

# Leading SAFe®

Thriving in the digital age with Business Agility

5.0

SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.



# Welcome to the course!

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### **Access the SAFe Community Platform**

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### **Prepare Yourself**

Prepare for certification with your learning plan: access your course workbook, study materials, and practice test prior to taking your exam



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Get certified to achieve recognition of your skills and open the door to new career opportunities



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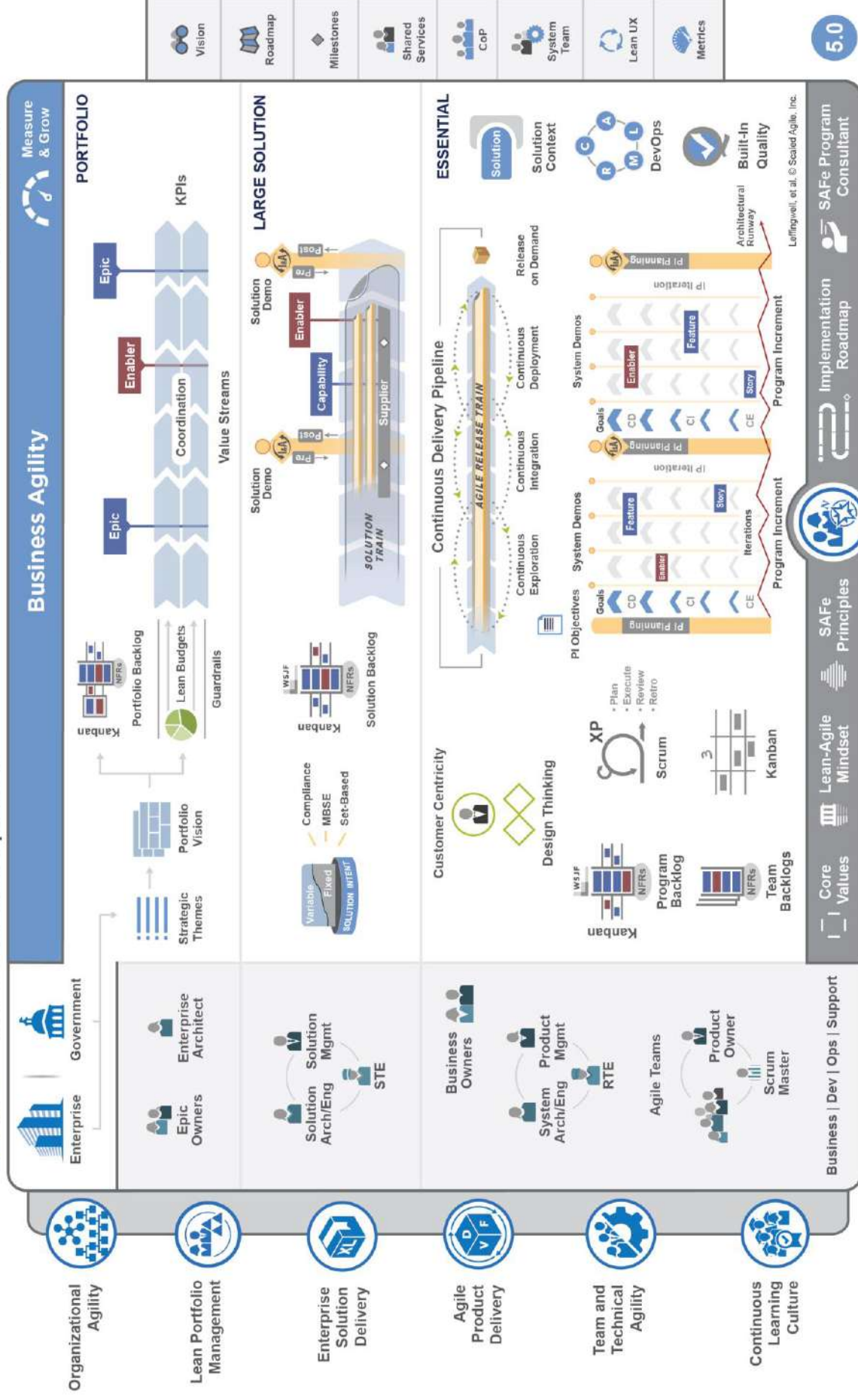
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# SAFe® for Lean Enterprises

## Full Configuration

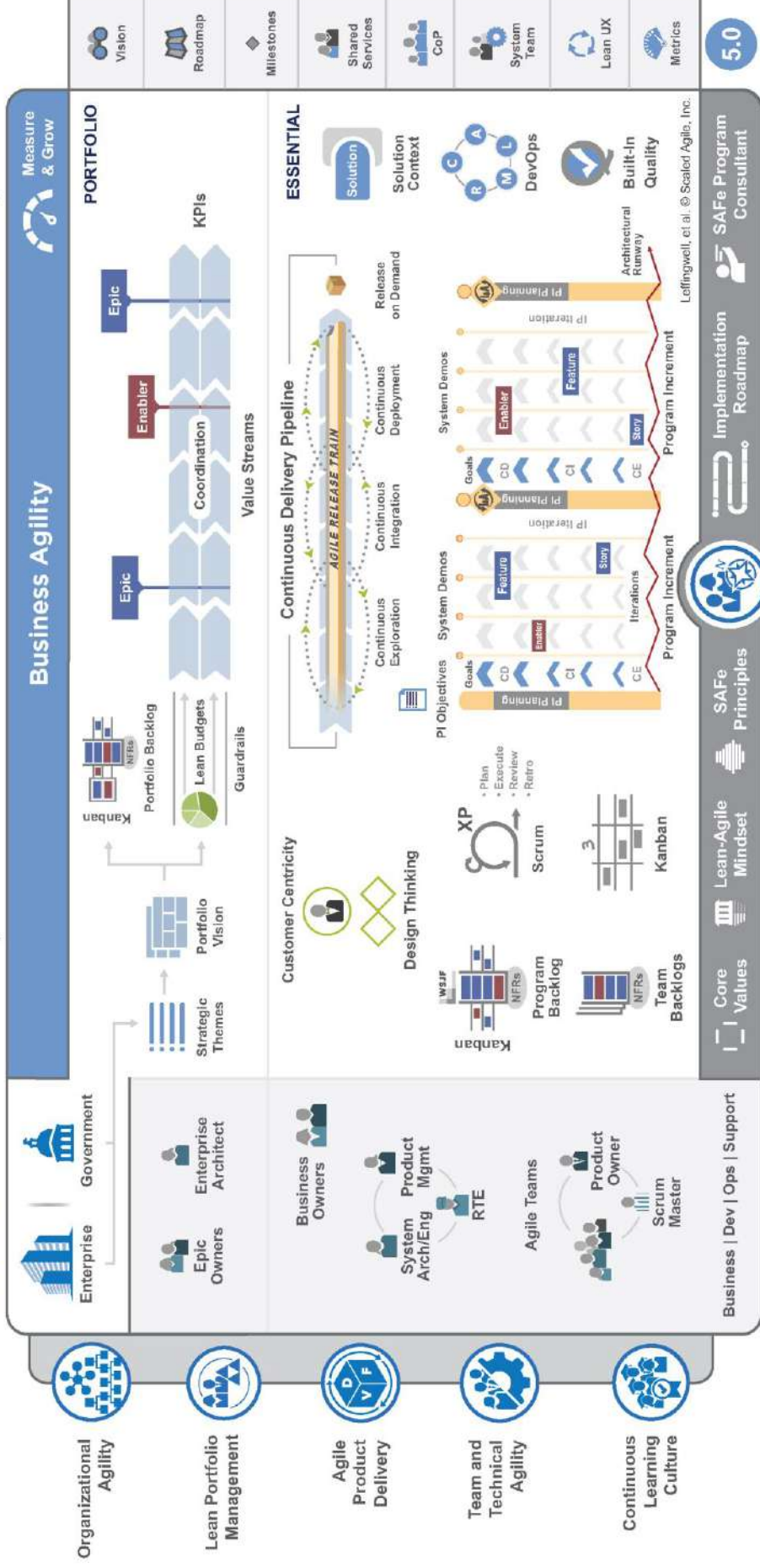


Lean-Agile Leadership



# SAFe® for Lean Enterprises

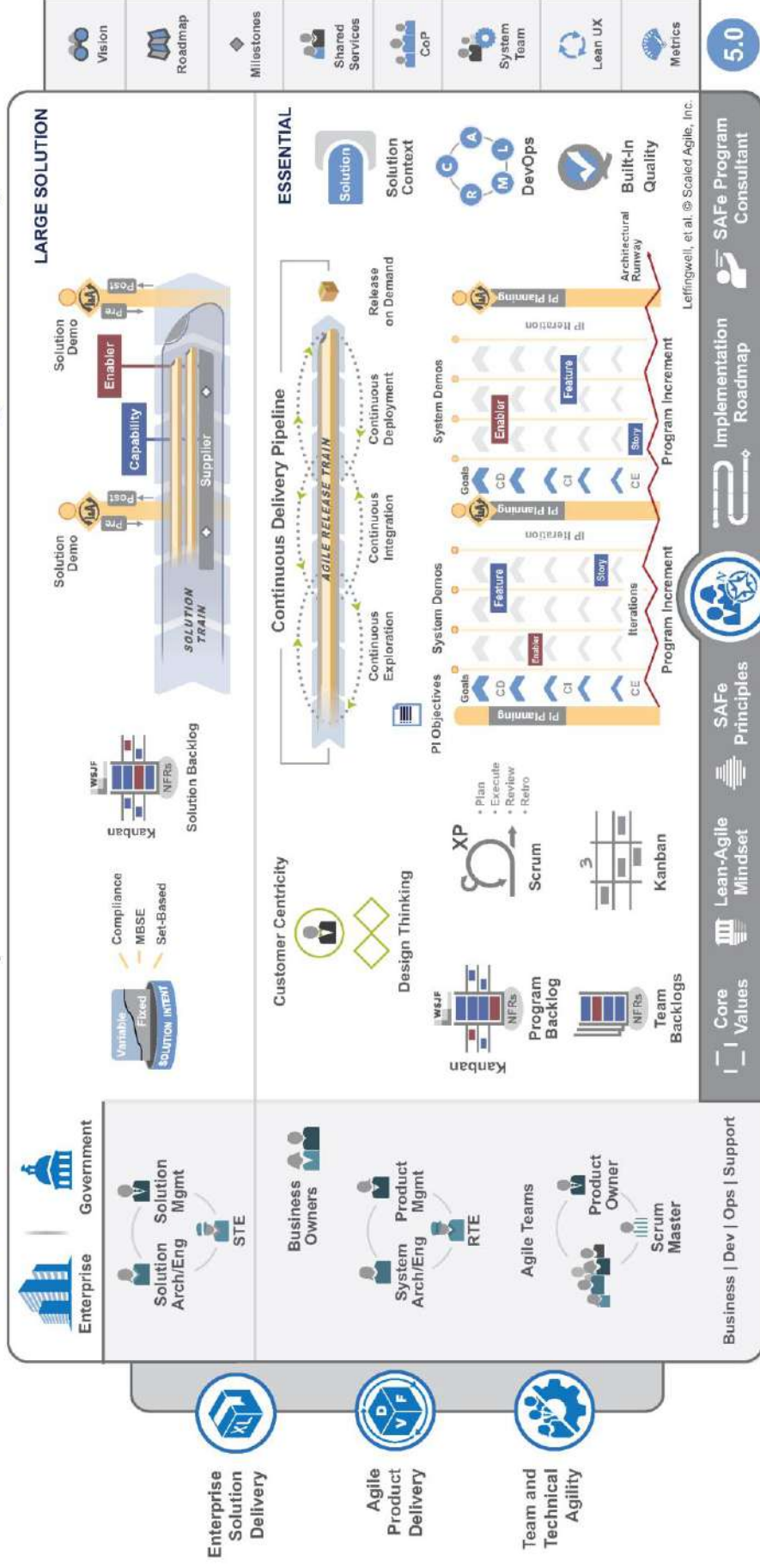
## Portfolio Configuration





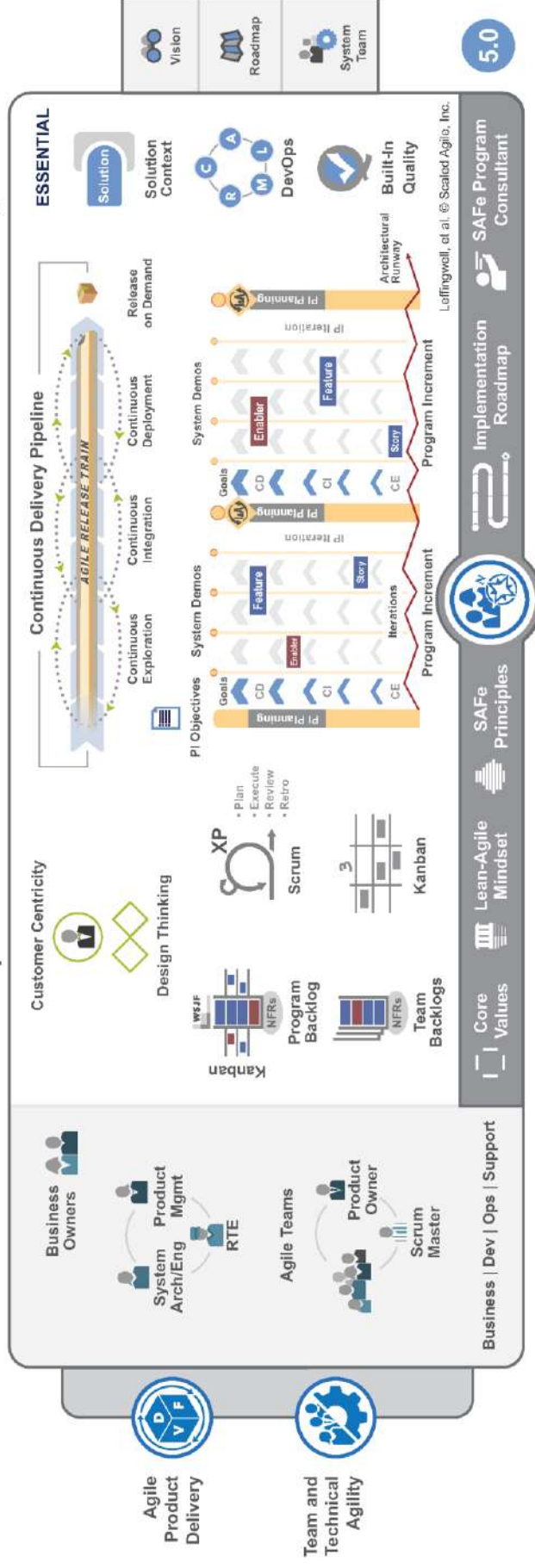
# SAFe® for Lean Enterprises

## Large Solution Configuration



Lean-Agile Leadership

## Essential Configuration



# BUSINESS AGILITY

## MEASURE & GROW

### EXECUTION

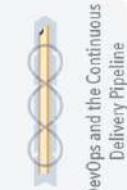
#### Enterprise Solution Delivery

- Apply Lean system engineering to build really big systems
- Coordinate and align the full supply chain
- Continually evolve live systems



#### Agile Product Delivery

- The customer is the center of your product strategy
- Develop on cadence and release on demand
- Continuously explore, integrate, deploy, and innovate



#### Team And Technical Agility

- High-performing, cross-functional, Agile teams
- Business and technical teams build business solutions
- Quality business solutions delight customers



### STRATEGY

#### Lean Portfolio Management

- Align strategy, funding, and execution
- Optimize operations across the portfolio
- Lightweight governance empowers decentralized decision-making



#### Organizational Agility

- Create an enterprise-wide, Lean-Agile mindset
- Lean out business operations
- Respond quickly to opportunities and threats



#### Continuous Learning Culture

- Everyone in the organization learns and grows together
- Exploration and creativity are part of the organization's DNA
- Continuously improving solutions, services, and processes is everyone's responsibility



#### Lean-Agile Leadership

- Inspire others by modeling desired behaviors
- Align mindset, words, and actions to Lean-Agile values and principles
- Actively lead the change and guide others to the new way of working


















## Business results



# SAFe® Courses and Certifications

Course	Description	Certification
Leading SAFe®	Thriving in the digital age with Business Agility	 with SAFe® 5 Agilist Certification
Implementing SAFe®	Achieving Business Agility with the Scaled Agile Framework	 with SAFe® 5 Program Consultant Certification
SAFe® for Government	Applying Lean-Agile Practices in the Public Sector with SAFe®	 with SAFe® 5 Government Practitioner Certification
Lean Portfolio Management	Aligning Strategy with Execution	 with SAFe® 5 Lean Portfolio Manager Certification
SAFe® Product Owner/Product Manager	Delivering Value through Effective Program Increment Execution	 with SAFe® 5 Product Owner/Product Manager Certification
Agile Product and Solution Management	Using Design Thinking to Create Valuable Products in the Lean Enterprise	 with SAFe® 5 Agile Product and Solution Manager Certification
SAFe® Scrum Master	Applying the Scrum Master Role within a SAFe® Enterprise	 with SAFe® 5 Scrum Master Certification
SAFe® Advanced Scrum Master	Advancing Scrum Master Servant Leadership with SAFe®	 with SAFe® 5 Advanced Scrum Master Certification
SAFe® Release Train Engineer	Facilitating Lean-Agile Program Execution	 with SAFe® 5 Release Train Engineer Certification
SAFe® for Architects	Architecting for Continuous Value Flow with SAFe®	 with SAFe® 5 Architect Certification
SAFe® DevOps	Optimizing Your Value Stream	 with SAFe® 5 DevOps Practitioner Certification
SAFe® for Teams	Establishing Team Agility for Agile Release Trains	 with SAFe® 5 Practitioner Certification
Agile Software Engineering	Enabling Technical Agility for the Lean Enterprise	 with SAFe® 5 Agile Software Engineer Certification

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## Privacy Notice

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# Leading SAFe®

Thriving in the digital age with Business Agility

**SAFe® Authorized Course** Attending this course gives students access to the SAFe® Agilist exam and related preparation materials.

5.0



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Notes:

## Logistics

- ▶ Class times
- ▶ Breaks
- ▶ Lunch
- ▶ Restrooms
- ▶ Accessing Wi-Fi
- ▶ Working agreements

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Notes:





## Discussion: Introductions

Duration



- ▶ **Step 1:** Introduce yourself to someone you don't know
- ▶ **Step 2:** Share something you know about SAFe and the role of the Lean-Agile Leader



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Notes:

## Course goals

At the end of this course you should be able to:

- ▶ Lead the transformation to Business Agility with SAFe
- ▶ Become a Lean-Agile leader
- ▶ Understand Customer needs with Design Thinking
- ▶ Enable Agile Product Delivery
- ▶ Initiate Lean Portfolio Management

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Notes:



## Activity: Course goals overview

Duration



- ▶ **Step 1:** Introduce yourself to someone and share three things you would like to take away from the course.
- ▶ **Step 2:** Review the outlined course goals posted on flip chart sheets around the room.
- ▶ **Step 3:** You have three votes total. Place a dot on the goals that are most relevant to you.

Notes:

## Lesson 1

# Thriving in the digital age with Business Agility

### Learning Objectives:

- 1.1 Thrive in the digital age
- 1.2 Describe SAFe as an operating system for Business Agility
- 1.3 Explain the Seven Core Competencies of Business Agility



SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.



# 1.1 Thrive in the digital age

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Notes:

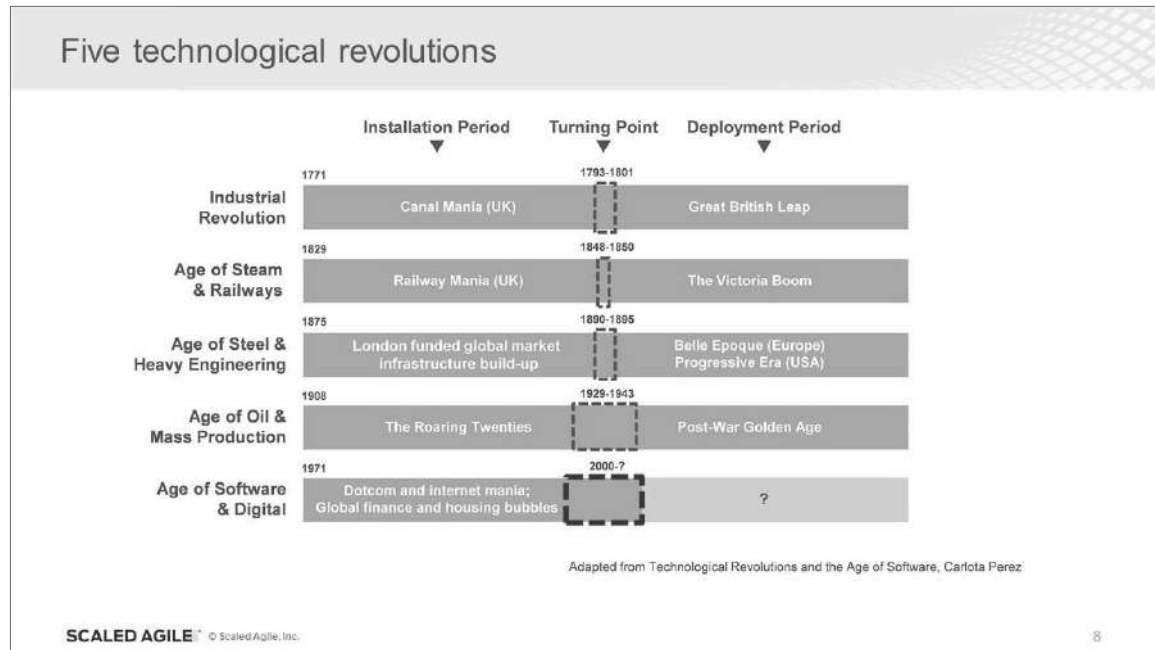
“Those who master large-scale software delivery will define the economic landscape of the 21<sup>st</sup> century.

—Mik Kersten



Notes:

## 1.1 Thrive in the digital age



Notes:

### Are we at the turning point?

- ▶ "BMW Group's CEO expects that in their future more than half of its R&D staff will be software developers." (Mik Kersten, Project to Product)
- ▶ "Amazon and Whole Foods Merger to Introduce Cross-Platform Selling and Lower Prices" (Forbes, August 2017)
- ▶ The market cap of Tesla (\$43B market cap, \$21B revenue) now exceeds the market cap of Ford (\$36.2B market cap, \$160B revenue) 8:1 value ratio (September 2019)
- ▶ Apple is now the biggest watchmaker in the world (Investopedia 2019)

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Notes:

### Competing in the Age of Software



The problem is not with our organizations realizing that they need to transform; the problem is that organizations are using managerial frameworks and infrastructure models from past revolutions to manage their businesses in this one.

—Mik Kersten

Notes:

### Rethinking the organization



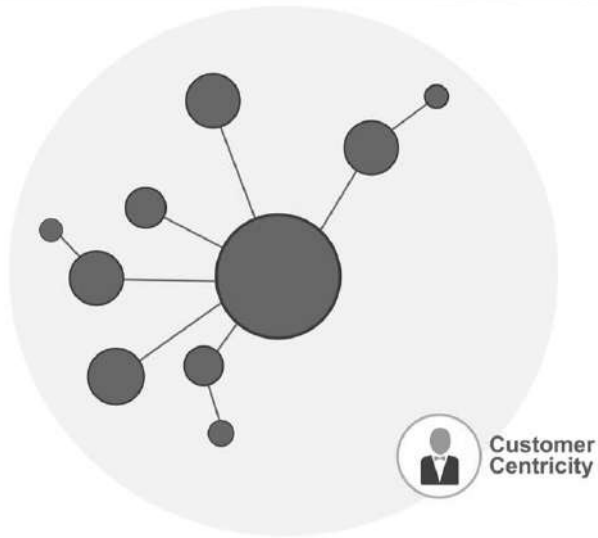
The world is now changing at a rate at which the basic systems, structures, and cultures built over the past century cannot keep up with the demands being placed on them.

—John P. Kotter



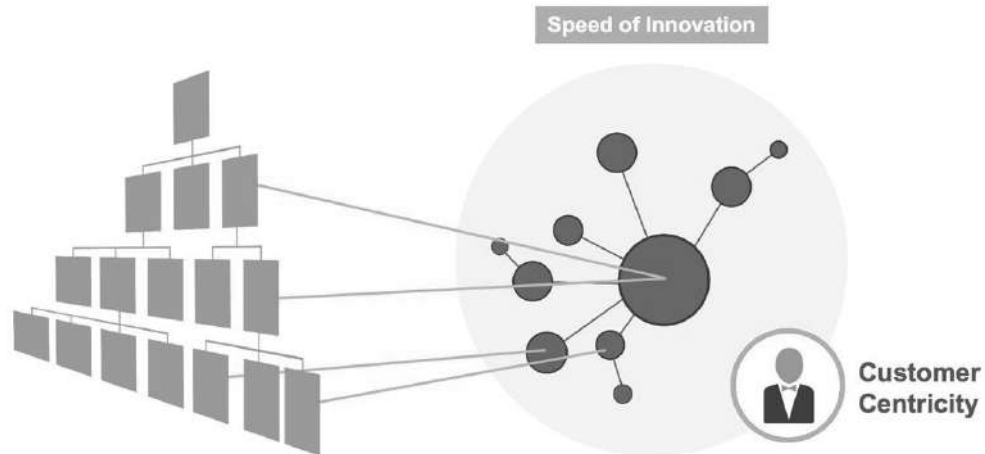
Notes:

### We started with a network



Notes:

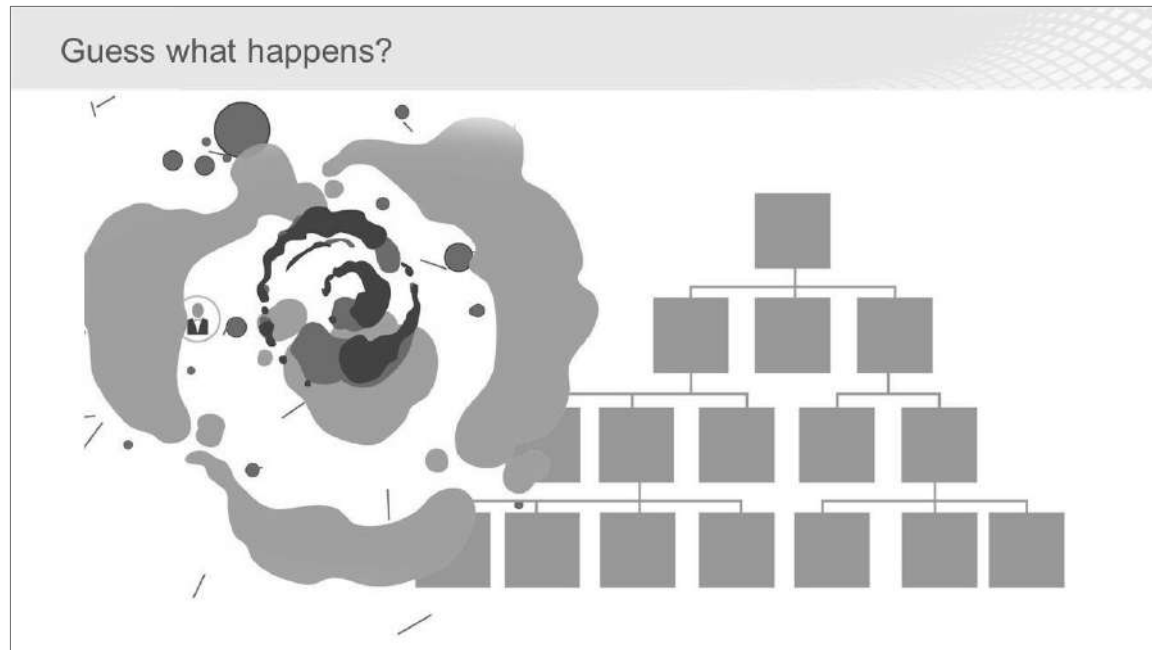
### We add hierarchy for stability and execution



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Notes:



Notes:

“ The solution is not to trash what we know and start over but instead to reintroduce a second system—one which would be familiar to most successful entrepreneurs.

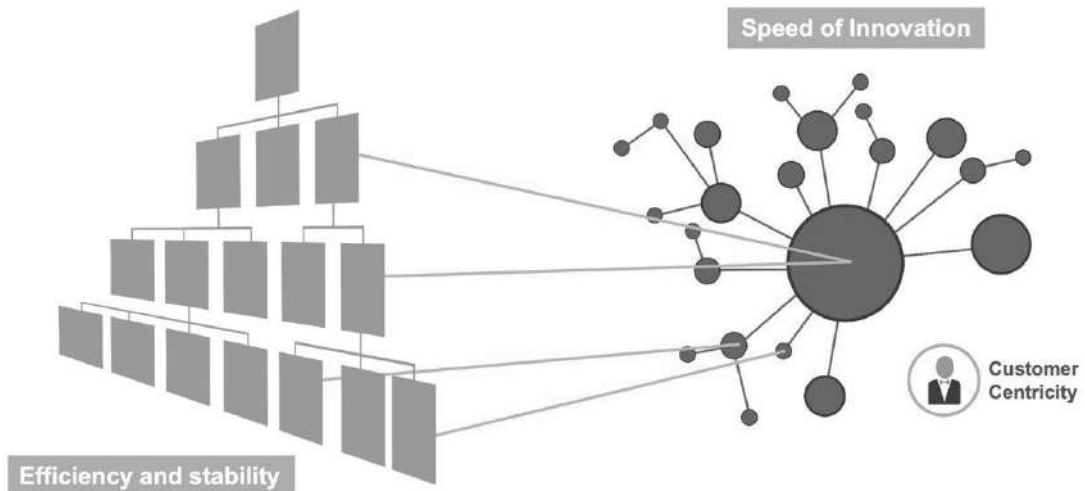
You need a dual operating system.

—John P. Kotter

Notes:

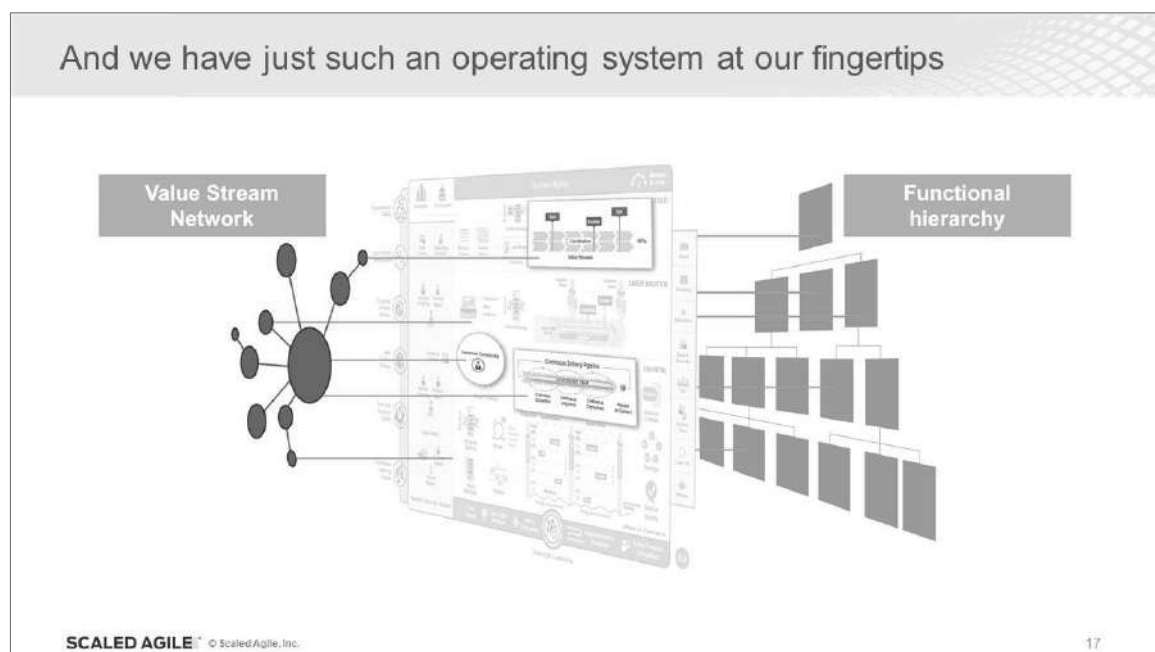


We need a dual operating system for Business Agility



Notes:

And we have just such an operating system at our fingertips



Notes:

### 1.2 Describe SAFe as an operating system for Business Agility

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Notes:



*Every business is a software business now. Achieving a state of **business agility** means that the entire organization—not just development—is engaged in continually and proactively delivering innovative business solutions faster than the competition.*

*— Dean Leffingwell  
Creator of SAFe*

Notes:

## 1.2 Describe SAFe as an operating system for Business Agility

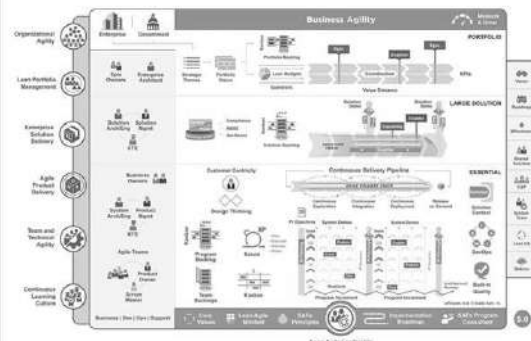
Business Agility requires technical agility **and** a business-level commitment to product and Value Stream thinking.

