

Lesson 4

Experiencing PI Planning

1. Introducing the Scaled Agile Framework
2. Embracing a Lean-Agile Mindset
3. Understanding SAFe Principles
4. Experiencing PI Planning
5. Exploring, Executing, and Releasing Value
6. Leading the Lean-Agile Enterprise
7. Empowering a Lean Portfolio
8. Building Large Solutions

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

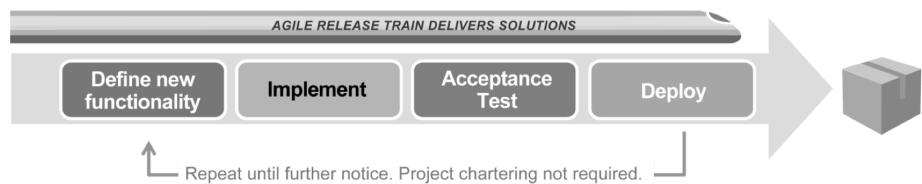
Learning objectives

- 4.1 Prepare to experience PI Planning
- 4.2 Create and review draft PI plans
- 4.3 Finalize plans and establish Business Value
- 4.4 Review final plans and commit to a set of PI Objectives

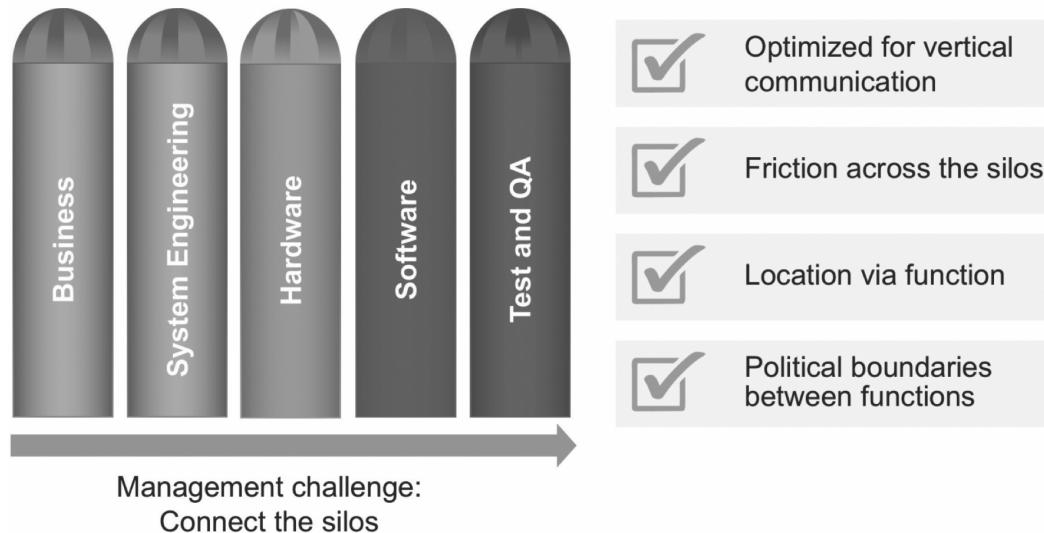
4.1 Prepare to experience PI Planning

The Agile Release Train

- ▶ A virtual organization of 5 – 12 teams (50 – 125+ individuals) that plans, commits, and executes together
- ▶ Program Increment (PI) is a fixed timebox; default is 10 weeks
- ▶ Synchronized Iterations and PIs
- ▶ Aligned to a common mission via a single Program Backlog
- ▶ Operates under architectural and UX guidance
- ▶ Frequently produces valuable and evaluable system-level Solutions

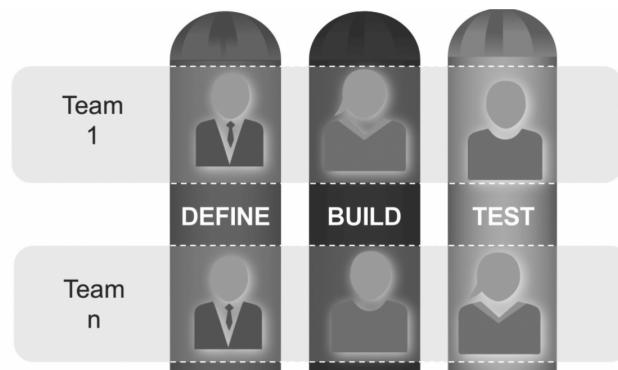


Value streams cut across organizational silos



Build cross-functional Agile Teams

- ▶ Cross-functional, self-organizing entities that can define, build and test a feature or component
- ▶ Optimized for communication and delivery of value
- ▶ Deliver value every two weeks



Agile Teams power the train



Scrum
Master

- ▶ Coach the Agile team and facilitate team meetings
- ▶ Removes impediments; protects the team from outside influence
- ▶ Attends Scrum of Scrum meetings



