Empathy Mapping

#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

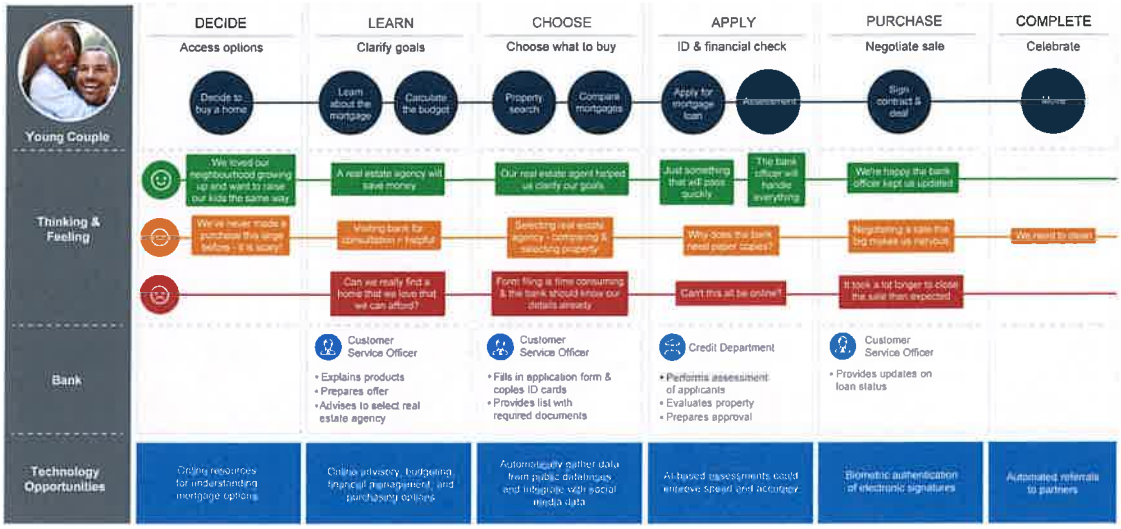
What are their fears, frustrations and anxieties?

GAINS

What are their wants, needs, hopes and dreams?

What other thoughts and feelings might motivate their behavior?

Use journey maps to design the end-to-end Customer experience



Customer journey map (mortgage loan)

Use Story maps to capture workflows

Stories within an activity are typically prioritized from "Stories essential to complete the activity" to "Stories that delight the user."

4.2 Prioritizing the Program Backlog

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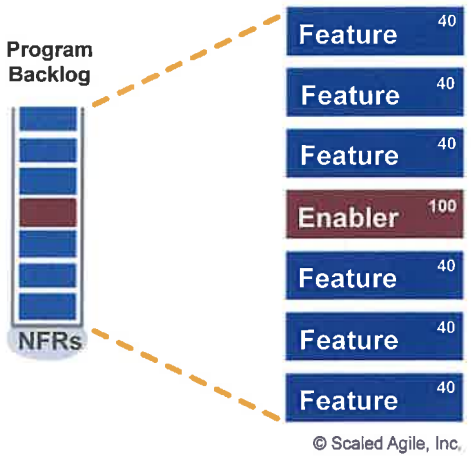
4-15

FEATURES ... OCHEKUVA NA CCA 10 TIMA

Features are managed through the Program Backlog

The Program Backlog is the holding area for upcoming Features that will 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

- The Feature benefit hypothesis justifies development cost and provides business perspective for decision-making
- Acceptance criteria are typically defined during Program Backlog refinement
- Reflect functional and nonfunctional requirements
- Fits in one PI

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

Example Feature

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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

Feature:
Multi-factor authentication

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

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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

Business Feature

Feature:
Shipping Method Selection
Benefit hypothesis:
Users can select a shipping method based on cost, delivery speed, and carrier

Enabler Story

Determine how to calculate the shipping costs

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

User Story

As a book purchaser **I can** see the price for each shipping method for my current order **so that** I can select a shipping method based on price.

PERSON

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4-20

Describe Three Features

Feature: Multi-factor authentication

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

Feature:

Benefit Hypothesis:

Feature:

Benefit Hypothesis:

Feature:

Benefit Hypothesis:

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.

Apply estimating poker for fast, relative estimating

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

?	1	2	3	5	8	13	20	40	100	∞

Steps	
1	Each estimator gets a deck of cards
2	Read 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

Estimation is a whole-team exercise

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

The whole team estimates Stories

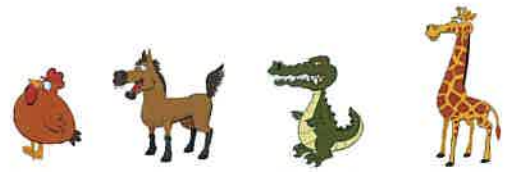
Warning: *Estimation performed by a manager, architect, or select group negates these benefits*

Activity: Relative size estimating

Prepare 7 min | Share 3 min

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

- **Step 1:** In your groups, 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*



