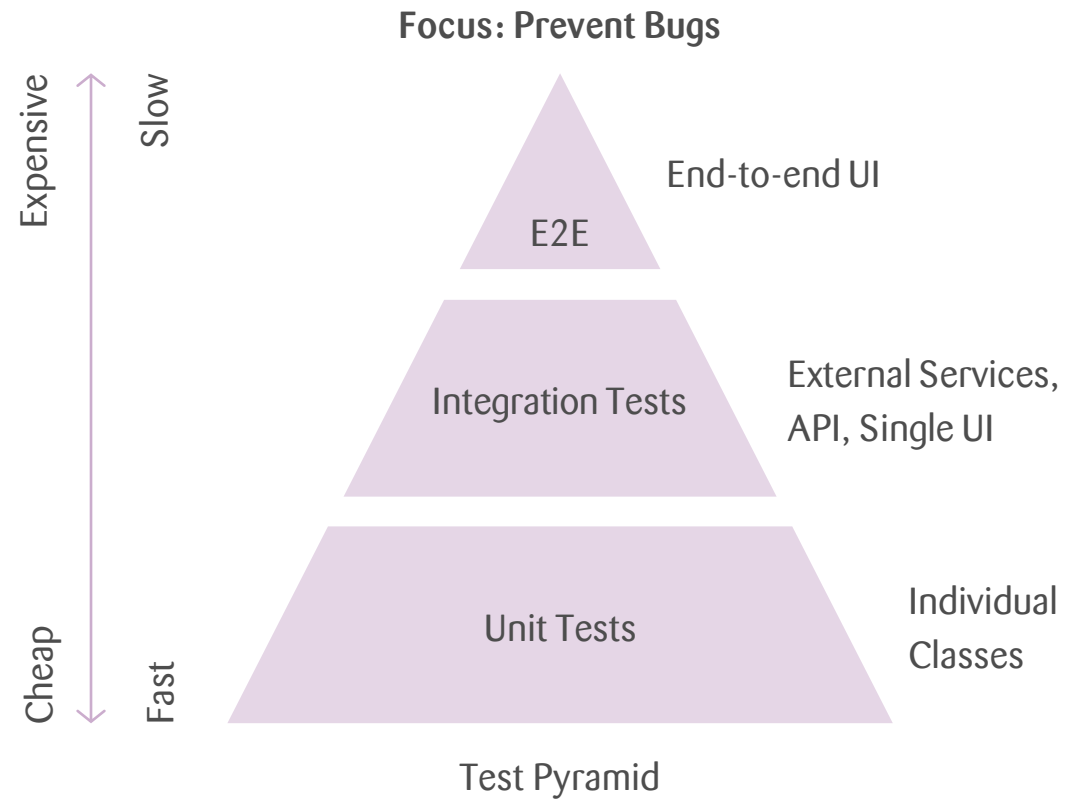
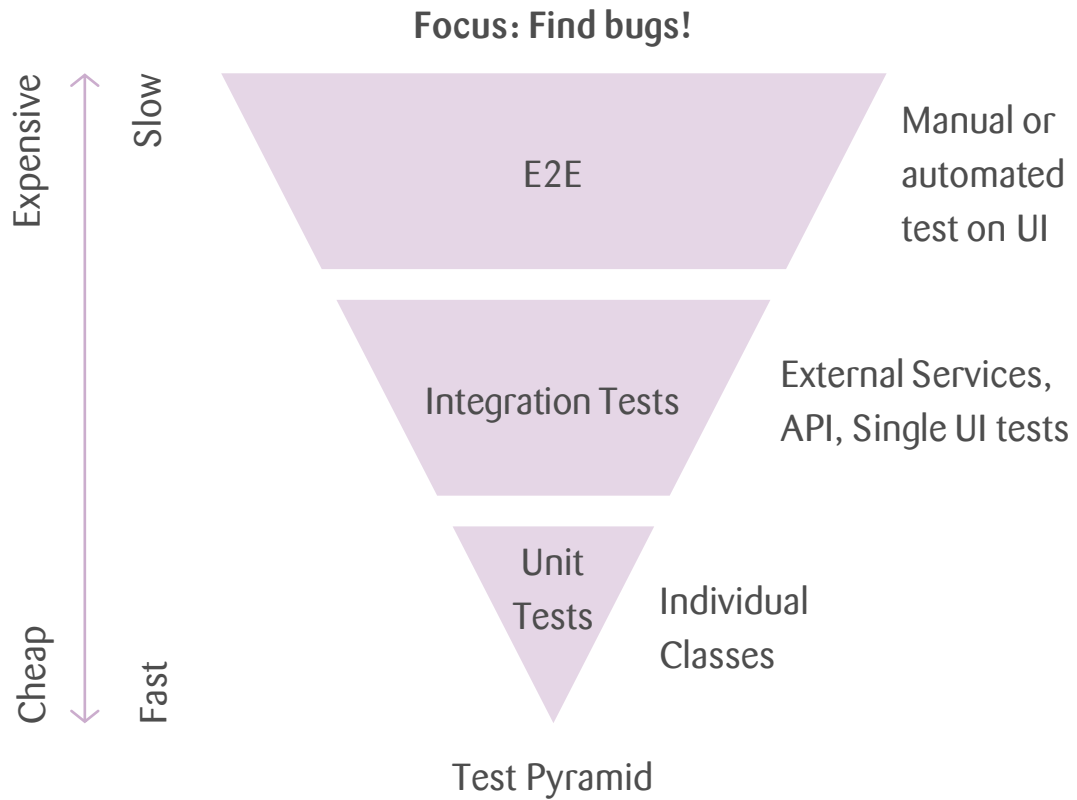


