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Content

1. Context of scaling agile and DevOps
2. DevOps, exploring, executing and releasing value.
3. Continuous delivery pipeline
 - Continuous Exploration
 - Continuous Integration
 - Continuous Deployment
 - Release on Demand
4. Lessons learned
5. Applied SAFe
6. Conclusions
7. Q&A-Session

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Peter Pedross

CEO AND FOUNDER OF PEDCO AG

- 30+ years experience in Software Engineering.
- Studied Software Engineering, Finance and Management Psychology
- World-wide responsible for lifecycles, processes, methods and tools at a leading Swiss financial institute
- Several publications and lectures since 1995 in USA, Japan and Europe.
- Certified in "Scaled Agile Framework" and "Disciplined Agile Delivery", EFQA, CMMI, PMI.
- Encountered first experience with Agile in 1999 (XP)
- President of the board for computer science at the Swiss Association of Quality and member of the board of directors.



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Context

WHY IS DEVOPS, AGILE AND SCALED AGILITY CLOSELY RELATED?

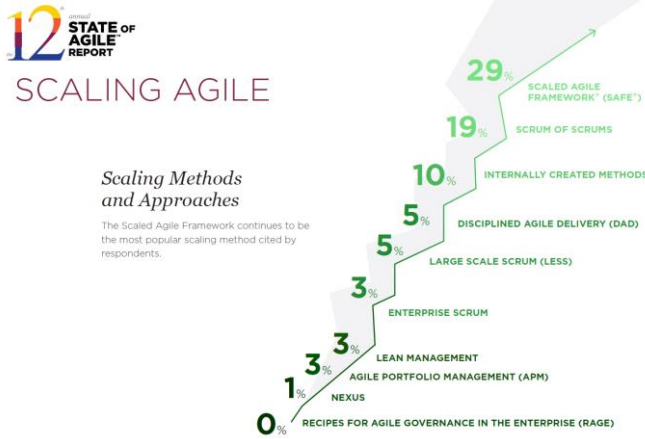
- **Increasing competitive pressure**
- **High innovation levels and high efficiency**
- **Low time-to-market, fast value releasing**
- **Industry 4.0, Lean Start up, Agile**
- **Cyber-physical systems, increased complexity and dependency**
- **Just agile teams are too small to build complex systems**
- **Regulatory and organisational environment is becoming ever more demanding**
- **Most agile delivery teams face compliance requirements (regulatory and/or organizational).**
- **Strategy and governance steering is needed**



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Trends in Scaled Agility (12th State of Agile Report by Version One; April 2018)

OVERVIEW IN USAGE OF THE MOST COMMON AGILE FRAMEWORKS



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Trends in Scaled Agility (12th State of Agile Report by Version One; April 2018)

REAL CHANGE SEEMS TO BE A BIGGER ISSUE WITHIN SCALED AGILITY



*Respondents were able to make multiple selections.

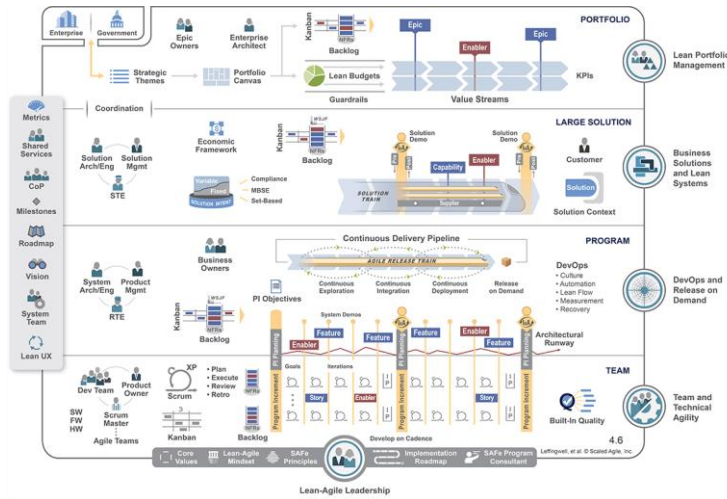
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SAFe - #1 Framework for Scaled Agility

SCALING UP FROM TEAM TOWARDS PROGRAM, LARGE SOLUTION, PORTFOLIO AND ENTERPRISE



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SAFe
Source: www.scaledagileframework.com