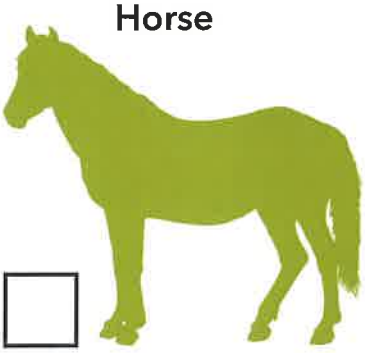
Chicken Horse Crocodile Giraffe

Gorilla Hyena Elephant

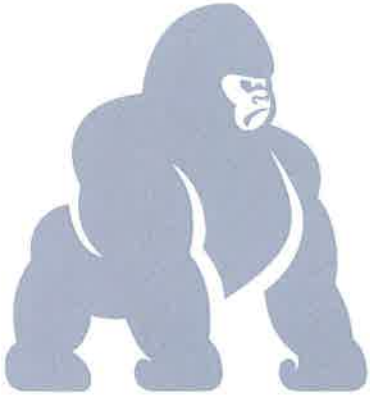
Relative Size Estimating

Hyena

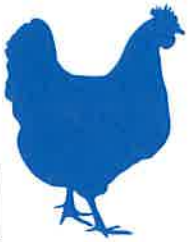
Horse



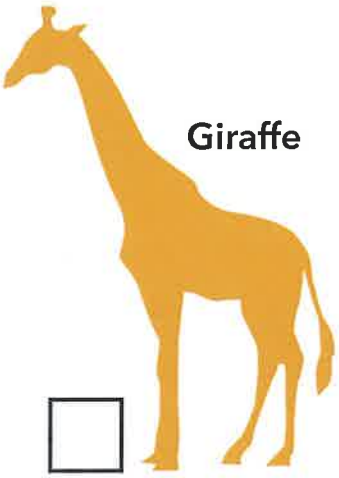
Gorilla



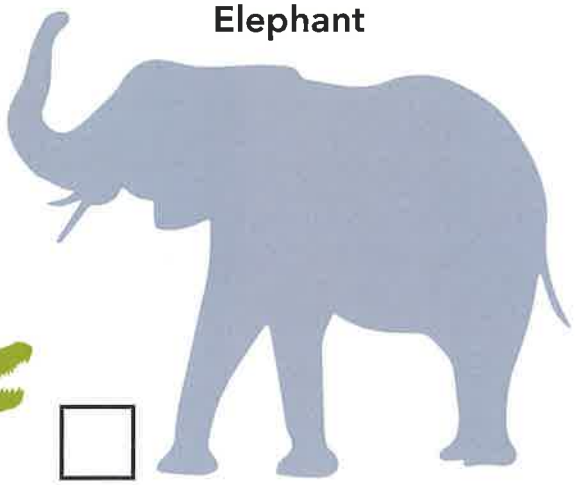
Chicken



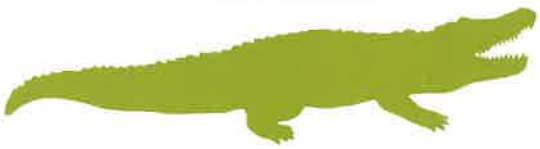
Giraffe



Elephant



Crocodile

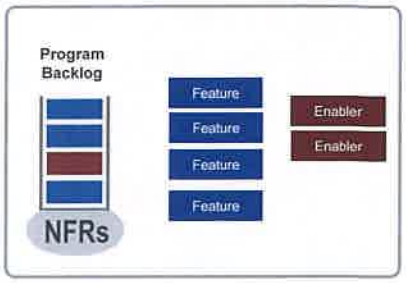


Prioritize Features for optimal ROI

In a flow system, *job sequencing* is the key to improving economic outcomes.

To prioritize based on Lean economics, we need to know two things:

- The cost of delay (CoD) in delivering value
- What is the cost to implement the valuable thing?



If you only quantify one thing, quantify the cost of delay. —Donald G. Reinertsen

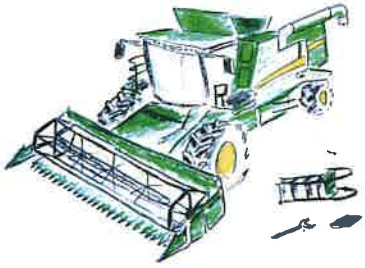
Video: Calculating WSJF to Prioritize the Program Backlog

Duration 5 min

https://bit.ly/Video-CalculatingWSJF

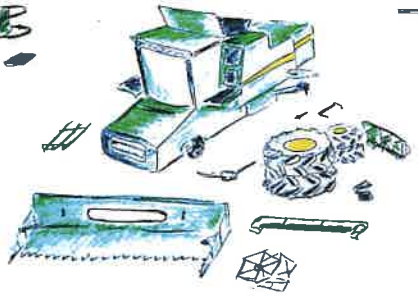
Example with equal CoD: Which job first?

A $$, 1 day



B $$, 3 days

C $$, 10 days



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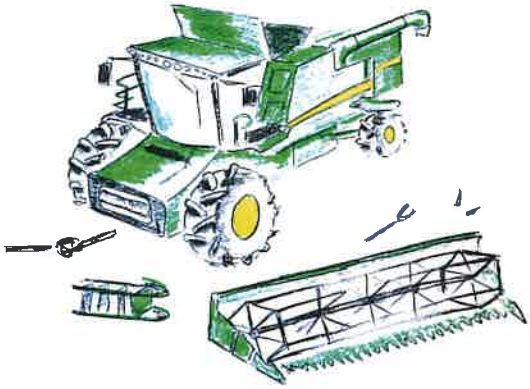
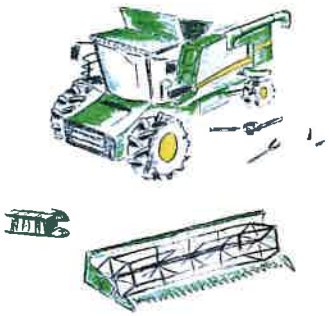
Example with equal duration: Which job first?

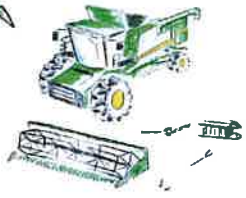
A $$$, 3 days



B $$, 3 days



C $, 3 days



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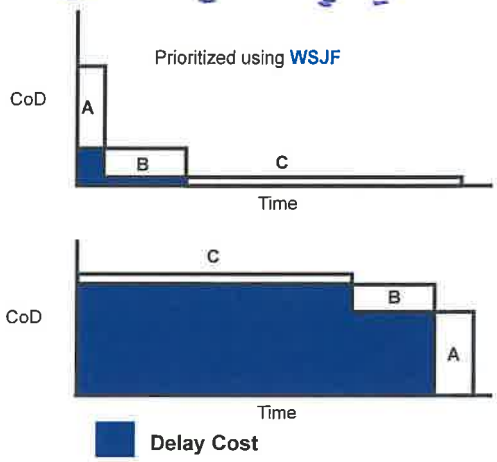
General case: Any cost of delay (CoD) and duration

In the general case, give preference to jobs with shorter duration and higher CoD, using weighted shortest job first (WSJF):



$$WSJF = \frac{\text{Cost of delay}}{\text{Job duration (Job size)}}$$

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

4-29

Components of cost of delay

1) **User-Business Value**

Relative value to the Customer or business

- They prefer this over that
- Revenue impact?
- Potential penalty or other negative impact?

2) **Time Criticality**

How user/business value decays over time

- Is there a fixed deadline?
- Will they wait for us or move to another Solution?
- What is the current effect on Customer satisfaction?

3) **Risk Reduction & Opportunity Enablement (RR&OE)**

What else does this do for our business

- Reduce the risk of this or future delivery?
- Is there value in the information we will receive?
- Enable new business opportunities?

4-30

KAŽDÝ ART SI MŮŽE UPRAVIT SET OTÁZEK PODLE SEBE

Calculate WSJF with relative estimating

In order to calculate WSJF, teams need to estimate cost of delay and duration

- For duration, use job size as a quick proxy
- Relative estimating is a quick technique to estimate job size and relative value
- WSJF stakeholders: Business Owners, Product Managers, Product Owners, and System Architects

$$\text{WSJF} = \frac{\text{User-business value} + \text{Time criticality} + \text{Risk reduction and/or opportunity enablement}}{\text{Job size}}$$

FEATURE

4-31

FEATURE

Activity: Weighted shortest job first (WSJF) prioritization

Prepare 10 min | Share 5 min

- **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.

4-32

Weighted Shortest Job First (WSJF)

$$WSJF = \frac{\text{User-business value} + \text{Time criticality} + \text{Risk reduction and/or opportunity enablement}}{\text{Job size}}$$

Feature	User-business value		Time criticality		RR | OE value		COD		Job size		WSJF
		+		+		=	0.00	÷		=	
		+		+		=	0.00	÷		=	
		+		+		=	0.00	÷		=	

4.3 PI Planning

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Video: The Power of PI Planning

Duration 2 min

https://bit.ly/Video-PowerofPIPlanning

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What is PI Planning?