And it requires that **everyone** involved in delivering **business Solutions** use Lean and Agile practices.



Notes:

SAFe® for Lean Enterprises is a knowledge base of proven, integrated principles, practices, and competencies for achieving Business Agility by implementing Lean, Agile, and DevOps at scale.

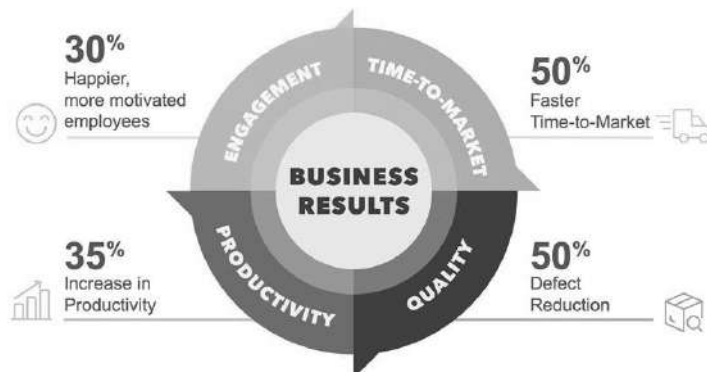


Notes:

## 1.2 Describe SAFe as an operating system for Business Agility

### Why SAFe?

SAFe business benefits are derived directly from case studies written by SAFe customers



Source: Typical results from [scaledagile.com/case-studies](https://scaledagile.com/case-studies)

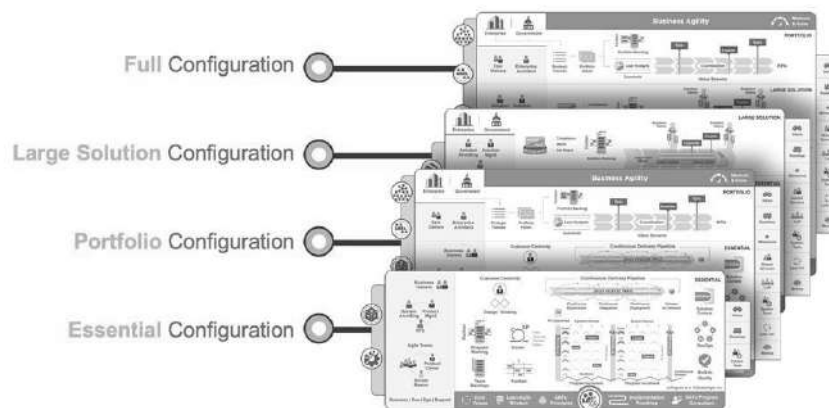
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Notes:

### SAFe configurations

Four configurations provide the right solution for each Enterprise.

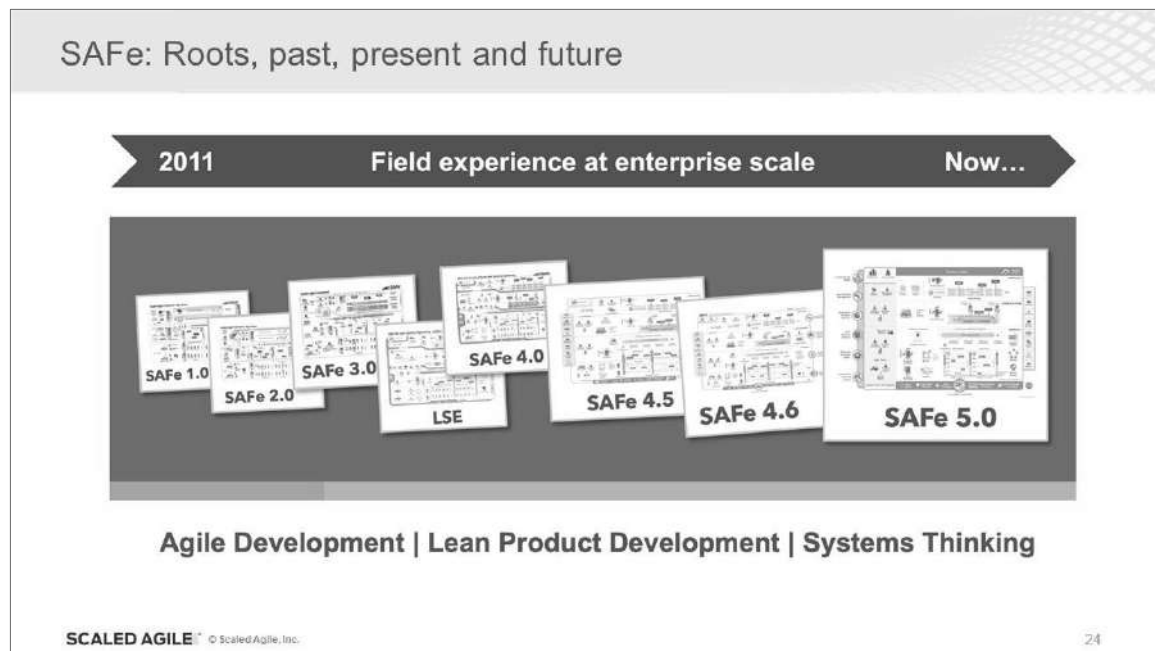


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Notes:

## 1.2 Describe SAFe as an operating system for Business Agility



Notes:



Notes:

## 1.3 Explain the Seven Core Competencies of Business Agility

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Notes:



## 1.3 Explain the Seven Core Competencies of Business Agility

### Why Team and Technical Agility?

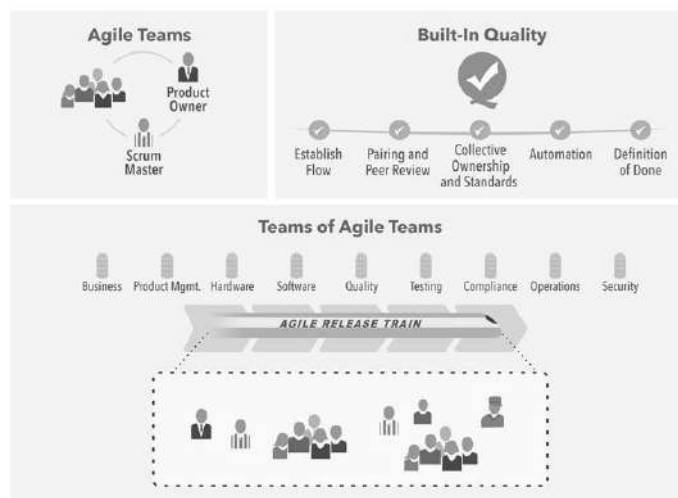
Agile Teams and teams of Agile Teams create and support the business Solutions that deliver value to the Enterprise's customers. Consequently, an organization's ability to thrive in the digital age is entirely dependent on the ability of its teams to deliver Solutions that reliably meet a customer's needs.



Notes:

### Team and Technical Agility

The Team and Technical Agility competency describes the critical skills and Lean-Agile principles and practices that high-performing Agile Teams and teams of Agile Teams use to create high-quality solutions for their customers.



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Notes:

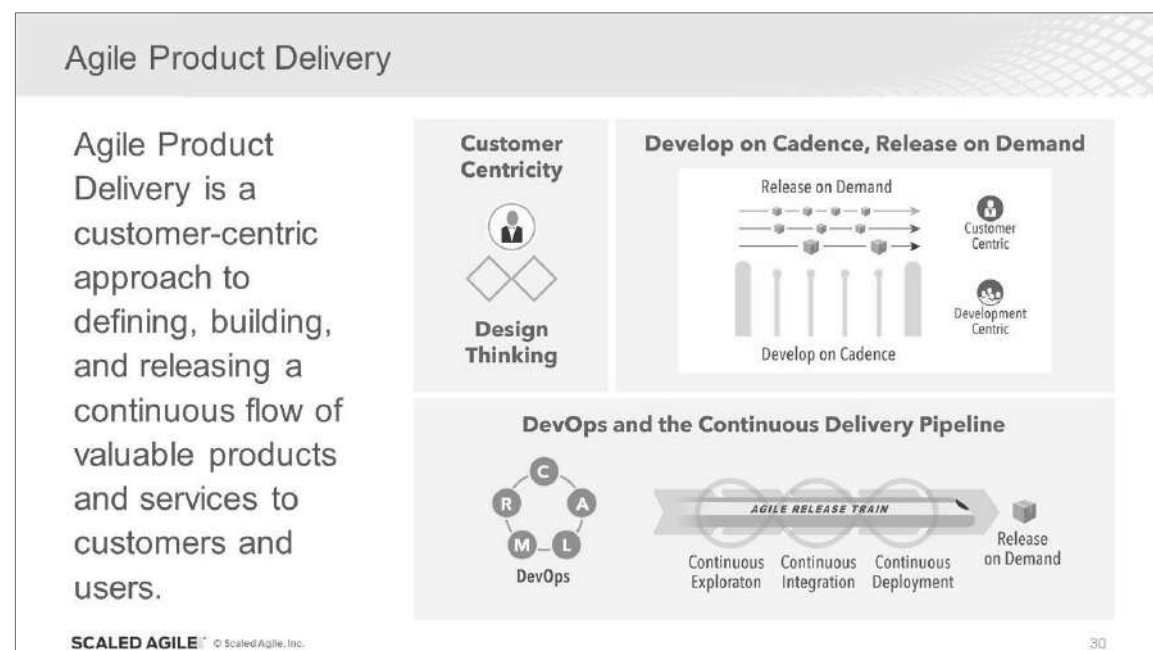
## 1.3 Explain the Seven Core Competencies of Business Agility

### Why Agile Product Delivery?

In order to achieve Business Agility, Enterprises must rapidly increase their ability to deliver innovative products and services. To be sure that the Enterprise is creating the right Solutions for the right customers at the right time, they must balance their execution focus with a customer focus.



Notes:

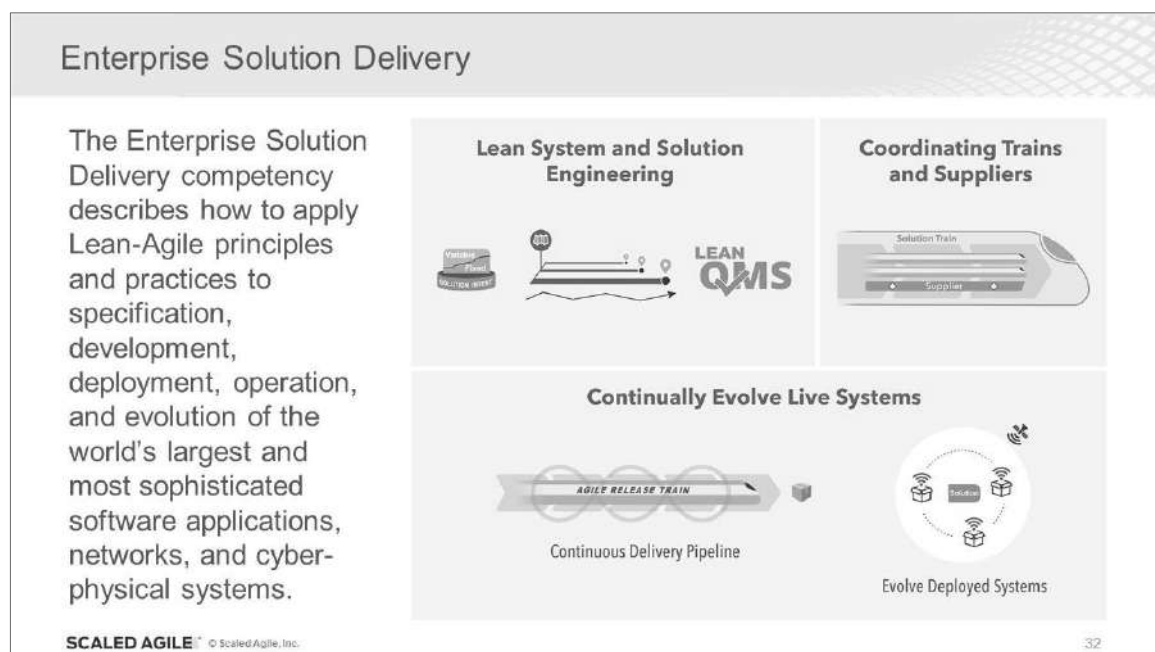


Notes:

## 1.3 Explain the Seven Core Competencies of Business Agility

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Notes:



Notes:

## 1.3 Explain the Seven Core Competencies of Business Agility

### Why Lean Portfolio Management?

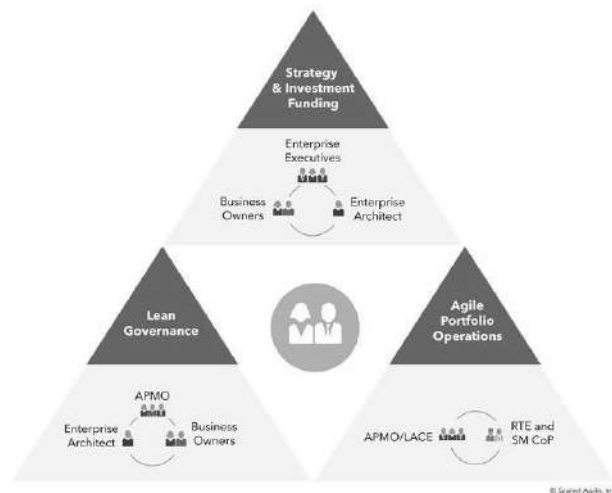
Traditional approaches to portfolio management were not designed for a global economy or the impact of digital disruption. These factors put pressure on Enterprises to work under a higher degree of uncertainty, and yet deliver innovative Solutions much faster.



Notes:

### Lean Portfolio Management

The Lean Portfolio Management competency aligns strategy and execution by applying Lean- and systems-thinking approaches to strategy and investment funding, Agile portfolio operations, and governance.



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Notes:

## 1.3 Explain the Seven Core Competencies of Business Agility

### Why Organizational Agility?

Without Organizational Agility, Enterprises simply cannot respond sufficiently to the challenges and opportunities that today's rapidly changing markets present. Without it, employees and the Enterprises associate an individual's value with their functional skills, rather than business outcomes.



Notes:



Notes:

## 1.3 Explain the Seven Core Competencies of Business Agility

### Why Continuous Learning Culture?

In order to thrive in the current climate, organizations must evolve into adaptive engines of change, powered by a culture of fast and effective learning at all levels. Learning organizations leverage the collective knowledge, experience, and creativity of their workforce, customers, supply chain, and the broader ecosystem.



Notes:

### Continuous Learning Culture

The Continuous Learning Culture competency describes a set of values and practices that encourage individuals, and the Enterprise as a whole, to continually increase knowledge, competence, performance, and innovation



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Notes:



## 1.3 Explain the Seven Core Competencies of Business Agility

### Why Lean-Agile Leadership?

An organization's managers, executives, and other leaders are responsible for the adoption, success, and ongoing improvement of Lean-Agile development and the competencies that lead to Business Agility. Only they have the authority to change and continuously improve the systems that govern how work is performed.



Notes:



Notes:

## 1.3 Explain the Seven Core Competencies of Business Agility

### The management challenge



*It is not enough that management commit themselves to quality and productivity, they must know what it is they must do.*

*Such a responsibility cannot be delegated.*

*—W. Edwards Deming*

*...and if you can't come, send no one"*

*—Vignette from "Out of the Crisis," W. Edwards Deming*

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Notes:

### Measure and Grow

Measure and Grow is the way portfolios evaluate their progress towards Business Agility and determine their next improvement steps.



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Notes:

## Lesson review

In this lesson you:

- ▶ Discussed what is necessary to be able to thrive in the digital age
- ▶ Described SAFe as your operating system for Business Agility
- ▶ Explained the Seven Core Competencies of Business Agility

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Notes:

- ▶ Scaled Agile Framework recommended reading for this lesson:
  - *SAFe for Lean Enterprises*
  - *Business Agility*
  - *Measure and Grow*



## Lesson 2

# Becoming a Lean-Agile Leader

### Learning Objectives:

- 2.1 Embrace the Lean-Agile Mindset
- 2.2 Apply Lean and Agile at scale with the SAFe Principles



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# 2.1 Embrace the Lean-Agile Mindset

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Notes:

## Exemplifying SAFe core values

### Alignment

- › Provide the relevant briefings and participate in Program Increment (PI) Planning
- › Help with backlog visibility, review, and preparation
- › Help with Value Stream organization and coordination
- › Constantly check for understanding
- › Communicate the mission, visions and strategy at every opportunity

### Built-in Quality

- › Demonstrate quality by refusing to accept or ship low-quality work
- › Support investments in capacity planning for maintenance and reduction of technical debt
- › Ensure UX, architecture, operations, security, compliance, and others, are part of the flow of work

### Transparency

- › Visualize all relevant work
- › Take ownership and responsibility for errors and mistakes
- › Admit your own mistakes
- › Support others who acknowledge and learn from their mistakes—never punish the messenger

### Program Execution


- › Participate as an active business owner in PI execution
- › Celebrate high quality and predictably delivered Program Increments
- › Aggressively remove impediments and demotivators

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Notes:

## 2.1 Embrace the Lean-Agile Mindset




### Taking Action: Exemplifying SAFe's core values

Duration

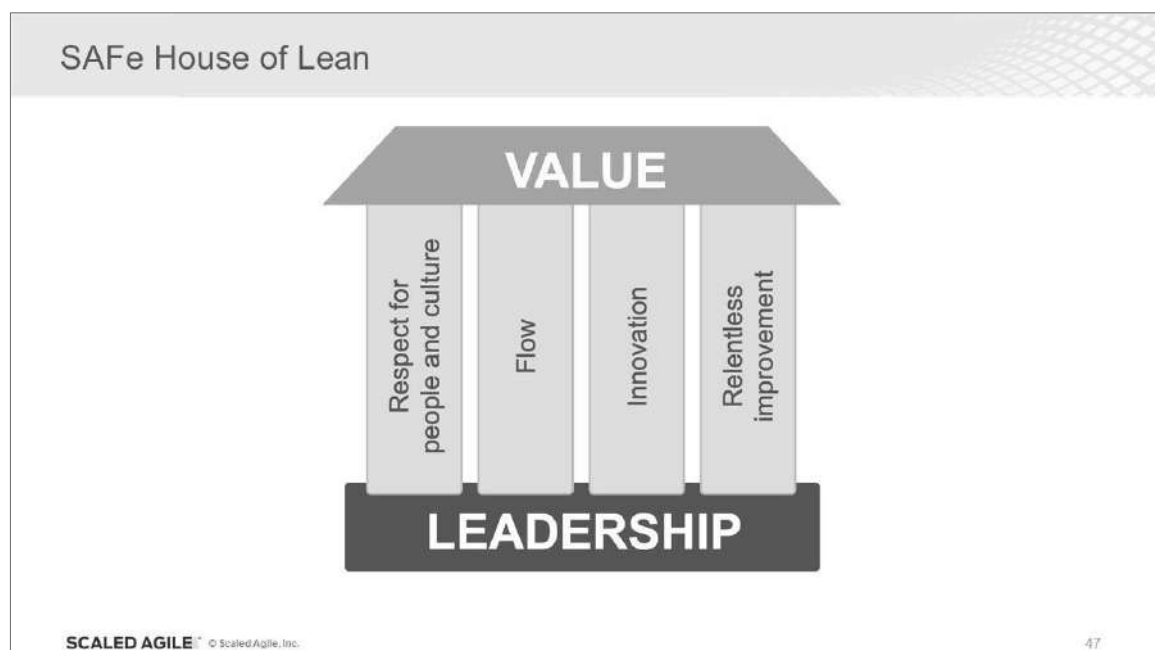
5 min

- ▶ **Step 1:** Individually choose one of SAFe's four core values: Alignment, Transparency, Built-In Quality, and Program Execution
- ▶ **Step 2:** At your table, discuss how can you exemplify that core value in your organization
- ▶ **Step 3:** Write down one example in the Action Plan in your workbook



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Notes:



Notes:



## 2.1 Embrace the Lean-Agile Mindset

### Value

Achieve the shortest sustainable lead time with:

- ▶ The best quality and value to people and society
- ▶ High morale, safety, and Customer delight

A diagram shaped like a classical temple. The roof is labeled 'VALUE'. It is supported by four pillars labeled 'Respect for people and culture', 'Flow', 'Innovation', and 'Relentless improvement'. The entire structure sits on a base labeled 'LEADERSHIP'.

*There is only one boss. The customer.  
And he can fire everybody in the company.*  
—Sam Walton

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Notes:

### Respect for people and culture

- ▶ Generative culture
- ▶ People do all the work
- ▶ Your Customer is whoever consumes your work
- ▶ Build long-term partnerships based on trust
- ▶ To change the culture, you have to change the organization

A diagram shaped like a classical temple. The roof is labeled 'VALUE'. It is supported by four pillars labeled 'Respect for people and culture', 'Flow', 'Innovation', and 'Relentless improvement'. The entire structure sits on a base labeled 'LEADERSHIP'.

*Culture eats strategy for breakfast.*  
—Peter Drucker

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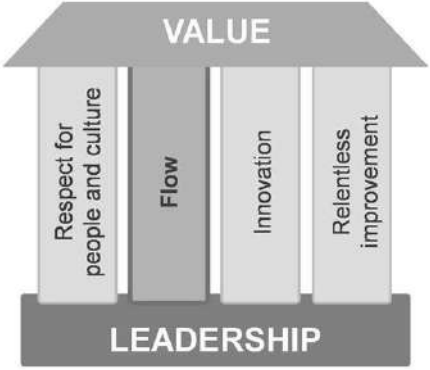
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Notes:

## 2.1 Embrace the Lean-Agile Mindset

### Flow

- ▶ Optimize sustainable value delivery
- ▶ Build-in quality
- ▶ Understand, exploit, and manage variability
- ▶ Move from projects to products



*Operating a product development process near full utilization is an economic disaster.*  
—Don Reinertsen

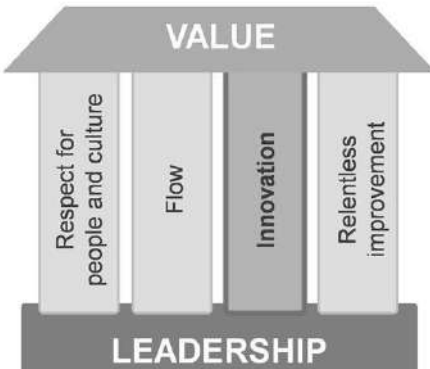
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Notes:

### Innovation

- ▶ Innovative people
- ▶ Provide time and space for innovation
- ▶ Go see
- ▶ Experimentation and feedback
- ▶ Innovation riptides
- ▶ Pivot without mercy or guilt



*Innovation comes from the producer.*  
—W. Edwards Deming

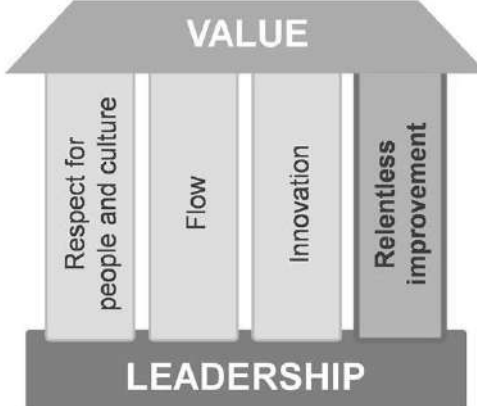
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Notes:

### Relentless Improvement

- ▶ A constant sense of danger
- ▶ Optimize the whole
- ▶ Problem-solving culture
- ▶ Base improvements on facts
- ▶ Reflect at key Milestones



The diagram is a house-shaped structure. The roof is labeled 'VALUE'. The base is a dark grey rectangle labeled 'LEADERSHIP'. There are four vertical pillars supporting the roof. From left to right, they are labeled: 'Respect for people and culture', 'Flow', 'Innovation', and 'Relentless improvement'.

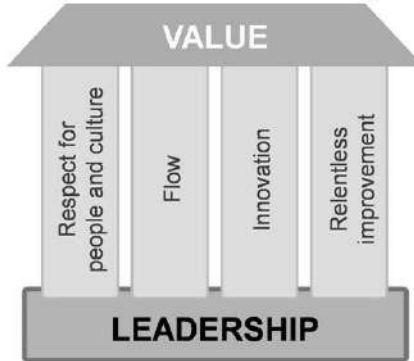
*Those who adapt the fastest win.*

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Notes:

### Leadership

- ▶ Lead by example
- ▶ Adopt a growth mindset
- ▶ Exemplify the values and principles of Lean-Agile and SAFe
- ▶ Develop people
- ▶ Lead the change
- ▶ Foster psychological safety




The diagram is a house-shaped structure. The roof is labeled 'VALUE'. The base is a dark grey rectangle labeled 'LEADERSHIP'. There are four vertical pillars supporting the roof. From left to right, they are labeled: 'Respect for people and culture', 'Flow', 'Innovation', and 'Relentless improvement'.

*People are already doing their best;  
the problems are with the system.  
Only management can change the system.  
—W. Edwards Deming*

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Notes:

## 2.1 Embrace the Lean-Agile Mindset



Activity: Assessing a Lean mindset

Duration  
5 min

► **Step 1:** Assess where your team stands in embracing a Lean mindset.

► **Step 2:** Discuss the results of the self-assessment. Do you have similar low or high scores?

	(low) 1	2	3	4	(high) 5
Value delivery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respect for people and culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relentless improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>


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Notes:

	(low) 1	2	3	4	(high) 5
Value delivery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Respect for people and culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relentless improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 2.1 Embrace the Lean-Agile Mindset




### Taking Action: Improving the Lean-Agile mindset

Prepare  
3 min

Share  
2 min

- ▶ **Step 1:** Select one of the lowest scores in the assessment.
- ▶ **Step 2:** Brainstorm one to three actions you could take to improve this area.
- ▶ **Step 3:** Share your ideas at your table. Give and receive constructive suggestions on how the ideas offered can improve the mindset scores.
- ▶ **Step 4:** Write down one idea in your Action Plan and be prepared to share.



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Notes:

### The Agile Manifesto

We are uncovering better ways of developing software by doing it and helping others do it.

**Through this work we have come to value:**

**Individuals and interactions** over processes and tools

**Working software** over comprehensive documentation

**Customer collaboration** over contract negotiation

**Responding to change** over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

 [agilemanifesto.org](http://agilemanifesto.org)

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Notes:

### The Agile Manifesto Principles

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference for the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

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Notes:


### The Agile Manifesto Principles

7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity—the art of maximizing the amount of work not done—is *essential*.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

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Notes:




Activity: Agile principles at scale

Prepare  
5 min

Share  
3 min

- ▶ **Step 1:** Review the principles behind the Agile Manifesto
- ▶ **Step 2:** Select one principle at each table
- ▶ **Step 3:** Categorize as:
  - Works as is
  - Not applicable
  - Requires rethinking for scale
- ▶ **Step 4:** Share your findings with the class

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Notes:

### Agile Manifesto Principles

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference for the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
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10. Simplicity—the art of maximizing the amount of work not done—is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.