Delayed feedback

Shift testing left for fast and continuous feedback

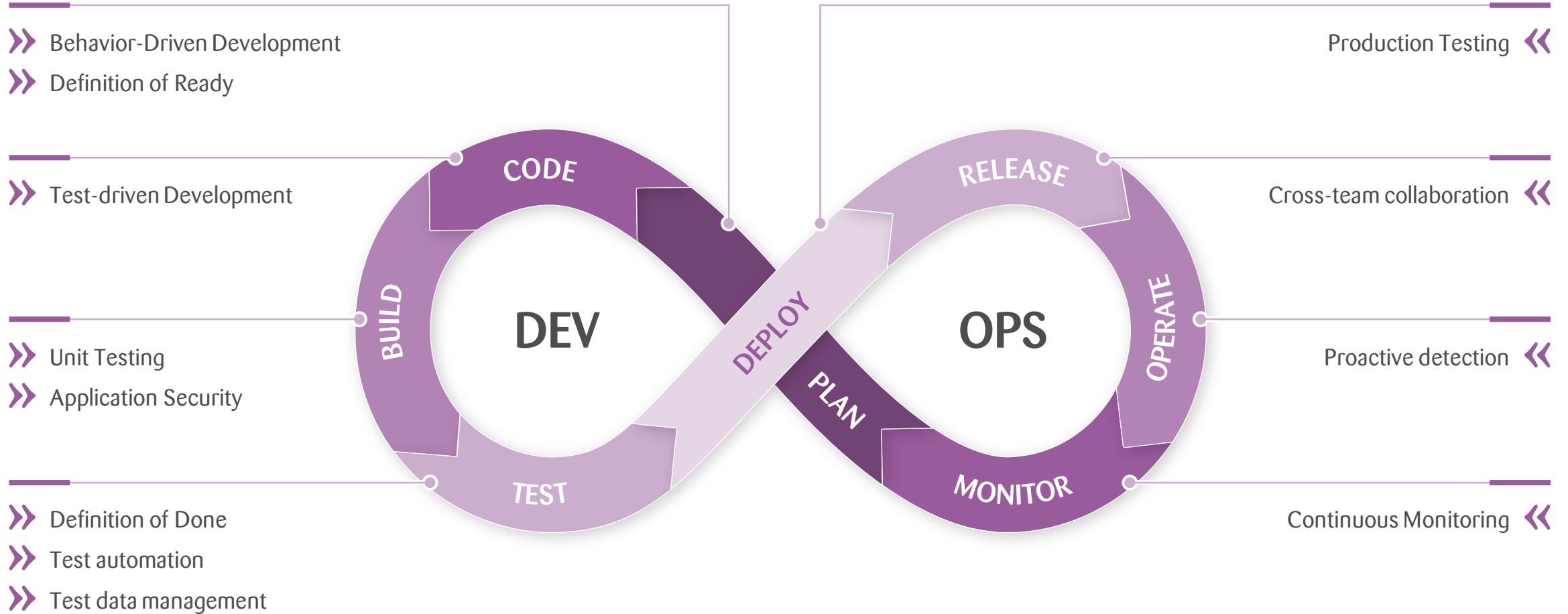


The right balance of tests

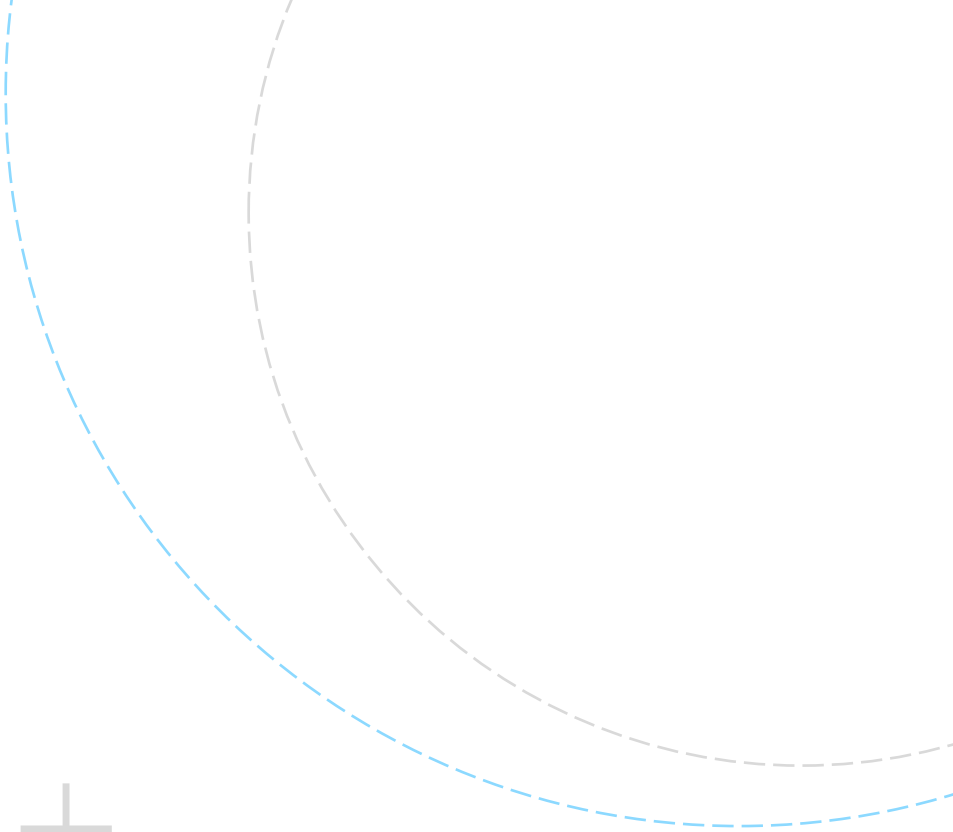
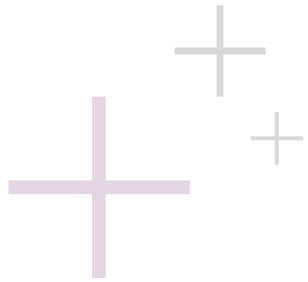