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

- Two days every 8 – 12 weeks (10 weeks is typical)
- Everyone plans together
- Product Management owns Feature priorities
- Development teams own Story planning and high-level estimates
- Architect/Engineering and UX work as intermediaries for governance, interfaces, and dependencies

PI Planning

Agile Team

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The benefits of PI Planning

- Establishing personal 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

Cross-team collaboration

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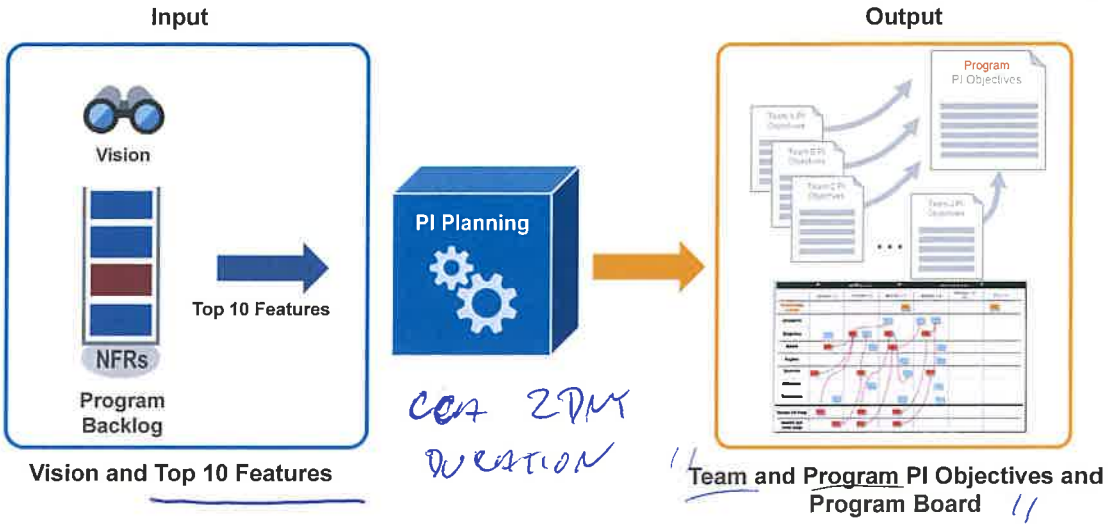
The PI Planning process



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Create Alignment with PI Objectives

- Objectives are business summaries of what each team intends to deliver in the upcoming PI.
- They often directly relate to intended Features in the backlog.
- Other examples:
  - 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	BV	AV
1. Show routing calculations between the 5 most frequent destinations		
2. Navigate autonomously from distribution center to the most frequent destination		
3. Parallel park for a delivery		
4. Return to the distribution center after delivery		
5. Include traffic data in route planning		
6. Recall a delivery that is already in progress		
Uncommitted Objectives		
7. Spike: Reduce GPS signal loss by 25%		
8. Demonstrate real-time rerouting to avoid delays (e.g., accident, construction)		

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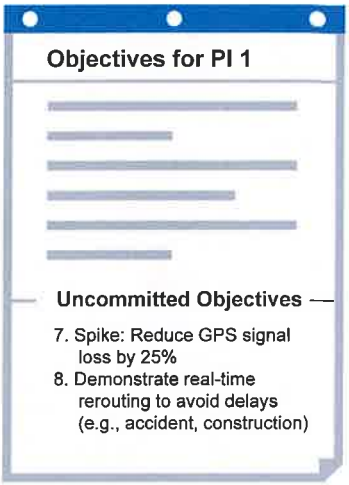
Maintain predictability with uncommitted objectives

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, it should be moved to uncommitted
- If an objective has many unknowns, consider moving it to uncommitted and put in early spikes
- Uncommitted objectives count when calculating load



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

Outcomes of the PI Planning simulation

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

Communication

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

Estimate Capacity

Experience estimating capacity for the Iteration

Objectives

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

Manage risks

Experience managing program risks

Activity: Identify ART roles

Duration 3 min

- **Step 1:** Identify ART 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, Development Manager	Volunteer

Your Instructor will be the RTE.

Simulation: Why are we here?

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.

4-43

Simulation: Day 1 agenda

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

4-44

Simulation: Day 2 agenda

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

Simulation: Briefings

Executive

Product Manager

System Architect

Simulation: Planning guidance

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

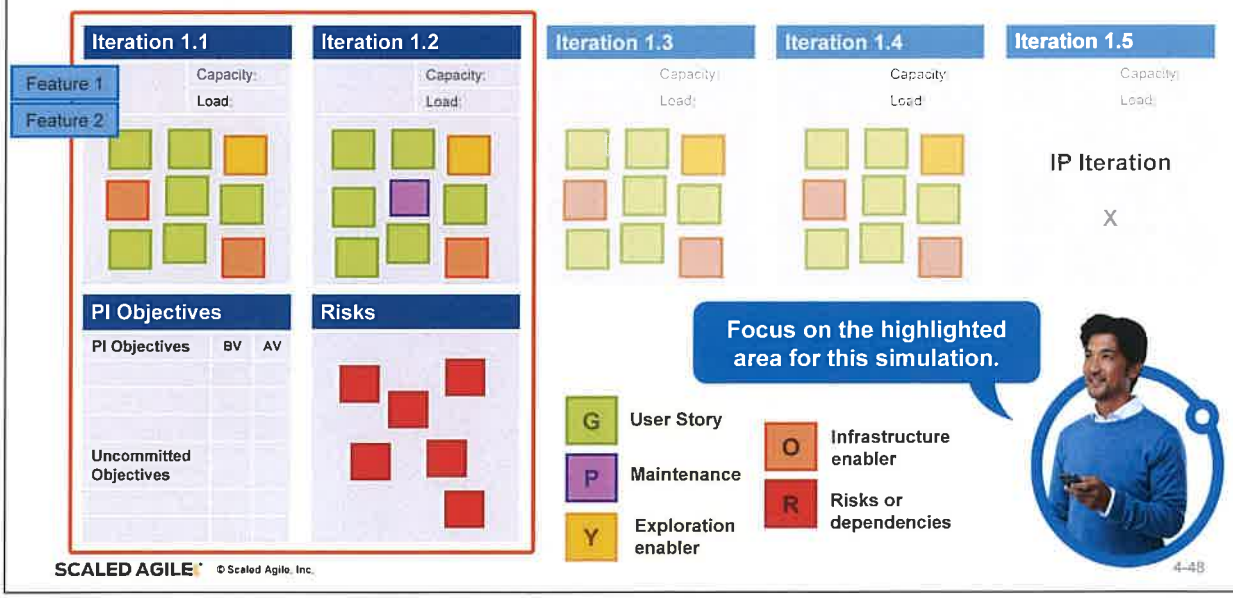
Product Owners: You have the content authority to make decisions at the user Story level

Scrum Masters: Your responsibility is to manage the timebox, the dependencies, and the ambiguities

Agile Team: Your responsibility is to define user Stories, plan them into the Iteration, and work out interdependencies with other teams