### 2.2 Apply Lean and Agile at scale with the SAFe Principles

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Notes:

#### SAFe Lean-Agile Principles

- #1 Take an economic view
- #2 Apply systems thinking
- #3 Assume variability; preserve options
- #4 Build incrementally with fast, integrated learning cycles
- #5 Base milestones on objective evaluation of working systems
- #6 Visualize and limit WIP, reduce batch sizes, and manage queue lengths
- #7 Apply cadence, synchronize with cross-domain planning
- #8 Unlock the intrinsic motivation of knowledge workers
- #9 Decentralize decision-making
- #10 Organize around value

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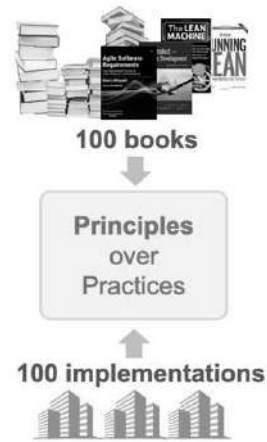
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Notes:

### Why focus on the principles?

*A common disease that afflicts management the world over is the impression that, "Our problems are different." They are different to be sure, but the principles that will help to improve the quality of products and services are universal in nature. —W. Edwards Deming*

- ▶ A Lean-Agile transformation will deliver substantial benefits
- ▶ However, it is a significant change, and every implementation is different
- ▶ Leaders should understand why the practices work; it's part of 'knowing what it is they must do'
- ▶ If a practice needs to change, understanding the principles will assure the change moves the Enterprise in the right direction



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Notes:

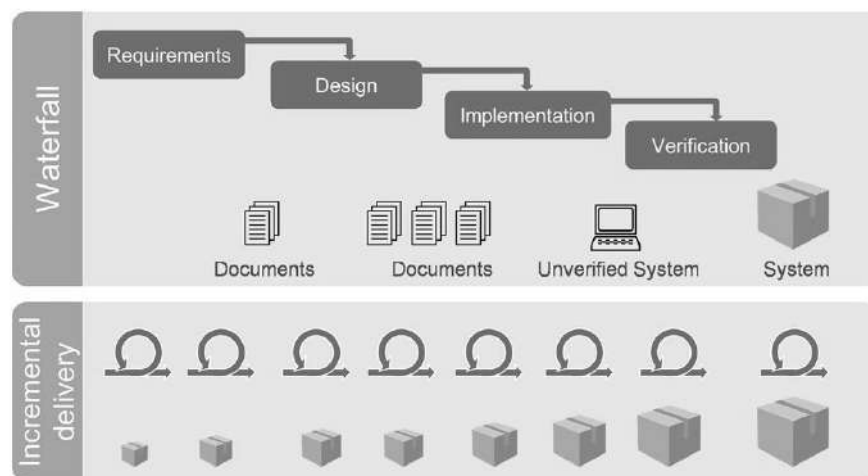
### #1 Take an economic view

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Notes:

#### Agile economics: Deliver early and often

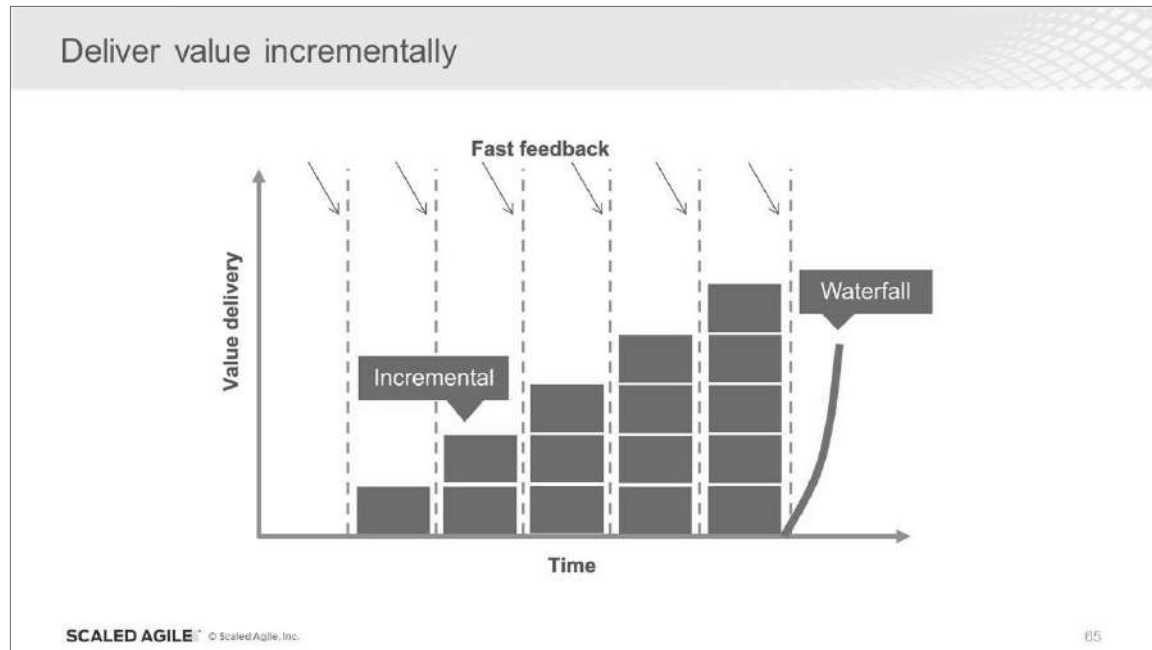


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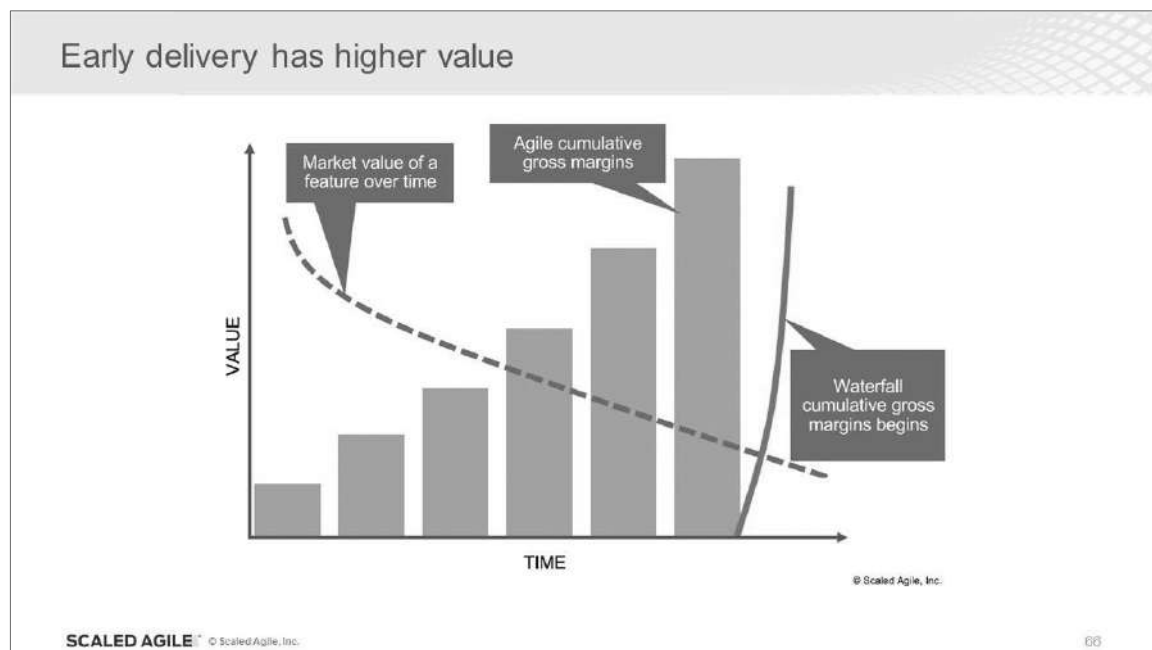
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Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles




Notes:



Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles



Activity: Accelerating value delivery

Prepare  
5 min

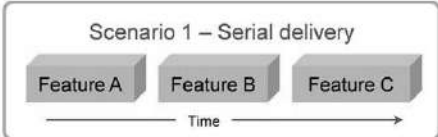
Share  
2 min

► **Step 1:** Consider that your backlog has three Features. Each will take the entire team one month and delivers one unit of value.

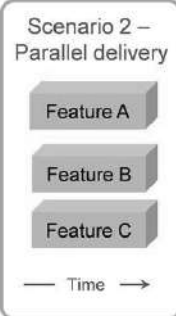
► **Step 2:** Plot the value delivery of serial and simultaneous/parallel implementation scenarios for delivering the Features.

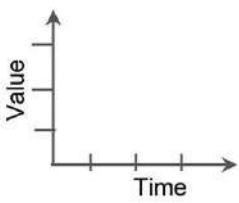
- **NOTE:** Assume 20% task switching overhead for each team member in Scenario 2
- **HINT:** Plot the serial case first

Scenario 1 – Serial delivery



Scenario 2 – Parallel delivery



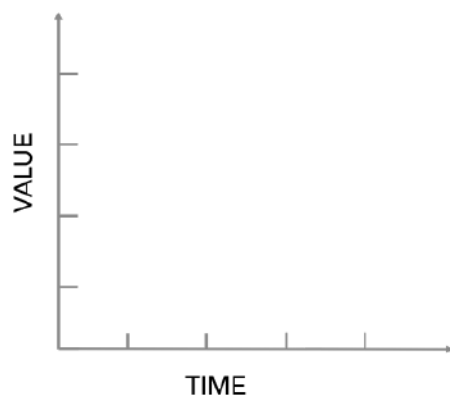


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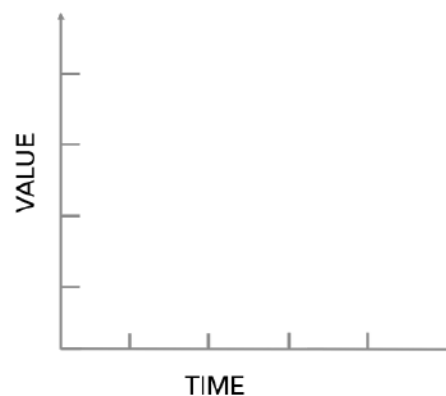
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Notes:

Plot Serial Delivery



Plot Parallel Delivery



NOTE: Assume 20% task switching overhead

### Solution economic trade-offs

Understanding tradeoff parameters:

- ▶ Sequence jobs for maximum benefit
- ▶ Do not consider money already spent
- ▶ Make economic choices continuously
- ▶ Empower local decision making
- ▶ If you only quantify one thing, quantify the cost of delay

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Notes:

### #2 Apply systems thinking

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Notes:

#### Systems thinking



***A system must be managed. It will not manage itself.***

*Left to themselves, components become selfish, independent profit centers and thus destroy the system...*

*The secret is cooperation between components toward the aim of the organization.*

*—W. Edwards Deming*

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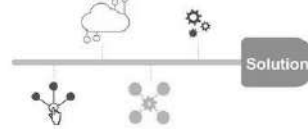
Notes:

### Attributes of systems thinking

The Solution and the Enterprise are both affected by the following:

- ▶ Optimizing a component does not optimize the system
- ▶ For the system to behave well as a system, a higher-level understanding of behavior and architecture is required
- ▶ The value of a system passes through its interconnections
- ▶ A system can evolve no faster than its slowest integration point

The Solution itself is a system



The Enterprise building the system is a system too



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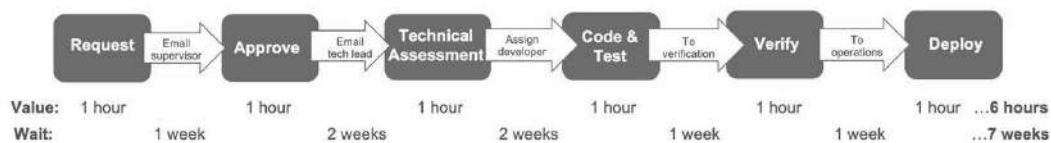
Notes:

### Optimize the full Value Stream

*All we are doing is looking at the timeline, from when the customer gives us an order to when we collect the cash. And we are reducing the timeline by reducing the non-value added wastes. —Taiichi Ohno*

- ▶ Most problems with your process will surface as *delays*
- ▶ Most of the time spent getting to market is a result of these delays
- ▶ Reducing delays is the fastest way to reduce time-to-market

#### Focus on the delays!




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Notes:





Discussion: Identifying delays

Prepare  
3 min




Share  
2 min

- ▶ **Step 1:** Identify three delays from your context and write them down.
- ▶ **Step 2:** Write down what you think might be some potential causes for the delays.
- ▶ **Step 3:** Consider how systems thinking relates to finding possible solutions for the delays. Who is ultimately responsible for the optimization of the full Value Stream?
- ▶ **Step 4:** Share your insights with the class.

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Notes:

Delay #1:	
Potential cause:	
Delay #2:	
Potential cause:	
Delay #3:	
Potential cause:	

### #3 Assume variability; preserve options

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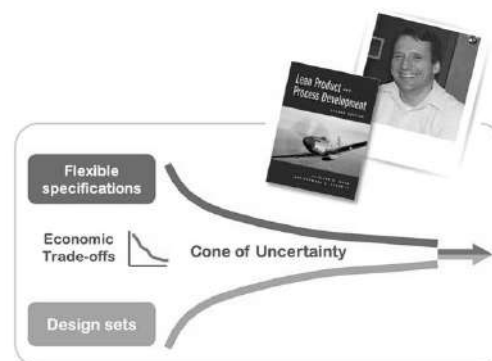
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Notes:

#### Development occurs in an uncertain world

*Aggressively evaluate alternatives. Converge specifications and solution set. —Allen Ward*

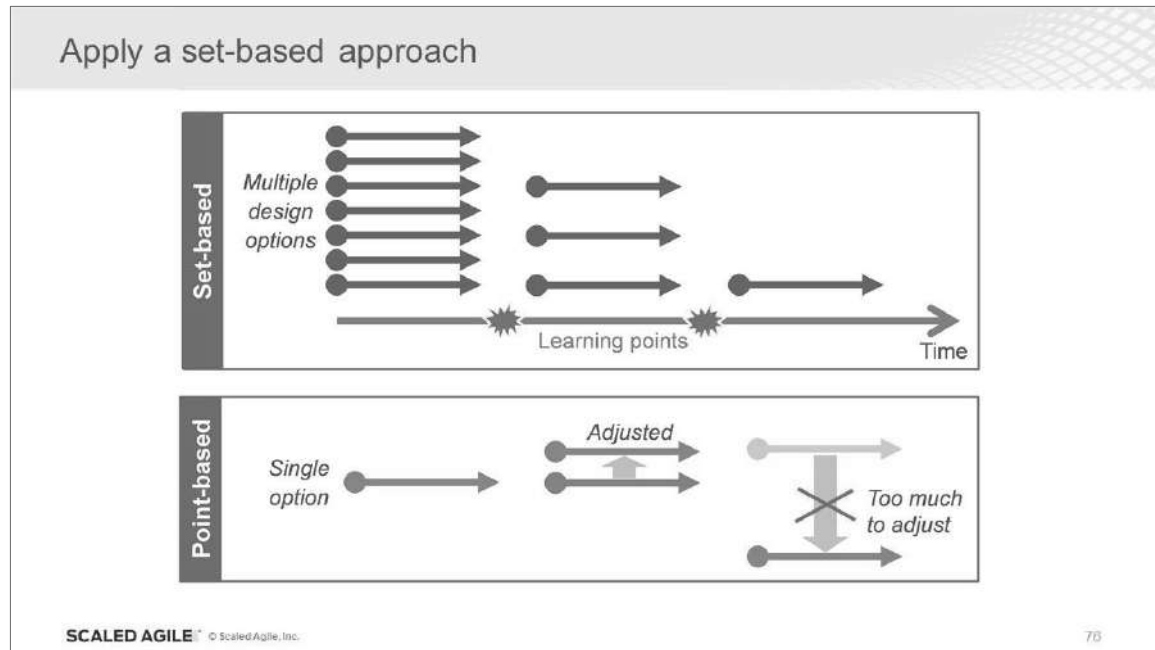
- ▶ You cannot possibly know everything at the start
- ▶ Requirements must be flexible to make economic design choices
- ▶ Designs must be flexible to support changing requirements
- ▶ Preservation of options improves economic results



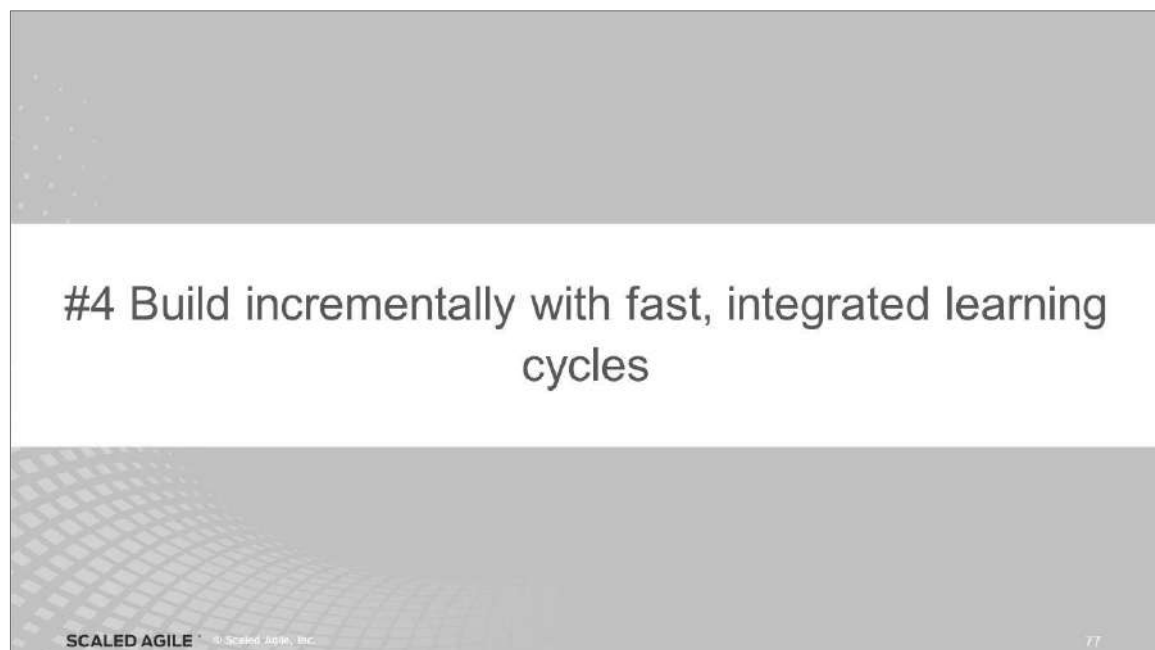
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Notes:



Notes:



Notes:

### Apply fast learning cycles

- ▶ Improves learning efficiency by decreasing the time between action and effect
- ▶ Reduces the cost of risk-taking by truncating unsuccessful paths quickly
- ▶ Is facilitated by small batch sizes
- ▶ Requires increased investment in development environment

*The shorter the cycles, the faster the learning*

The iterative learning cycle



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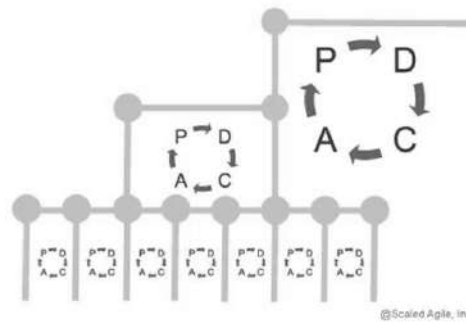
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Notes:

### Apply fast learning cycles

Integration points control product development:

- ▶ Integration points accelerate learning
- ▶ Development can proceed no faster than the slowest learning loop
- ▶ Improvement comes through synchronization of design loops and faster learning cycles

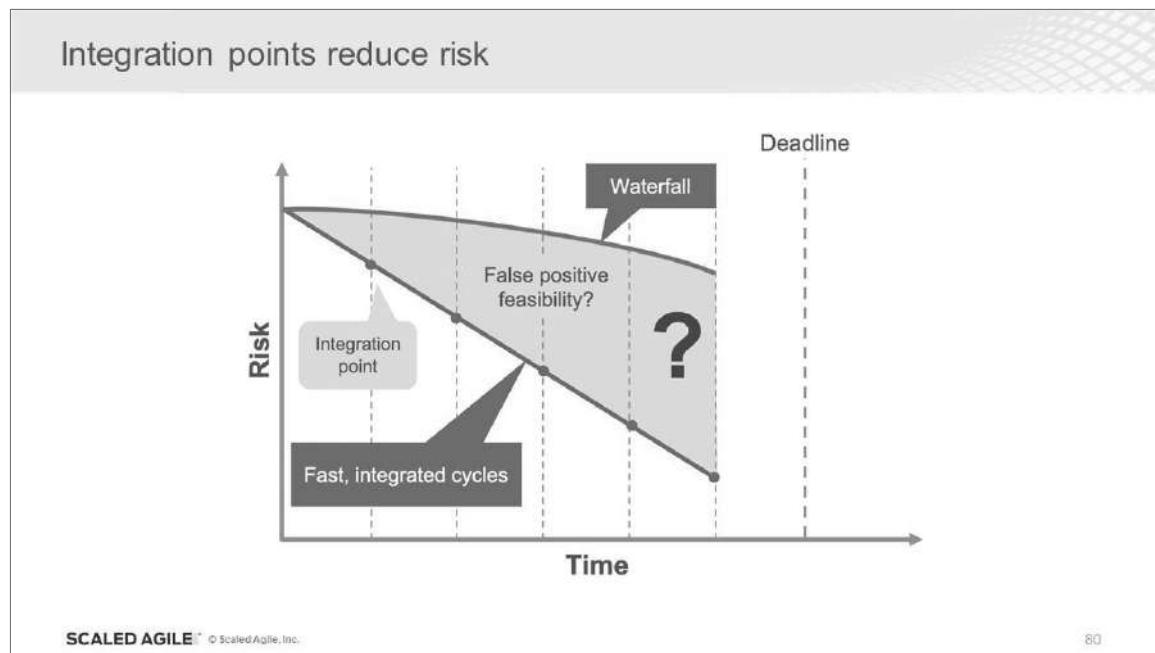


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Notes:



Notes:

#5 Base milestones on objective evaluation of working systems

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Notes:

### The problem of phase-gate milestones

*There was in fact no correlation between exiting phase gates on time and project success... the data suggested the inverse might be true. —Lean Machine*

- ▶ They force design decisions too early; this encourages false-positive feasibility.
- ▶ They assume a 'point' Solution exists and can be built correctly the first time.
- ▶ They create huge batches and long queues, and they centralize requirements and design in program management.



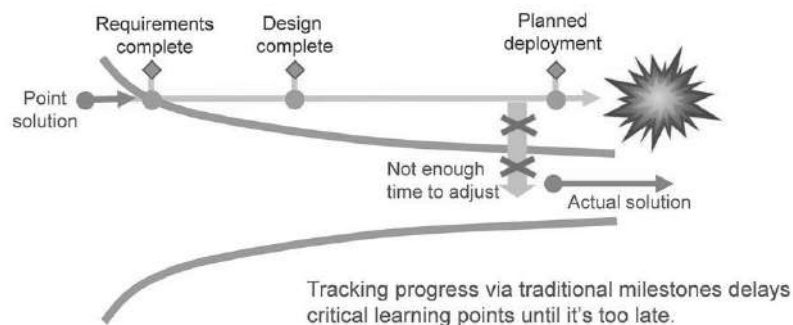
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Notes:

### The problem of phase-gate milestones

Phase gates fix requirements and designs too early, making adjustments too late and costly as new facts emerge.



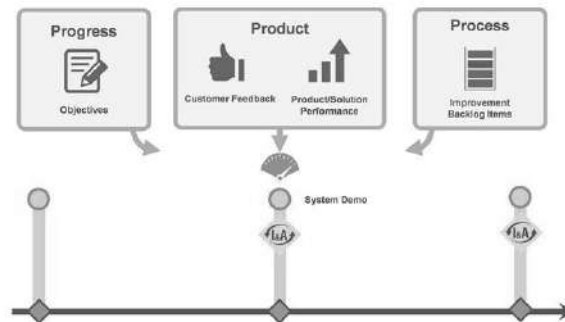
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Notes:

### Apply objective Milestones

Program Increment (PI) System Demos are orchestrated to deliver objective progress, product, and process Metrics.



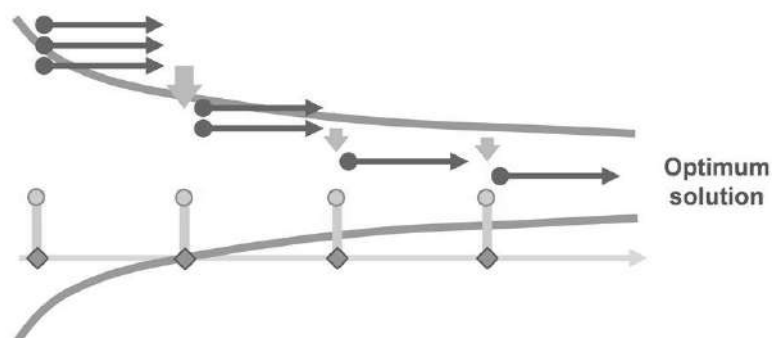
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Notes:

### Iterate to the optimum solution

Objective Milestones facilitate learning and allow for continuous, cost-effective adjustments towards an optimum Solution.



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Notes:

### #6 Visualize and limit WIP, reduce batch sizes, and manage queue lengths

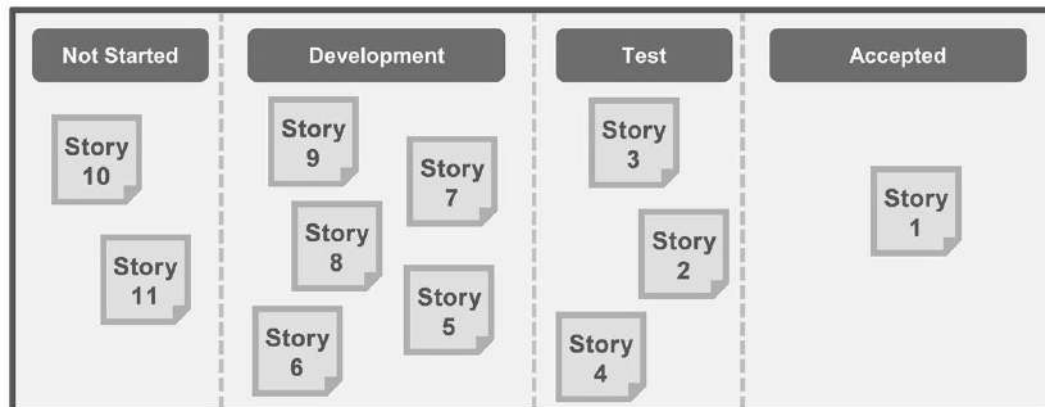
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Notes:

An example from the field

How is this team doing? How do you know that?



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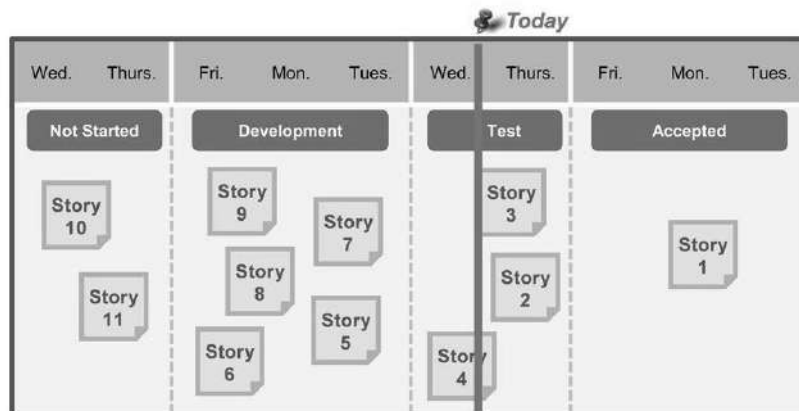
Notes:



## 2.2 Apply Lean and Agile at scale with the SAFe Principles

Visualize to increase understanding


Now how do you think they are doing?



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Notes:



Activity: WIP improvement opportunities

Prepare  
5 min

Share  
3 min

- ▶ **Step 1:** Look at the BVIR graphic in your workbook.
- ▶ **Step 2:** At your table, discuss what the effect would be of a three-story WIP constraint on Development and Test.
- ▶ **Step 3:** Consider this scenario: You're a developer. You just finished story 6. What would you do if:
  - There is no WIP constraint
  - The three-story WIP constraint is in place
- ▶ **Step 4:** Which scenario has the highest throughput?

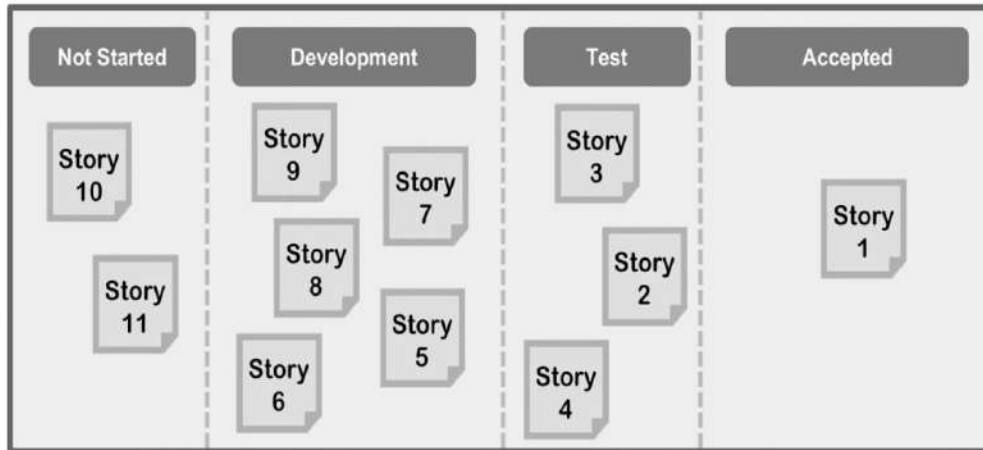
Fri.	Mon.	Tues.	Wed.	Thurs.
Development			Test	
Story 9		Story 7	Story 3	
Story 8		Story 5	Story 2	
Story 6			Story 4	

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Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles



What is the throughput if there is no WIP constraints?



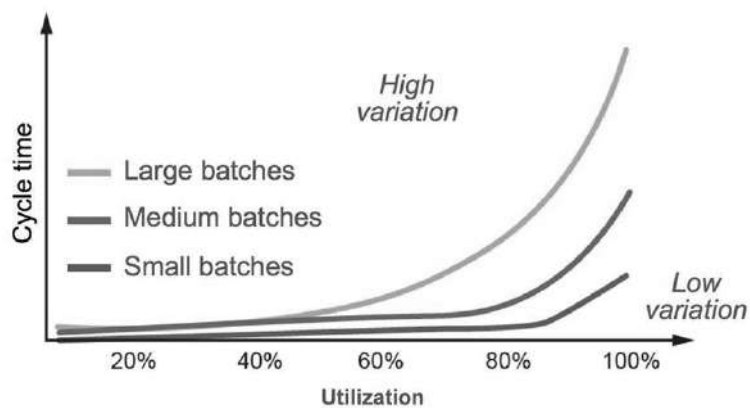
low | high

What is the throughput if there is a three-story WIP constraint?



low | high

### Reduce batch size for higher predictability



Source: *Implementing Lean Software Development*, Poppendieck, Mary.

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Notes:





### Activity: Experience a large batch size




- ▶ **Step 1:** Create groups of five people with 10 coins per group. Designate one person as the timekeeper. The remaining four people will be processing the coins.
- ▶ **Step 2:** Person by person, flip each coin one at a time, recording your own results (heads or tails).
- ▶ **Step 3:** Pass all coins at the same time to the next person, who repeats step two, until all four people are done
- ▶ **Step 4:** The timekeeper stops the timer and records the total time



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Notes:



Activity: Experience a small batch size

Duration  
5 min

- ▶ **Step 1:** Ensure that the timekeeper is ready to start the timer
- ▶ **Step 2:** This time, each person flips one coin at a time, records the result (heads or tails), and immediately passes each coin to the next person
- ▶ **Step 3:** The timekeeper will stop the timer when the last person flips the last coin and records the result



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Notes:

The importance of small batches

- ▶ Large batch sizes increase variability
- ▶ High utilization increases variability
- ▶ Severe project slippage is the most likely result
- ▶ Small batches go through the system faster with lower variability
- ▶ The most important batch is the handoff batch

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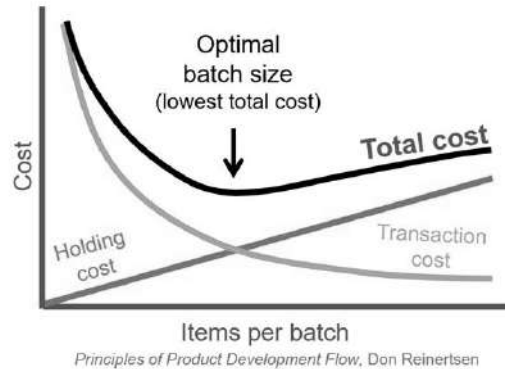
93

Notes:

### Finding optimal batch size

Optimal batch size is an example of a U-curve optimization.

- ▶ Total costs are the sum of holding costs and transaction costs
- ▶ Higher transaction costs make optimal batch size bigger
- ▶ Higher holding costs make batch size smaller



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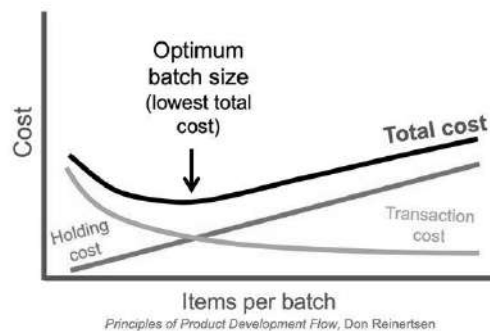
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Notes:

### Reducing optimal batch size

Reducing transaction costs reduces total costs and lowers optimum batch size.