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Numbers on SAFe

PROVIDED BY SCALED AGILE		<h3>At a Glance</h3>	
<p>350,000 SAFe-trained professionals in 110+ countries</p>	<p>220 Scaled Agile Partners in 50 countries</p>	<p>SAFE SUMMIT</p>	<p>Freely Available SAFe's knowledge base is freely available at scaledagileframework.com</p>
<p>70% US <i>Fortune</i> 100 enterprises have SAFe-trained professionals</p>	<p>2 million Annual visitors to SAFe and Scaled Agile websites</p>	<p>Training A comprehensive role-based curriculum for successfully implementing SAFe and skills validation through professional certification.</p>	<p>Configurable SAFe is able to accommodate enterprises of all sizes and industries</p> <p>Fastest Growing Method SAFe cited as preferred solution for scaling Agile:</p> <ul style="list-style-type: none"> • 2018 Agile in the Enterprise survey by Gartner Research • 12th Annual State of Agile Report by VersionOne • 2017 Scaling Agile Report by cPrime
<p>Pledge 1% Scaled Agile stock equity & employee time to Pledge 1% campaign</p>	<h3>SAFe CASE STUDIES</h3>		
<p>30 - 75% Faster Time-to-Market</p>	<p>25 - 75% Increase in Productivity</p>	<p>20 - 50% Improvements in Quality</p>	<p>10 - 50% Increased Employee Engagement</p>

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Devops

MINDSET, CULTURE AND A SET OF TECHNICAL PRACTICES



*“Imagine a world where product owners, Development, QA, IT Operations, and Infosec work together, not only to help each other, but also to ensure that the overall organization succeeds. By working toward a common goal, they enable the fast flow of planned work into production, while achieving world-class stability, reliability, availability, and security.
—The DevOps Handbook*

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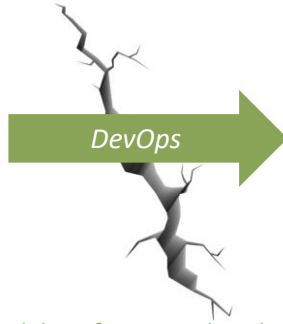
What is DevOps?

AN AGILE APPROACH TO BRIDGE THE GAP BETWEEN DEVELOPMENT AND OPERATIONS

Deliver value *faster and more reliably!*

Development:

- ▶ Create change
- ▶ Add or modify Features



Operations:

- ▶ Create stability
- ▶ Create or enhance services

DevOps is a capability of every Agile Release Train

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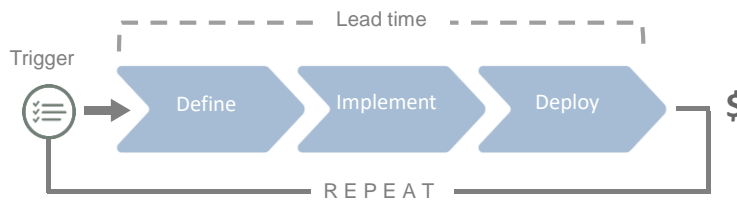
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DevOps is IN the Value Stream

VALUE OCCURS **ONLY** WHEN THE END USERS ARE OPERATING THE SOLUTION.



DevOps isn't optional. The only question is how efficient it is.

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The Goal of DevOps

IMPROVE COLLABORATION ACROSS THE VALUE STREAM

From planning through delivery, the goal of DevOps is to improve collaboration across the value stream by developing and automating a **continuous delivery pipeline**.

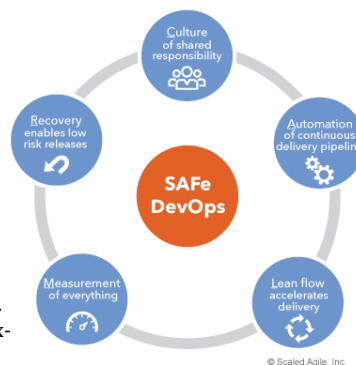
In doing so, DevOps:

- Increases the frequency and quality of deployments
- Improves innovation and risk-taking by making it safer to experiment
- Realizes faster time to market
- Improves solution quality and shortens the lead time for fixes
- Reduces the severity and frequency of release failures
- Improves the Mean Time to Recovery (MTTR)

A CALMR approach to DevOps

TO IMPROVE COLLABORATION BETWEEN DEVELOPMENT AND IT OPERATIONS

- **Culture** Establish a culture of shared responsibility for development, deployment, and operations.
- **Automation** Automate the Continuous Delivery Pipeline.
- **Lean flow** Keep batch sizes small, limit WIP, and provide extreme visibility.
- **Measurement** Measure the flow through the pipeline. Implement application telemetry.
- **Recovery** Architect and enable low-risk releases. Establish fast recovery, fast reversion, and fast fix-forward.