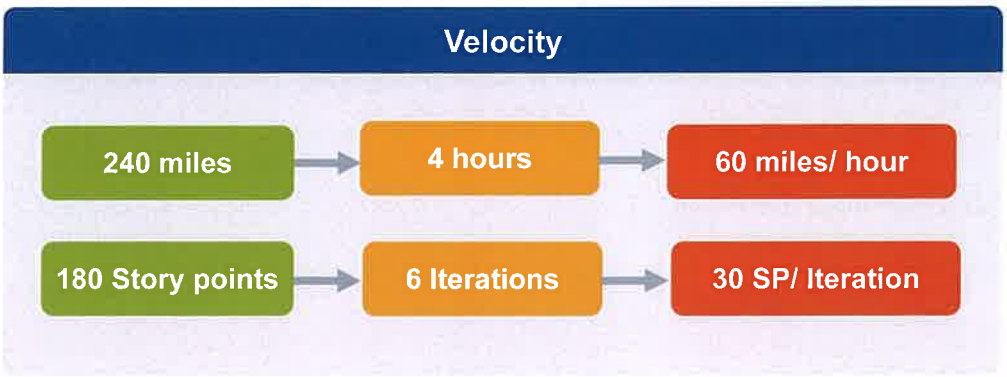
4-47

Simulation: Planning requirements



4-48

Simulation: Using historical data to calculate velocity



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

Simulation: Calculate your 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

Activity: Calculate your 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

4-51

Activity: Team breakout #1

Duration 50 min

You will be planning a short Program Increment with two Iterations.

- **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.

4-52

Activity: Scrum of Scrums (SoS)

Duration: 5 min

- **Step 1:** Observe the SoS, 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)

Scrum of Scrums questions are on the following slide.

Activity: Scrum of Scrums (SoS)

Duration: 5 Min

SoS Sync Questions	Team 1	Team 2	Team 3	Team 4	Team 5
Have you identified the capacity for each Iteration of 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 tradeoffs 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.					

Activity: Draft plan review

Prepare

7 min

- **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

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?

Activities during day 2

Day 1	
Business context	8:00–9:00
Product/Solution Vision	9:00–10:30
Architecture Vision and development practices	10:30–11:30
Planning context and lunch	11:30–1:00
Team breakouts	1:00–4:00
Draft plan review	4:00–5:00
Management review and problem solving	5:00–6:00

Day 2	
Planning adjustments	8:00–9:00
Team breakouts	9:00–11:00
Final plan review and lunch	11:00 –1:00
Program risks	1:00–2:00
PI confidence vote	2:00–2:15
Plan rework if necessary	2:15–???
Planning retrospective and moving forward	After commitment

4-57

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
  - Realignment of work and teams

4-58

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

Objectives for PI 1	BV	AV
1. Show routing calculations between the 5 most frequent destinations	10	
2. Navigate autonomously from distribution center to the most frequent destination	8	
3. Parallel park for a delivery	7	
4. Return to the distribution center after delivery	10	
5. Include traffic data in route planning	7	
6. Recall a delivery that is already in progress	7	
Uncommitted Objectives		
7. Spike: Reduce GPS signal loss by 25%	2	
8. Demonstrate real-time rerouting to avoid delays (e.g., accident, construction)	5	

Activity: Setting business value

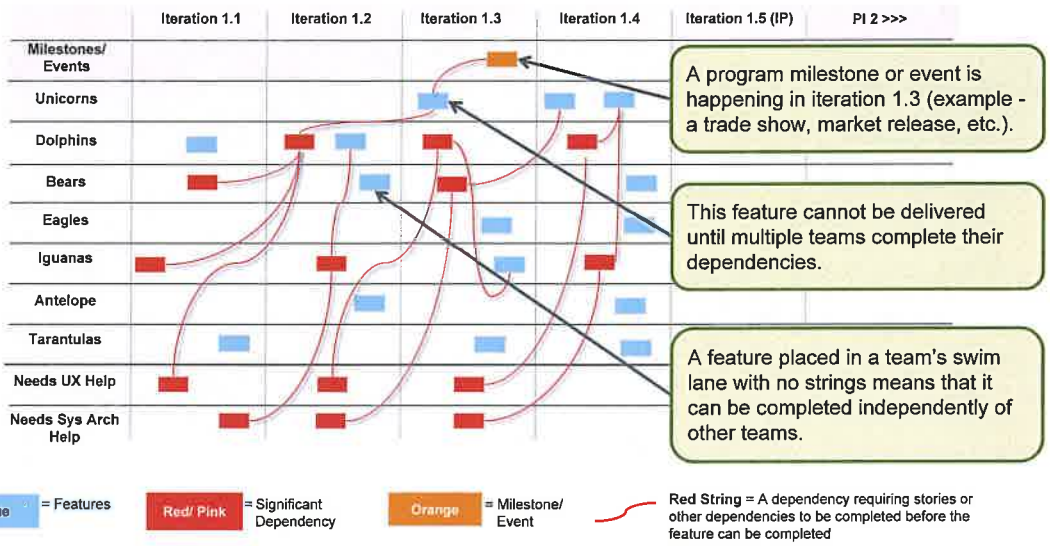
Duration: 7 min

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

Objectives for PI 1	BV	AV
1. Show routing calculations between the 5 most frequent destinations	10	
2. Navigate autonomously from distribution center to the most frequent destination	8	
3. Parallel park for a delivery	7	
4. Return to the distribution center after delivery	10	
5. Include traffic data in route planning	7	
6. Recall a delivery that is already in progress	7	
Uncommitted Objectives		
7. Spike: Reduce GPS signal loss by 25%	2	
8. Demonstrate real-time rerouting to avoid delays (e.g., accident, construction)	5	

Program Board: Feature delivery, dependencies, and Milestones



Final plan review

Teams and Business Owners peer-review all final plans.

Final plan review agenda

1. Changes to capacity and load
2. Final PI Objectives with business value
3. Program risks and impediments
4. Q&A session

Building the final plan

- Final plans are reviewed by all teams
- Business Owners are asked whether they accept the plan
- If so, the plan is accepted
- If not, the plans stay in place, and the team continues planning after the review

A team presenting their final plan

Used with permission of Discount Tire Corporation

Addressing program risks

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

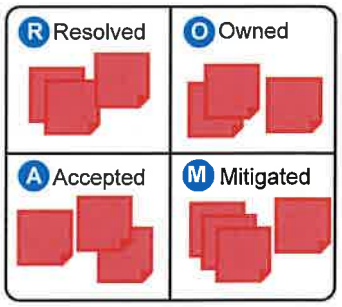
ROAMing risks:

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.

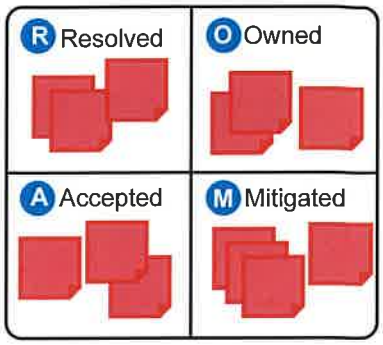


Activity: Manage program risks

Duration: 7 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.