- ▶ Reducing batch size:
  - Increases predictability
  - Accelerates feedback
  - Reduces rework
  - Lowers cost
- ▶ Batch size reduction probably saves **twice** what you think



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Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles



Video: Formula 1 Pit Stops: 1950 and Today

Duration  
2 min



[https://youtu.be/RRy\\_73ivcms](https://youtu.be/RRy_73ivcms)


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Notes:

Manage queue lengths

Email from a client service organization:

**Thank you for contacting us.** 

*We are experiencing increased volumes and apologize in advance for the delay.*

*Our goal is to contact you within . . .*

Long queues: All bad

Long queues create

- Longer lead times
- Increased risk
- More variability
- Lower quality
- Less motivation

*Principles of Product Development Flow, Don Reinertsen*

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Notes:

### Reduce queue lengths

- ▶ Understand Little's Law
  - Faster processing time decreases wait
  - Shorter queue lengths decrease wait
- ▶ Control wait times by controlling queue lengths:
  - WIP limits, small batches, defer commitments

$$W_q = \frac{L_q}{\lambda}$$

Average wait time = average queue length  
divided by average processing rate

**Example** - Given average processing speed of 10 Features per quarter and a committed set of 30 Features, a new Feature will experience approximate wait time of:

$$\frac{30 \text{ items}}{10 \text{ items/Q}} = 3 \text{ Q}$$

Notes:



### #7 Apply cadence, synchronize with cross-domain planning

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Notes:

#### Cadence and synchronization

##### Cadence

- ▶ Converts unpredictable events into predictable occurrences and lowers cost
- ▶ Makes waiting times for new work predictable
- ▶ Supports regular planning and cross-functional coordination
- ▶ Limits batch sizes to a single interval
- ▶ Controls injection of new work
- ▶ Provides scheduled integration points

*Note: Delivering on cadence requires scope or capacity margin*

##### Synchronization

- ▶ Causes multiple events to happen simultaneously
- ▶ Facilitates cross-functional tradeoffs
- ▶ Provides routine dependency management
- ▶ Supports full system and integration and assessment
- ▶ Provides multiple feedback perspectives

*Note: To work effectively, design cycles must be synchronized*

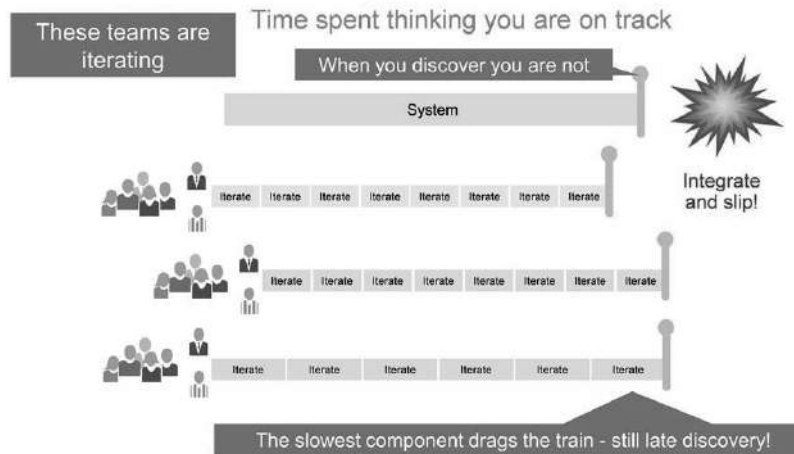
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Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles

### Cadence without synchronization is not enough

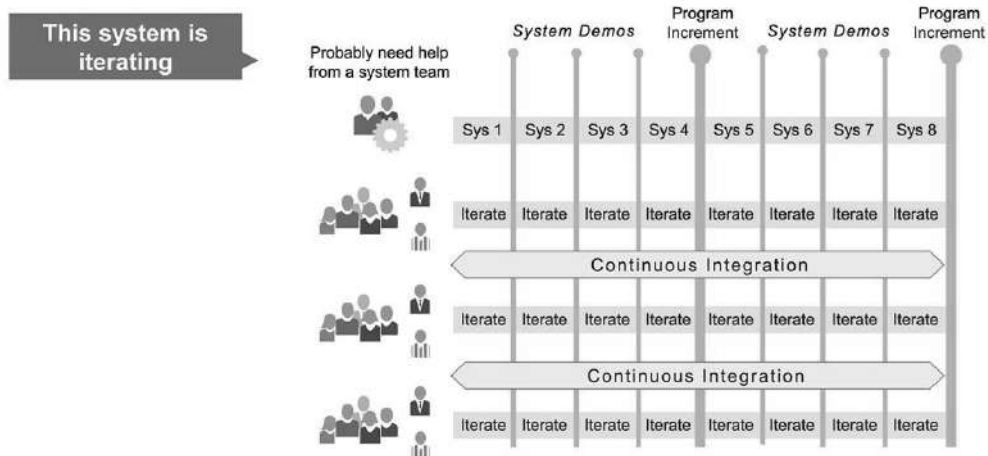


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Notes:

### Synchronize to assure delivery



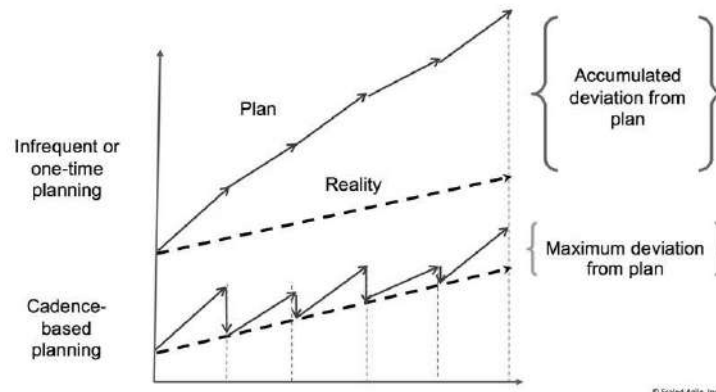
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Notes:

### Control variability with planning cadence

Cadence-based planning limits variability to a single interval.



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Notes:

### Synchronize with cross-domain planning

*Future product development tasks can't be pre-determined. Distribute planning and control to those who can understand and react to the end results.*

—Michael Kennedy, *Product Development for the Lean Enterprise*

- ▶ All stakeholders meet face-to-face (but typically in multiple locations)
- ▶ Management sets the mission with minimum possible constraints
- ▶ Requirements and design happen
- ▶ Important stakeholder decisions are accelerated
- ▶ Teams create and take responsibility for plans



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Notes:

### #8 Unlock the intrinsic motivation of knowledge workers

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Notes:

#### On managing knowledge workers

- ▶ Workers themselves are most qualified to make decisions about how to perform their work
- ▶ Workers must be heard and respected for management to lead effectively
- ▶ Knowledge workers have to manage themselves: they need autonomy
- ▶ Continuing innovation has to be part of the work and the responsibility of knowledge workers

*Workers are knowledge workers if they know more about the work they perform than their bosses.*

— Peter Drucker

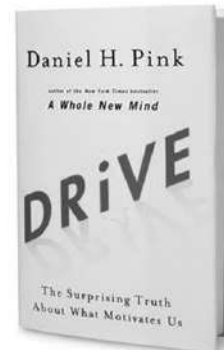
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Notes:

### Unlocking intrinsic motivation with autonomy, mastery, and purpose

- ▶ *Autonomy* is the desire to be self-directing and have control over what we work on, how we do our work, and who we work with
- ▶ *Mastery* is the urge to get better at what we do and improve our personal and team skills
- ▶ *Purpose* is the desire to do something that matters and has meaning



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Notes:

### #9 Decentralize decision-making

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Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles



Video: Greatness by David Marquet

Duration  
10 min



[https://youtu.be/OqmdLcyES\\_Q](https://youtu.be/OqmdLcyES_Q)

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Notes:

### Decentralize decision-making

Define the economic logic behind a decision; empower others to make the changes.


Centralize	De-centralize everything else
<ul style="list-style-type: none"><li>▶ <b>Infrequent</b> - Not made very often and usually not urgent (example: internationalization strategy)</li><li>▶ <b>Long-lasting</b> - Once made, highly unlikely to change (example: common technology platform)</li><li>▶ <b>Significant economies of scale</b> - Provide large and broad economic benefit (example: compensation strategy)</li></ul>	<ul style="list-style-type: none"><li>▶ <b>Frequent</b> - Routine, everyday decisions (example: Team and Program Backlog)</li><li>▶ <b>Time critical</b> - High cost of delay (example: point release to customer)</li><li>▶ <b>Require local information</b> - Specific and local technology or customer context is required (example: Feature criteria)</li></ul>

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Notes:

## 2.2 Apply Lean and Agile at scale with the SAFe Principles



### Activity: Decentralize decision-making

Prepare  

3

min

Share  

2

min

- ▶ **Step 1:** Consider three significant decisions you are currently facing. Write them down in the table provided in your workbook.
- ▶ **Step 2:** Rate each decision based on the frequency, time criticality, and economies of scale, assigning the value of 2 or 0.
- ▶ **Step 3:** Add the total values: 0 – 3 centralize and 4 – 6 decentralize

Decision	Frequent? Y=2 N=0	Time-critical? Y=2 N=0	Economies of scale? Y=0 N=2	Total

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Notes:

Decision	Frequent? Y=2 N=0	Time Critical Y=2 N=0	Economies of scale? Y=0 N=2	Total

### Keys to practicing decentralized decision making

- ▶ Openly discuss how decisions are made and explore opportunities to move authority for those decisions closer to where the work is performed.
- ▶ Establish a decision-making framework that equips knowledge workers with the information to make good decisions.
- ▶ Provide clarity on organizational objectives, coach effective problem-solving, and provide opportunities to exercise and cultivate decision-making abilities.
- ▶ Take responsibility for making and communicating strategic decisions—those that are infrequent, long lasting, and have significant economies of scale. Decentralize all others.

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Notes:

### #10 Organize around value

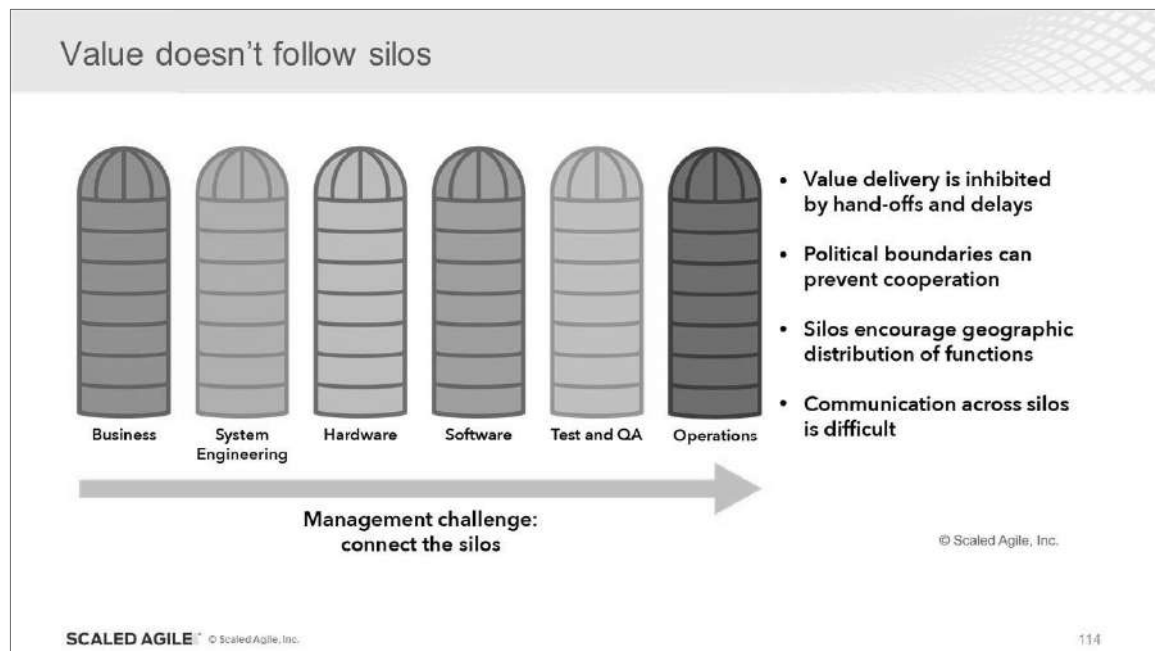
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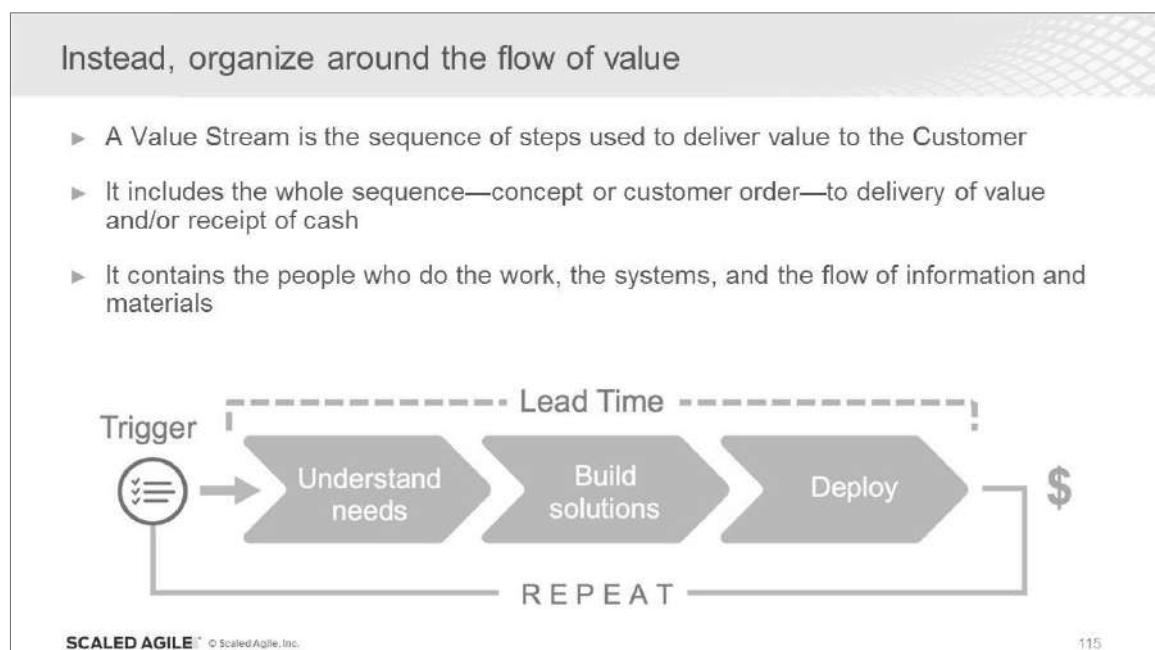
Notes:



## 2.2 Apply Lean and Agile at scale with the SAFe Principles



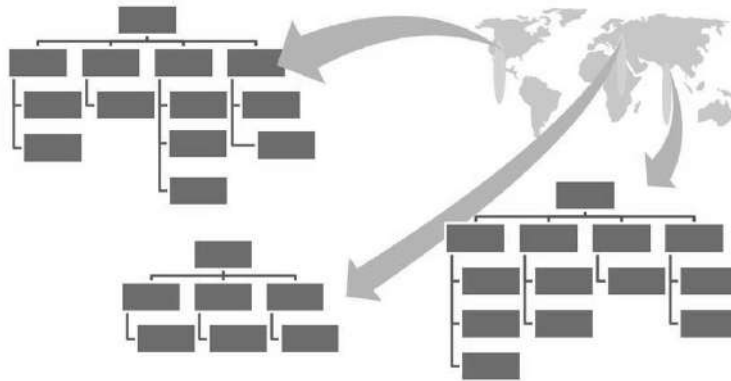
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Notes:

Value at scale is distributed

Value often flows across organizational boundaries.



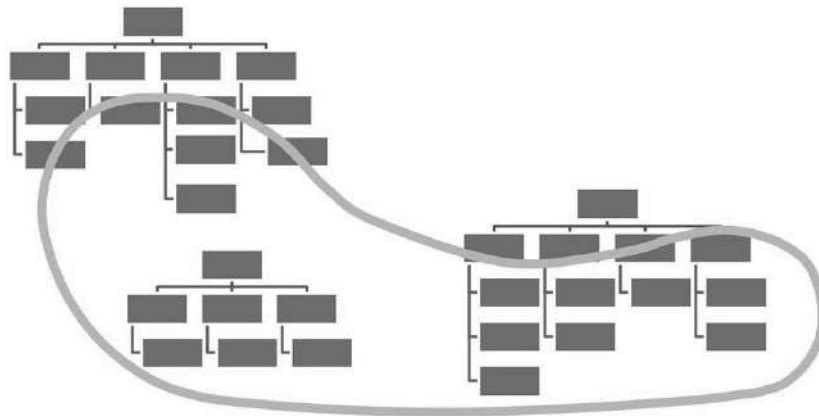
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Notes:

Find the 'kidney'

Use this thinking tool to identify the Value Stream within which to build one or more Agile Release Trains



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Notes:


Principles are great, but ...

*Clarity on how to **think**, without clarity on how to **act**, leaves people unmoved.*

—Daniel Pink

... it's time to put this thinking to work.  
**Let's start doing.**

Notes:




Taking Action: Advocating SAFe Principles

Prepare  
3 min

Share  
2 min

- **Step 1:** Individually identify three actions you can take to model and advocate SAFe Principles in your Enterprise.
- **Step 2:** Write them down in your Action Plan.
- **Step 3:** At your table, share some of the insights you gained from SAFe Principles.



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Notes:

## Lesson review

In this lesson you:

- ▶ 2.1 Embraced the Lean-Agile Mindset
- ▶ 2.2 Applied Lean and Agile at scale with the SAFe Principles

Notes:

- ▶ Scaled Agile Framework recommended reading for this lesson:
  - *Core Values*
  - *Lean-Agile Mindset*
  - *SAFe Principles*
  - *Lean-Agile Leadership*

## Lesson 3

# Establishing Team and Technical Agility

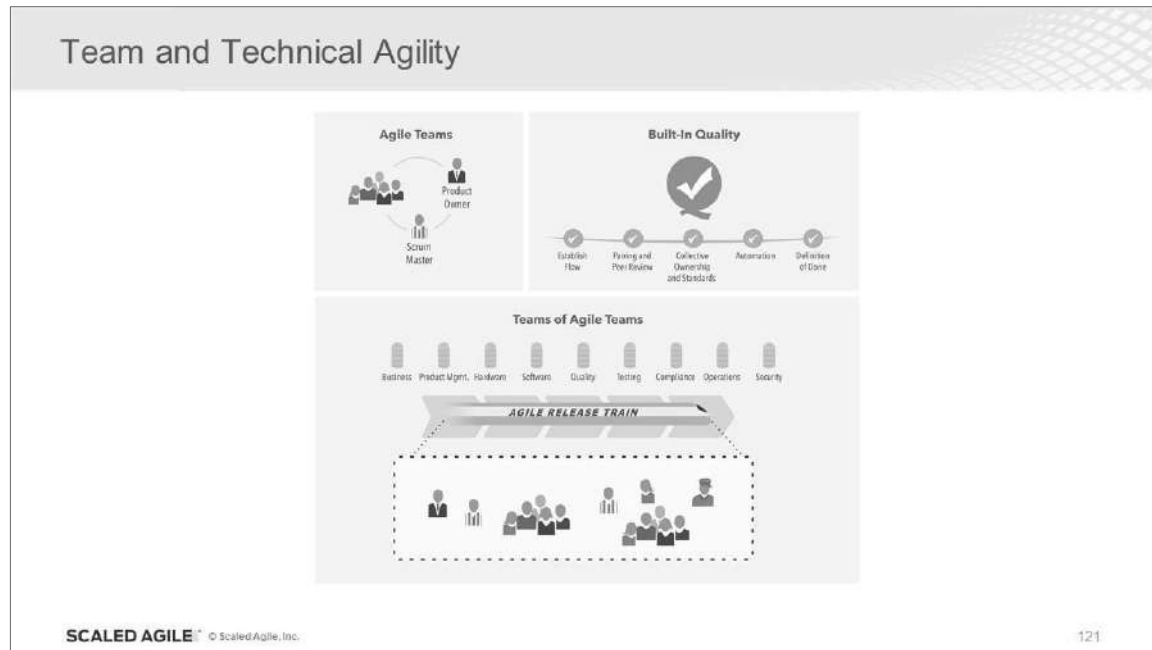
### Learning Objectives:

- 3.1 Form cross-functional Agile Teams
- 3.2 Build quality in
- 3.3 Organize Agile Release Trains (ARTs) around the flow of value

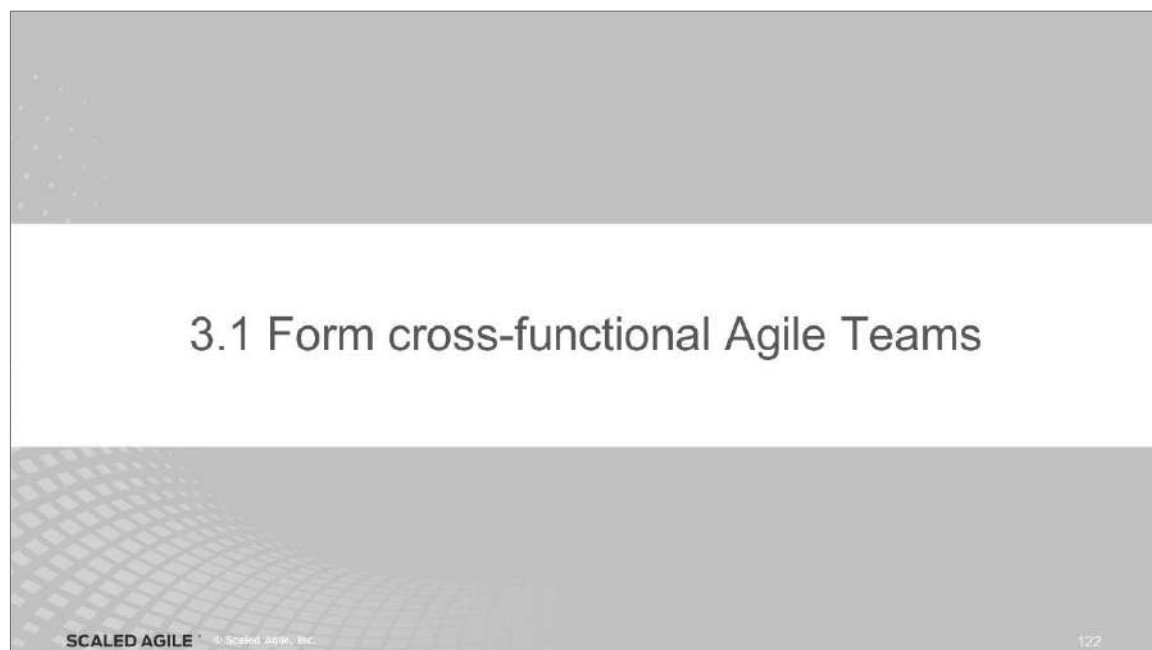


SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.

## 3.1 Form cross-functional Agile Teams



Notes:



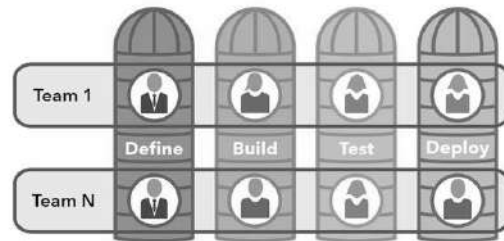
Notes:

## 3.1 Form cross-functional Agile Teams

### Build cross-functional Agile Teams

Agile Teams are cross-functional, self-organizing entities that can define, build and test, and where applicable, deploy increments of value

- ▶ Optimized for communication and delivery of value
- ▶ Deliver value every two weeks
- ▶ Two specialty roles:
  - Scrum Master
  - Product Owner



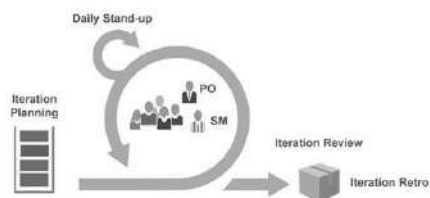
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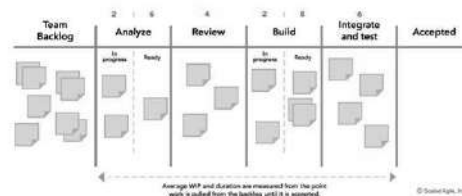
Notes:

### Teams execute Iterations with Scrum and Kanban

Scrum is built on transparency, inspection, adaptation, and short learning cycles



Kanban visualizes and optimizes the flow of work through the system

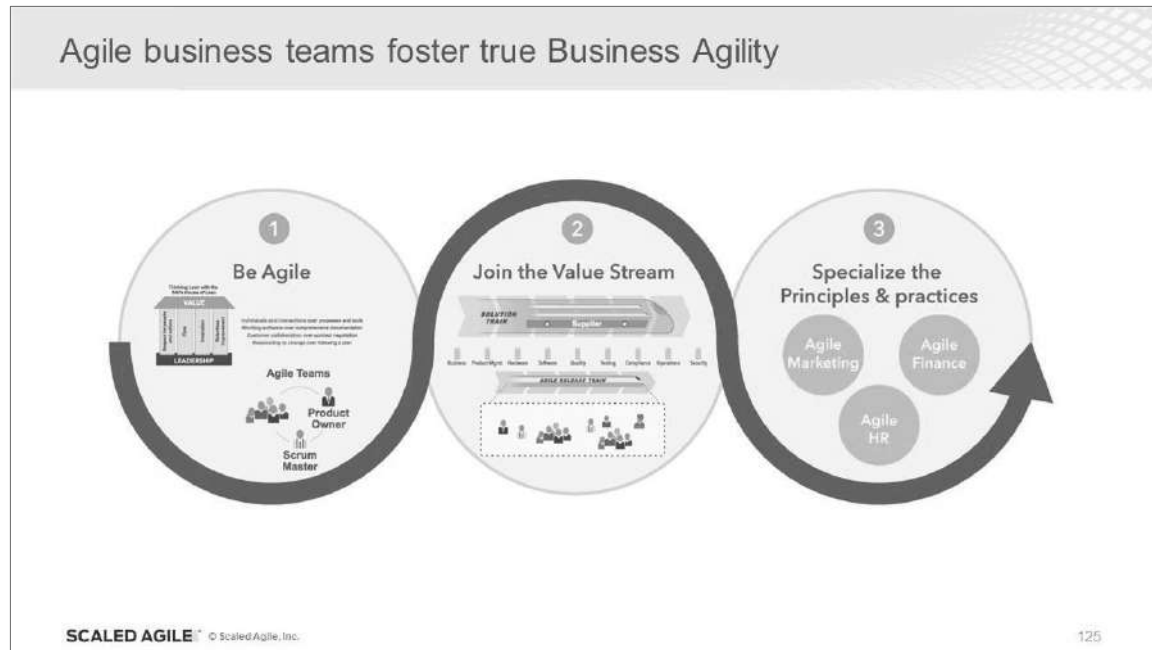


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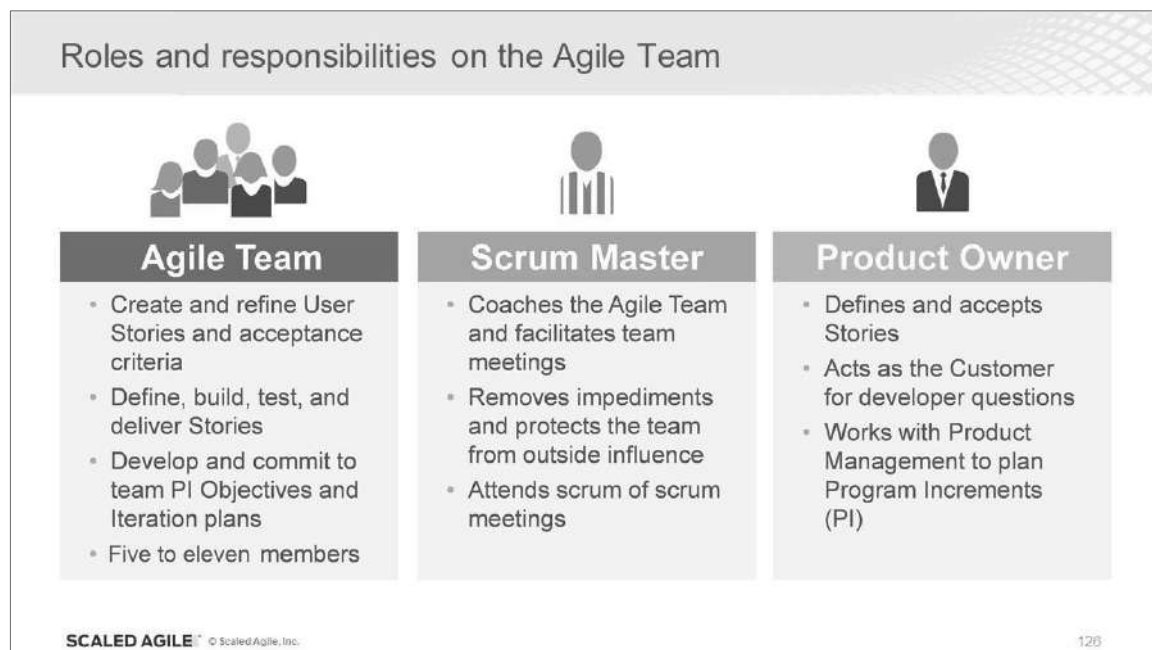
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Notes:

### 3.1 Form cross-functional Agile Teams



Notes:



Notes:



## 3.1 Form cross-functional Agile Teams



Activity: Identify team names and roles

Duration  
2 min

- ▶ **Step 1:** Your team is your table. Create a team name.
- ▶ **Step 2:** Select a Scrum Master for your team.
- ▶ **Step 3:** Select a Product Owner for your team.
- ▶ **Step 4:** Make sure the team name and the names of the people selected are visible to all other teams
  - **Note:** In the next lesson, you will experience PI Planning



Product Owner

Scrum Master

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Notes:



Notes:

Build quality in

*You can't scale crappy code (or hardware, or anything else).*

- ▶ Ensures that every increment of the Solution reflects quality standards
- ▶ Is required for high, sustainable development velocity
- ▶ Many practices apply to every team, business or technology:
  - Establish flow
  - Peer review and pairing
  - Collective ownership and standards
  - Automation
  - Definition of done

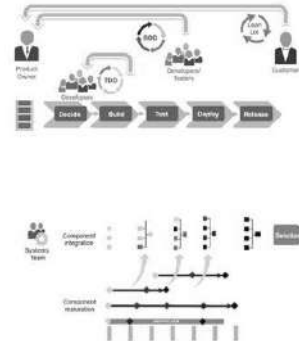
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Notes:

### Built-in Quality practices for technology-focused teams

Some practices were built for technology teams:

- ▶ Includes software quality practices (most inspired by XP) like Agile architecture, Agile testing, behavior-driven development, test-driven development, refactoring, and code quality
- ▶ Supports hardware quality with exploratory, early iterations; frequent system-level integration; design verification; MBSE; and Set-Based Design



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Notes:

## 3.3 Organize Agile Release Trains (ARTs) around the flow of value

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Notes:

Agile Release Trains (ARTs) continuously deliver value

- ▶ A virtual organization of 5 – 12 teams (50 – 125+ individuals)
- ▶ Synchronized on a common cadence, a Program Increment (PI)
- ▶ Aligned to a common mission via a single Program Backlog