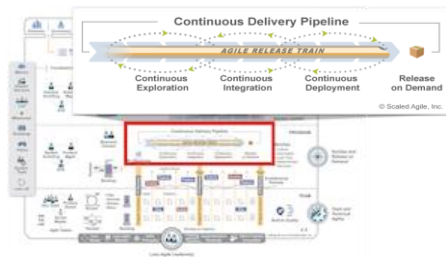




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Continuous Delivery Pipeline

LEAN AND AGILE STRATEGY FOR RAPIDLY ACCELERATING THE RELEASES OF VALUE TO THE CUSTOMER

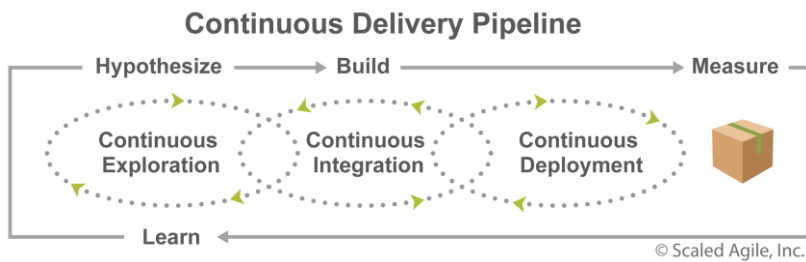


“Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.”
—Agile Manifesto

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Continuous Delivery Pipeline

LEAN AND AGILE STRATEGY FOR RAPIDLY ACCELERATING THE RELEASES OF VALUE TO THE CUSTOMER



- Explore user value
- Integrate and demo value
- Continuously deploy to production
- Release value whenever the business needs it

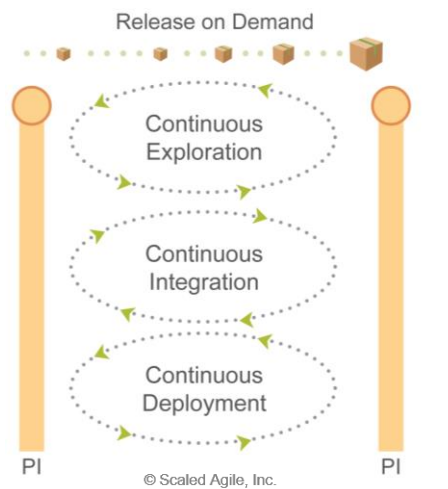
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Continuous Delivery

HAPPENS ALL THE TIME!



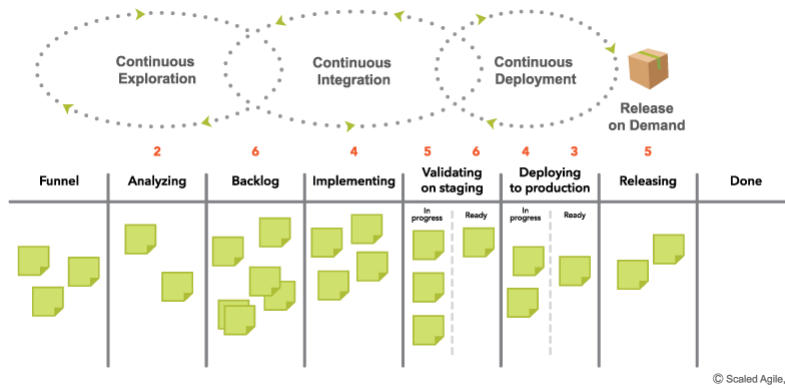
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Tracking Continuous Delivery

VISUALIZE AND TRACK THE ONGOING WORK.



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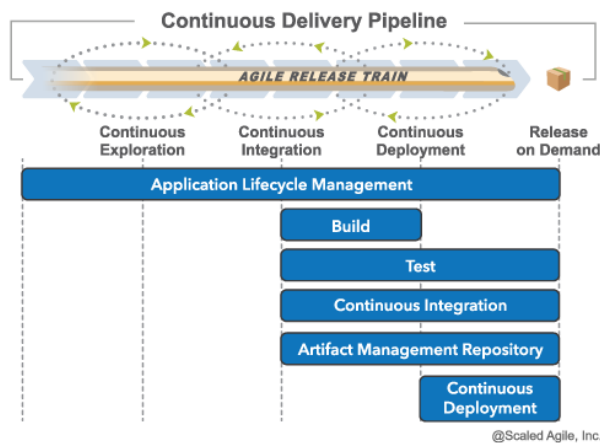
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SAFe DevOps: CALMR - Automate Everything