4-65

Confidence vote: Team and program

Once program risks have been 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

ART

No confidence	Little confidence	Good confidence	High confidence	Very high confidence

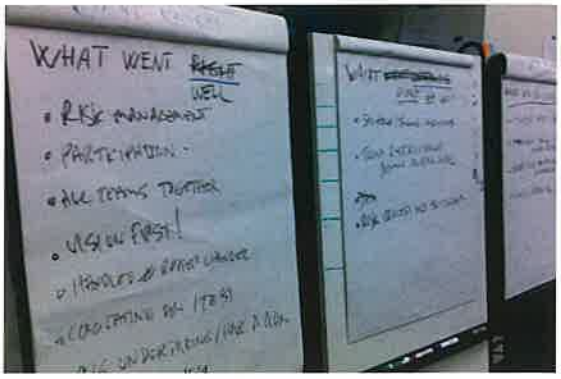
4-66

Run a planning meeting retrospective

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

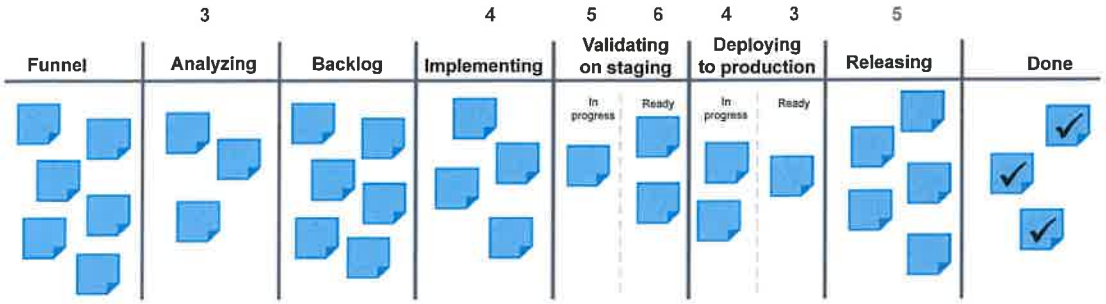
The PI Planning Event Retrospective

1. What went well
2. What didn't
3. What we can do better next time



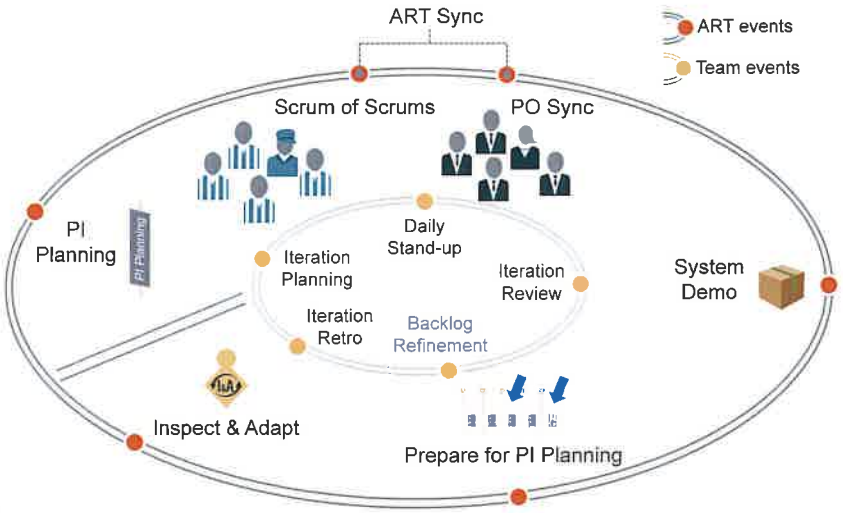
4.4 Develop on Cadence; Release on Demand

Manage the flow of work with the Program Kanban

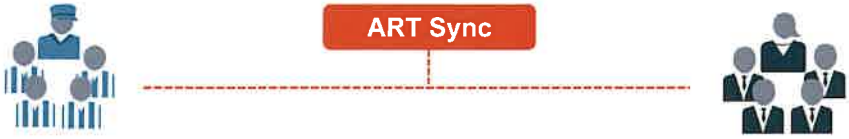


ART events drive the train

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



ART sync is used to coordinate progress



Scrum of scrums

- Visibility into progress and impediments
- Facilitated by RTE
- Participants: Scrum Masters, other select team members, SMEs if necessary
- Weekly or more frequently, 30–60 minutes
- Timeboxed and followed by a meet-after

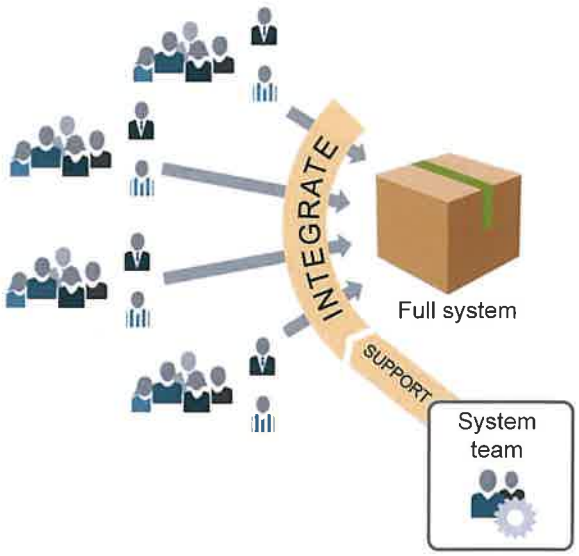
PO Sync

- Visibility into progress, scope, and priority adjustments
- Facilitated by RTE or PM
- Participants: PM, POs, other stakeholders, and SMEs as necessary
- Weekly or more frequently, 30–60 minutes
- Timeboxed and followed by a meet-after

4-71

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



4-72

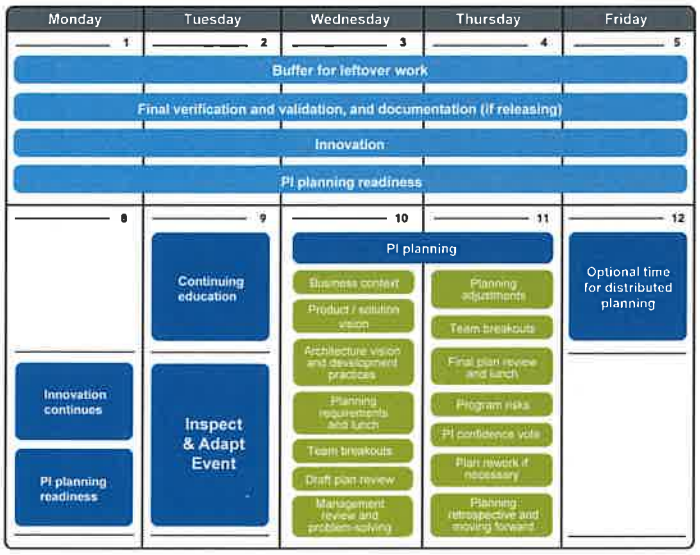
Innovation and Planning (IP) Iteration

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

Example IP Iteration calendar



Without the IP Iteration...