Continuous Testing

Build quality into your product by testing early and often

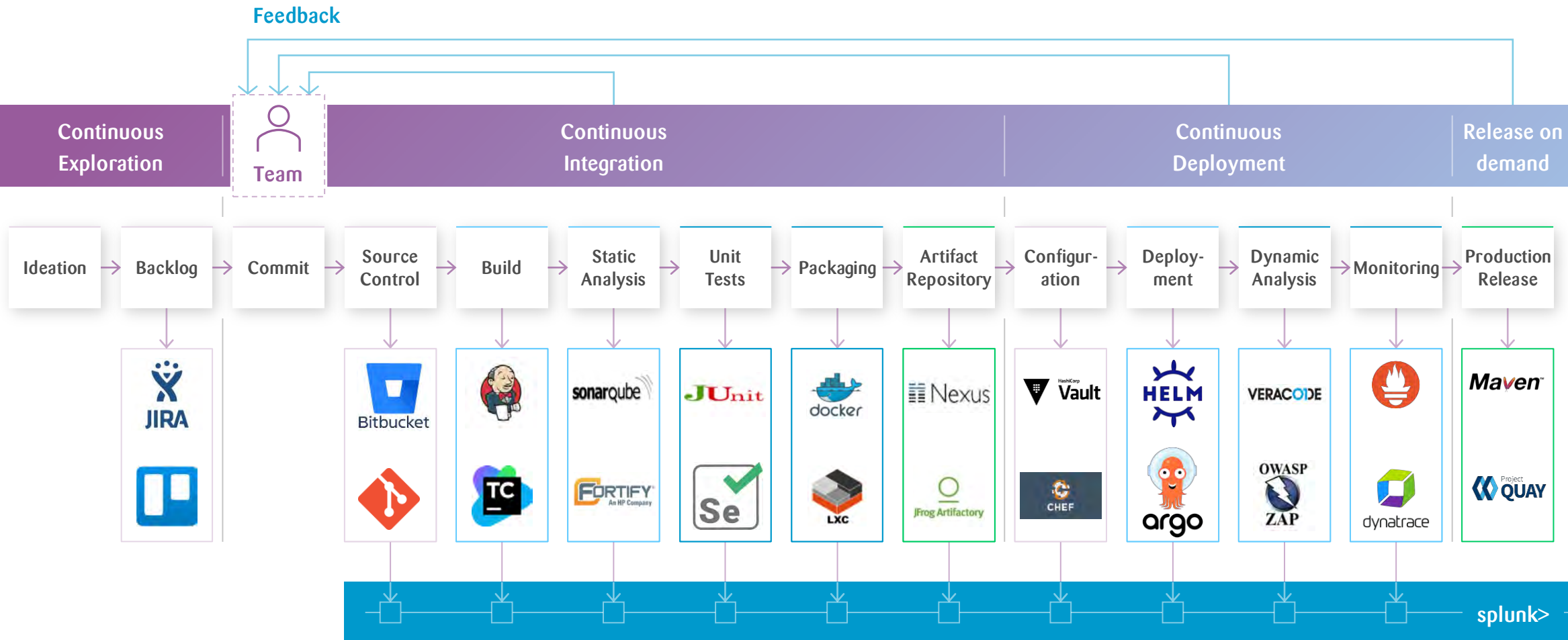


» Built-in
security

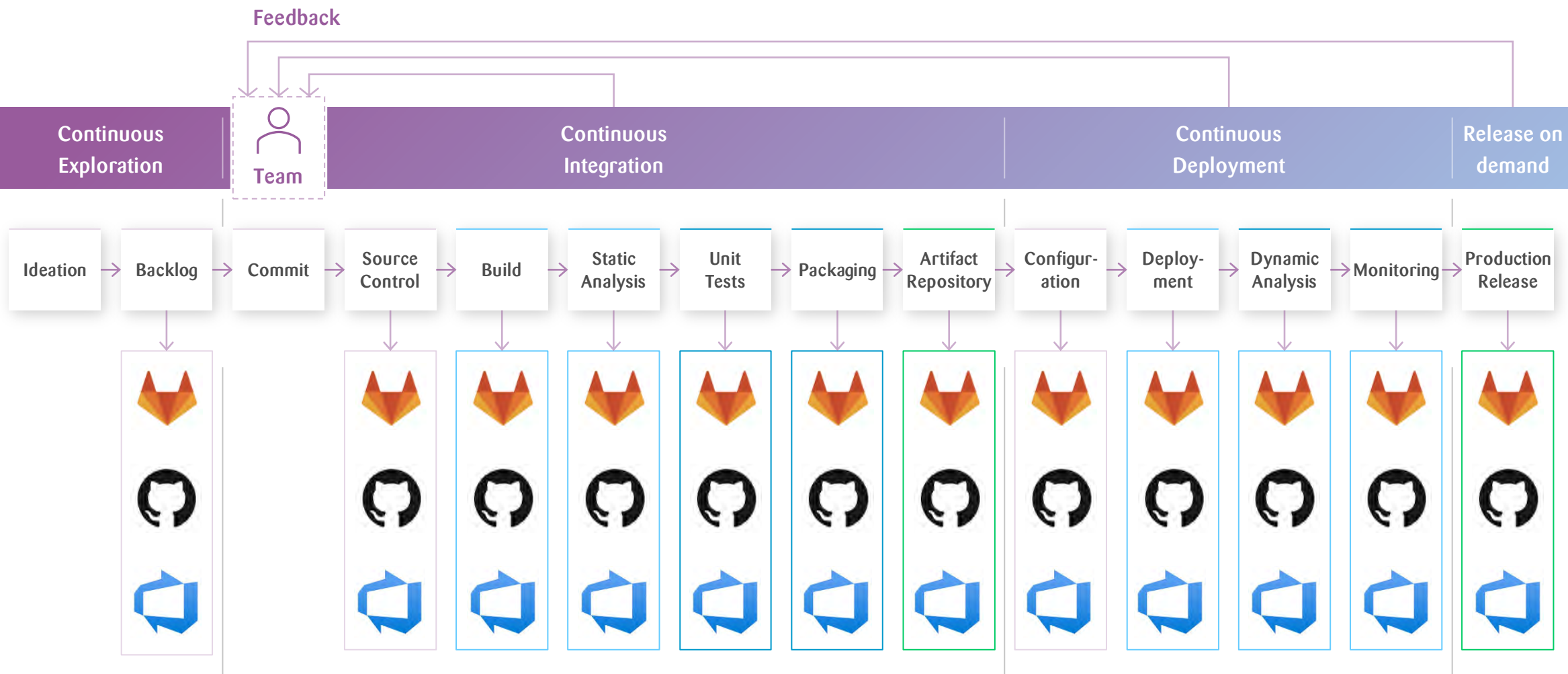


The Continuous Delivery Pipeline

Example of a Continuous Delivery Pipeline with tools that can be used

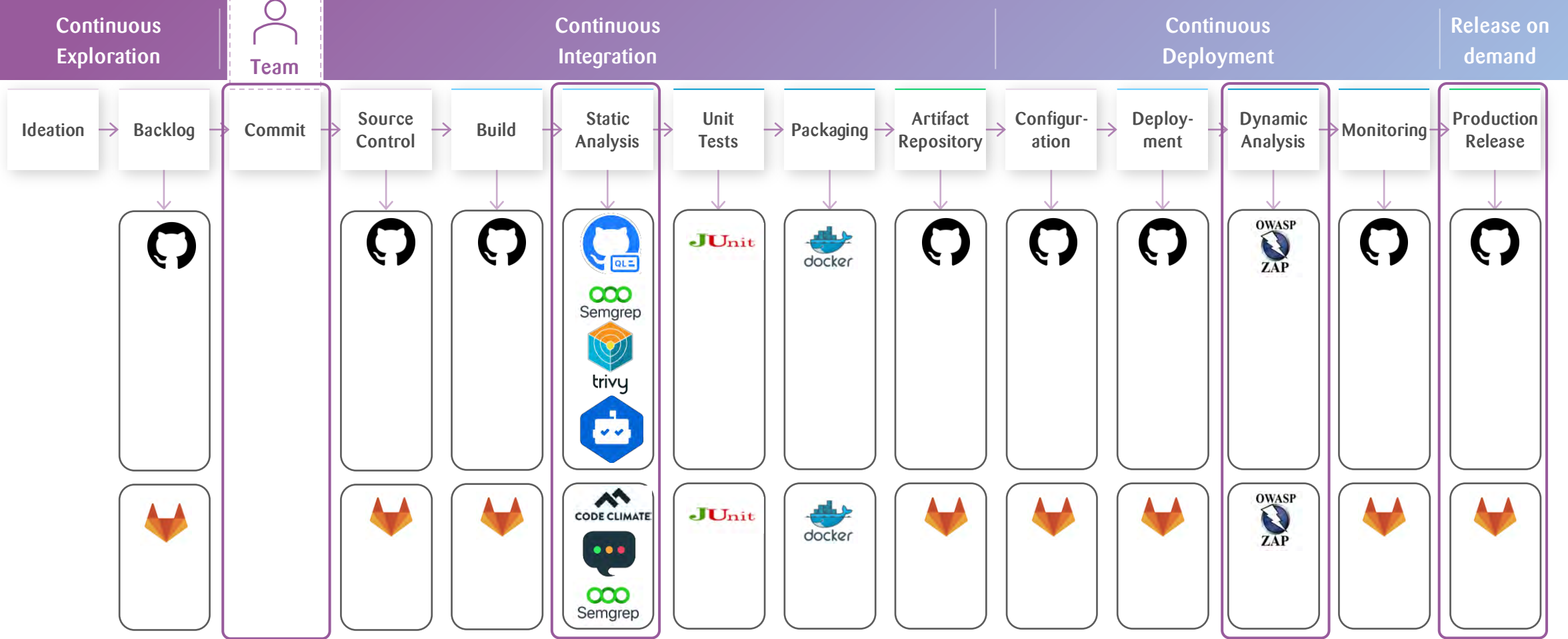


What the platform vendors promise....



DevSecOps

Feedback

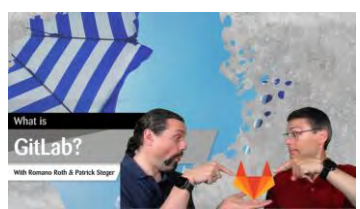


Merge Request

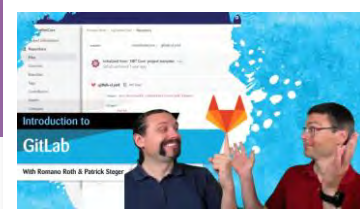
Software Composition Analysis
 License Compliance
 SAST (Static Application Security Testing)
 Container Scanning
 Secret Detection

DAST (Dynamic Application Security Testing)

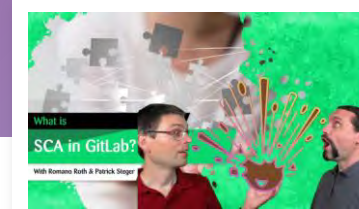
Scheduled Pipelines



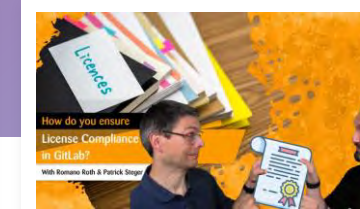
What is GitLab?
<https://youtu.be/SHK8uN5fBhs>