MANUAL PROCESSES ARE THE ENEMY OF FAST VALUE DELIVERY, HIGH PRODUCTIVITY, AND SAFETY

Typical 'tool chain':



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Continuous Exploration

FOSTER INNOVATION AND BUILD ALIGNMENT ON WHAT SHOULD BE BUILT



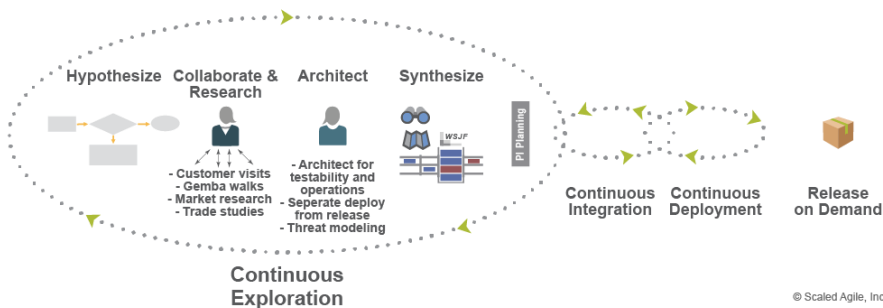
“Specifically, you can take the time to develop and bring to the table an outside-in, market-centric perspective that is so compelling and so well informed that it can counterbalance the inside-out company-centric orientation of last year’s operating plan.

—Geoffrey Moore, Escape Velocity

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Continuous Exploration

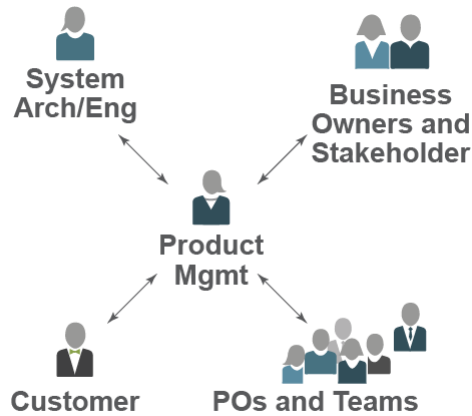
FOSTER INNOVATION AND BUILD ALIGNMENT ON WHAT SHOULD BE BUILT



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Continuous Exploration

COLLABORATE AND RESEARCH CUSTOMER NEEDS



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Architect the solution

ARCHITECTURE DRIVES AND ENABLES THE CONTINUOUS DELIVERY PIPELINE

Architects guide Agile Teams in the design process considering to:

- Architecting for releasability
- Architecting for testability
- Separating deploy and release
- Architecting for operations
- Threat modeling

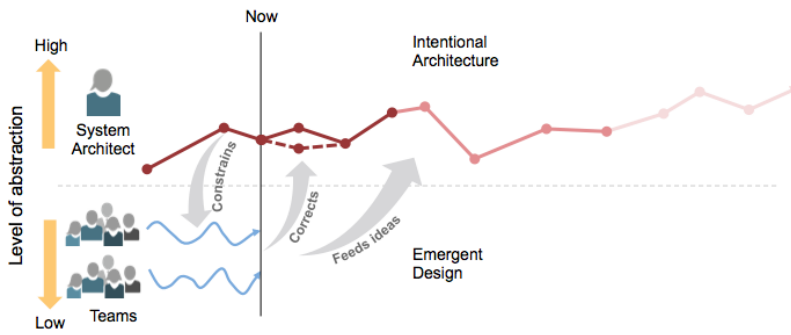
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Intentional Architecture & Emergent Design

ARCHITECTURE IS A COLLABORATION



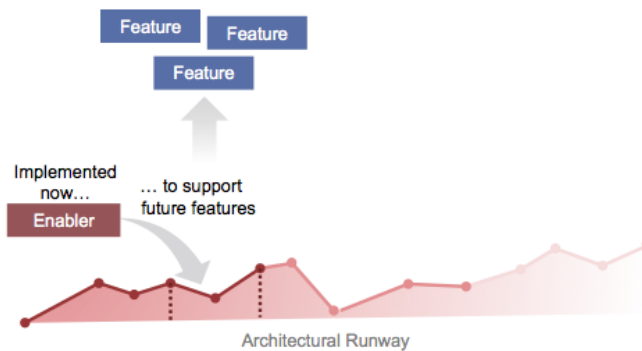
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SAFe Architectural Runway