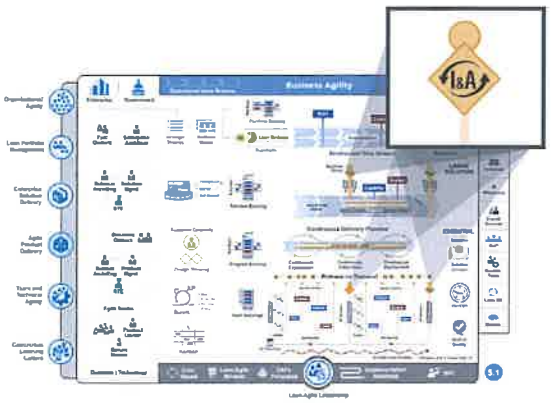
- Lack of delivery capacity buffer impacts predictability
- Little innovation; tyranny of the urgent
- Technical debt grows uncontrollably
- People burn out
- No time for teams to plan, demo, or improve together

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



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, ART stakeholders, Product Management, RTE, Scrum Masters, and teams

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4-77

Program performance reporting

Prior to or as part of the PI System Demo, teams review the business value achieved for each of their 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	Business Value: 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
Uncommitted Objectives		
- Fuzzy search by full name	7	0
- Improve tag quality to 80% relevance	4	4
Totals	50	45
% Achievement: 90%		

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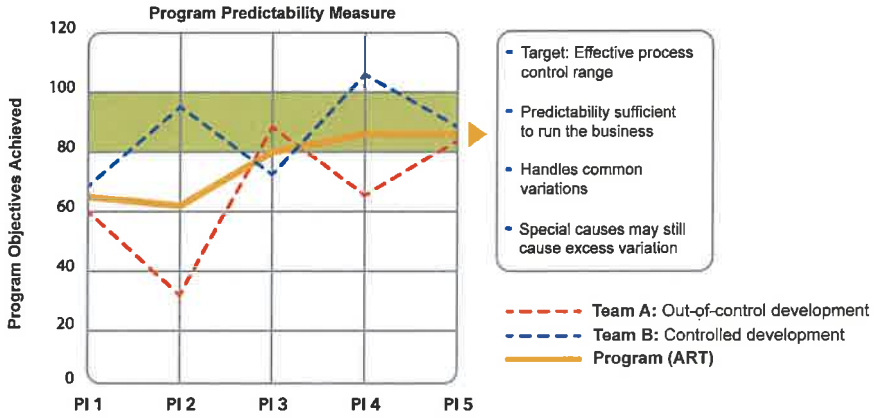
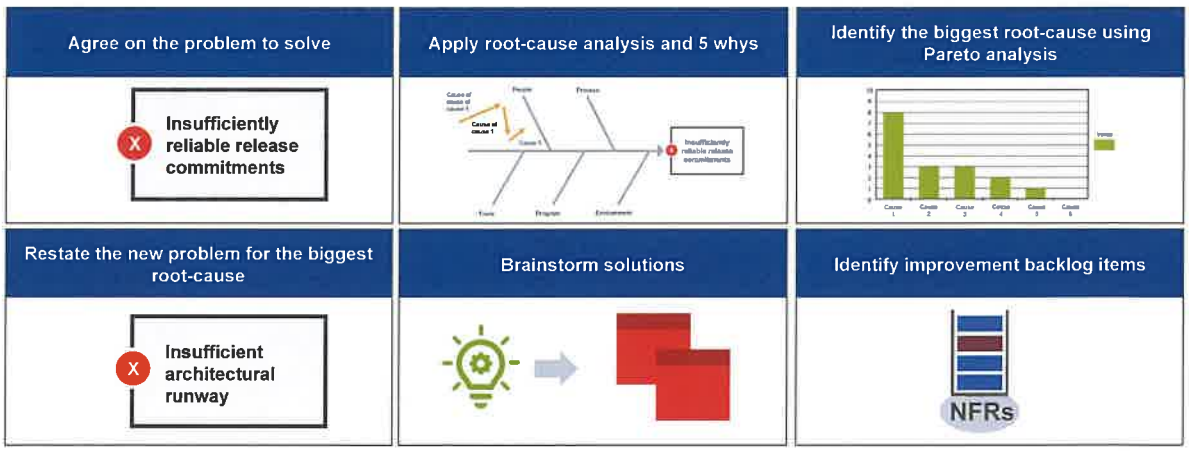
4-78

Measure ART Predictability

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



The Problem-Solving Workshop



4.5 Building a Continuous Delivery Pipeline with DevOps

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Activity: DevOps myth or fact

Prepare

7 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 the page that follows the quiz

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DevOps Myth or Fact Quiz

Instructions: Take this myth or fact quiz individually. Check your results with the answer key at the bottom of the page that follows the quiz.

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

Notes

Click to reveal quiz answers

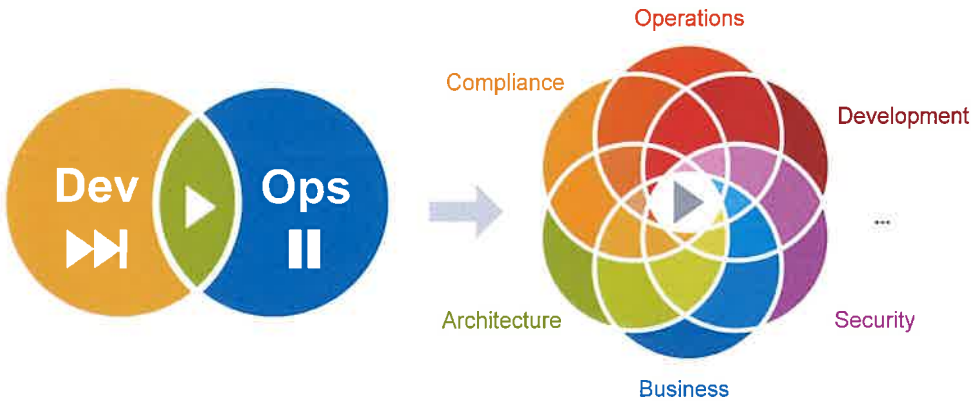
1. MYTH 2. FACT 3. MYTH 4. MYTH 5. FACT 6. FACT 7. FACT 8. MYTH 9. MYTH 10. FACT

Video: What is DevOps?

Duration 2 min

https://bit.ly/Video-WhatisDevOps

Maximize speed *and* stability



Optimized for development speed

Optimized for stability

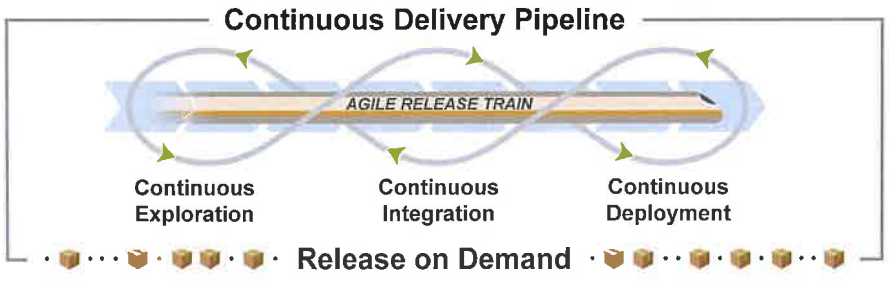
Working together for speed and stability