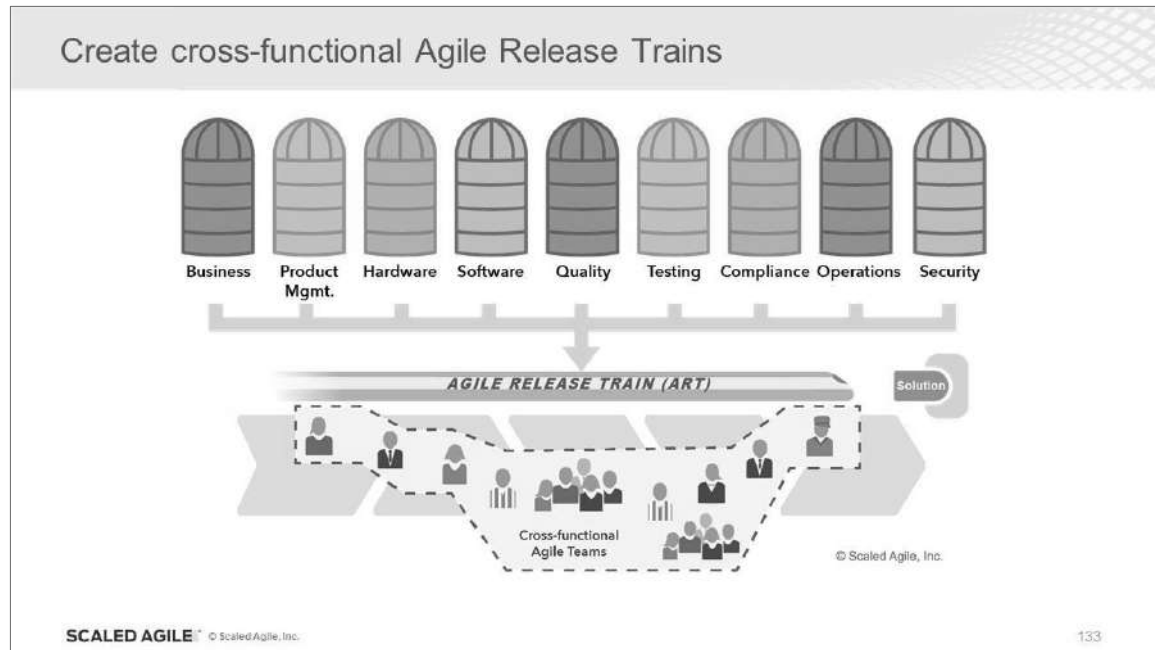


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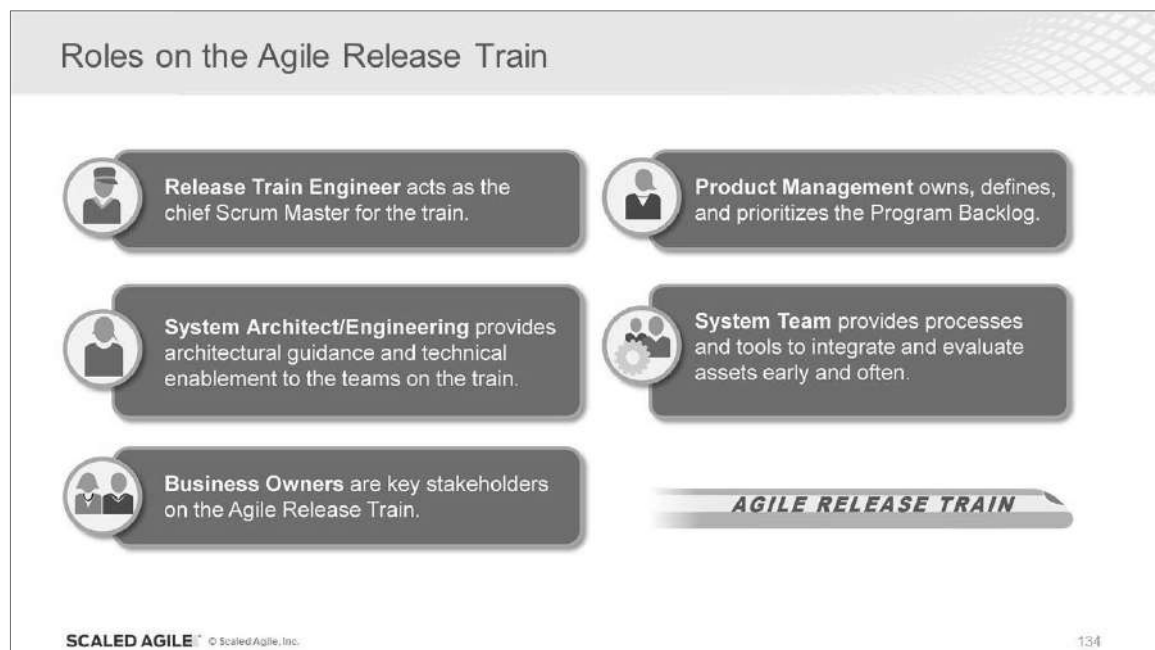
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Notes:

### 3.3 Organize Agile Release Trains (ARTs) around the flow of value



Notes:



Notes:

## Lesson review

In this lesson, you:

- ▶ Discussed how to form cross-functional Agile Teams
- ▶ Explored how to build quality in
- ▶ Discussed how to organize Agile Release Trains (ARTs) around the flow of value

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Notes:

- ▶ Scaled Agile Framework recommended reading for this lesson:
  - *Team and Technical Agility*
  - *Built-in Quality*
  - *Agile Teams*
  - *Agile Release Train*

## Lesson 4

# Building Solutions with Agile Product Delivery

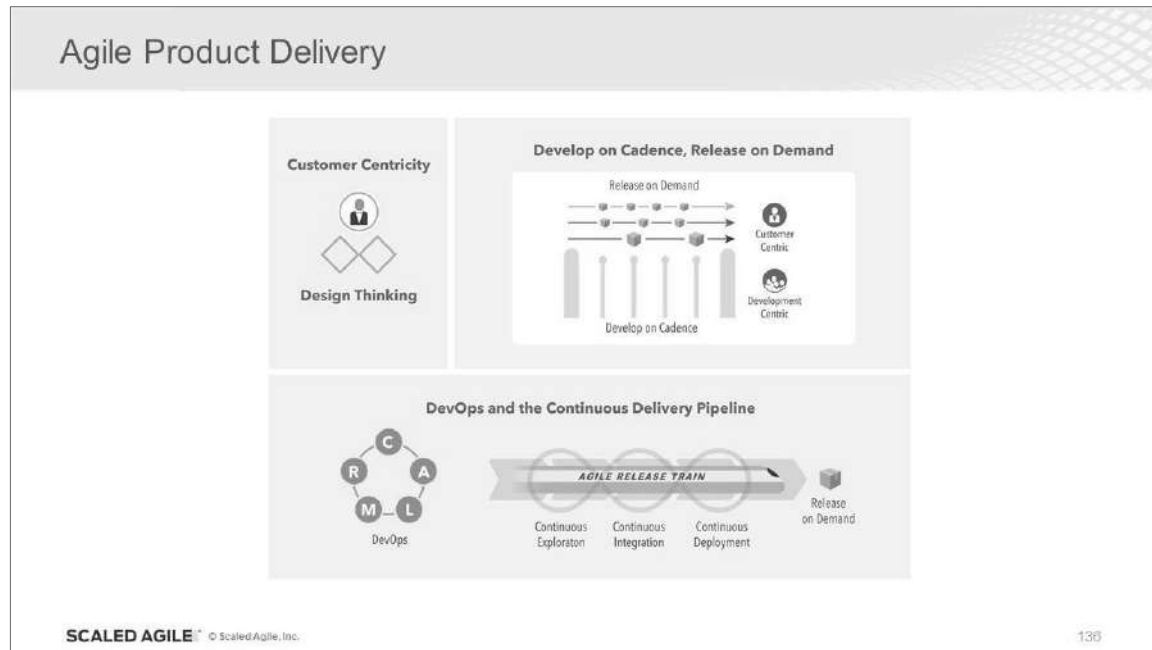
### Learning Objectives:

- 4.1 Apply Customer Centricity with Design Thinking
- 4.2 Prioritize the Program Backlog
- 4.3 Participate in PI Planning
- 4.4 Develop on Cadence; Release on Demand
- 4.5 Build a Continuous Delivery Pipeline with DevOps



SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.

## 4.1 Apply Customer Centricity with Design Thinking




Notes:



Notes:





Discussion: Customer Centricity


Prepare  
3 min

Share  
2 min

► **Step 1:** Discuss as a team:

- What are some of the characteristics of a customer-centric Enterprise?
- Why is it important to maintain focus on the Customer?

► **Step 2:** Be prepared to share with the class.



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Notes:

### Why Customer Centricity?

All customer-centric Enterprises deliver whole-product Solutions that are designed with a deep understanding of Customer needs.

Customer-centric businesses generate:

- greater profits
- increased employee engagement
- more satisfied customers.



Customer-centric governments and nonprofits create:

- the resiliency, sustainability, and alignment needed to fulfill their mission.

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Notes:

### Customer Centricity is a mindset

Whenever a customer-centric Enterprise makes a decision, it deeply considers the effect it will have on its end users.



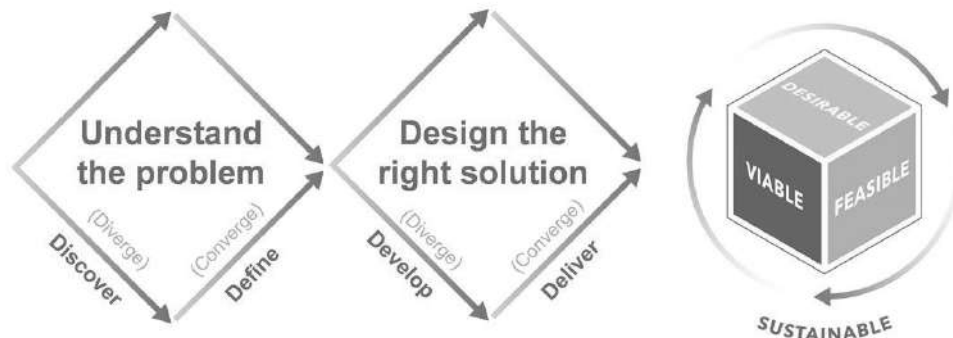
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Notes:

### What is Design Thinking?

Design Thinking is an iterative Solution development process that promotes a holistic approach to delighting all stakeholders.



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Notes:

### Use personas to understand Customers

*Personas* are fictional characters based upon your research. They represent the different people who might use your product or Solution in a similar way.

- Convey the problems they're facing in context (i.e., their work environment) and key triggers for using the product
- Capture rich, concise information (photographs, family stories, jobs, etc.) that inspire great products without unnecessary details



#### Cary the Consumer

Age: 36  
Location: Reno, Nevada, USA  
Time in App: 10 minutes

"I'm a working dad with three children ages 3, 6, and 10. I'm also in a band, which means I want to spend as much time as possible with my kids and my band. I need my package delivered on time so that I can maximize time with my family."

I like technology! I have an iPhone, iPad, and nice home Wi-Fi setup

I'm not home on some weekends

I'd rather order online than dial the phone and talk to somebody

My wife also works during the week, so she doesn't have much spare time to help

Text is my favorite form of communication with suppliers

I don't own a computer, only tablets and phones

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Notes:

### Use empathy maps to promote Customer identification

- ▶ The empathy map is a tool that helps teams develop deep, shared understanding and empathy for other people
- ▶ Use it to design better experiences and Value Streams




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Notes:

## 4.1 Apply Customer Centricity with Design Thinking

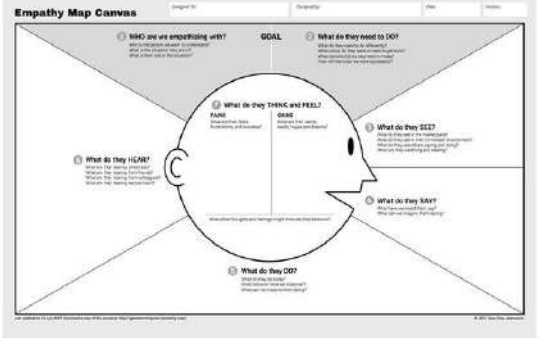


Activity: Empathy mapping

Prepare  
7 min

Share  
3 min

- ▶ **Step 1:** On a flip chart, as a team, create an empathy map using the example in your workbook
- ▶ **Step 2:** Fill in the empathy map based on users/consumers segment of a product or Solution (pick one or more contexts from your table)
- ▶ **Step 3:** Discuss:
  - How would the empathy map inform the potential Solution development?
- ▶ **Step 4:** Be prepared to share with the class.



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Notes:

## 4.1 Apply Customer Centricity with Design Thinking

**Empathy Map Canvas**

Designed for: \_\_\_\_\_ Designed by: \_\_\_\_\_ Date: \_\_\_\_\_ Version: \_\_\_\_\_

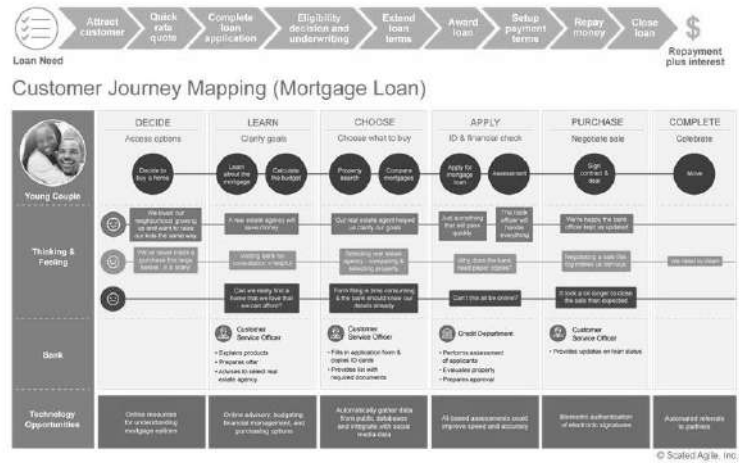
The diagram is a large rectangle divided into seven numbered sections around a central face. The face has a large open mouth on the right and a small ear on the left. The sections are:

- 1 WHO are we empathizing with?**  
Who is the person we want to understand?  
What is the situation they are in?  
What is their role in the situation?
- 2 What do they need to DO?**  
What do they need to do differently?  
What job(s) do they want or need to get done?  
What decision(s) do they need to make?  
How will we know we were successful?
- 3 What do they SEE?**  
What do they see in the marketplace?  
What do they see in their immediate environment?  
What do they see others saying and doing?  
What are they watching and reading?
- 4 What do they SAY?**  
What have we heard them say?  
What can we imagine them saying?
- 5 What do they DO?**  
What do they do today?  
What behavior have we observed?  
What can we imagine them doing?
- 6 What do they HEAR?**  
What are they hearing others say?  
What are they hearing from friends?  
What are they hearing from colleagues?  
What are they hearing second-hand?
- 7 What do they THINK and FEEL?**  
**PAINS**  
What are their fears, frustrations, and anxieties?  
**GAINS**  
What are their wants, needs, hopes and dreams?  
What other thoughts and feelings might motivate their behavior?

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## 4.1 Apply Customer Centricity with Design Thinking

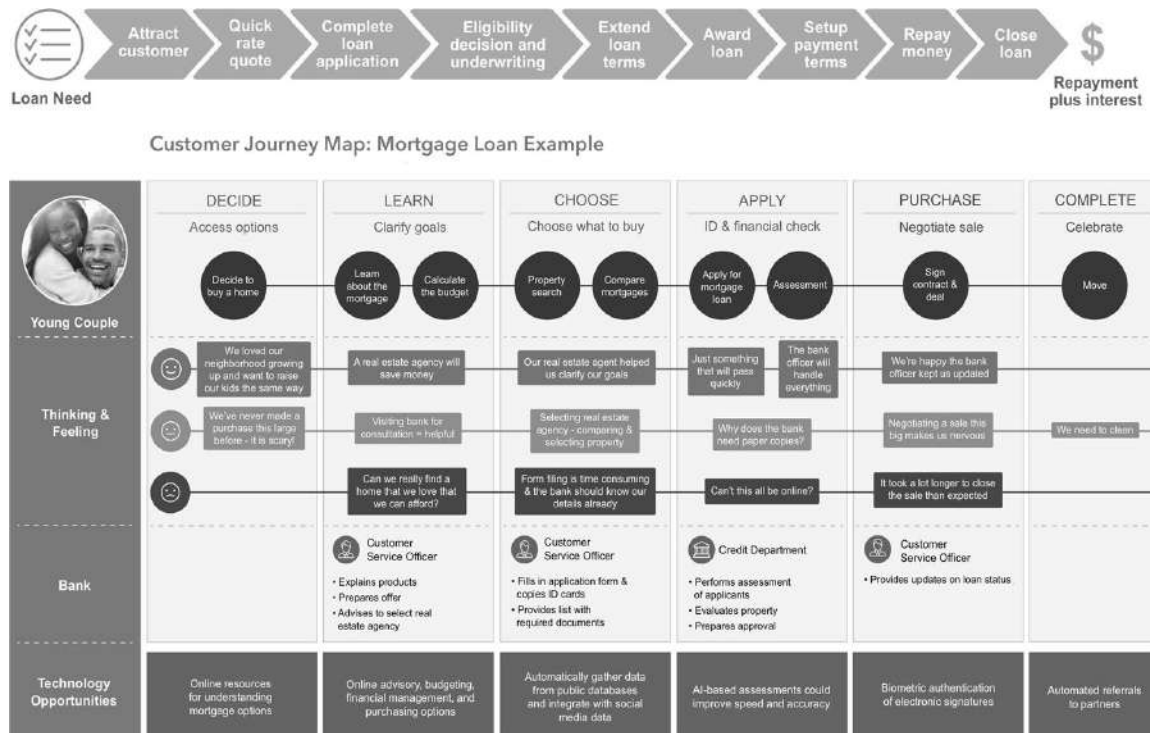
### Use journey maps to design the Customer experience



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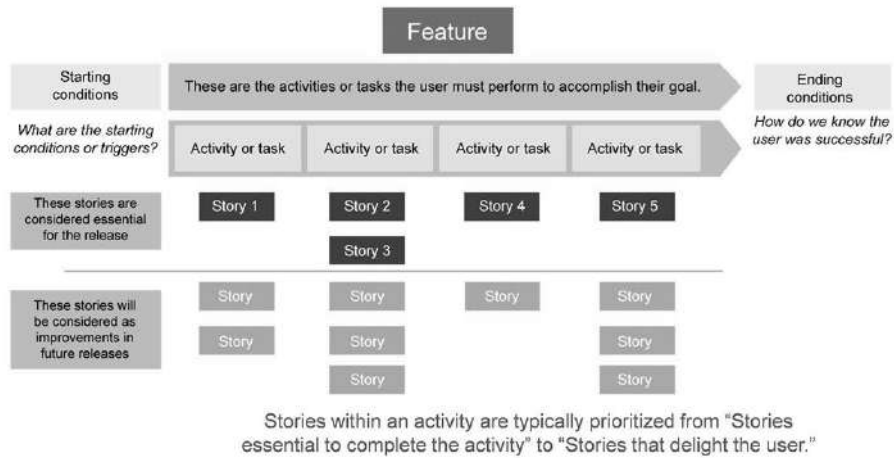
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Notes:



## 4.1 Apply Customer Centricity with Design Thinking

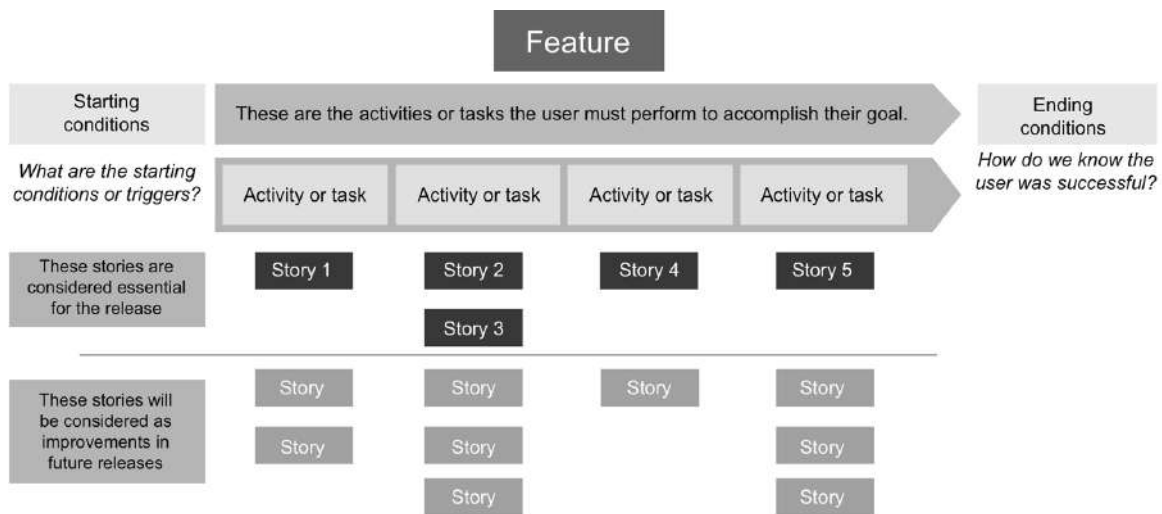
### Use story maps to capture workflows



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Notes:



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### 4.2 Prioritize the Program Backlog

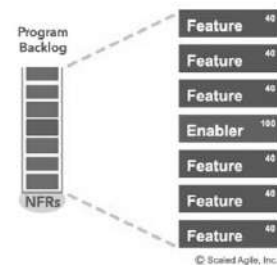
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Notes:

#### Features are managed through the Program Backlog

The Program Backlog is the holding area for upcoming Features, which are intended to address user needs and deliver business benefits for a single Agile Release Train (ART).



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### Vision aligns everyone on the product's direction

The Vision is a description of the future state of the product

- ▶ How will our product solve our customer's problems?
- ▶ What Features does it have?
- ▶ How will it differentiate us?
- ▶ What Nonfunctional Requirements does it deliver?



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### Features represent the work for the Agile Release Train

- ▶ Feature is an industry-standard term familiar to marketing and Product Management
- ▶ A benefit hypothesis justifies Feature implementation cost and provides business perspective when making scope decisions
- ▶ Acceptance criteria are typically defined during Program Backlog refinement
- ▶ Reflect functional and nonfunctional requirements
- ▶ Fits in one PI

#### Example:

*Multi-factor authentication*

#### Benefit hypothesis

Enhance user security via both password and a device.

#### Acceptance criteria


1. USB tokens as a first layer
2. Password authentication second layer
3. Multiple tokens on a single device
4. User activity log reflecting both authentication factors

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Notes:

## 4.2 Prioritize the Program Backlog



Activity: Describe three Features

Prepare  
7 min

- ▶ **Step 1:** Individually identify three Features from your context
- ▶ **Step 2:** In your workbook, write down the Features and the benefit hypothesis for these Features
- ▶ **Step 3:** Choose one of the Features and write down some acceptance criteria for it

**Example:**

**Feature:**  
Multi-factor authentication

**Benefit Hypothesis:**  
Enhance user security via both password and a device.

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Notes:

Feature 1:

Benefit hypothesis:

Acceptance Criteria:

Feature 2:

Benefit hypothesis:

Acceptance Criteria:

Feature 3:

Benefit hypothesis:

Acceptance Criteria:

### Features are implemented by Stories

- ▶ Stories are small increments of value that can be developed in days and are relatively easy to estimate
- ▶ Story user-voice form captures role, activity, and goal
- ▶ Features fit in one PI for one ART; Stories fit in one iteration for one Team

#### Enabler Story

Relocate mount for obstacle sensor to the top bracket so that it has a full 360° around the vehicle.

Enabler Stories represent different types of work, such as: *Exploration, Architecture, Infrastructure, Compliance*

#### Business Feature

**Feature:** Avoid obstacles unique to government installations  
**Benefit hypothesis:** Characterize sensor's ability to detect and process obstacles unique to government installations

#### User Story

**As an** obstacle sensor **I can** track a single obstacle that continually changes speed and directions - like carts, pedestrians, forklifts, etc. **So that** vehicle control can respond to the obstacle's dynamic behavior

Notes:

### Estimate Stories with relative Story points

- ▶ A Story point is a singular number that represents:
  - Volume: How much is there?
  - Complexity: How hard is it?
  - Knowledge: What do we know?
  - Uncertainty: What's not known?
- ▶ Story points are relative. They are not connected to any specific unit of measure.

#### How *big* is it?



Guidance: Compared with other Stories, an 8-point Story should take relatively four times longer than a 2-point Story.

Notes:

## 4.2 Prioritize the Program Backlog

### Apply estimating poker for fast, relative estimating

- ▶ Estimating poker combines expert opinion, analogy, and disaggregation for quick but reliable estimates
- ▶ All team members participate



#### Steps

- 1 Each estimator gets a deck of cards
- 2 Reads a job
- 3 Estimators privately select cards
- 4 Cards are turned over
- 5 Discuss differences
- 6 Re-estimate

Source: Mike Cohn, *Agile Estimating and Planning*

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Notes:

### Estimation is a whole-team exercise

- ▶ Increases accuracy by including *all* perspectives
- ▶ Builds understanding
- ▶ Creates shared commitment



The whole team estimates Stories

**Warning:** Estimation performed by a Manager, Architect, or select group negates these benefits.

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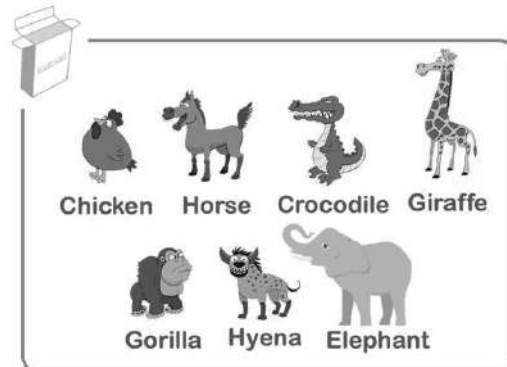


### Activity: Relative size estimating



Use estimating poker to relatively estimate the mass of a set of animals.

- **Step 1:** As a team at your table, identify the smallest animal and mark it as 1
- **Step 2:** Estimate the remaining animals using values 1, 2, 3, 5, 8, 13, 20, 40, 100



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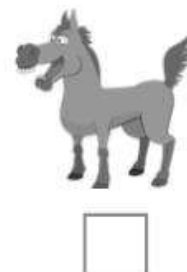
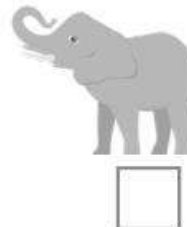
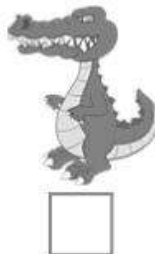
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### Relative Size Estimating

Think in relative sizing of these animals. Which one would be smallest? Mark it as 1.

At your table, you will find a deck of Estimating Poker cards. As a team, use the cards to estimate the remaining of the animals.

If you identify the Hyena as 1. How would you relatively estimate the horse for example?



## 4.2 Prioritize the Program Backlog

### Prioritization of Features in a flow-based system

Prioritization in a flow-based system requires knowing two things:

- ▶ The cost of delay (CoD) of delivering value
- ▶ The duration to implement the value

*If you only quantify one thing, quantify the Cost of Delay.*

—Don Reinertsen, *Principles of Product Development Flow*

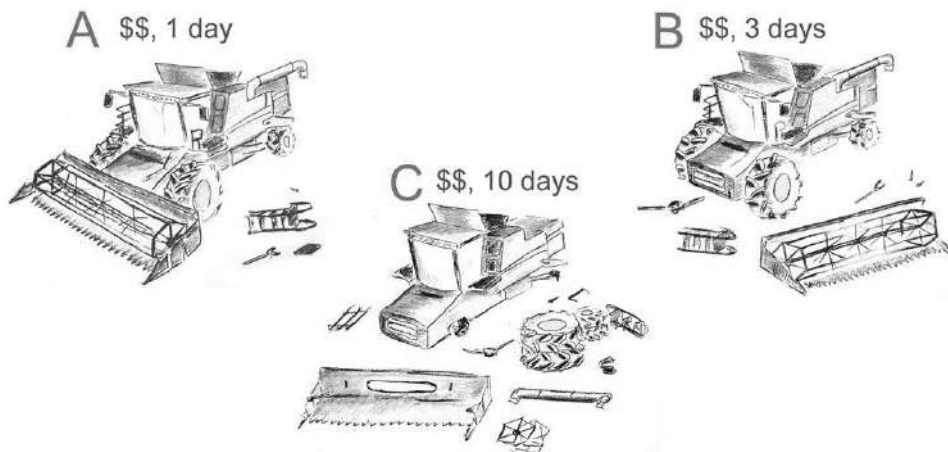


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Notes:

### Example with equal CoD: Which job first?



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Notes:

## 4.2 Prioritize the Program Backlog

Example with equal duration: Which job first?

**A** \$\$\$, 3 days

**B** \$\$, 3 days

**C** \$, 3 days

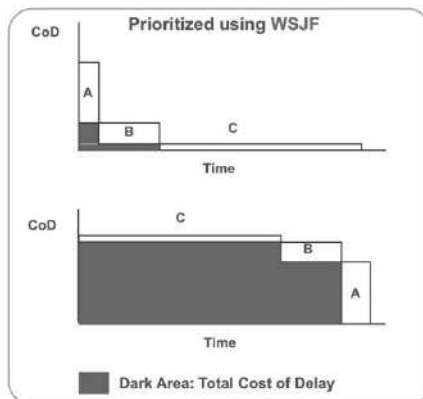
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Notes:

General case: Any Cost of delay (CoD) and duration

In the general case, give preference to jobs with shorter duration and higher CoD, using Weighted Shortest Job First (WSJF):



$$\text{WSJF} = \frac{\text{Cost of Delay}}{\text{Job Duration (Job size)}}$$

Feature	Duration	CoD	WSJF
A	1	10	10
B	3	3	1
C	10	1	0.1

*Adapted from The Principles of Product Development Flow, Donald G. Reinertsen*

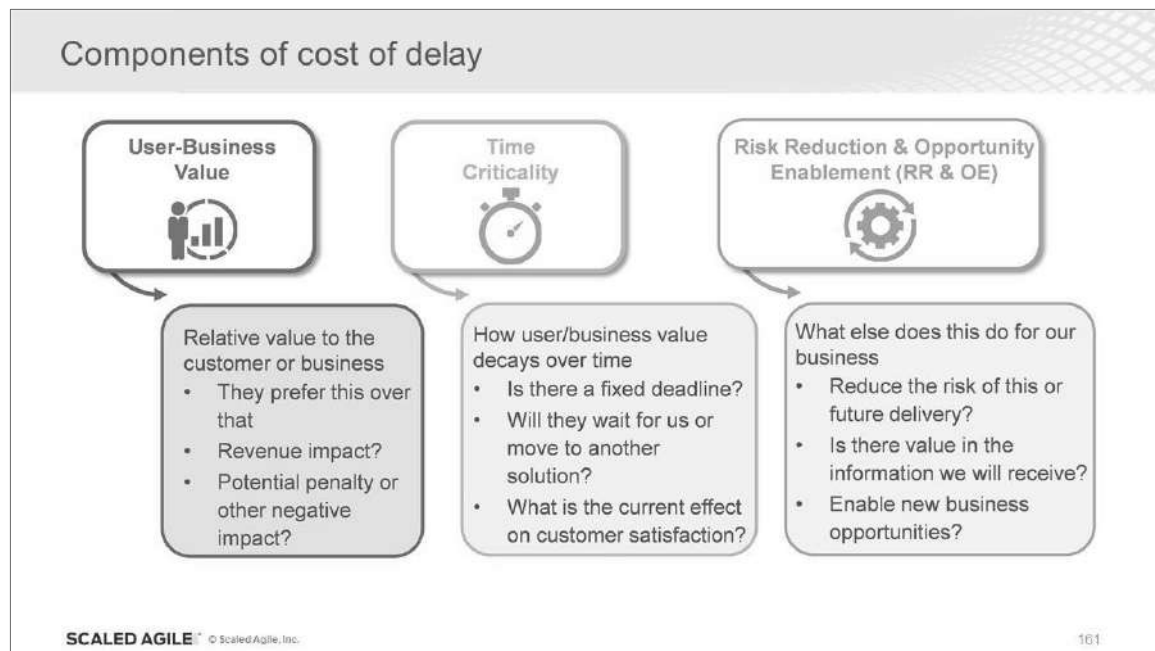
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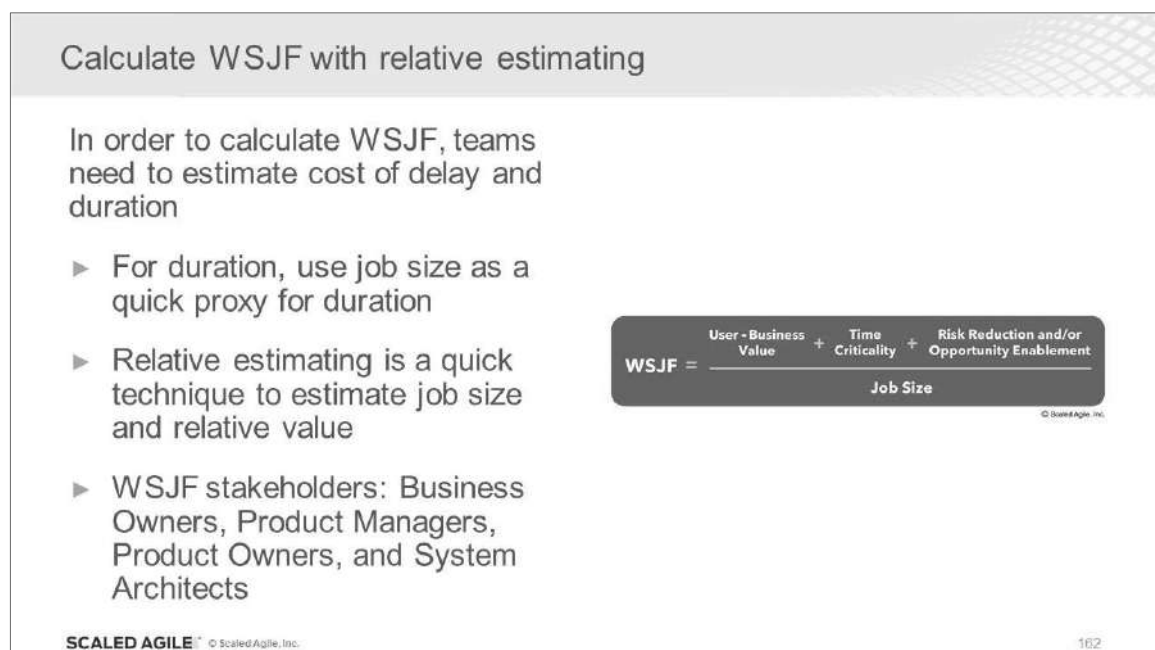
Notes:



## 4.2 Prioritize the Program Backlog




Notes:





Notes:

## 4.2 Prioritize the Program Backlog



### Activity: Weighted Shortest Job First (WSJF) prioritization

Prepare  


Share  


► **Step 1:** Prioritize three of the Features you identified earlier using WSJF

► **Step 2:** Share some insights from this activity with the class

Feature	User-business value	Time criticality	RR   OE value	CoD	Job size	WSJF
	+	+	=	÷	=	
	+	+	=	÷	=	
	+	+	=	÷	=	

Scale for each parameter: 1, 2, 3, 5, 8, 13, 20  
 Note: Do one column at a time, start by picking the smallest item and giving it a "1"  
 There must be at least one "1" in each column!