BUILT BY INTENTIONAL ARCHITECTURE AND EMERGENT DESIGN COMPLEMENT EACH OTHER AT SCALE



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Continuous Integration

CONTINUOUSLY DEVELOP, BUILD, TEST END-TO-END AND VALIDATE ON STAGING ENVIRONMENT

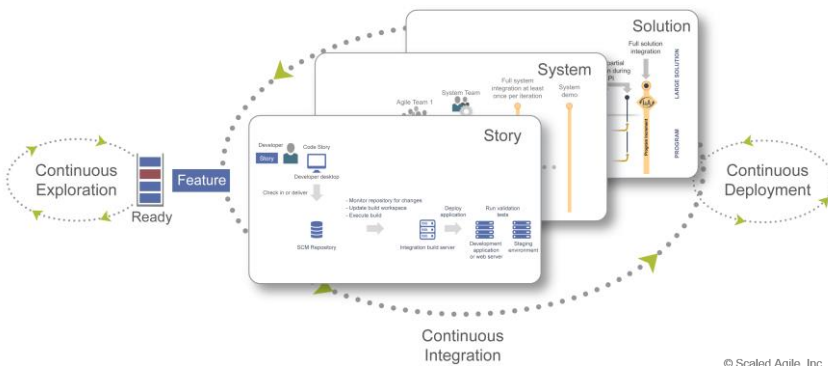


“The epiphany of integration points is that they control product development. They are the leverage points to improve the system. When timing of integration points slip, the project is in trouble.”
—Dantar Oosterwal, *The Lean Machine*

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Continuous Integration (CI)

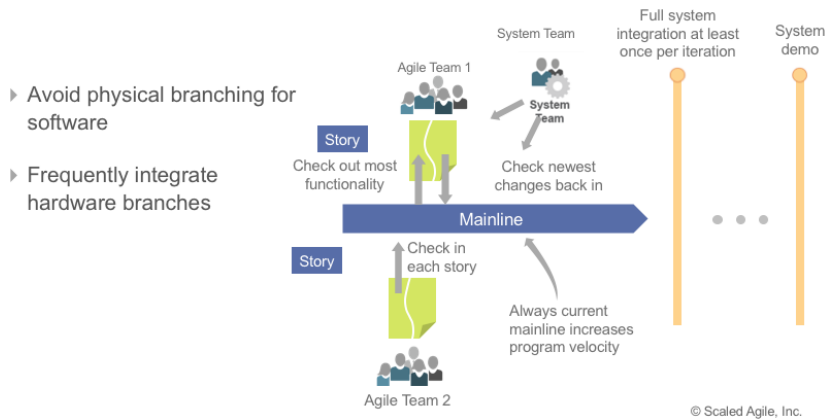
CONTINUOUSLY DEVELOP, BUILD, TEST END-TO-END AND VALIDATE ON STAGING ENVIRONMENT



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CI: Continuous system integration

INTEGRATED FREQUENTLY TO ASSURE THAT THE SOLUTION IS EVOLVING AS ANTICIPATED



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Continuous Deployment

TAKE VALIDATED FEATURES FROM STAGING AND DEPLOY THEM INTO PRODUCTION



“In order for you to keep up with customer demand, you need to create a deployment pipeline. You need to get everything in version control. You need to automate the entire environment creation process. You need a deployment pipeline where you can create test and production environments, and then deploy code into them, entirely on demand.
—Erik to Grasshopper, The Phoenix Project

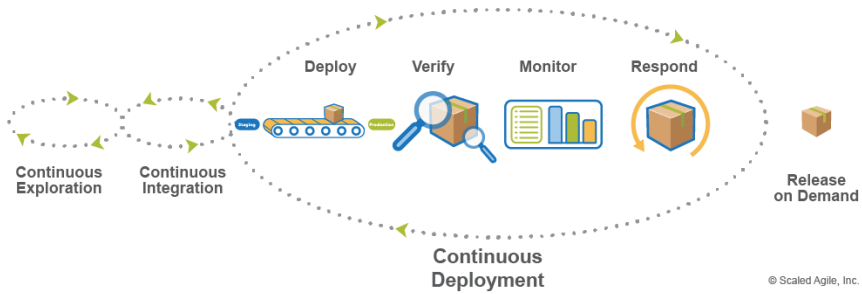
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Continuous Deployment(CD)

CONTINUOUSLY DEPLOY POTENTIAL END-USER VALUE TO PRODUCTION



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Continuous Deployment(CD)