A CALMR approach to DevOps

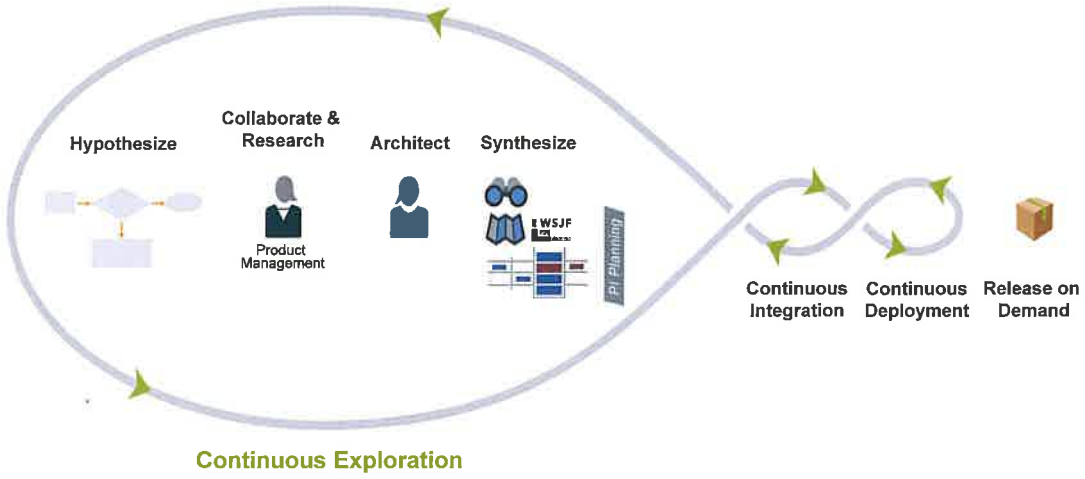
- **C**ulture - Establish a culture of shared responsibility for development, deployment, and operations.
- **A**utomation - Automate the Continuous Delivery Pipeline.
- **L**ean flow - Keep batch sizes small, limit WIP, and provide extreme visibility.
- **M**easurement - Measure the flow through the pipeline. Implement full-stack telemetry.
- **R**ecovery - Architect and enable low-risk releases. Establish fast recovery, fast reversion, and fast fix-forward.

Building the Continuous Delivery Pipeline with DevOps

- The Continuous Delivery Pipeline (CDP) represents the workflows, activities, and automation needed to deliver new functionality more frequently.
- Each Agile Release Train builds and maintains, or shares, a pipeline.
- Organizations map their current pipeline into this new structure and remove delays and improve the efficiency of each step.



Continuous Exploration – Understand Customer needs



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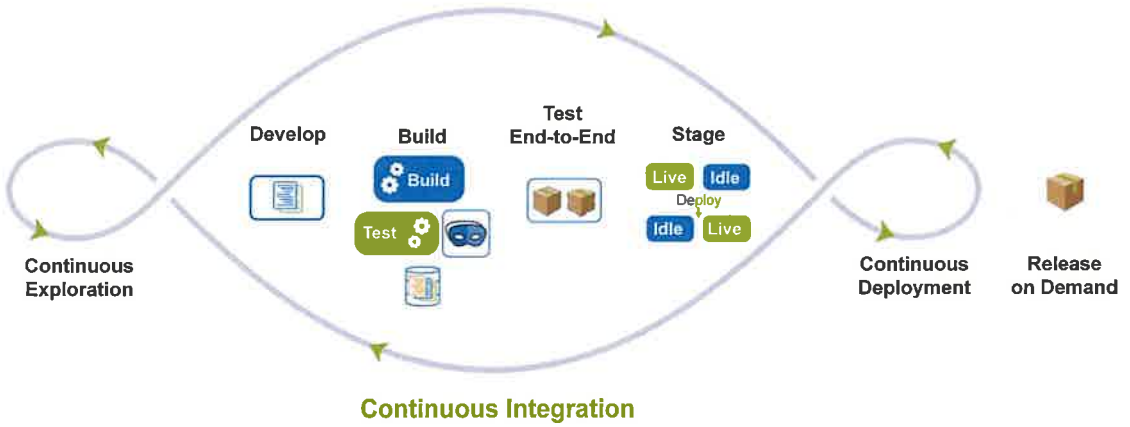
Continuous Integration – A critical technical practice of the ART



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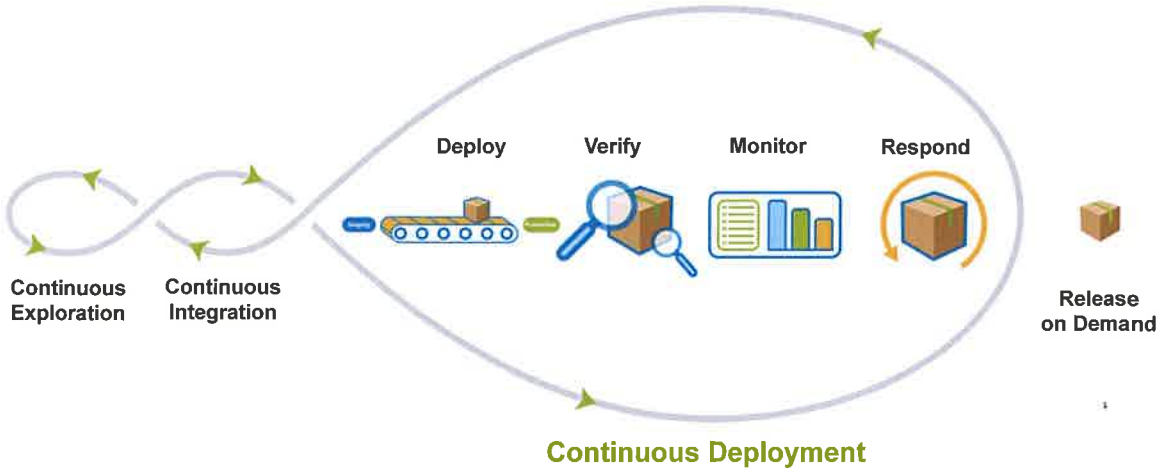
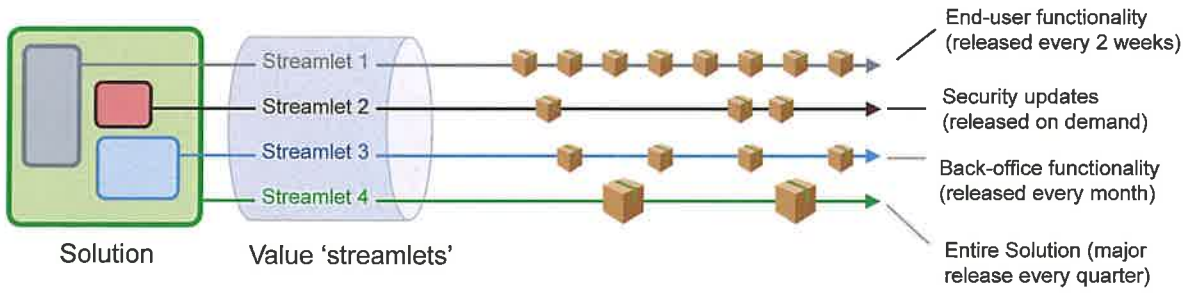
Continuous Deployment – Getting to production early