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Notes:

Feature	User-business value	Time criticality	RR   OE value	CoD	Job size	WSJF
	+	+	=	÷	=	
	+	+	=	÷	=	
	+	+	=	÷	=	

Scale for each parameter: 1, 2, 3, 5, 8, 13, 20

Note: Do one column at a time, start by picking the smallest item and giving it a "1."  
There must be at least one "1" in each column!

### 4.3 Participate in PI Planning

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Notes:

#### Program Increment Planning

Program Increment (PI) Planning is a cadence-based, face-to-face event that serves as the heartbeat of the Agile Release Train (ART), aligning all the teams on the ART to a shared mission and Vision.

- ▶ Two days every 8 – 12 weeks (10 weeks is typical)
- ▶ Everyone attends, in person if at all possible
- ▶ Product Management owns Feature priorities
- ▶ Agile Teams own Story planning and high-level estimates
- ▶ Architect/Engineering and UX work as intermediaries for governance, interfaces, and dependencies



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Notes:



Video: The Power of PI Planning





<https://youtu.be/EF0yGq9XCrA>

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Notes:

The benefits of PI Planning

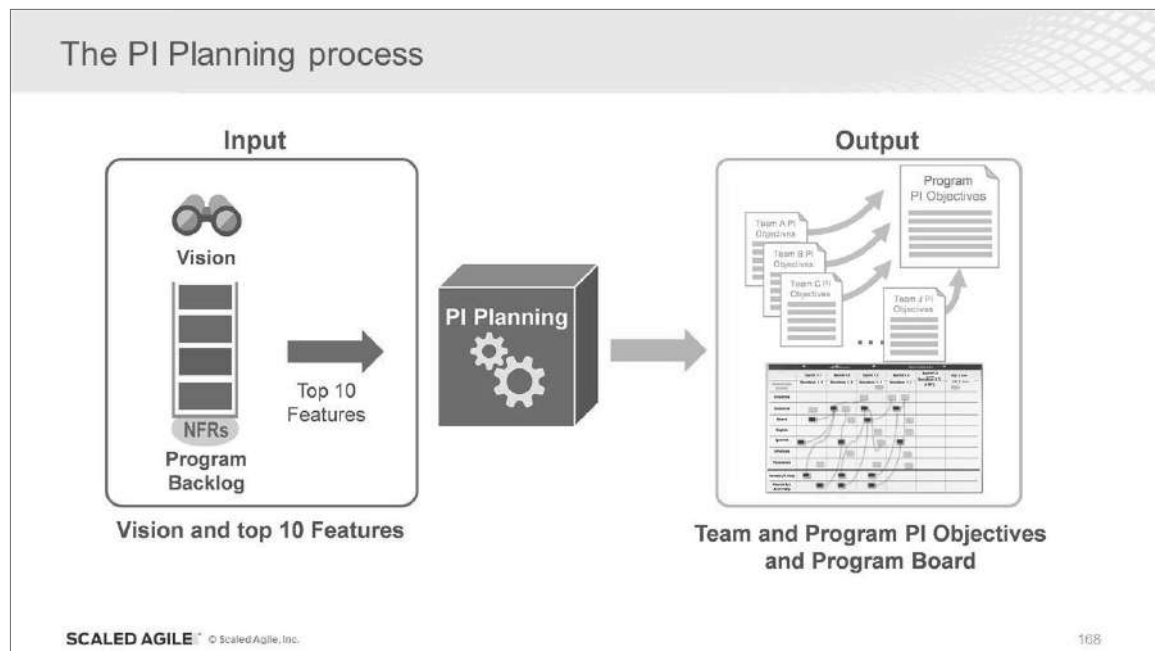
- ▶ Establishing face-to-face communication across all team members and stakeholders
- ▶ Aligning development to business goals with the business context, Vision, and Team/Program PI Objectives
- ▶ Identifying dependencies and fostering cross-team and cross-ART collaboration
- ▶ Providing the opportunity for 'just the right amount' of architecture and Lean User Experience (UX) guidance
- ▶ Matching demand to capacity, eliminating excess work in process (WIP)
- ▶ Fast decision making

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Notes:

## 4.3 Participate in PI Planning



Notes:

Align to a mission with PI Objectives

- ▶ Objectives are business summaries of what each team intends to deliver in the upcoming PI.
- ▶ They often map directly to the Features in the backlog.
- ▶ Example:
  - Aggregation of a set of Features
  - A Milestone like a trade show
  - An Enabler Feature supporting the implementation
  - A major refactoring

Objectives for PI 1	Business Value	Actual Value
<b>Structured location and validation of locations</b>		
• Navigate autonomously from distribution center to top 5 most frequent destinations	—	—
• Park at 1 building that requires parallel parking	—	—
• Reduce GPS signal loss by 25%	—	—
• Build and demonstrate proof of concept for next generation vehicle navigation systems	—	—
<b>Uncommitted Objectives</b>		
• Spike: conduct hijack testing of the vehicle sensors	—	—

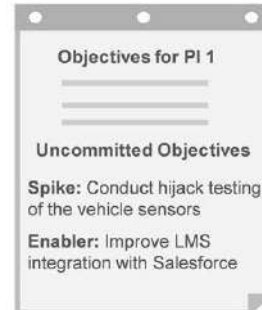
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Notes:

### Maintain predictability with uncommitted objectives

Uncommitted objectives help improve the predictability of delivering business value.

- ▶ They are planned and aren't extra things teams do 'just in case you have time'
- ▶ They are not included in the commitment, thereby making the commitment more reliable
- ▶ If a team has low confidence in meeting a PI Objective, encourage them to move it to uncommitted
- ▶ If an item has many unknowns, consider moving it to uncommitted and put in early spikes
- ▶ Uncommitted objectives do count in velocity/capacity.



Notes:

### Prepare to experience a simulated PI Planning event

#### The flow of the simulation



You will be presented with the program Vision



You will be involved in planning two iterations considering Stories and Features



You will be drafting PI Objectives based on the program Vision and Features




You will be collaborating with the Business Owners to assign business value to the PI Objectives

Notes:


## 4.3 Participate in PI Planning

### Outcomes of the PI Planning simulation


Actively participating in a simulated PI Planning event will enable you to:




Experience the business benefits of establishing communication across all team members and stakeholders



Experience estimating capacity for the iteration



Experience drafting PI Objectives for achieving the Program Increment and committing to the plan



Experience managing program risks

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Notes:

### Activity: Identify program roles

Duration: 3 min

- **Step 1:** Identify program roles for the simulation
- **Step 2:** Ensure that you have all key roles required for the PI Planning simulation

Simulation role	Assigned to
Executive	Volunteer
Product Manager	Volunteer
System Architect, UX and Development Manager	Volunteer

**Example:** Your Instructor will be the RTE. A volunteer will be the Product Manager, etc.

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Notes:

## 4.3 Participate in PI Planning



Simulation: Why are we here?

 RTE




**Alignment to a common mission**  
*We are here to gain alignment and commitment around a clear set of prioritized objectives. I will now review the agenda for the next two days of the PI Planning Event.*

**PI Planning Agenda**


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Notes:



Simulation: Day 1 agenda



 Presented by RTE

8:00 > 9:00	Business Context		› State of the business and upcoming objectives
9:00 > 10:30	Product/Solution Vision		› Vision and prioritized Features
10:30 > 11:30	Architecture Vision and development practices		› Architecture, common frameworks, etc. › Agile tooling, engineering practices, etc.
11:30 > 1:00	Planning context and lunch		› Facilitator explains planning process
1:00 > 4:00	Team breakouts		› Teams develop draft plans and identify risks and impediments › Architects and Product Managers circulate
4:00 > 5:00	Draft plan review		› Teams present draft plans, risks, and impediments
5:00 > 6:00	Management review and problem solving		› Adjustments made based on challenges, risks, and impediments


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Notes:










## 4.3 Participate in PI Planning



### Simulation: Day 2 agenda




Presented by RTE

8:00 - 9:00	Planning adjustments		› Planning adjustments made based on previous day's management meeting
9:00 - 11:00	Team breakouts		› Teams develop final plans and refine risks and impediments › Business Owners circulate and assign business value to team objectives
11:00 - 1:00	Final plan review and lunch		› Teams present final plans, risks, and impediments
1:00 - 2:00	Program risks		› Remaining program-level risks are discussed and ROAMed
2:00 - 2:15	PI confidence vote		› Team and program confidence vote
2:15 - ???	Plan rework if necessary		› If necessary, planning continues until commitment is achieved
After commitment	Planning retrospective and moving forward		› Retrospective › Moving forward › Final instructions

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Notes:




### Simulation: Briefings


Executive



Product Manager




System Architect




Notes:




## 4.3 Participate in PI Planning



Simulation: Planning guidance




Expect this first PI Planning to feel a bit chaotic. Future PI Planning meetings will become more routine.

-  **Product Owners:** You have the content authority to make decisions at the user Story level
-  **Scrum Masters:** Your responsibility is to manage the timebox, the dependencies, and the ambiguities
-  **Agile Team:** Your responsibility is to define users Stories, plan them into the Iteration, and work out interdependencies with other teams

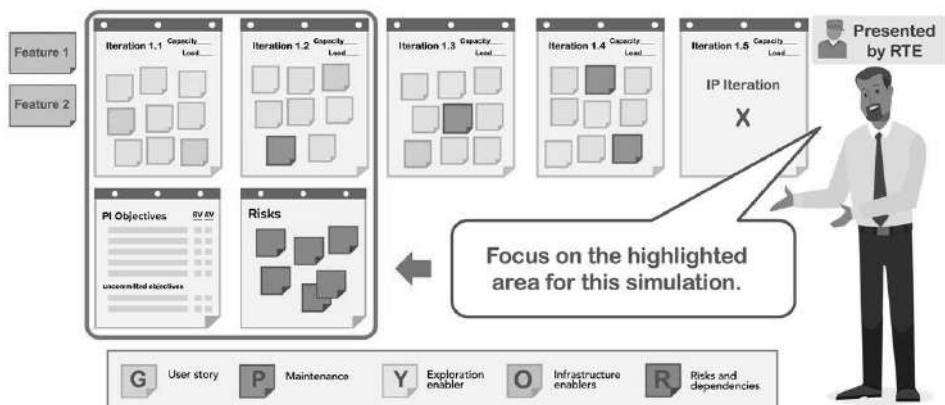
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Notes:



Simulation: Planning requirements



Feature 1

Feature 2

Iteration 1.1 Capacity Load

Iteration 1.2 Capacity Load

Iteration 1.3 Capacity Load

Iteration 1.4 Capacity Load

Iteration 1.5 Capacity Load

IP Iteration X

PI Objectives

Risks

Presented by RTE

Focus on the highlighted area for this simulation.


G User story P Maintenance Y Exploration enabler O Infrastructure enablers R Risks and dependencies

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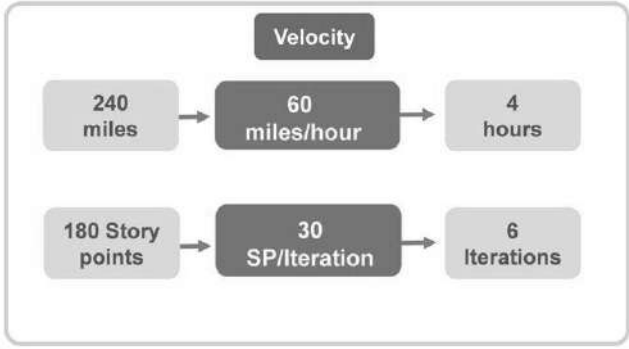
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Notes:

## 4.3 Participate in PI Planning



Simulation: Using historical data to calculate velocity




```
graph LR; subgraph Velocity; direction LR; A[240 miles] --> B[60 miles/hour]; B --> C[4 hours]; D[180 Story points] --> E[30 SP/Iteration]; E --> F[6 Iterations]; end
```

Establish velocity by looking at the average output of the last Iterations.

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Notes:



Simulation: Calculating Iteration capacity

Calculating Iteration capacity

- ▶ For every full-time Agile Team member contributing to Solution development, give the team 8 points (adjust for part-timers).
- ▶ Subtract 1 point for every team member vacation day and holiday.
- ▶ Find a small Story that would take about a half day to develop and a half day to test and validate. Call it a 1.
- ▶ Estimate every other Story relative to that one.

Example:

A 7-person team composed of 3 developers, 2 testers, 1 Product Owner, and 1 Scrum Master

Exclude The Scrum Master, Product Owner, and vacation time from the calculation


Calculated capacity:  
5 x 8 points = 40 points per Iteration

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Notes:

## 4.3 Participate in PI Planning



Activity: Calculate capacity


Duration  
5 min

- ▶ **Step 1:** Review the example on the previous slide
- ▶ **Step 2:** Calculate your own capacity for the next two, 2-week Iterations
  - The first Iteration starts Monday
  - Use your real availability
- ▶ **Step 3:** Make sure you have your team's capacity calculated

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Notes:




Activity: Team breakout #1

Duration  
45 min

Use Estimating Poker to relatively estimate the mass of a set of animals.


- ▶ **Step 1:** Setup the team area. Enter the capacity for each Iteration.
- ▶ **Step 2:** Pick up a Feature from the Product Manager.
- ▶ **Step 3:** Estimate the Stories using Story Points.
- ▶ **Step 4:** Load the Stories into the Iterations.
- ▶ **Step 5:** Write the PI Objectives using clear statements.
- ▶ **Step 6:** Identify the uncommitted objectives.
- ▶ **Step 7:** Identify any program risks and dependencies.



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Notes:



### Activity: Scrum of scrums (SoS) sync

Duration

5

min

- ▶ **Step 1:** Observe the SoS sync, conducted by the RTE
- ▶ **Step 2:** Each team's Scrum Master provides the team's current status and addresses the questions from the RTE
- ▶ **Step 3:** The RTE holds a meet-after after the sync (limited to 1 – 2 topics for the simulation)

SoS Sync Questions	Team 1	Team 2
Have you identified the capacity for each iteration in the PI?		
Have you identified most of the Stories for the first two iterations and begun estimating?		
Have you begun resolving dependencies with other teams?		
Are you discussing trade-offs and conflicting priorities with your Business Owners?		
Have you identified any program risks?		
Will you be ready to start writing PI Objectives in the next 15 minutes?		
Is there anything you need to discuss with other Scrum Masters? If so, stay for the meet-after		

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Notes:



### Activity: Draft plan review



- ▶ **Step 1:** Present the summary of your team's first two iterations and one or more draft PI Objectives
- ▶ **Step 2:** Make sure that you have included the following:
  - Capacity and load for each iteration
  - Draft PI Objectives
  - Program risks and impediments

Notes:

### Management review and problem-solving

At the end of day 1, management meets to make adjustments to scope and objectives based on the day's planning.

#### Common questions during the managers' review:

- ▶ What did we just learn?
- ▶ Where do we need to adjust Vision? Scope? Team assignments?
- ▶ Where are the bottlenecks?
- ▶ What Features must be de-scoped?
- ▶ What decisions must we make between now and tomorrow to address these issues?

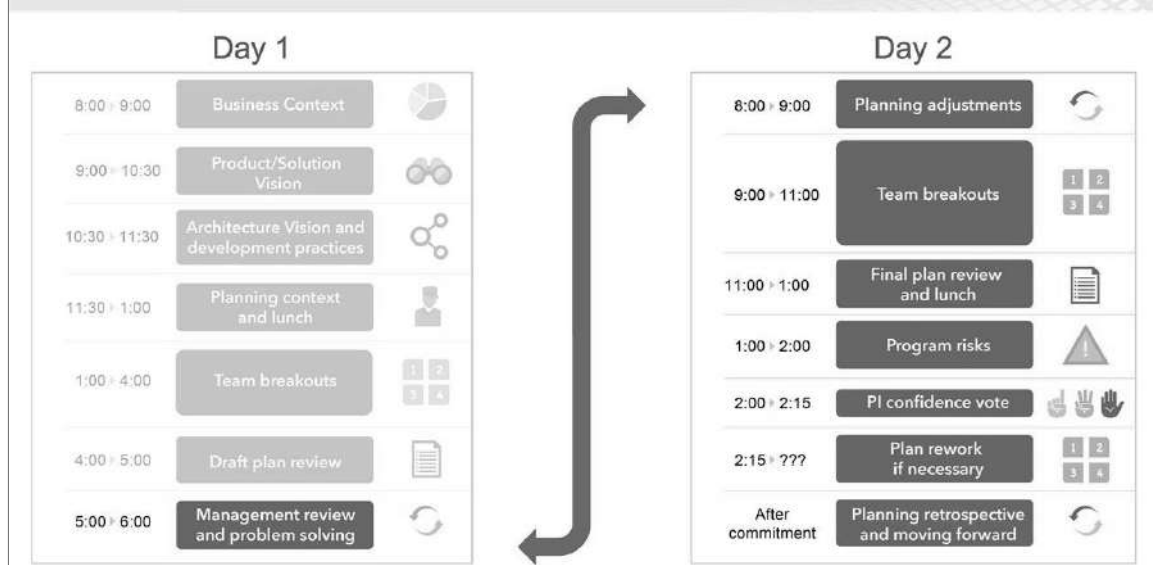


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Notes:

### Activities during day 2



Notes:

### Make planning adjustments

- ▶ Based on the previous day's management review and problem-solving meeting, adjustments are discussed.
- ▶ Possible changes:
  - Business priorities
  - Adjustment to Vision
  - Changes to scope
  - Movement of people



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Notes:

### Team breakout #2

Based on new knowledge and a good night's sleep, teams work to create their final plans.

- ▶ In the second team breakout, Business Owners circulate and assign business value to PI Objectives from low (1) to high (10)
- ▶ Teams finalize the Program Increment plan
- ▶ Teams also consolidate program risks, impediments, and dependencies
- ▶ Uncommitted objectives provide the capacity and guard band needed to increase the reliability of cadence-based delivery

Team A	
PI Objectives	BV
■ Proof of concept with mock sounds	10
■ Help with radar POC	4
■ Decide to create or buy engine noises	3
<b>Uncommitted</b>	
■ Proof of concept with real sounds	7

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Notes:



## 4.3 Participate in PI Planning



### Activity: Setting business value



The instructor will demonstrate assigning business value for one team's objectives.

- **Step 1:** Bring the Business Owners to one team's draft plans
- **Step 2:** The Business Owners will set value on a scale of 1 – 10 for each identified objective
- **Step 3:** Observe the discussion that would take place, illustrating the larger purposes and thought processes around assigning business value

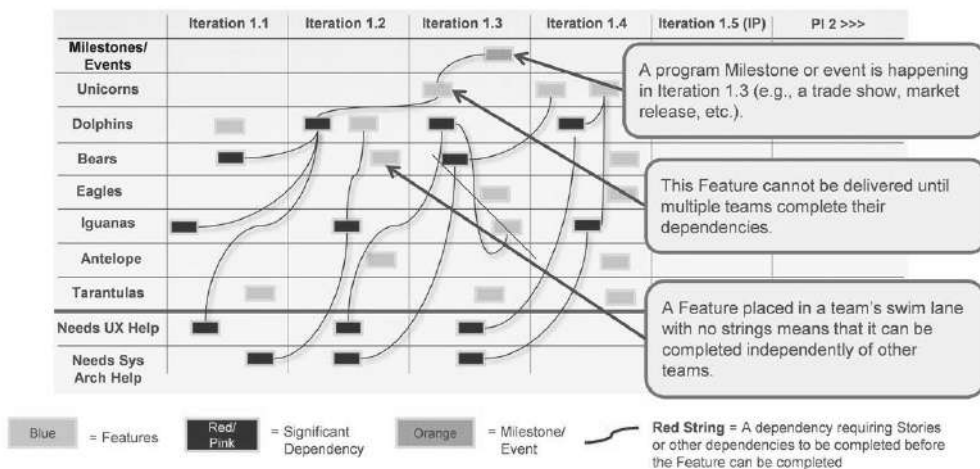
Team A	
PI Objectives	BV
■ Proof of concept with mock sounds	10
■ Help with radar POC	4
■ Decide to create or buy engine noises	3
<b>Uncommitted</b>	
■ Proof of concept with real sounds	7

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Notes:

### Program Board - Feature delivery, dependencies, and Milestones



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Notes:

### Final plan review

Teams and Business Owners peer-review all final plans.



**Final plan review**

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Notes:

### Building the final plan

- ▶ Final plans are collected at the front of the room
- ▶ Final plans are reviewed by all teams
- ▶ Business Owners are asked whether they accept the plan
- ▶ If so, the team's plan and program risk sheet are brought to the front of the room
- ▶ If not, the plans stay in place, and the team continues planning after the review



**A team's final plan**

*Used with permission of Discount Tire Corporation*

Notes:

### Addressing program risks

After all plans have been presented, remaining program risks and impediments are discussed and categorized.

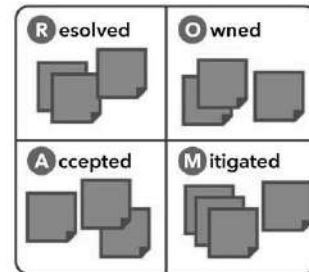
ROAMing risks:

**Resolved** - Has been addressed. No longer a concern.


**Owned** - Someone has taken responsibility.

**Accepted** - Nothing more can be done. If risk occurs, release may be compromised.

**Mitigated** - Team has plan to adjust as necessary.



Notes:

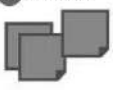

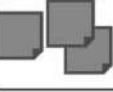
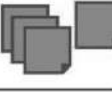


Activity: Manage program risks

Duration  
10 min

The instructor will demonstrate **ROAM**ing one to two risks for one team.

- ▶ **Step 1:** Pick one to two risk examples.
- ▶ **Step 2:** Read them in front of all teams and stakeholders.
- ▶ **Step 3:** Ask if anyone can own, help mitigate, or resolve the risks. Otherwise, accept as is.
- ▶ **Step 4:** Put each risk into a corresponding quadrant of the ROAM sheet for the program.

<b>R</b> esolved 	<b>O</b> wned 
<b>A</b> ccepted 	<b>M</b> itigated 

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Notes:

### Confidence vote: Team and program

After dependencies are resolved and risks are addressed, a confidence vote is taken by the team and program.

#### A commitment with two parts:

1. Teams agree to do everything in their power to meet the agreed-to objectives
2. In the event that fact patterns dictate that it is simply not achievable, teams agree to escalate immediately so that corrective action can be taken



No confidence



Little confidence



Good confidence



High confidence



Very high confidence



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Notes:

### Run a planning meeting retrospective

The PI planning event will evolve over time. Ending with a retrospective will help continuously improve it.



A Team's Retrospective

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Notes:

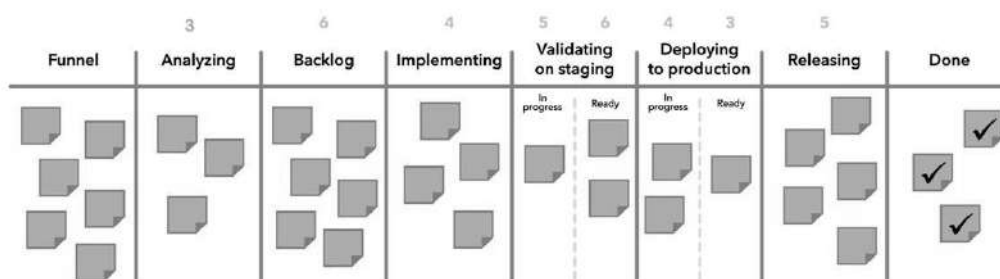
### 4.4 Develop on Cadence; Release on Demand

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Notes:

#### Manage the flow of work with the Program Kanban



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Notes:

### An example of a Program Kanban



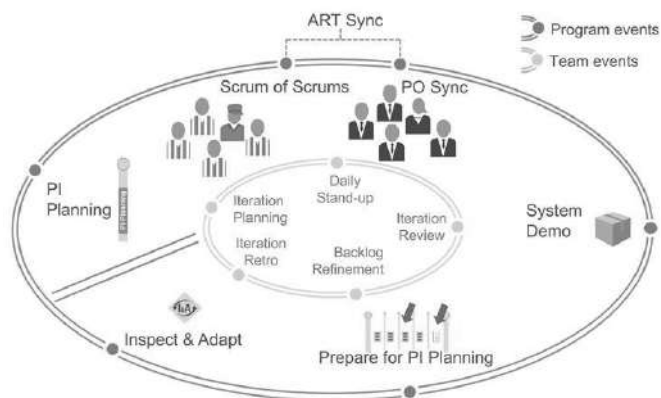
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Notes:

### Program events drive the train

Program events create a closed-loop system to keep the train on the tracks.



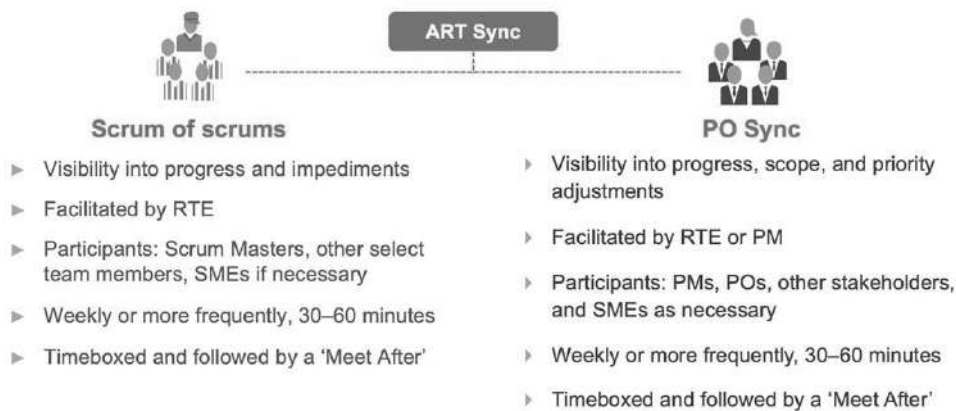
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Notes:

### ART sync is used to coordinate progress

Programs coordinate dependencies through sync meetings.



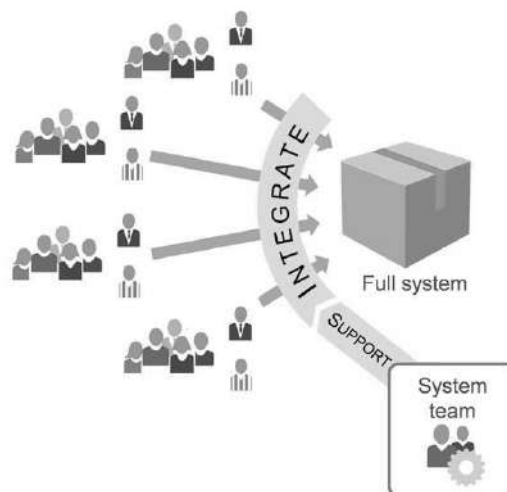
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Notes:

### Demo the full system increment every two weeks

- ▶ Features are functionally complete or 'toggled' so as not to disrupt demonstrable functionality
- ▶ New Features work together and with existing functionality
- ▶ Happens after the Iteration review (may lag by as much as one iteration, maximum)
- ▶ Demo from a staging environment which resembles production as much as possible



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Notes:



### Innovation and Planning (IP) Iteration

*Provide sufficient capacity margin to enable cadence. —Donald G. Reinertsen*

Facilitate reliability, Program Increment readiness, planning, and innovation

- ▶ **Innovation:** Opportunity for innovation, hackathons, and infrastructure improvements
- ▶ **Planning:** Provides for cadence-based planning
- ▶ Estimating guard band for cadence-based delivery

Notes:

### IP Iteration calendar

Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5
Buffer for leftover work				
Final verification and validation, and documentation (if releasing)				
Innovation				
PI planning readiness				
6	7	8	9	10
Innovation continues	Continuing education	PI planning		
		Business context	Planning adjustments	Optional time for distributed planning
		Product / solution vision	Team breakouts	
		Architecture vision and development practices	Final plan review and lunch	
PI planning readiness	Inspect & Adapt Event	Planning requirements and launch	Program risks	
		Team breakouts	PI confidence vote	
		Draft plan review	Plan rework if necessary	
		Management review and problem-solving	Planning retrospective and moving forward	
11	12	13	14	15

Notes:

### Without the IP Iteration...

- ▶ Lack of delivery capacity buffer impacts predictability
- ▶ Little innovation; tyranny of the urgent
- ▶ Technical debt grows uncontrollably
- ▶ People burn out
- ▶ No time for teams to plan, demo, or improve together



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Notes:

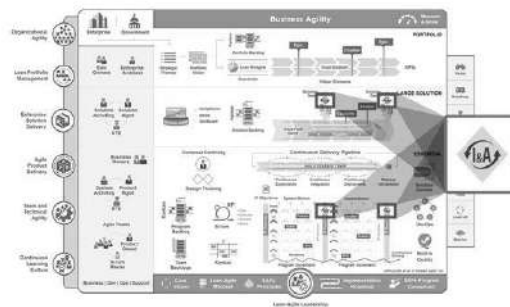
### Improving results with the Inspect and Adapt event

#### Three parts of Inspect and Adapt:

1. The PI System Demo
2. Quantitative and Qualitative Measurement
3. Problem-Solving Workshop

**Timebox:** 3 – 4 hours per PI

**Attendees:** Teams and stakeholders



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Notes:

## PI System Demo

At the end of the PI, teams demonstrate the current state of the Solution to the appropriate stakeholders.