BING CONTINUOUS DELIVERY - MICROSOFT ENGINEERING STORIES



<https://youtu.be/3sFT7tyEQk>

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Release on Demand

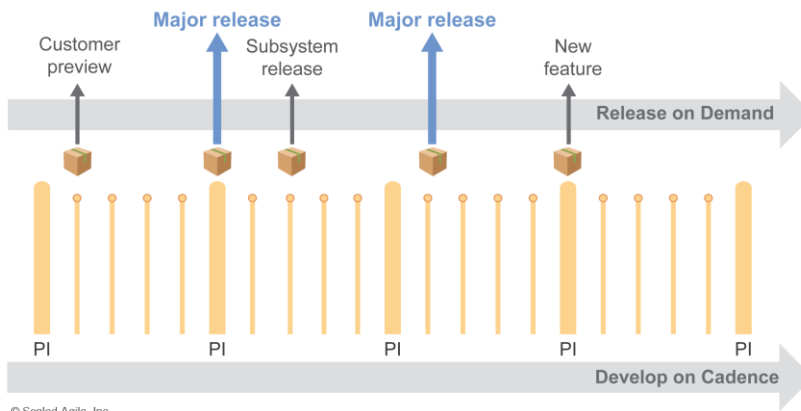
DEPLOY NEW FUNCTIONALITY INTO PRODUCTION AND RELEASE TO CUSTOMERS BASED ON DEMAND



“Develop on Cadence. Release on Demand.”
— A SAFe mantra

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Decouple deployment from release



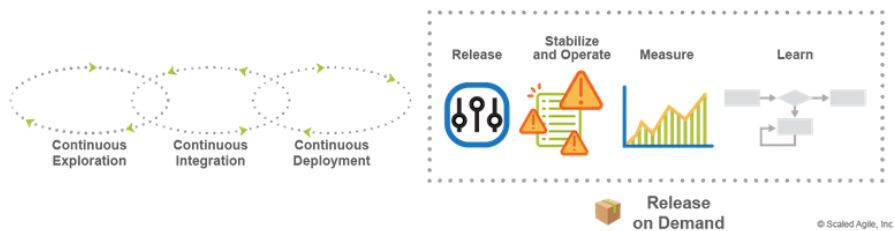
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Release on Demand

CONTINUOUSLY DEPLOY POTENTIAL END-USER VALUE TO PRODUCTION

- When should a release happen?
- What elements of the system should be released?
- Which end-users should receive the release?



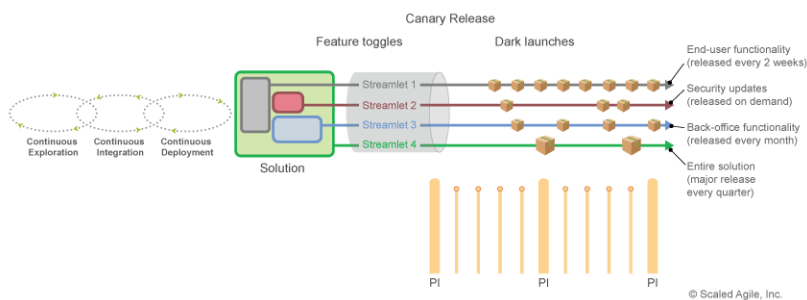
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Decouple Release Elements from the Solution

IS A RELEASE A MONOLITHIC, ALL-OR-NOTHING PROCESS?



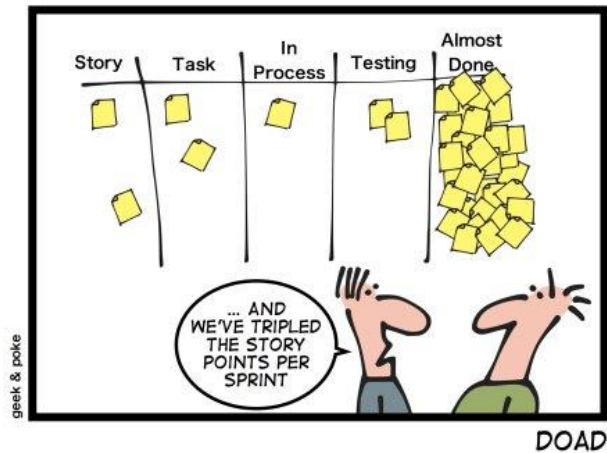
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Steering of different release strategies

HOW DO YOU WORK WITH DEFINITIONS OF DONE?