Introduction to GitLab
<https://youtu.be/GQ3x9bkCK90>



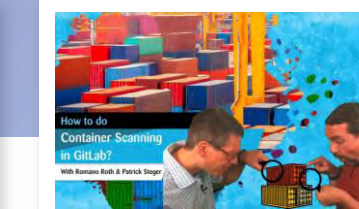
SCA
https://youtu.be/l69W5Ym_M5o



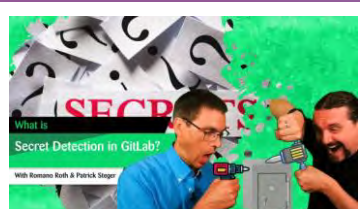
License Compliance
https://youtu.be/Kmbj_PCiHyk



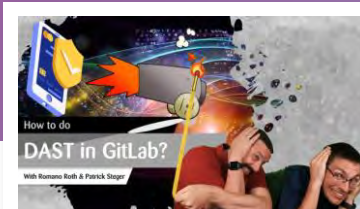
SAST
<https://youtu.be/owwIMUamdDc>



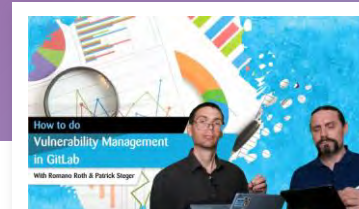
Container Scanning
<https://youtu.be/1AUKQ32K6D4>



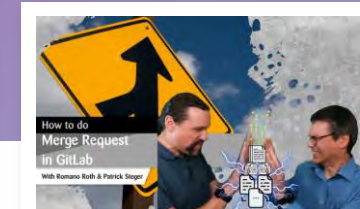
Secret Detection
<https://youtu.be/Qs28ONnj00s>



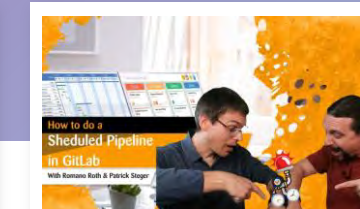
DAST
<https://youtu.be/Jy1OiuPZrKs>



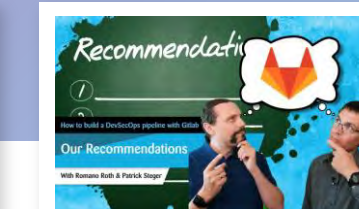
Vulnerability Management
<https://youtu.be/XSrlVyv0H1c>



Merge Request
<https://youtu.be/h4AN7S2gwg>



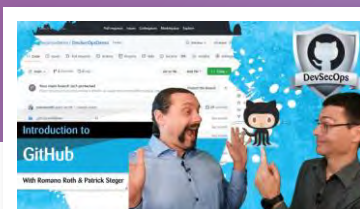
Schedule Pipeline
<https://youtu.be/PqPW3zQeP94>



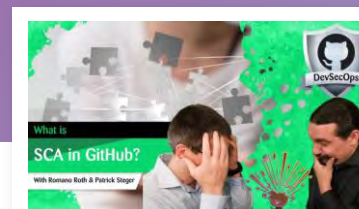
Recommendations
<https://youtu.be/dphgw9xxjuw>



What is GitHub?
https://youtu.be/_m5KYEi1Tha



Introduction to GitHub
<https://youtu.be/6ZdxXD8ZDA>



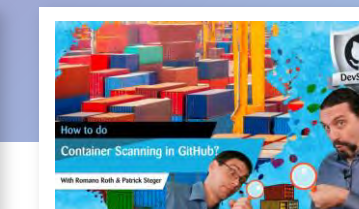
SCA
<https://youtu.be/xM3eleryjYo>



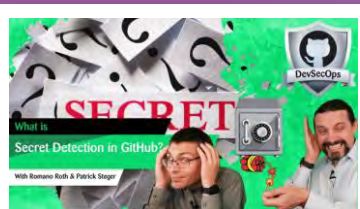
License Compliance
<https://youtu.be/l71Bh2xkDcQ>



SAST
<https://youtu.be/p4xS2X5KsNk>



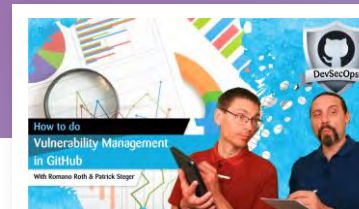
Container Scanning
https://youtu.be/_ZeKh3GcbqU



Secret Detection
<https://youtu.be/k-uuPTLNXGM>



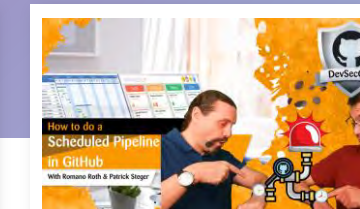
DAST
https://youtu.be/v_xo1kqNYsE



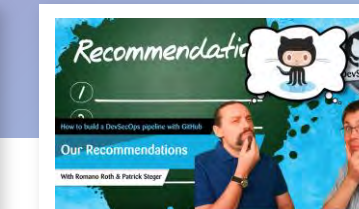
Vulnerability Management
<https://youtu.be/XSrlVyv0tbd>



Pull Requests
<https://youtu.be/h4AN7S2qtbd>



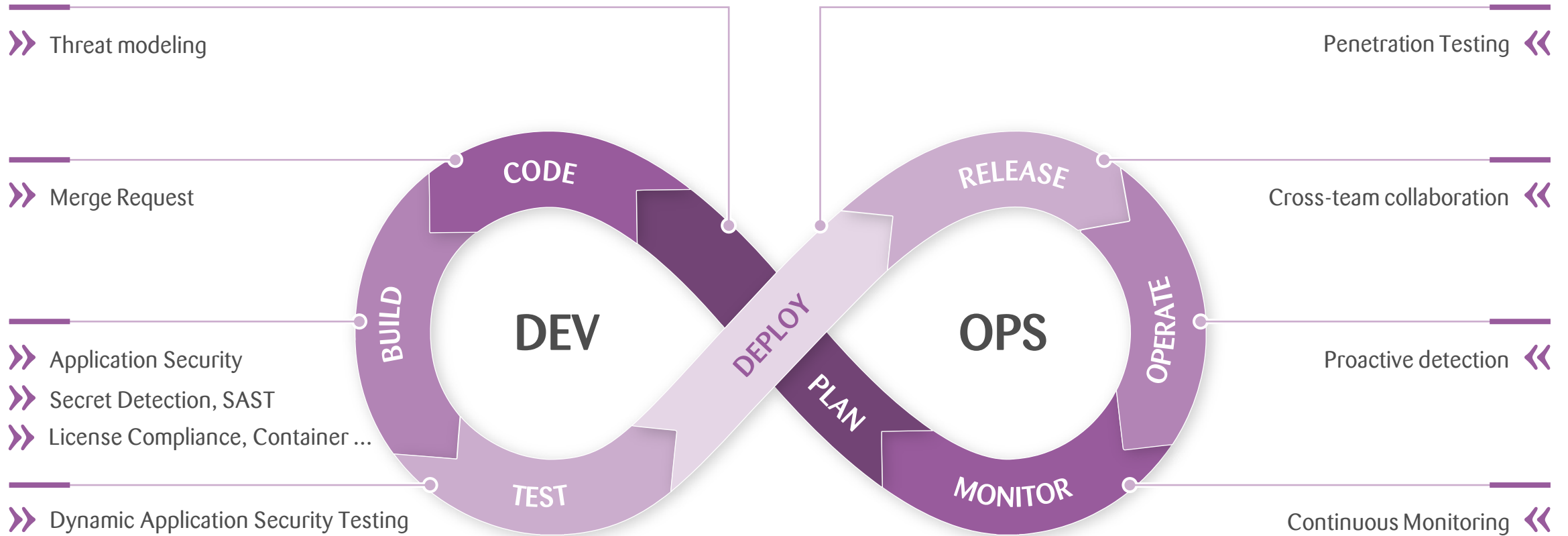
Schedule Pipeline
<https://youtu.be/PqPW3zQetbd>