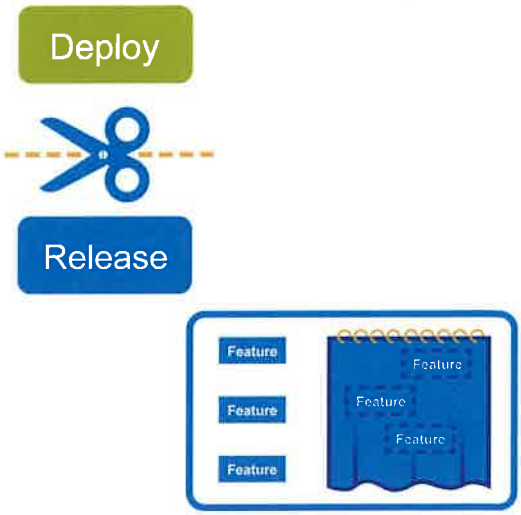


Decouple release elements from the total Solution

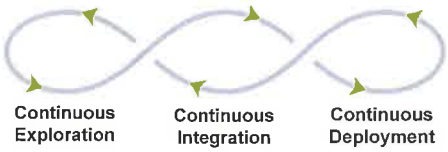


Separate deploy from release

- 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
- Timing of the release becomes a business decision



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

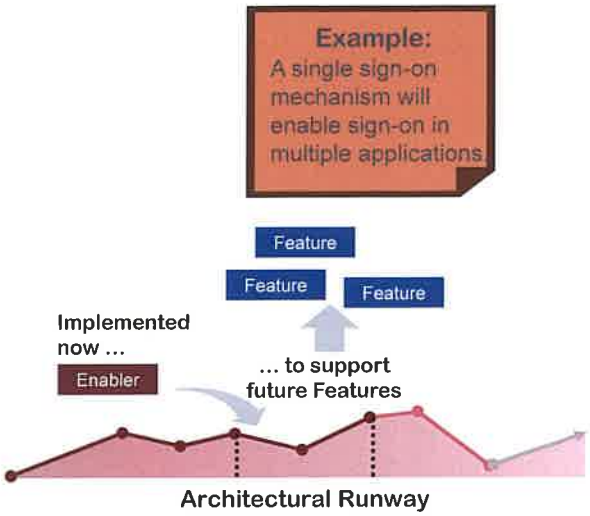


Release on Demand

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



Action Plan: Improving Agile Product Delivery

Prepare 5 min Share 3 min

- **Step 1:** Consider the practices and the events that support Agile Product Delivery as discussed earlier
- **Step 2:** Identify three minimum viable improvements you could execute to improve Agile Product Delivery. Write them down in your Action Plan
- **Step 3:** Share your insights with the class

Action Plan

Improving Agile Product Delivery

Lesson review

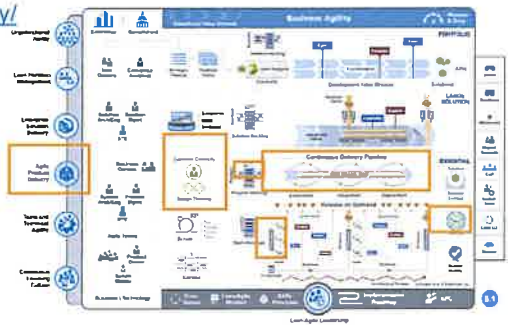
In this lesson you:

- Identified the benefits of Customer Centricity
- Practiced Design Thinking
- Experienced Program Backlog prioritization with WSJF
- Participated in a PI Planning simulation
- Explored how to Develop on Cadence and Release on Demand
- Discussed how to build a Continuous Delivery Pipeline with DevOps

Articles used in this lesson

Read these Framework articles to learn more about topics covered in this lesson

- Agile Product Delivery
  https://www.scaledagileframework.com/agile-product-delivery/
- Customer Centricity
  https://www.scaledagileframework.com/customer-centricity/
- Design Thinking
  https://www.scaledagileframework.com/design-thinking/
- WSJF
  https://www.scaledagileframework.com/wsjf/
- PI Planning
  https://www.scaledagileframework.com/pi-planning/
- DevOps
  https://www.scaledagileframework.com/devops/
- Continuous Delivery Pipeline
  https://www.scaledagileframework.com/continuous-delivery-pipeline/



Continue your SAFe journey with the following resources

Apply the *Empathy Map* Collaborate template to inform Solution development: https://bit.ly/Template-EmpathyMap	Write *SMART PI Objectives* with the following guide: https://bit.ly/Community-SMARTObjectivesPDF
Review the five-minute *WSJF Overview* and the five-minute *Calculating WSJF* videos in preparation for a prioritization workshop: https://bit.ly/Video-WSJFOverview https://bit.ly/Video-CalculatingWSJF	Use the *PI Planning* Collaborate templates to run a successful remote PI Planning Event: https://bit.ly/Community-PIPlanning
Facilitate effective *ART Events* using the following tools and guidance: https://bit.ly/Community-SAFeARTandTeamEvents	Run an *Agile Product Delivery Assessment* to identify improvement opportunities: https://bit.ly/Community-MeasureAndGrow

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Lesson notes

Enter your notes below. If using a digital workbook, save your PDF often so you don't lose any of your notes.

Lesson 5

Exploring Lean Portfolio Management

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

SA SAFe 5

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5-1

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.

Lesson Topics

5.1 Defining a SAFe Portfolio

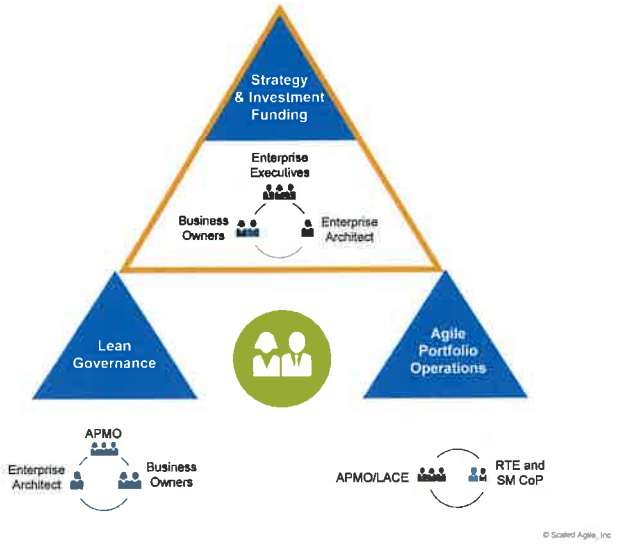
5.2 Connecting the portfolio to the Enterprise strategy

5.3 Maintaining the Portfolio Vision

5.4 Realizing the Portfolio Vision through Epics

5.5 Establishing Lean Budgets and Guardrails

5.6 Establishing portfolio flow



5-3

Learning objectives

At the end of this lesson, you should be able to:

- Describe the purpose and elements of a SAFe portfolio
- Construct well-written strategic themes
- Employ the portfolio canvas to describe the current and future state
- Create Epic hypothesis statements to inform the Vision
- Distinguish traditional and Lean budgeting approaches
- Construct a Portfolio Kanban

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5-4