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Releasing includes additional activities

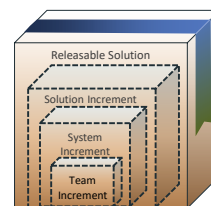
STEERED WITH DEFINITIONS OF DONE

System validation:

- User acceptance testing
- Final NFR testing
- Integration testing with other systems
- Regulatory standards and requirements

Documentation:

- Release communications
- End user documentation
- Bill of materials
- Training support personnel
- Installation/deployment instructions
- Legal, regulatory, other approvals
- etc. ...



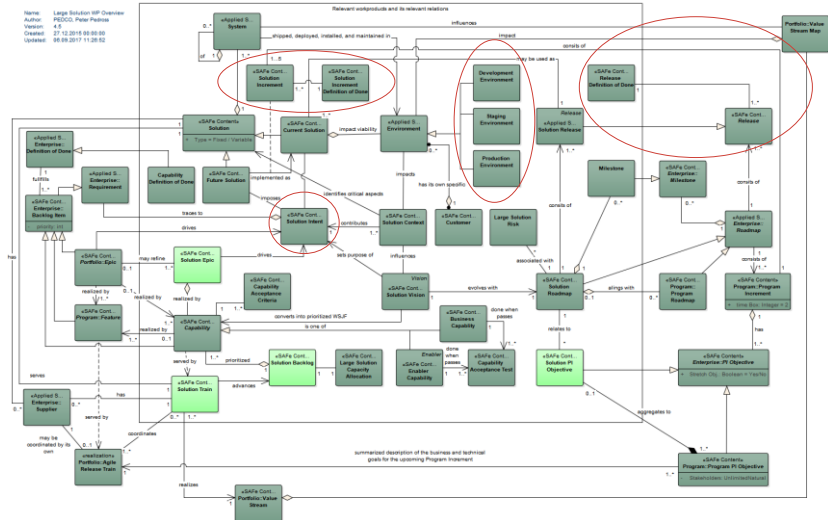
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DevOps, DoD's, Environments and Releases

EXAMPLE OF APPLIED SAFE: IN REALITY COMPLEX



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Lessons Learned (1/2)

DEVOPS IS THE NATURAL FRIEND OF AGILE DEVELOPMENT.

- ✓ Continuous delivery allows a 'Lean-Startup'-Approach.
- ✓ Continuous deployment and 'Release on demand' allows to fulfill customer needs early.
- ✓ Existing definition and templates, e.g. DevOps Health Radar are very helpful tools.
- ✓ Working towards a common culture is key (CALMR).
- ✓ Depending on the attributes of a solution or on existing documentation the form of 'DoD's can vary very much.
- ✓ Commercial frameworks such as SAFe or others are an excellent starting point to be applied in the development of high assurance systems.
- ✓ Feature toggling is a commonly well used pattern for 'Release on Demand'.



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Lessons Learned (2/2)

DEVOPS IS THE NATURAL FRIEND OF AGILE DEVELOPMENT ... AND NEEDS CAREFUL IMPLEMENTATION

- The concurrent and complex interaction of teams need help in form of defined processes, roles and responsibility.
- Regulated requirements need specific DoD's in order to 'Build Compliance in' for every iteration.
- Even young companies, with fairly newer systems can run monolithic systems, and hinder fast value delivery.
- Solution-Architecture must be built to allow application of a continuous delivery pipeline
- Automated CI/CD typically fails if more than two teams work on an architectural building block. The solution architecture needs to fulfill specific criteria's as well.
- Organizational structure of enterprise must reflect chosen architecture in order to really makes the value flow. An organizational maturity should be achieved.
- System architecture, System architecture, system architecture, system architecture, system architecture...



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PEDCO Applied SAFE

OUR COMMITMENT

*“We provide a practical **PLATFORM** to master the complexity of bringing a lean agile organization to life, in the smoothest and most effective way!”*

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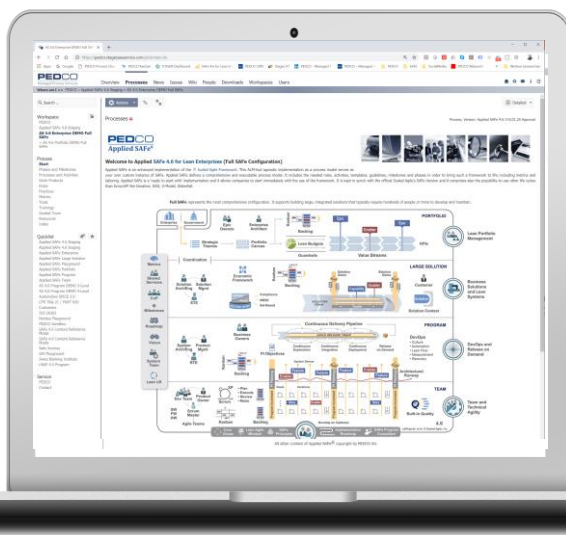
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Need to reinvent the wheel again?