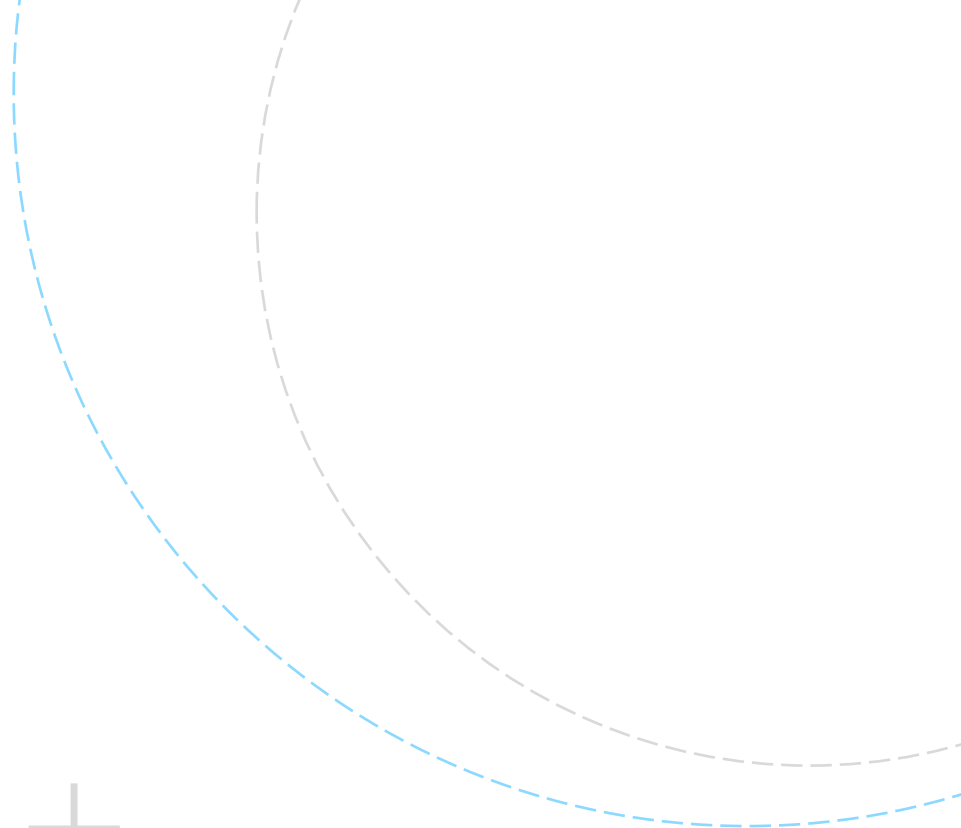
Recommendations
<https://youtu.be/dphgw9xxtbd>

Continuous Security

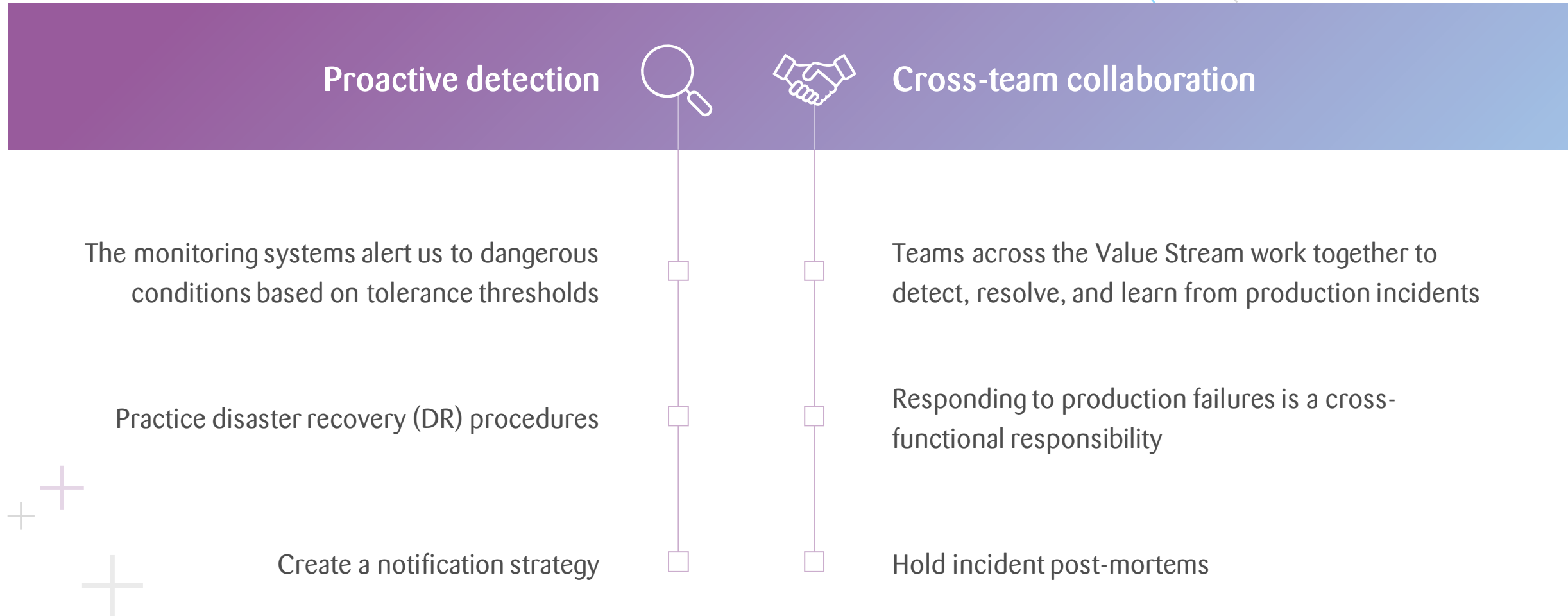
Security affects every aspect of the continuous delivery cycle



» Built for
operability



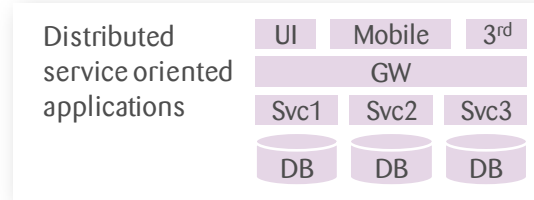
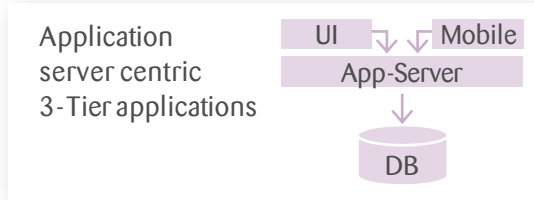
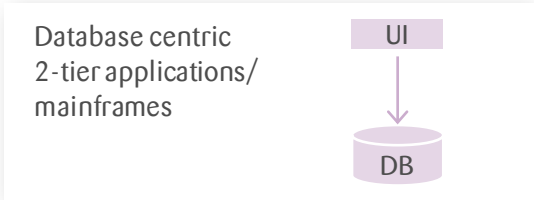
You build it you run it!



Evolution of monitoring



Typical Systems



Challenge

Is my holy cow – the DB – still running?

Numbers are not enough. The Logic is in the App-Server! What happens in the App-Server?

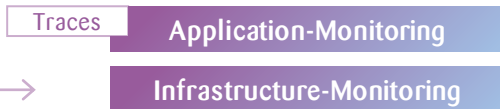
There is no single App-Server anymore! Are all parts on all levels contributing to requests working as intended?