- ▶ Often led by Product Management, POs, and the System Team
- ▶ Attended by Business Owners, program stakeholders, Product Management, RTE, Scrum Masters, and teams



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Notes:

## Program performance reporting

As part of the PI System Demo, teams compare planned vs actual PI Objectives.

- ▶ Teams meet with their Business Owners to self-assess the business value they achieved for each objective
- ▶ Each team's planned vs actual business value is then rolled up to the program predictability measure.

Objectives for PI 3	Business Value	
	Plan	Actual
• Structured locations and validation of locations	7	7
• Build and demonstrate a proof of concept for context images	8	8
• Implement negative triangulation by: tags, companies and people	8	6
• Speed up indexing by 50%	10	5
• Index 1.2 billion more web pages	10	8
• Extract and build URL abstracts	7	7
<b>Uncommitted Objectives</b>		
• Fuzzy search by full name	7	0
• Improve tag quality to 80% relevance	4	4
<b>Totals</b>	<b>50</b>	<b>45</b>
<b>% Achievement:</b>	<b>90%</b>	

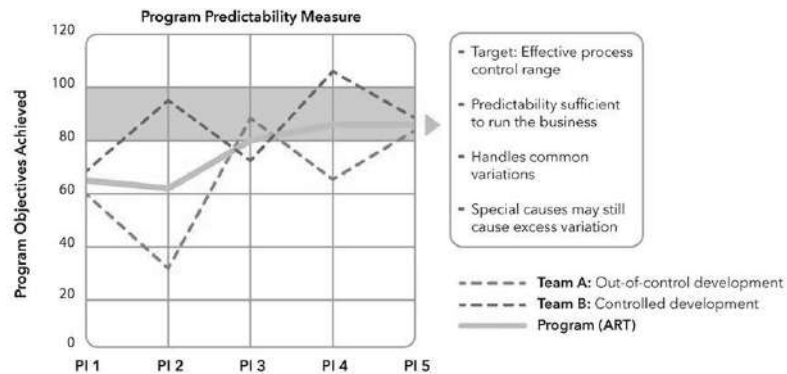
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Notes:

### Quantitative and qualitative measurement

The report compares actual business value achieved to planned business value.



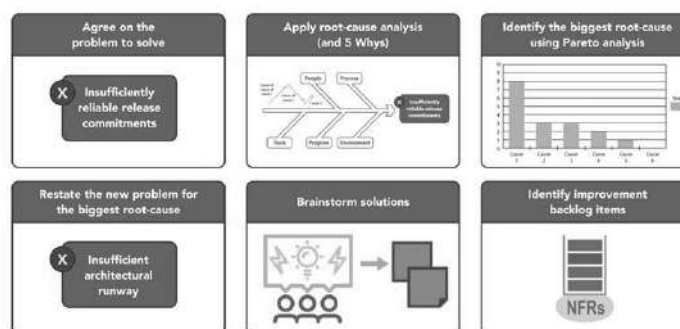
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Notes:

### The problem-solving workshop

Teams conduct a short retrospective, to systematically address the larger impediments that are limiting velocity.




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Notes:




Notes:



Activity: DevOps myth or fact

Prepare  
5 min

- ▶ **Step 1:** Take the myth or fact quiz in your workbook
- ▶ **Step 2:** Check your results with the answer key at the bottom of page that follows the quiz



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Notes:

### Myth or Fact Quiz

MYTH   FACT

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. DevOps is just about automation   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. DevOps is a cultural change   |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. You don't need Lean-Agile to have a successful DevOps implementation        |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Agile is for development not operations                                     |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. The deployment pipeline is used to deploy environments as well as solutions |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. DevOps tries to bridge the gap between new Features and stable solutions    |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Measurements are an important part of DevOps                                |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Automation of testing reduces the holding cost                              |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. DevOps is only for small software companies                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Chaos monkey was developed by Netflix                                      |



Video: What is DevOps?

Duration 



<https://vimeo.com/342037390/3a25026214>

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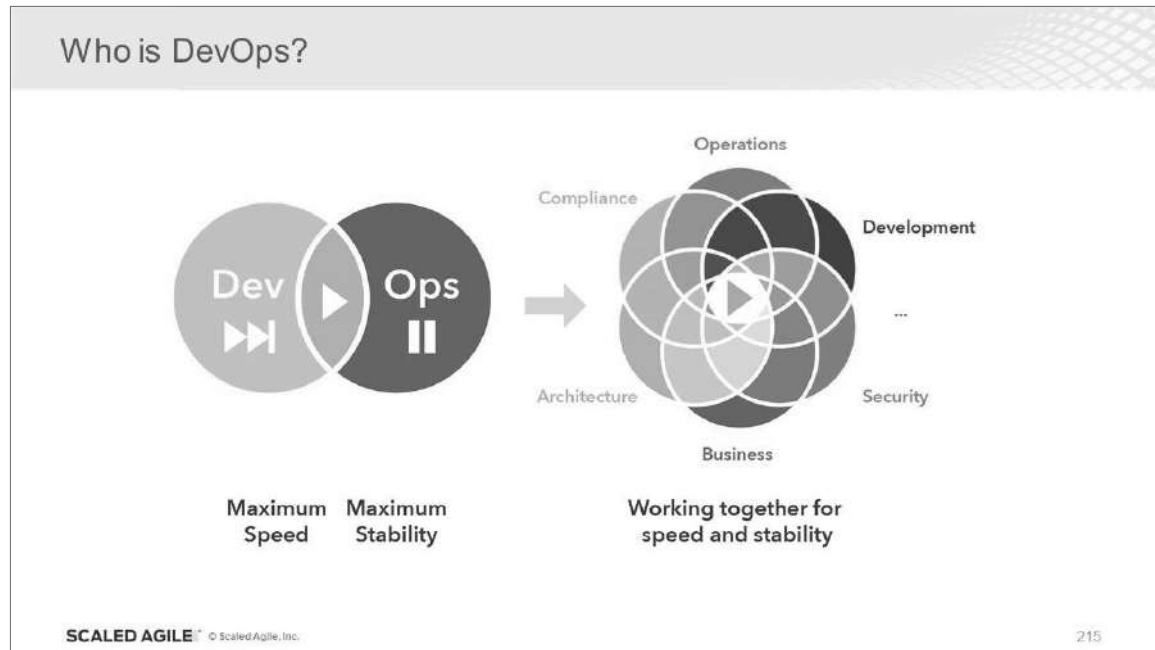
Notes:

## 4.5 Build a Continuous Delivery Pipeline with DevOps

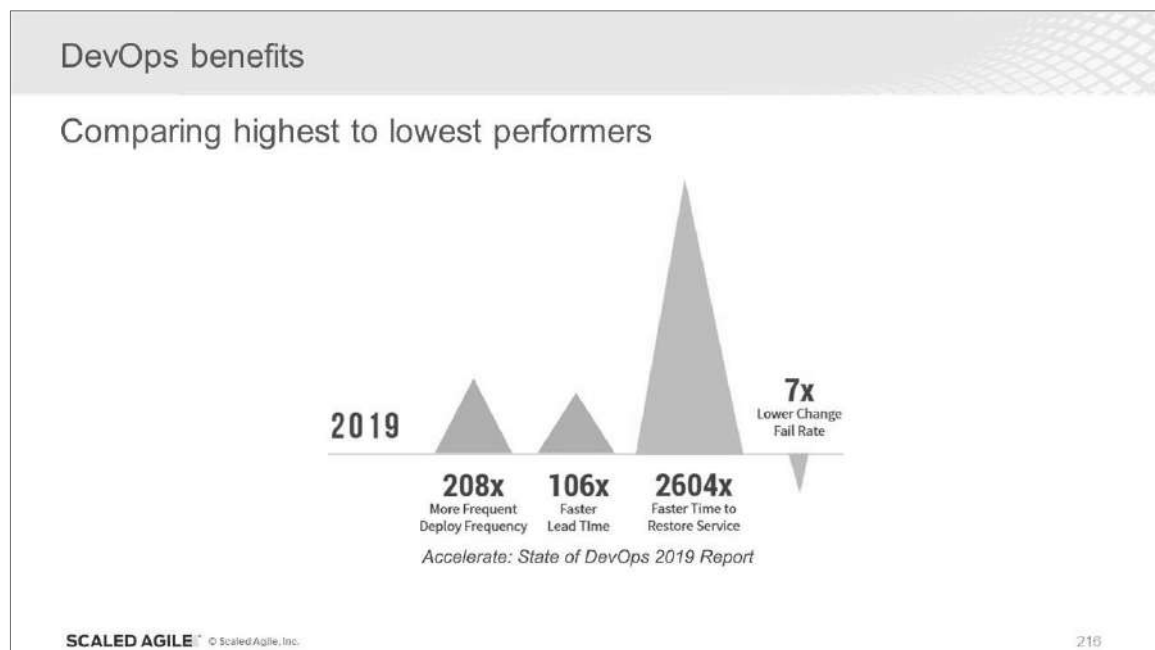
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## 4.5 Build a Continuous Delivery Pipeline with DevOps



Notes:



Notes:

## 4.5 Build a Continuous Delivery Pipeline with DevOps

### A CALMR approach to DevOps

- ▶ **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 full-stack telemetry.
- ▶ **Recovery** - Architect and enable low-risk releases. Establish fast recovery, fast reversion, and fast fix-forward.



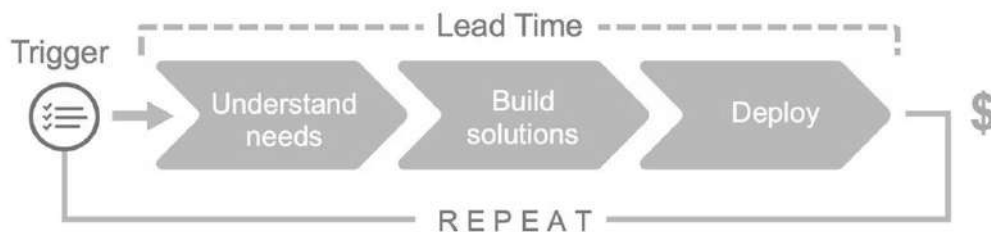
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Notes:

### 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.

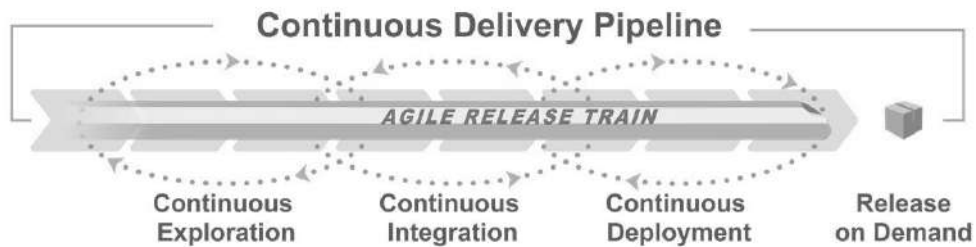
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Notes:

## 4.5 Build a Continuous Delivery Pipeline with DevOps

The Continuous Delivery Pipeline enables the flow of value

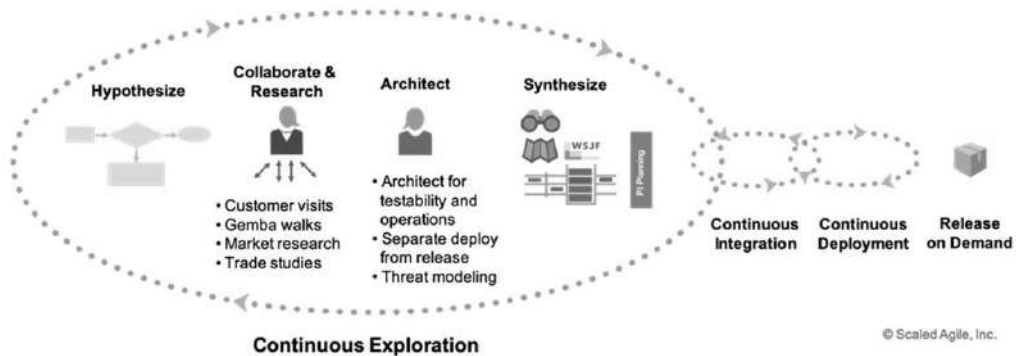


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Notes:

Continuous Exploration – Understand Customer needs



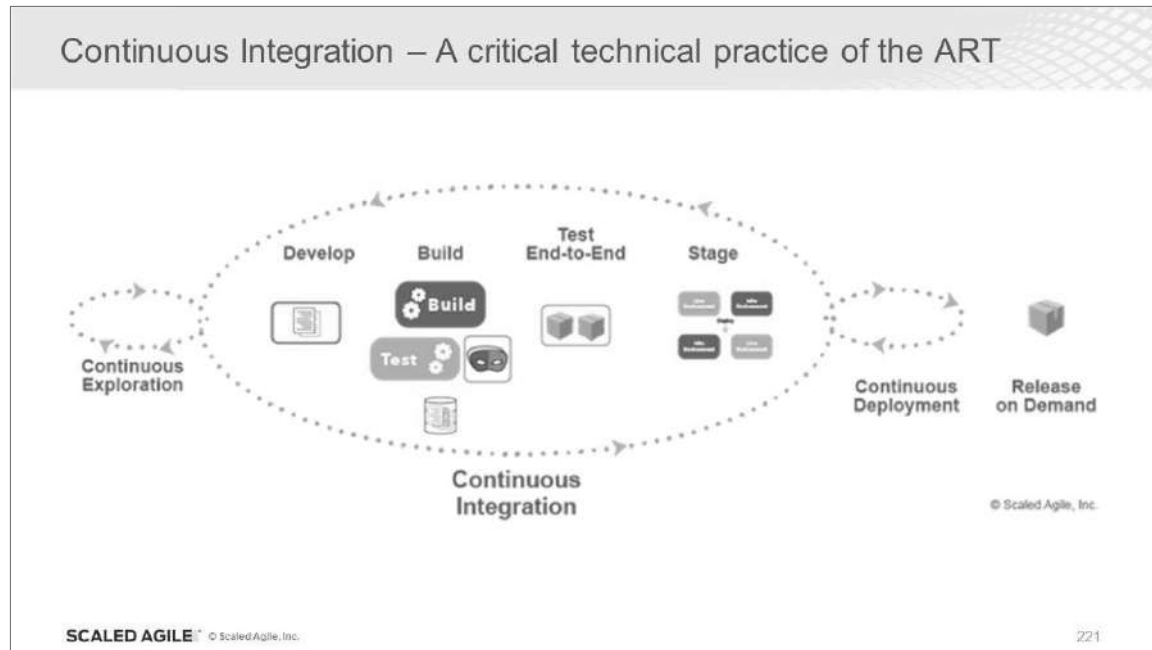
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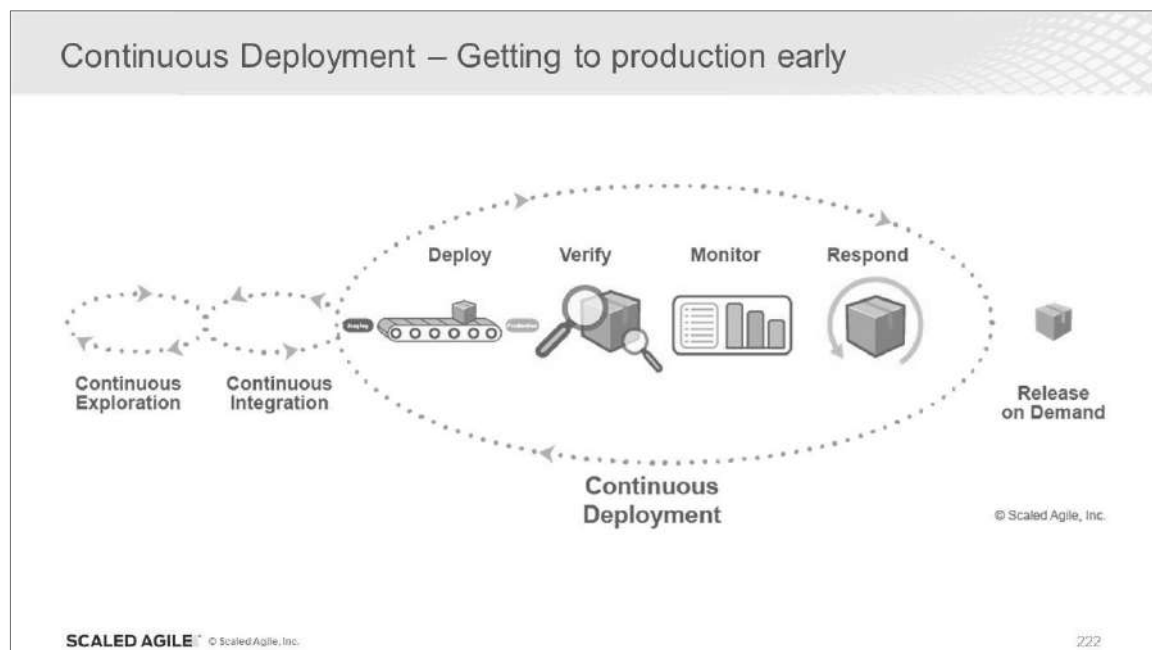
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Notes:

## 4.5 Build a Continuous Delivery Pipeline with DevOps



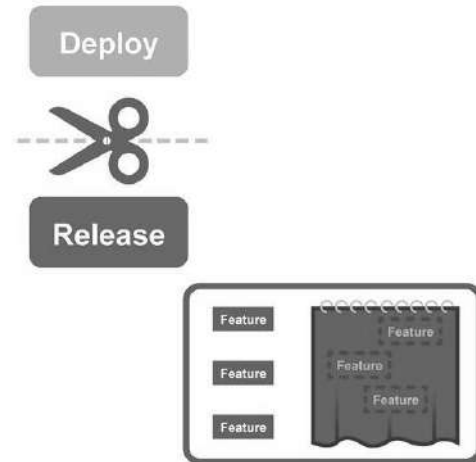
Notes:



Notes:

### Separate deploy from release

- ▶ Separate deploy to production from release
- ▶ Hide all new functionality under feature toggles
- ▶ Enables testing background and foreground processes in the actual production environment before exposing new functionality to users

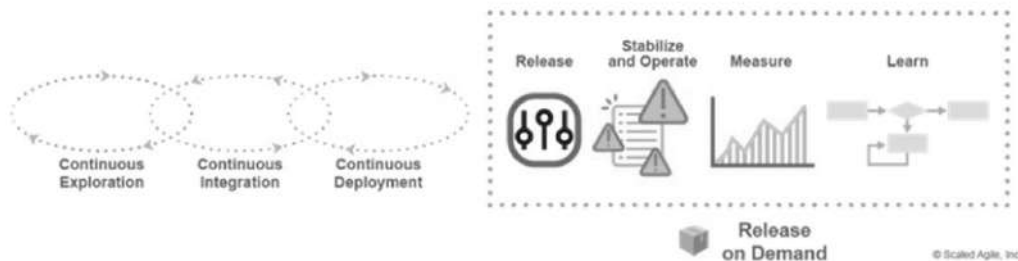


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Notes:

### Release on Demand – Making value available when it's needed



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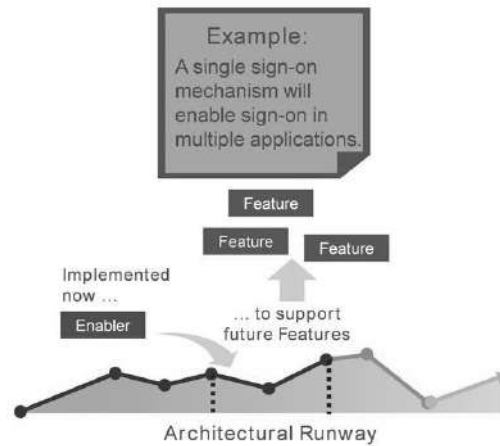
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Notes:

### Architect for releasability

Architectural Runway is existing code, hardware components, marketing branding guidelines, etc., that enable near-term business Features.

- ▶ Enablers build up the runway
- ▶ Features consume it
- ▶ Architectural Runway must be continuously maintained
- ▶ Use capacity allocation (a percentage of train's overall capacity in a PI) for Enablers that extend the runway



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Notes:

## Lesson review

In this lesson you:

- ▶ Applied Customer Centricity with Design Thinking
- ▶ Prioritized the Program Backlog
- ▶ Participated in PI Planning
- ▶ Developed on Cadence; Released on Demand

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Notes:

- ▶ Scaled Agile Framework recommended reading for this lesson:
  - *Agile Product Delivery*
  - *Customer Centricity*
  - *Design Thinking*
  - *WSJF*
  - *PI Planning*
  - *DevOps*
  - *Continuous Delivery Pipeline*





## Lesson 5

# Exploring Lean Portfolio Management

### Learning Objectives:

- 5.1 Define a SAFe portfolio
- 5.2 Connect the portfolio to Enterprise strategy
- 5.3 Maintain the Portfolio Vision
- 5.4 Establish portfolio flow
- 5.5 Fund Value Streams



SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.

### 5.1 Define a SAFe portfolio

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Notes:

#### The role of Lean Portfolio Management (LPM)

*Most strategy dialogues end up with executives talking at cross-purposes because ... nobody knows exactly what is meant by **vision** and **strategy**, and no two people ever quite agree on which topics belong where.*

*That is why, when you ask members of an executive team to describe and explain the corporate strategy, you frequently get wildly different answers. We just don't have a good business discipline for converging on issues this abstract.*

—Geoffrey Moore, *Escape Velocity*



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Notes:

## 5.1 Define a SAFe portfolio

### Lean Portfolio Management empowers the portfolio

The LPM function governs each SAFe portfolio, providing three essential collaborations to realize its responsibilities:

- ▶ *Strategy and investment funding*
- ▶ Agile portfolio operations
- ▶ Lean governance



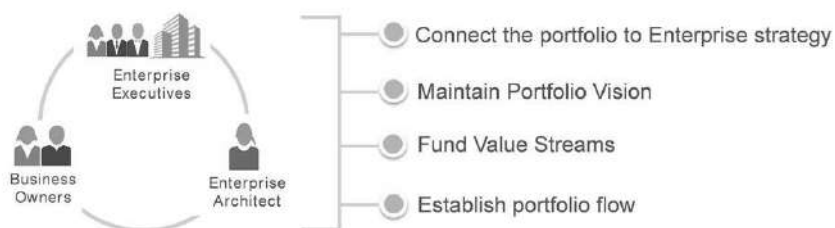
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Notes:

### Strategy and investment funding is a collaboration

- ▶ Key stakeholders collaborate to develop and communicate the portfolio strategy
- ▶ They provide Lean Budgeting and funding to the Value Streams that develop and maintain the portfolio products and services
- ▶ They build a Portfolio Kanban system to establish flow



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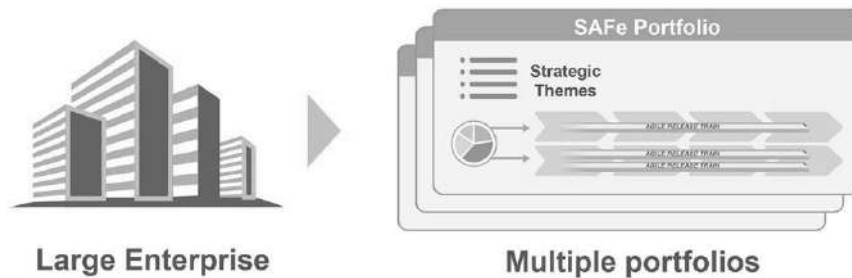
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Notes:

## 5.1 Define a SAFe portfolio

### Large Enterprises will have multiple portfolios

In larger Enterprises, there can be multiple SAFe portfolios, typically one for each line of business, business unit, or division.



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Notes:

### Define the portfolio with the Portfolio Canvas

- ▶ The Portfolio Canvas is a template for identifying a specific SAFe portfolio
- ▶ It defines the domain of the portfolio and other key elements

**Portfolio Canvas** Portfolio Name: \_\_\_\_\_ Date: \_\_\_\_\_ Version: \_\_\_\_\_

Value Propositions						
Value Stream	Solutions	Customer	Channels	Customer Relationships	Budget	ROI/Revenue

Key Partners	Key Activities	Key Resources

Cost Structure	Revenue Streams

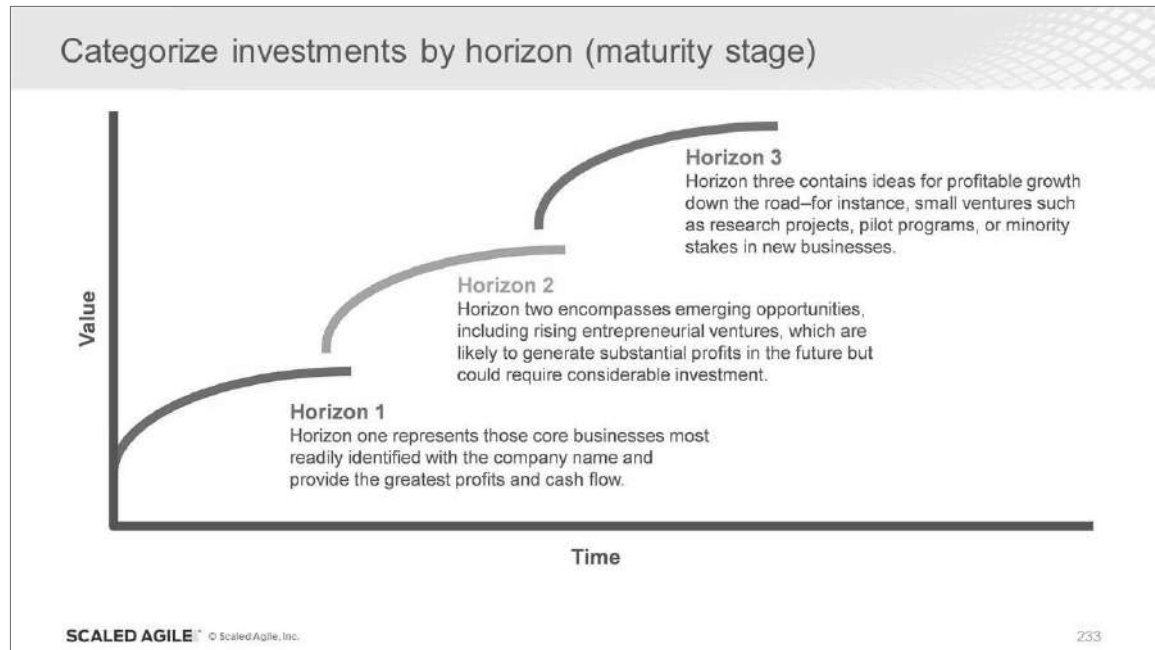
The Portfolio Canvas is adapted from The Business Model Canvas (<http://www.businessmodelgeneration.com>).  
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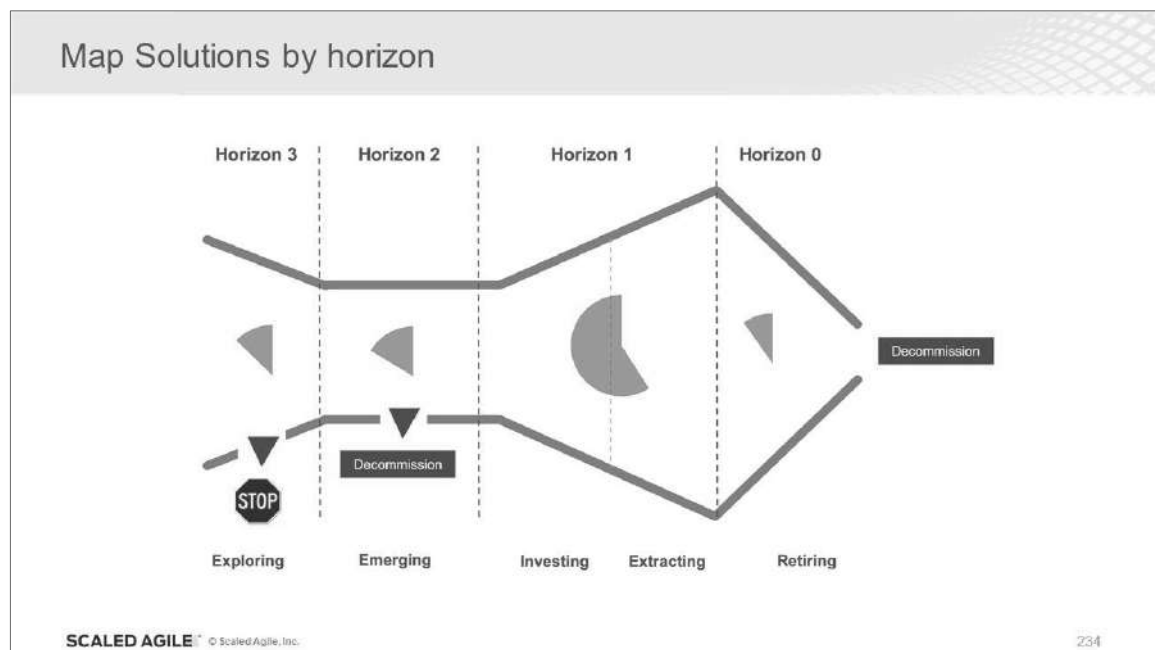
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Notes:

## 5.1 Define a SAFe portfolio



Notes:



Notes:

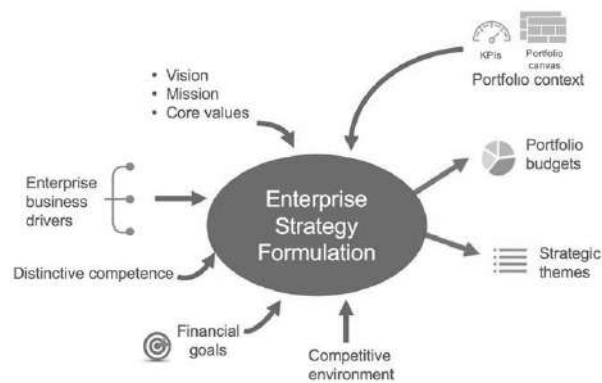
### 5.2 Connect the portfolio to Enterprise strategy

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Notes:

#### A model for Enterprise strategy formulation



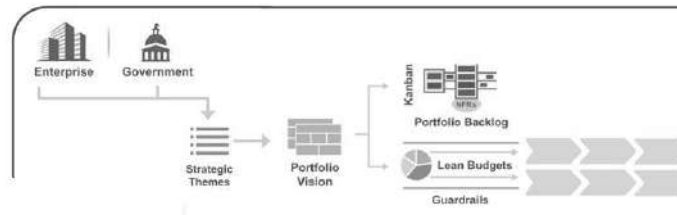
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Notes:

### Establish Strategic Themes

- Differentiation from the current state to the desired future state
- A collaboration between LPM and the larger Enterprise
- Enterprise business drivers drive Strategic Themes
- Portfolio context influences Strategic Themes



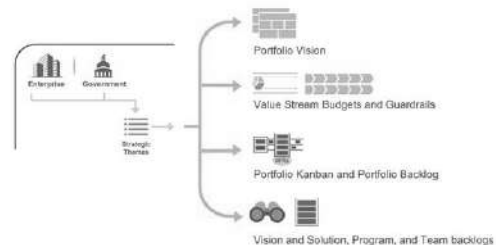
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Notes:

### Strategic Themes influence what gets built


- Strategic Themes are differentiating, specific, and itemized business objectives that connect a portfolio to the strategy of the Enterprise.
  - Provide context for decision-making, inputs to the Vision, budget, and backlogs
  - Adjust ART and Value Stream funding to track changing strategic priorities
  - Assist with Epic evaluation and decision-making
  - Influence each Program Vision and Roadmap



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Notes:




Activity: Identify Strategic Themes

Prepare  
5 min

Share  
2 min

- ▶ **Step 1:** Identify three Strategic Themes that help define the strategy of your portfolio in the upcoming year
- ▶ **Step 2:** Discuss:
  - Are these *differentiators* for your business, as opposed to 'business-as-usual' items?
- ▶ **Step 3:** Be prepared to share with the class



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Notes:



Strategic Theme #1

Strategic Theme #2

Strategic Theme #3

### 5.3 Maintain the Portfolio Vision

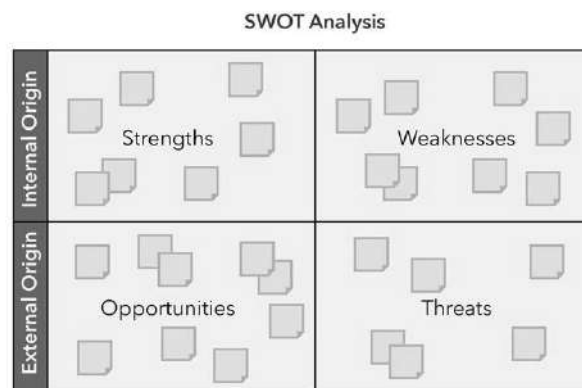
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Notes:

#### Identify opportunities for the portfolio's future state with SWOT

- Establishes an understanding of your organization's strengths and weaknesses
- Identifies the most significant opportunities and potential threats



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Notes:

### TOWS strategic options matrix

- ▶ While the SWOT and TOWS methods are both concerned with strengths, weaknesses, opportunities, and threats—the key difference between them are the outcomes that they create
- ▶ TOWS is used primarily for identifying strategic options to create a better future state

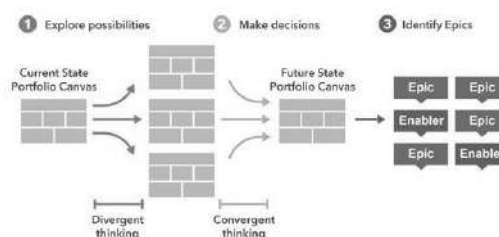
TOWS Strategic Options Matrix

		External Opportunities (O)	External Threats (T)
		1. _____	1. _____
		2. _____	2. _____
		3. _____	3. _____
		4. _____	4. _____
Internal Strength (S)	SO	ST	
1. _____	How can your strengths be used to exploit and maximize opportunities?	How can you apply your strengths to overcome present and potential threats?	
2. _____			
3. _____			
4. _____			
Internal Weaknesses (W)	WO	WT	
1. _____	How can your opportunities be leveraged to overcome weaknesses?	How can you minimize weaknesses and avoid threats?	
2. _____			
3. _____			
4. _____			

Notes:

### Envision the future state

- ▶ The portfolio canvas captured current state
- ▶ Use SWOT and TOWS to brainstorm potential future states
- ▶ Evaluate your options, and pick a future state
- ▶ Identify the Epics that will get you there



Notes:

### Express the future state as a Vision

#### A long view:

- › How will our portfolio of future solutions solve the larger customer problems?
- › How will these solutions differentiate us?
- › What is the future context within which our solutions will operate?
- › What is our current business context, and how must we evolve to meet this future state?