APPLIED SAFE: A FULLY FLEDGED IMPLEMENTATION OF SAFE AS A PROCESS MODEL



- Comprehensive Process Model (e.g. roles, activities, templates, guidelines, metrics, tailoring, milestones, phases)
- Built on SAFE® 4.6 as the 'de facto' Standard for Scaled Agility.
- Independent Instantiations on each Levels
- Customize with built-in Tailoring and run multiple concurrent Process Variations
- Extend, adapt and integrate with your own Process Assets
- Upward compatible, closely developed with and approved by SAI, elaborated in sync with future versions of SAFE®
- Includes licensed SAFE® Content
- Includes Compliance Mechanisms and Capabilities for Regulated Environments

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Applied SAFe®

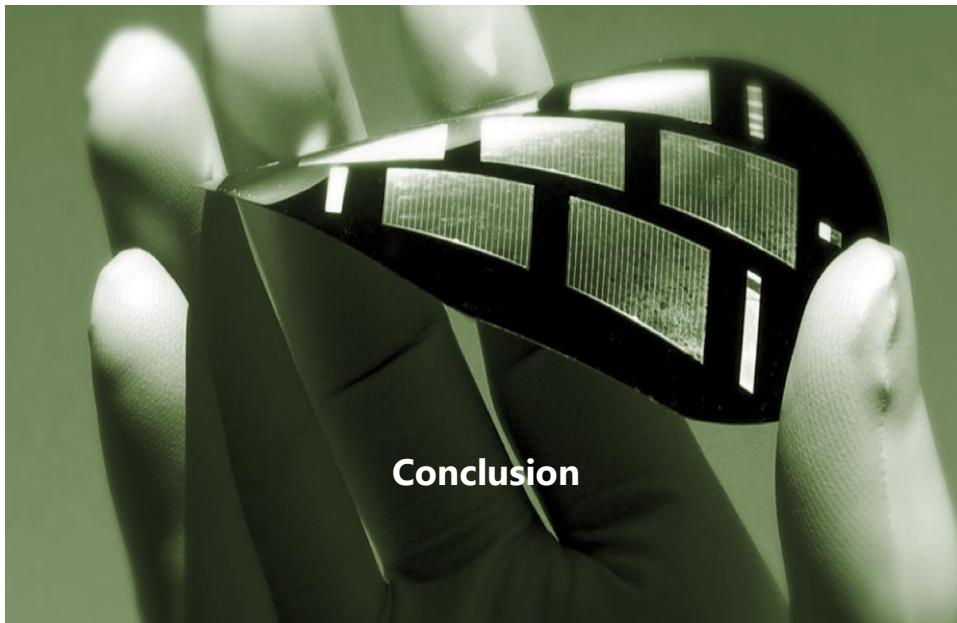
PROVEN BENEFITS

<p>Master Complexity</p>  <p>Customize with >440 Built-in configuration & tailoring options</p>  <p>Establish compliance to >27 defined reference models A-SPICE, CMMI, IEC 62304, etc.</p>	<p>Improve Clarity</p>  <p>67% Less discussion time on how to interpret SAFe®</p>  <p>2/3 Reduced ramp up time for new hires</p>	<p>Implement SAFe fast & precise</p>  <p>2 Years reduced cost of delay</p>  <p>20 Person years saved on process engineering</p>
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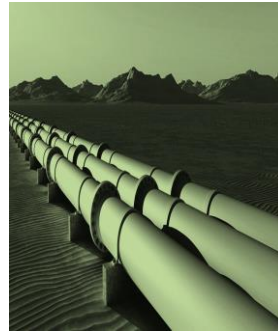
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Scaled Agility, DevOps and Continuous Delivery Pipeline

FRAMEWORKS, E.G. SAFE, HAVE THE HOOKS NEEDED FOR SUCCESSFUL IMPLEMENTATION

- ✓ Reduce Time-to-Market
- ✓ Allow fast customer feedback
- ✓ Increases quality of service
- ✓ Allows fast error detection and prevention of security threads
- ✓ Enables to build big systems in a secure way.
- ✓ Reduces impediments of alignment between development and operation.
- ✓ Focus on **lean flow of value**



Is worth the investment.



Questions & Answers



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