Solution



Gather metrics about Hardware and DB-Load and inspect logs in case of failure.

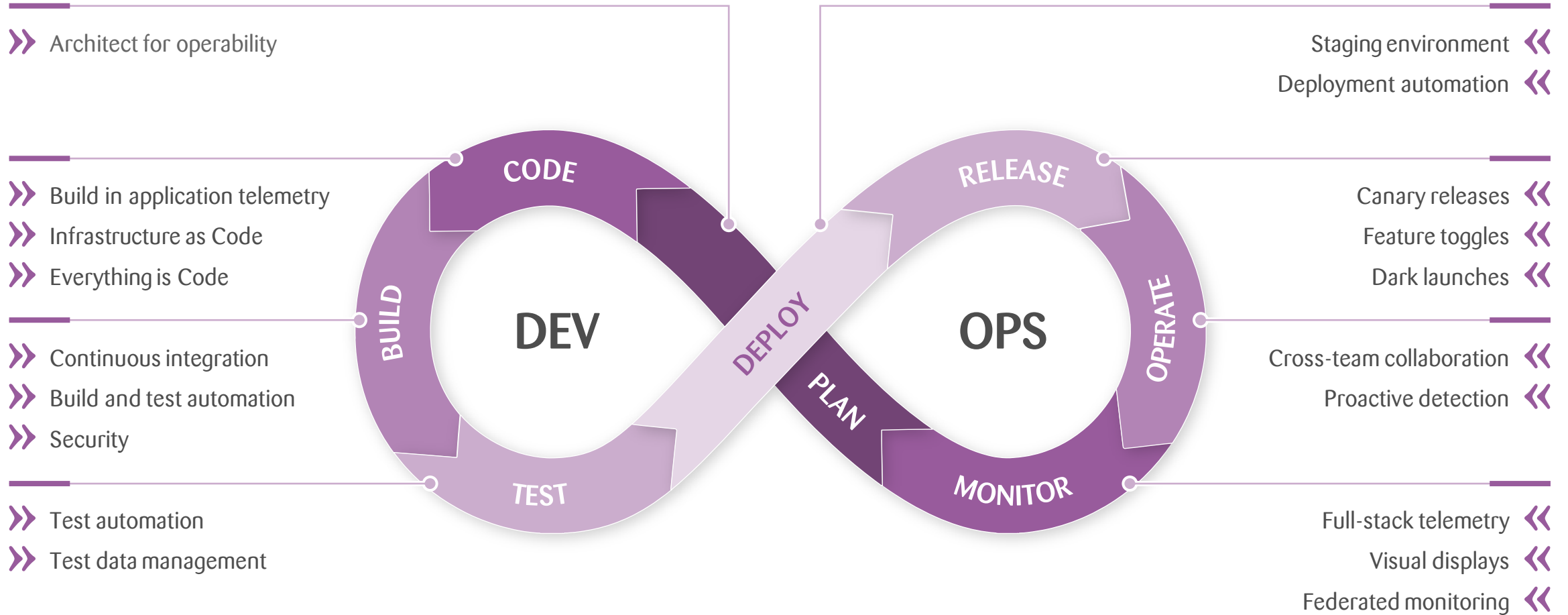


Looking into an application is something completely new, done by other people. Let's call it application monitoring in contrast to the old one, which we rename infrastructure monitoring.

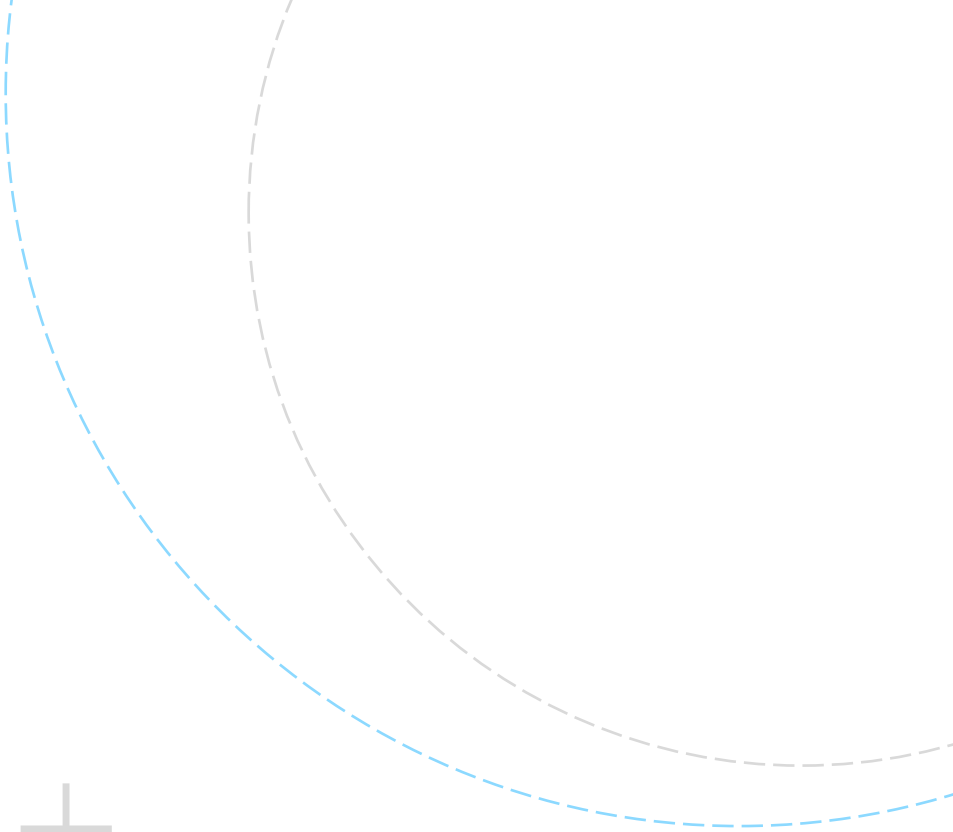
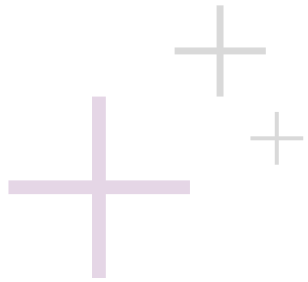


Weird behavior could originate from all levels. Metrics, Logs and Traces need to be centralized and correlated – facilitating easy navigation through the huge amount of available data.

We need to architect for operability

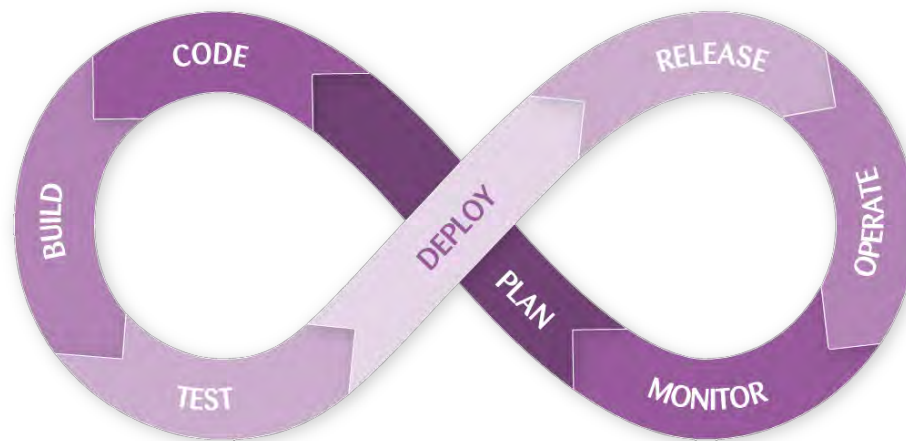


» Build a platform



Modern Software Development is a continuous process across the value stream

DevOps is a mindset, a culture, and a set of **technical practices**.