#### Vision: A postcard from the future



- › Aspirational, yet realistic and achievable
- › Motivational enough to engage others on the journey

**Result:** Everyone starts thinking about how to apply their strengths in order to get there.

Switch: How to Change Things When Change is Hard, Heath and Heath, Broadway Books, 2010

Notes:

### 5.4 Establish portfolio flow

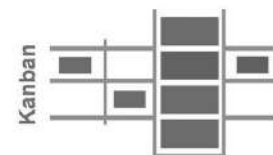
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Notes:

#### Govern Epic flow with the Portfolio Kanban

- ▶ Makes largest business initiatives visible
- ▶ Brings structure to analysis and decision-making
- ▶ Provides WIP limits to ensure the teams analyze responsibly
- ▶ Helps prevent unrealistic expectations
- ▶ Helps drive collaboration amongst the key stakeholders
- ▶ Provides a transparent and quantitative basis for economic decision-making

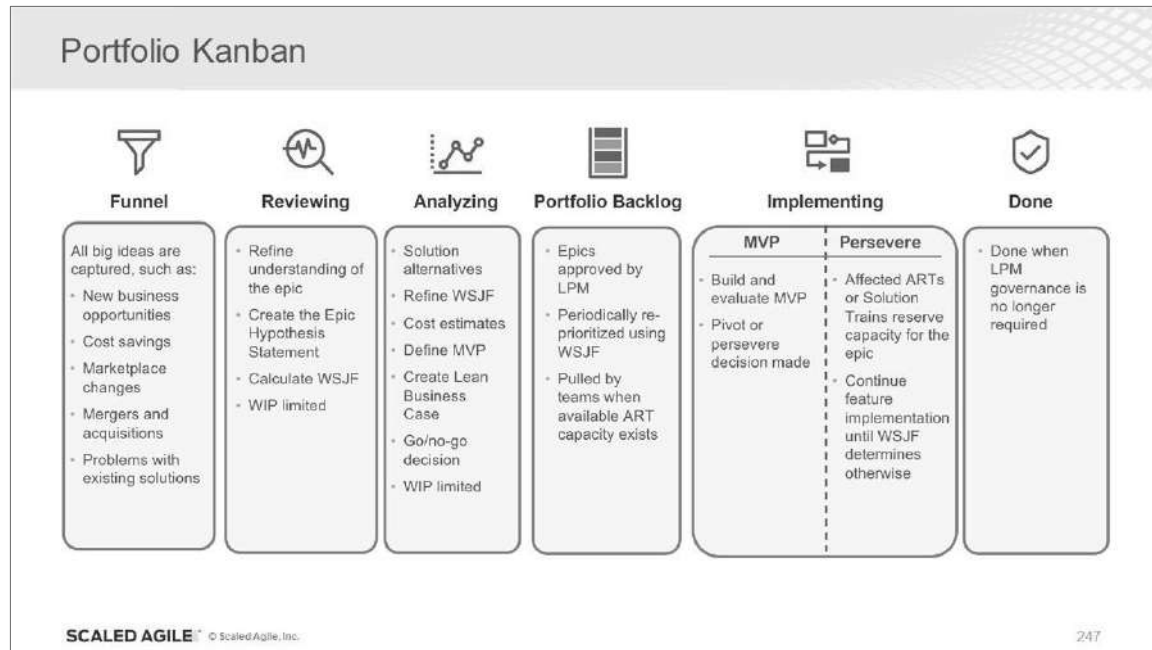


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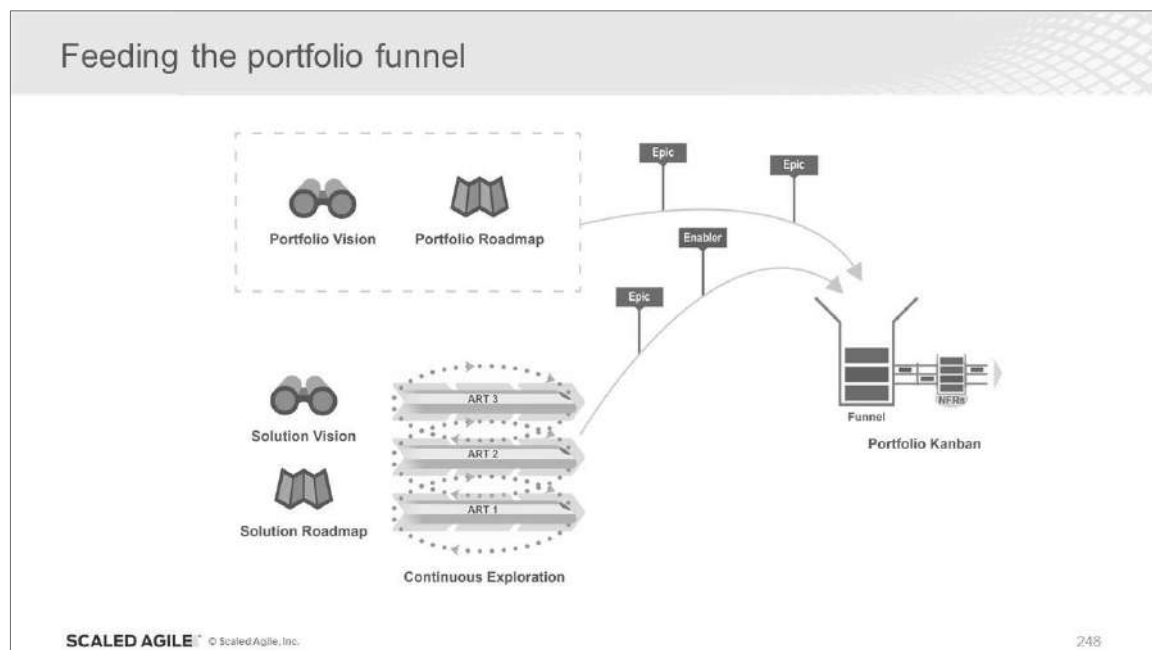
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Notes:

## 5.4 Establish portfolio flow



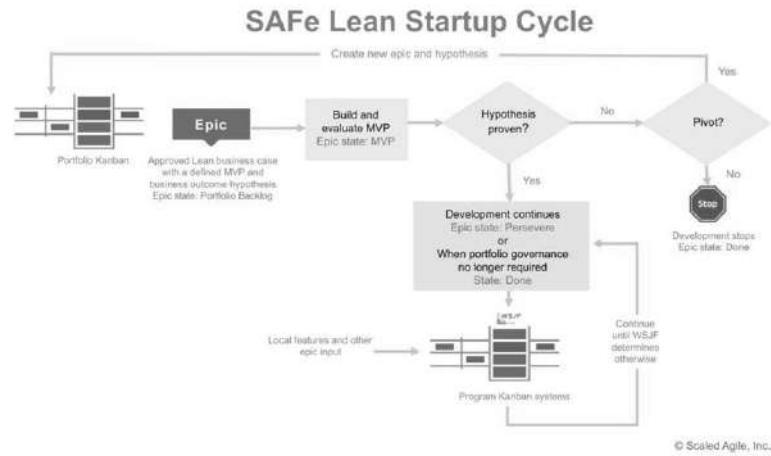
Notes:



Notes:

## 5.4 Establish portfolio flow

### MVPs foster innovation and control scope



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Notes:

### Epic hypothesis statement template


Epic Hypothesis Statement	
<b>Funnel Entry Date:</b>	<The date that the epic entered the funnel>
<b>Epic Name:</b>	<A short name for the epic>
<b>Epic Owner:</b>	<The name of the epic owner>
<b>Epic Description:</b>	<An elevator pitch (value statement) that describes the epic in a clear and concise way>  <b>For</b> <customers> <b>who</b> <do something> <b>the</b> <solution> <b>is a</b> <something - the 'how'> <b>that</b> <provides this value> <b>unlike</b> <competitor, current solution or non-existing solution> <b>our solution</b> <does something better - the 'why'>
<b>Business Outcomes:</b>	<The measurable benefits that the business can anticipate if the epic hypothesis is proven to be correct>
<b>Leading Indicators:</b>	<The early measures that will help predict the business outcome hypothesis. For more on this topic, see the Innovation Accounting advanced topic article>
<b>Nonfunctional Requirements (NFRs):</b>	<Nonfunctional requirements (NFRs) associated with the epic>

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Notes:



Activity: Epic writing

Prepare

10  
min

Share

3  
min

- ▶ **Step 1:** At your table, identify an Epic from one of your contexts
- ▶ **Step 2:** Write the Epic hypothesis statement
- ▶ **Step 3:** Discuss:
  - What could be an MVP to validate this Epic?

Epic Hypothesis Statement	
<b>Funnel Entry Date:</b>	<The date that the epic entered the funnel>
<b>Epic Name:</b>	<A short name for the epic>
<b>Epic Owner:</b>	<The name of the epic owner>
<b>Epic Description:</b>	<An elevator pitch (value statement) that describes the epic in a clear and concise way>  <b>For</b> <customers> <b>who</b> <do something> <b>the</b> <solution> <b>is a</b> <something> - the 'how'> <b>that</b> <provides this value> <b>unlike</b> <competitor, current solution or non-existing solution> <b>our solution</b> <does something better - the 'why'>
<b>Business Outcomes:</b>	<The measurable benefits that the business can anticipate if the epic hypothesis is proven to be correct>
<b>Leading Indicators:</b>	<The early measures that will help predict the business outcome hypothesis. For more on this topic, see the Innovation Accounting advanced topic article.>
<b>Nonfunctional Requirements (NFRs):</b>	<Nonfunctional requirements (NFRs) associated with the epic>

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Notes:



Epic Hypothesis Statement	
<b>Funnel Entry Date:</b>	<The date that the epic entered the funnel.>
<b>Epic Name:</b>	<A short name for the epic.>
<b>Epic Owner:</b>	<The name of the epic owner.>
<b>Epic Description:</b>	<p>&lt;An elevator pitch (value statement) that describes the epic in a clear and concise way.&gt;</p> <p><b>For</b> &lt;customers&gt;  <b>who</b> &lt;do something&gt;  <b>the</b> &lt;solution&gt;  <b>is a</b> &lt;something - the 'how'&gt;  <b>that</b> &lt;provides this value&gt;  <b>unlike</b> &lt;competitor, current solution or non-existing solution&gt;  <b>our solution</b> &lt;does something better – the 'why'&gt;</p>
<b>Business Outcomes:</b>	<The measurable benefits that the business can anticipate if the epic hypothesis is proven to be correct.>
<b>Leading Indicators:</b>	<The early measures that will help predict the business outcome hypothesis. For more on this topic, see the Innovation Accounting advanced topic article.>
<b>Nonfunctional Requirements (NFRs):</b>	<Nonfunctional requirements (NFRs) associated with the epic.>

Epic Hypothesis Statement	
<b>Funnel Entry Date:</b>	
<b>Epic Name:</b>	
<b>Epic Owner:</b>	
<b>Epic Description:</b>	
<b>Business Outcomes:</b>	
<b>Leading Indicators:</b>	
<b>Nonfunctional Requirements (NFRs):</b>	

### 5.5 Fund Value Streams

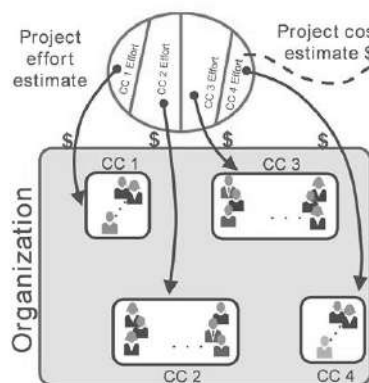
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Notes:

#### Problem: Cost-center budgeting

Traditional project-based, cost-center budgeting creates overhead and friction, lowers velocity.



Project

A project requires collaboration of cost centers, assignment of people, budget, and schedule. It takes multiple budgets to build a single project budget.

#### Result:

- ▶ Slow, complex budgeting process
- ▶ Leads to utilization-based planning and execution
- ▶ Low program throughput
- ▶ *Moves the people to the work*

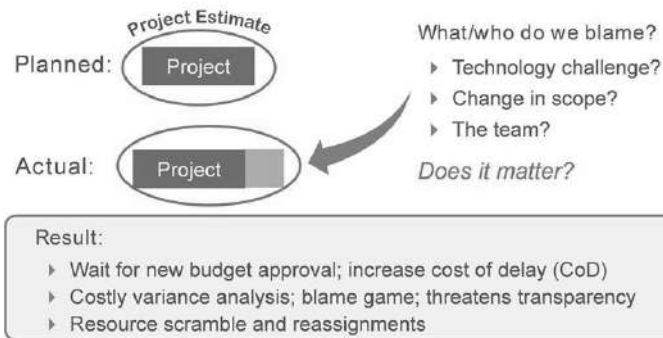
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Notes:

### Problem: Projects increase cost of delay

When overruns happen, project accounting and re-budgeting increases cost of delay and impacts culture.



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Notes:

### Solution: Fund Value Streams not projects

Funding Value Streams provides for full control of spend, with:

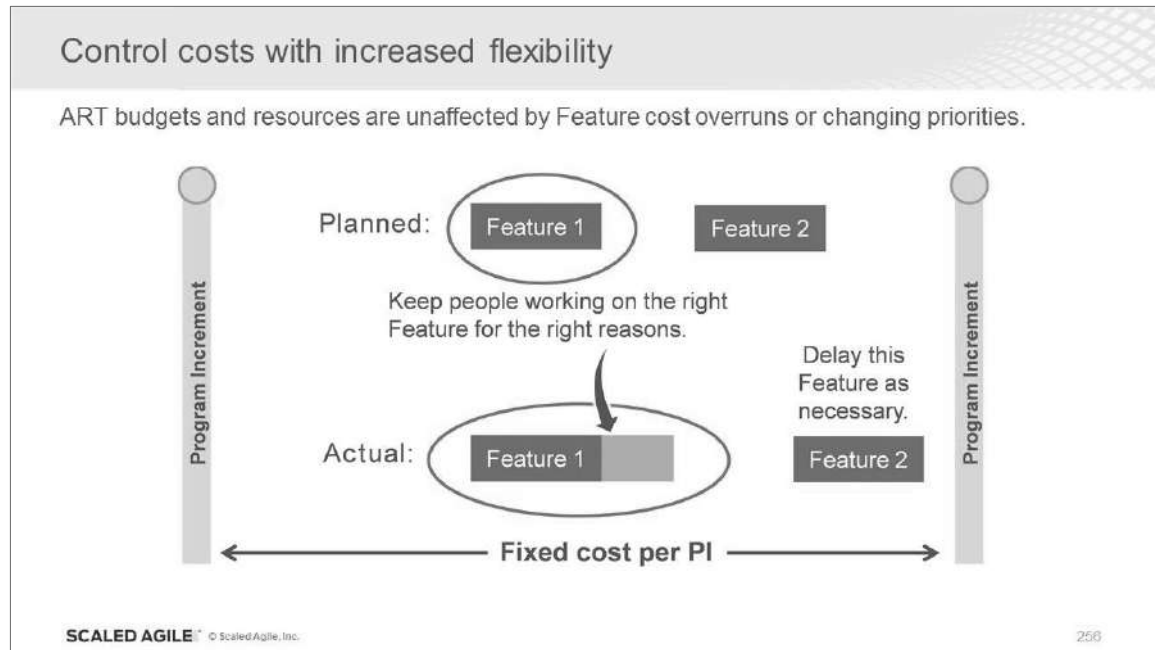
- ▶ No costly and delay-inducing project cost variance analyses
- ▶ No resource reassignments
- ▶ No blame game for project overruns



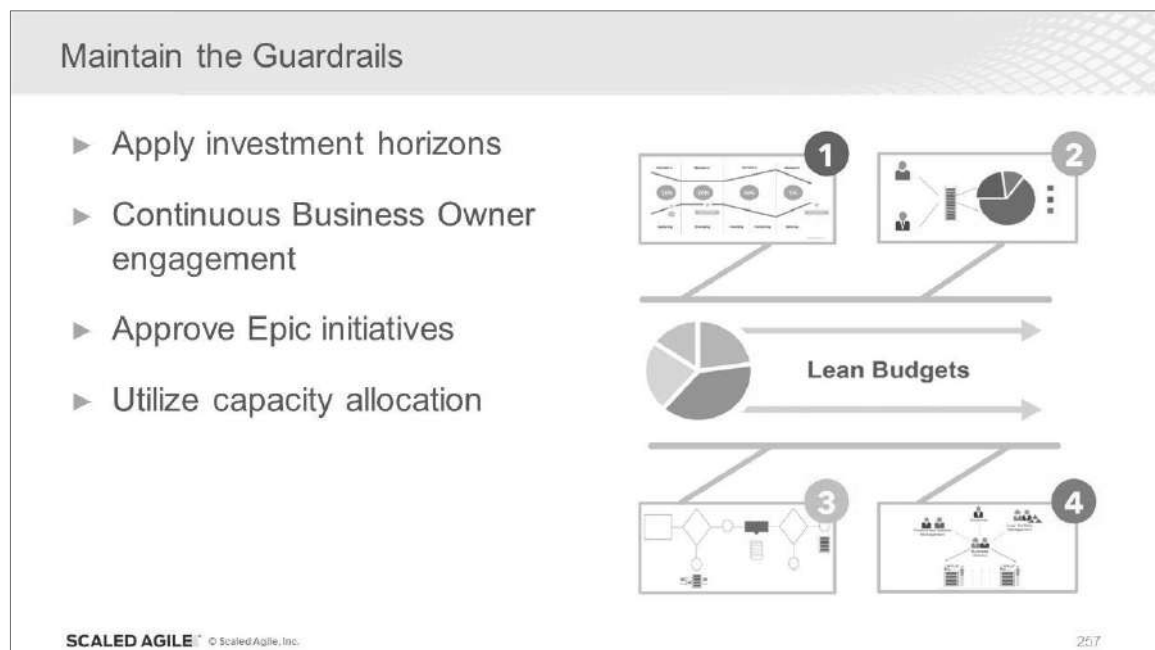
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Notes:



Notes:



Notes:

## Lesson review

In this lesson you:

- ▶ Defined a SAFe portfolio
- ▶ Connected the portfolio to Enterprise strategy
- ▶ Explored tools for maintaining the Portfolio Vision
- ▶ Discussed how to establish portfolio flow
- ▶ Discussed how to fund Value Streams

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Notes:

- ▶ Scaled Agile Framework recommended reading for this lesson:
  - *Lean Portfolio Management*
  - *Strategic Themes*
  - *Portfolio Vision*
  - *Lean Budgets*
  - *Guardrails*
  - *Portfolio Kanban*
  - *Epics*

## Lesson 6

# Leading the Change

### Learning Objectives:

- 6.1 Lead by example
- 6.2 Lead the change



SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.

### 6.1 Lead by example

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Notes:

#### Leading by example

*Setting an example is not the main means of influencing others, it is the only means. — Albert Einstein*

- ▶ **Authenticity** requires leaders to model desired professional and ethical behaviors.
- ▶ **Emotional intelligence** describes how leaders identify and manage their emotions and those of others through self-awareness, self-regulation, motivation, empathy, and social skills
- ▶ **Lifelong learning** depicts how leaders engage in ongoing, voluntary, and self-motivated pursuit of knowledge and growth, and they encourage and support the same in others
- ▶ **Growing others** encourages leaders to provide the personal, professional, and technical guidance and resources each employee needs to assume increasing levels of responsibility
- ▶ **Decentralized decision-making** moves the authority for decisions to where the information is



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Notes:



### Leading by example

- ▶ Through their words and actions, leaders provide the organization with patterns of expected behaviors
- ▶ The aggregation of those patterns determines the organization's culture, whether good or bad

Pathological <i>Power-oriented</i>	Bureaucratic <i>Rule-oriented</i>	Generative <i>Performance-oriented</i>
Low cooperation	Modest cooperation	High cooperation
Messengers blamed	Messengers neglected	Messengers trained
Responsibilities shirked	Narrow responsibilities	Responsibilities shared
Collaboration discouraged	Collaboration tolerated	Collaboration encouraged
Failure leads to scapegoating	Failure leads to justice	Failure leads to improvement
Innovation crushed	Innovation leads to problems	Innovation implemented

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Notes:

### 6.2 Lead the change

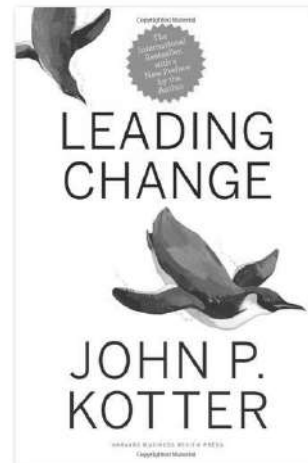
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Notes:

#### Keys to leading successful change

- ▶ Establish a sense of urgency
- ▶ Create a powerful guiding coalition
- ▶ Develop the vision and strategy
- ▶ Communicate the vision
- ▶ Empower employees for broad-based action
- ▶ Generate short-term wins
- ▶ Consolidate gains and produce more wins
- ▶ Anchor new approaches in the culture

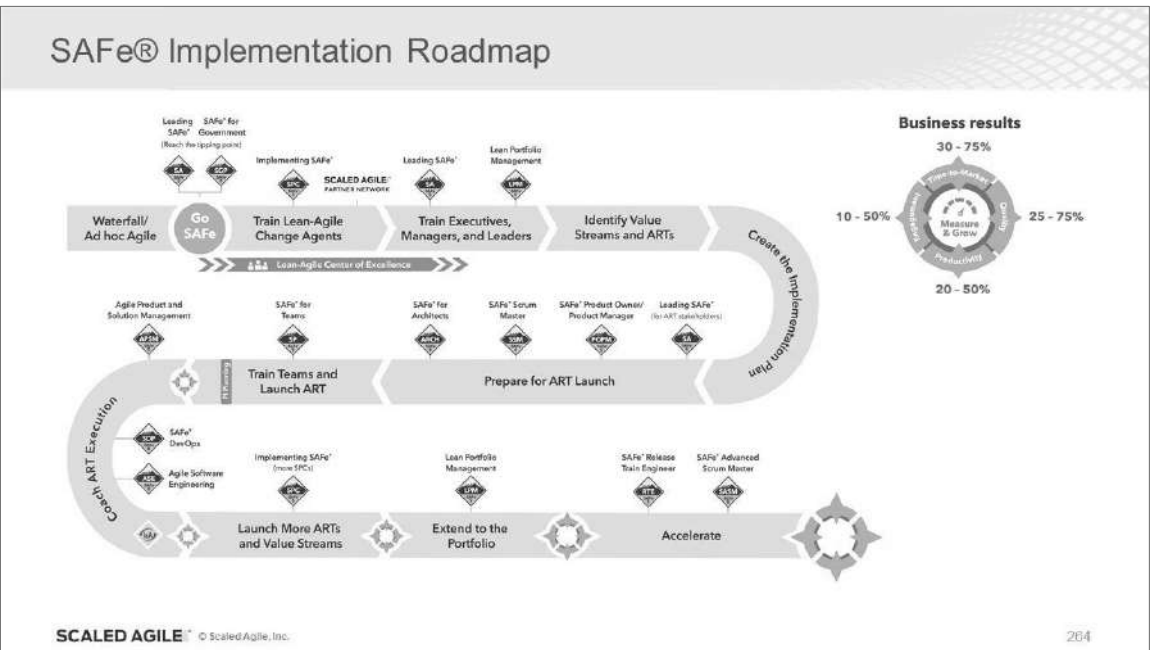



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Notes:

## 6.2 Lead the change






Activity: Leading the change

Prepare  
5 min

Share  
2 min

- ▶ **Step 1:** Identify three action items you can do in the next month to start leading the SAFe transformation.
- ▶ **Step 2:** Find a partner and share your ideas.
- ▶ **Step 3:** Discuss:
  - What outcomes do you hope to achieve with your Action Plan?



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Notes:

## Lesson review

In this lesson you:

- ▶ Explored how to lead by example
- ▶ Identified actions to take for leading the change

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Notes:

- ▶ Scaled Agile Framework recommended reading for this lesson:
  - *Lean-Agile Leadership*
  - *Implementation Roadmap*



## Lesson 7

# Becoming a Certified SAFe Agilist

### Learning Objectives:

#### 7.1 Becoming a Certified SAFe Professional



SAFe Authorized Course - Attending this course gives students access to the SAFe Agilist exam and related preparation materials.

### Make the most of your learning

**Access the SAFe Community Platform**

Manage your member profile, continue your learning with toolkits and videos, and access communities of practice and the member directory

**Prepare Yourself**

Extend your SAFe knowledge and prepare for certification with your learning plan, course workbook, study materials, and practice test before your exam

**Become a Certified SAFe Professional**

Demonstrate your validated knowledge, skills, and mindset to participate in SAFe methods

**Showcase Your SAFe Credentials**

Use your digital badge to view global insights, track market labor data, and see where your skills are in demand

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Notes:



### Video: Become a Certified SAFe Professional



Continue to build on the foundation of SAFe learning you began in class by studying and taking the certification exam.

Earning this certification demonstrates and establishes your new knowledge.

Certification details at:

<https://www.scaledagile.com/certification/about-safe-certification/>



<https://vimeo.com/307578726>

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Notes:





Video: Welcome to the SAFe Community Platform

Duration  
5 min

Want to learn more about the next steps on your SAFe Journey?

Access the SAFe Community Platform and discover all the SAFe resources available for your use!



<https://vimeo.com/201877314>

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Notes:

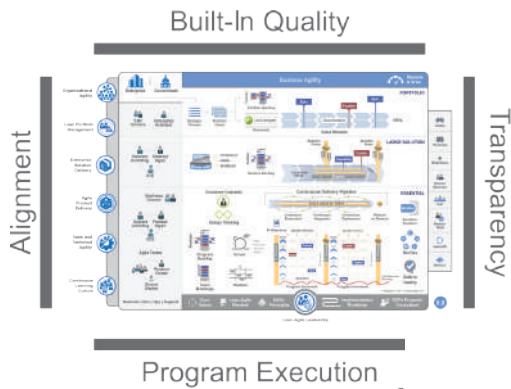


## Appendix 1

# Action Plan



## Exemplifying SAFe's Core Values



## Improving the Lean-Agile Mindset





## Advocating SAFe Principles

#1 Take an economic view

#2 Apply systems thinking

#3 Assume variability; preserve options

#4 Build incrementally with fast, integrated learning cycles

#5 Base milestones on objective evaluation of working systems

#6 Visualize and limit WIP, reduce batch sizes, and manage queue lengths

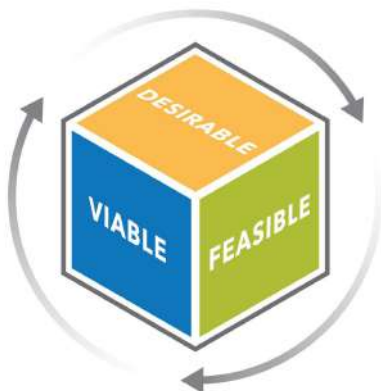
#7 Apply cadence, synchronize with cross-domain planning

#8 Unlock the intrinsic motivation of knowledge workers

#9 Decentralize decision-making

#10 Organize around value

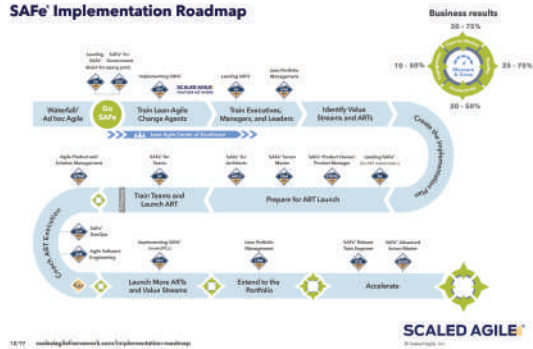
## Improving Agile Product Delivery





## Leading the Change

### SAFe® Implementation Roadmap



## Glossary

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### **SAFe Glossary:**

Visit the Scaled Agile Framework site ([v5.scaledagileframework.com/glossary](https://v5.scaledagileframework.com/glossary)) to download glossaries translated into other languages