Product
Owner

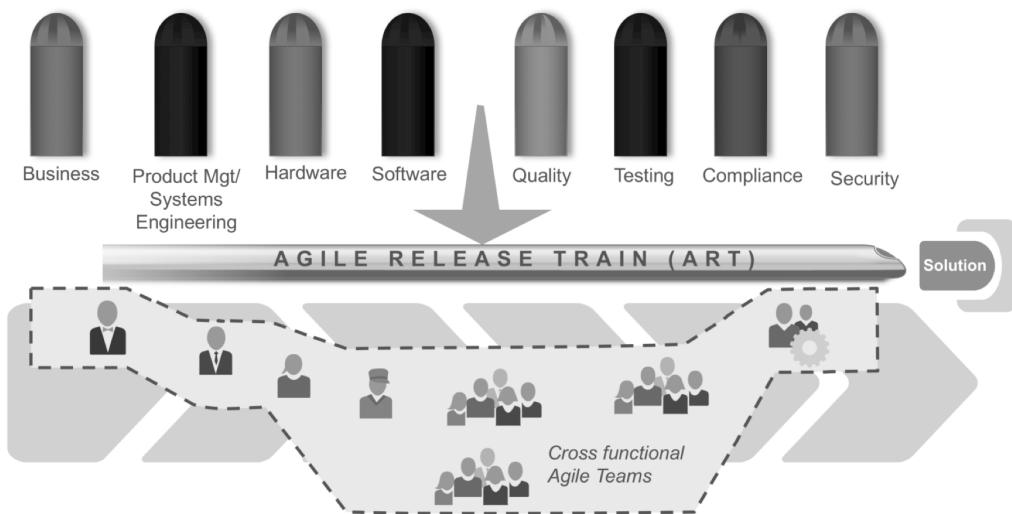
- ▶ Defines and accepts stories
- ▶ Acts as the customer for developer questions
- ▶ Works with product management to plan PIs



Development Team

- ▶ Create and refine user stories and acceptance criteria
- ▶ Define/Build/Test/Deliver stories
- ▶ Develop and commit to Team PI Objectives and iteration plans
- ▶ Three to nine members

Cross-functional Agile Release Trains deliver value



Program roles govern the train



Release Train Engineer acts as the Chief Scrum Master for the train.



Product Management owns, defines, and prioritizes the Program Backlog.



System Architect/Engineering provides architectural guidance and technical enablement to the teams on the train.



The System Team provides processes and tools to integrate and evaluate assets early and often.



Business Owners are the key stakeholders on the Agile Release Train.

PI Planning

Cadence-based PI Planning meetings are the pacemaker of the Agile Enterprise.

- ▶ Two days every 8 – 12 weeks (10 weeks is typical)
- ▶ Everyone attends in person if at all possible
- ▶ 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 example
<https://youtu.be/ZZAtI7nAB1M>
1:48



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
- ▶ Compare with other stories (an 8-point story should take 4X longer than a 2-point story)

How big is it?



Apply Estimating Poker for fast, relative estimating

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



Estimation is a whole team exercise

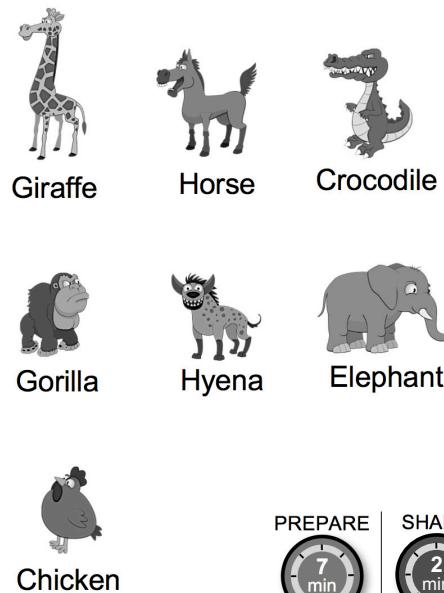
- ▶ Increases accuracy by including all perspectives
- ▶ Builds understanding
- ▶ Creates shared commitment

Estimation performed by a manager, architect, or select group negates these benefits.



Exercise: Relative size estimating

- Use Estimating Poker to relatively estimate the mass of a set of animals.
- ▶ As a team at your table, identify the smallest animal and mark it as 1
 - ▶ Estimate the remaining animals using values 1, 2, 3, 5, 8, 13, 20, 40, 100



4.2 Create and review draft PI plans

PI Planning: Simulation overview

Simulation

- ▶ In this simulation, we will plan the first Program Increment for “geekbooks.com”, an online bookstore and community portal targeting technology professionals
- ▶ Due to time constraints, only two of the typical five iterations will be planned



Exercise: Identify program roles

- ▶ Instructor asks the class for volunteers to play the roles
- ▶ Make sure all program roles have been assigned

Note: For the simulation, the System Architect/Engineer, UX and Development manager will be played by one person.