Plan	Code	Build	Test	Deploy	Operate	Release	Monitor
<ul style="list-style-type: none"> ▪ Backlog management ▪ Value Stream Management ▪ UX ▪ Lean Portfolio Management ▪ BDD ▪ Architecture ▪ Quality Management ▪ Agile SW Architecture ▪ DoR 	<ul style="list-style-type: none"> ▪ Git ▪ IDE ▪ IaC ▪ Code Review (PR) ▪ Documentation ▪ Secret Mgmt. ▪ Agile SWE ▪ TDD ▪ Remote Development ▪ Emergent SW Architecture 	<ul style="list-style-type: none"> ▪ Continuous Integration ▪ Software Composition Analysis ▪ License Compliance ▪ SAST ▪ Container Scanning ▪ Secret Detection ▪ Container Registry 	<ul style="list-style-type: none"> ▪ Test Automation ▪ Test Data Management ▪ Vulnerability Management ▪ Compliance Management ▪ Audit Security Policy Management ▪ DoD 	<ul style="list-style-type: none"> ▪ DAST ▪ API Security ▪ Scheduled Pipelines ▪ Environment Management ▪ Deployment automation ▪ Staging environment ▪ Continuous Delivery / Deployment ▪ Production Testing 	<ul style="list-style-type: none"> ▪ Cross-team collaboration ▪ Proactive detection ▪ Logging ▪ Tracing 	<ul style="list-style-type: none"> ▪ Release Orchestration ▪ Feature flags ▪ Canary releases ▪ Dark launches 	<ul style="list-style-type: none"> ▪ Continuous Monitoring ▪ Full-stack telemetry ▪ Visual displays ▪ Federated monitoring ▪ Observability ▪ Metrics (DORA) ▪ On-Call Schedule Mgmt. ▪ Incident Mgmt. ▪ Service desk ▪ Software Bill of Material

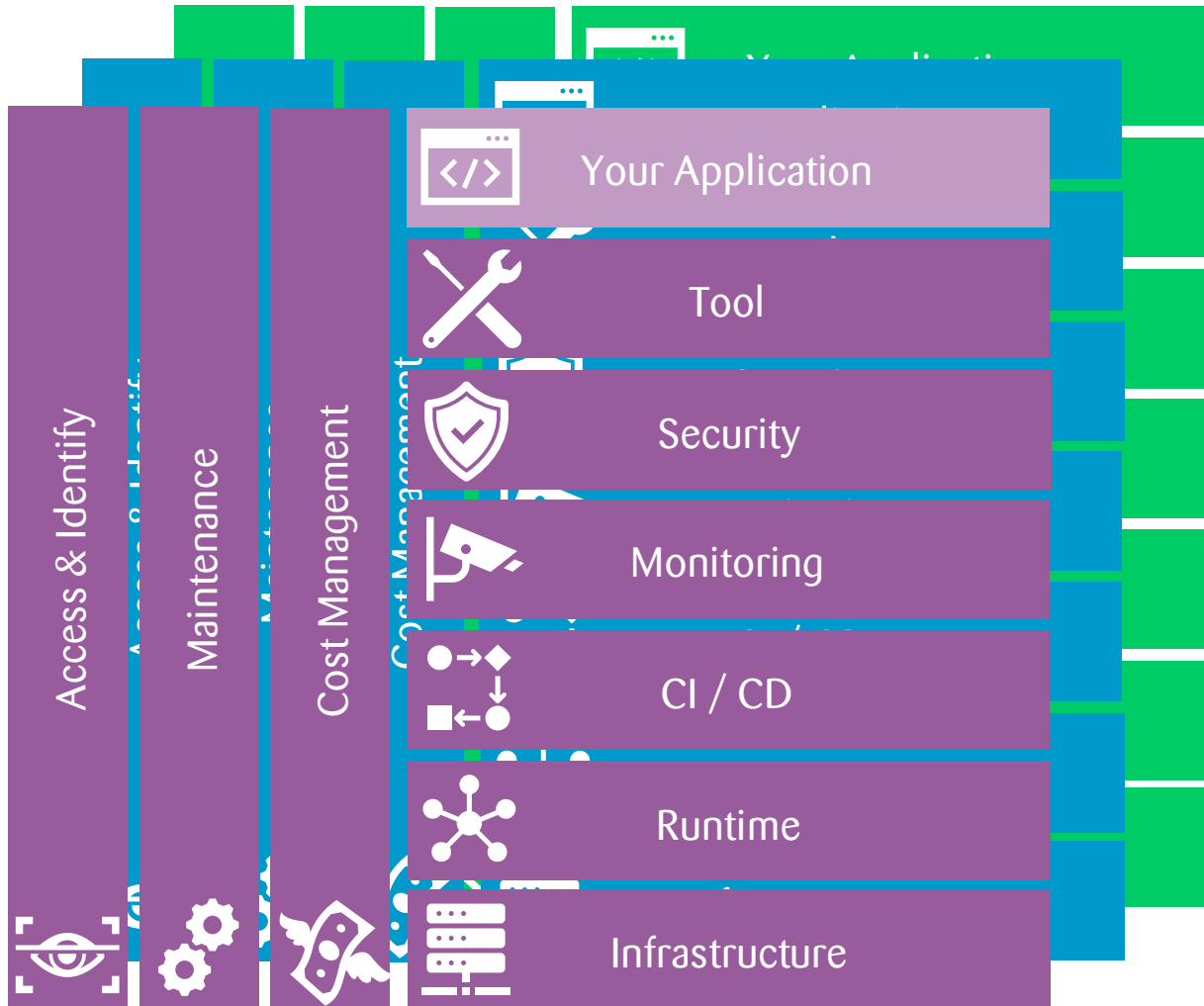
You need to take care about the full stack

You build it you run it!



Think about that on scale...

The cognitive load is too high!

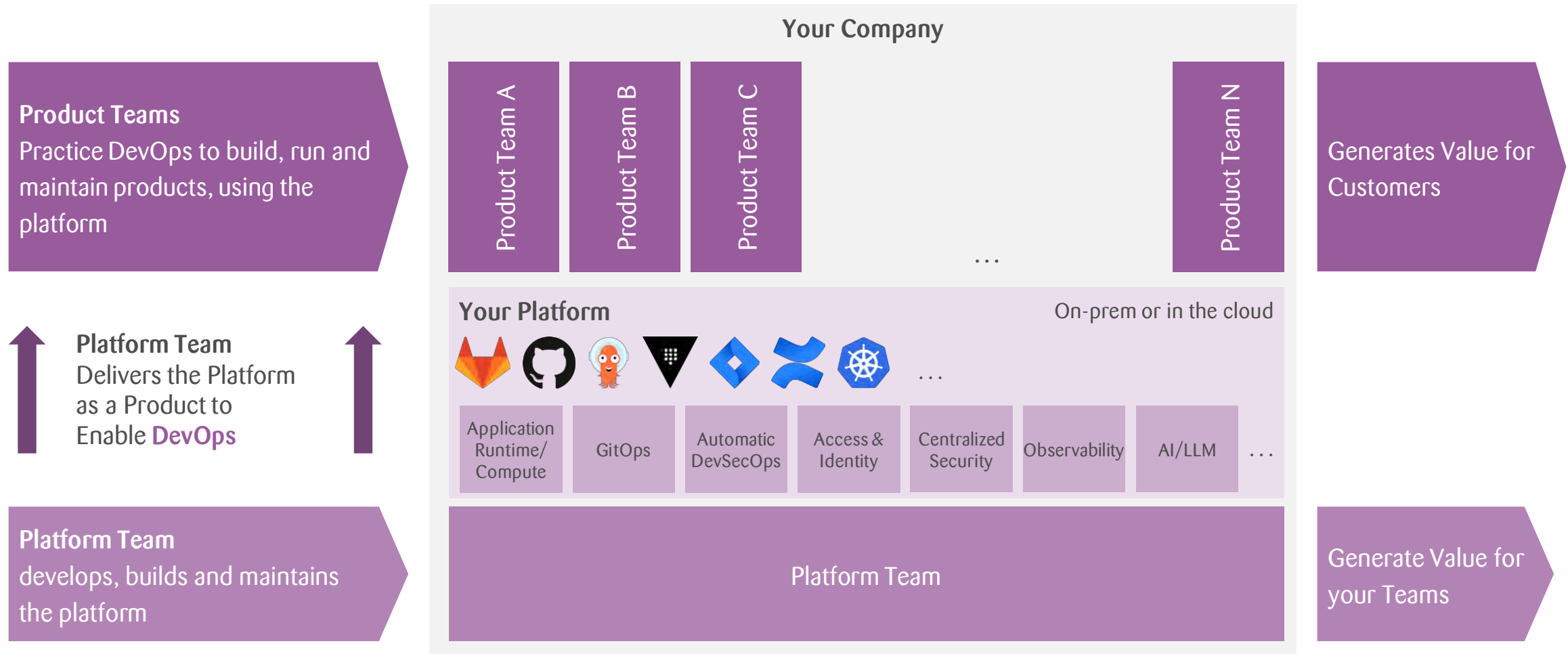


- Inconsistent and redundant platforms
 - Every team reinvents the wheel
 - Lack of operations experience in development
 - No synergies
 - Its not easy to move from one project / product to another
 - Complexity in tools
- ☞ The cognitive load is too high

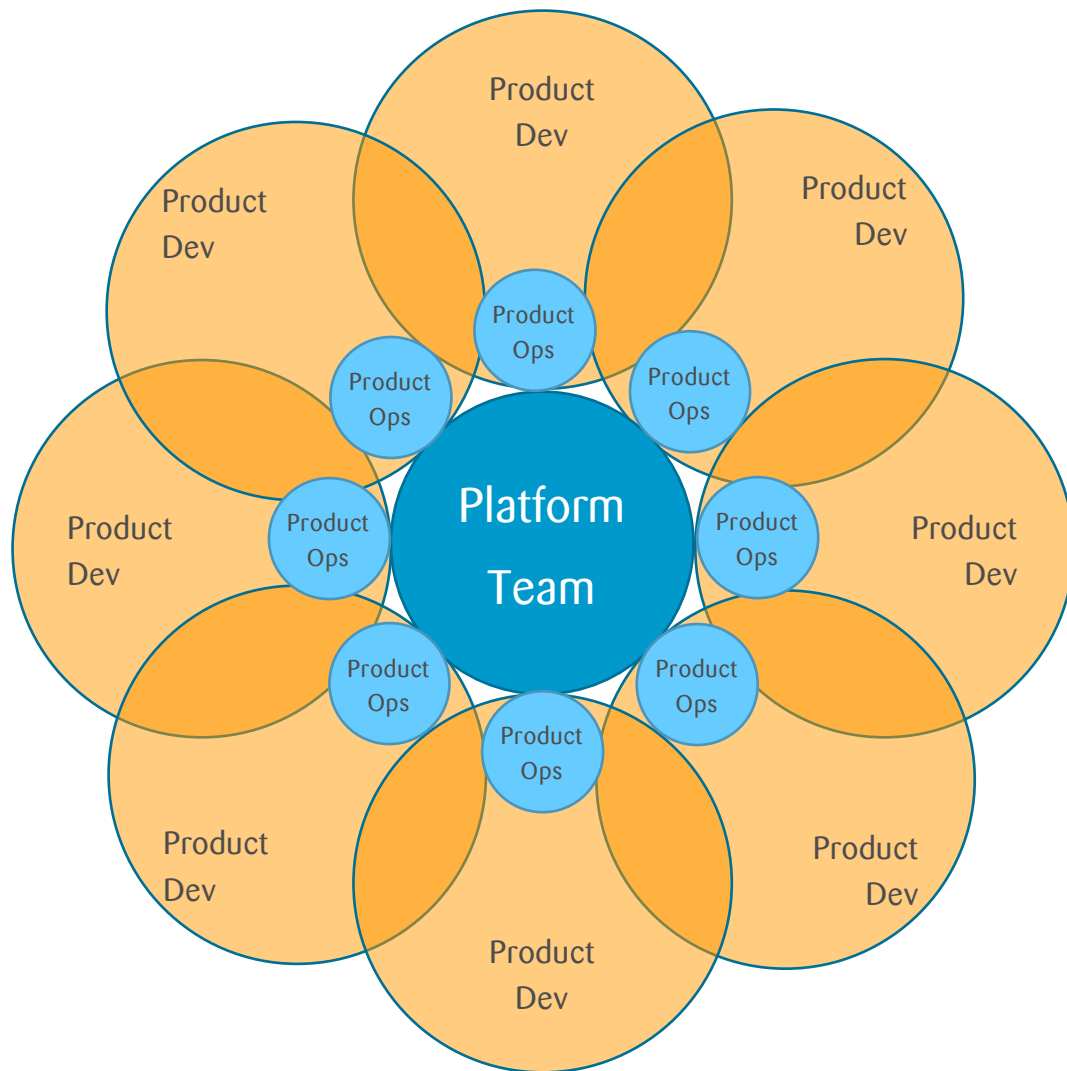


Platform Engineering Enables DevOps in Product Teams

The platform team reduce the cognitive load



Platform Engineering Scales the Platform to Multiple Product Teams



Platform engineering implements reusable tools and self-service capabilities with automated infrastructure operations, improving the developer experience and productivity.

This technology approach utilizes reusable configurable application components and services.

The benefit to users is in standardized tools, components and automated processes.

Gartner and international consultancies see platform engineering as a key technology trend in the next 1-2 years

By 2023

40% of organizations will have switched from multiple point solutions to DevOps value stream delivery platforms to streamline application delivery, up from less than 10% in 2020.

By 2025

95% of enterprises will fail to scale DevOps initiatives if shared self-service platform approaches are not adopted.

By 2027

75% of organizations will have switched from multiple point solutions to DevOps platforms to streamline application delivery, up from 25% in 2023.

- Gartner: 80 % of software engineering organizations will establish platform teams as internal providers of reusable services, components and tools for application delivery.
- BCG: Companies can build a data and digital platform that delivers three to five times the value in half the time and at half the cost.
- Platform Engineering: Leading tech players standardize the engineering approach to improve dev experience & productivity.

Summary

This is how to continuously build great products!

00

You're developing a products, not projects



01

DevOps: Bringing People, Process and Technology together to continuously deliver value



02

Apply continuous testing and build-in quality

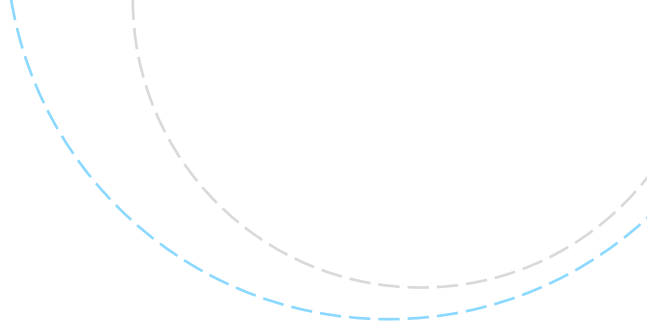
03

Apply continuous security



04

Build a platform



We are entering the age of industrialization of Software Development

Platform Engineering builds your Platform which enables teams to do DevSecOps.

This is the way how you can architect for continuous delivery!