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



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Exercise: Identify team names and roles

- ▶ Your team is your table
- ▶ Create a team name
- ▶ Name a Scrum Master for your team
- ▶ Name a Product Owner for your team
- ▶ Make the team name and the names of the people selected are visible to all other teams

While the teams perform the exercise, the trainer will instruct the program level roles for the upcoming “PI Planning Briefings” exercise



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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.



 Presented by RTE

Day 1 agenda

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		<ul style="list-style-type: none"> ▶ 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		<ul style="list-style-type: none"> ▶ 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

Simulation

Day 2 agenda

8:00-9:00	Planning adjustments		Planning adjustments made based on previous day's management meeting
9:00-11:00	Team breakouts	1 2 3 4	▶ 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	1 2 3 4	If necessary, planning continues until commitment is achieved
After commitment	Planning retrospective and moving forward		▶ Retrospective ▶ Moving Forward ▶ Final Instructions

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Business context

- ▶ At GeekBooks, we provide technology professionals with a far richer experience than brick-and-mortar bookstores and online competitors by creating immersive experiences far beyond shopping
- ▶ Unlike Amazon and other competitors, we provide community-building social experiences like book club chats, coding dojos, and communities of practice in an inspiring incubation environment, encouraging hackathons and prototyping
- ▶ We have an investor demo in 5 weeks to secure our second-round funding. This event is critical for our growth!
- ▶ The goal for the first PI is to get the foundational store functionality out of the way. That will allow us to build confidence and trust with the investors. And then, in the subsequent PIs, realize the features that will differentiate us on the market.



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Business context – SWOT

Strengths

- The best software engineers in the industry
- A nimble organization
- Adopting SAFe
- Co-located
- Great strategy!

Weaknesses

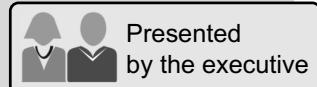
- Difficulties finding qualified FTEs in DevOps
- No System Team in place

Opportunities

- Develop new online social experiences rather than copy existing ones
- Accelerate global expansion through faster content translation
- Develop product offerings beyond books
- Build an advertising model

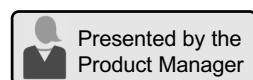
Threats

- Amazon has clear dominance
- LinkedIn tech communities continue to grow



Vision – online bookstore

- ▶ Our program vision is to provide technology professionals with a far richer experience than brick-and-mortar book stores and online competitors by creating immersive experiences far beyond shopping
- ▶ We will leverage industry best practices and features such as those offered by Amazon. This includes:
 - Tailoring our bookstore specifically to technology professionals
 - Have the easiest, fastest, and best online bookstore purchasing experience
 - Books in both electronic and print form
 - Start in US and expand into the global market
 - Support multiple languages
 - Support online communities of practice (book club chats and coding dojos, to start)
 - Sell items other than books to students



Remember: The investor demo is in 5 weeks!

Features

Priority	Feature	Description
1	Flexible search	Users will have a flexible, easy-to-use search capability to locate books
2	Shopping cart	Users can manage items in a shopping cart for immediate or future purchase
3	Purchase by credit card	Users can purchase products from us (as soon as implemented—only beta up until then)
4	Shipping method selection	Users can select a shipping method based on cost, delivery speed, and carrier
5	Profile management	Users can create and maintain their profiles rather than enter in their information each time they order
6	Book detail	Users can see informative and enticing details about a book
7	Book list sorting	Users can sort a list of books in a number of ways to more easily find what they are looking for
8	Book browsing	Users will have a simple and enjoyable way to discover new books and authors
9	Book rating	Users can rate books they've purchased to help others in their selection process
10	Commenting	Users can comment on books they've purchased to help others in their selection process



Presented by the
Product Manager

Feature Descriptions (for reference only)

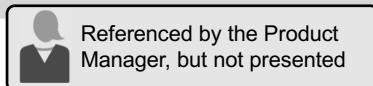
Priority	Feature	Description
1	Flexible search	Search by author, title, or genre from a single search field. Misspelling substitutions (i.e., “Did you mean ... ”). Present results as per-match algorithm.
2	Shopping cart	Users can easily access their cart from any page, view the same information displayed in the Book List, change the quantity, remove it from their cart, or save it for later. A subtotal for all items in their shopping cart should be displayed at the bottom. Items saved for later should appear below that.
3	Purchase by credit card	Users can select from their preferred credit card and shipping address as defined in their Profile or add new ones. Visa, Mastercard, Discover, and Diners Club are required. American Express is optional. Must be PCI compliant.
4	Shipping method selection	Users can select a shipping method based on the price, delivery speed, and estimated delivery date for all major carriers (USPS, UPS, and FedEx).
5	Profile management	Users can manage their login credentials (ID, password), personal information (name, email address, home address), nickname for book rating and commenting, credit card information (multiple), and shipping address (multiple). Physical addresses, email addresses, and credit card info should be verified as valid. Passwords must meet our current security standards.



Presented by the
Product Manager

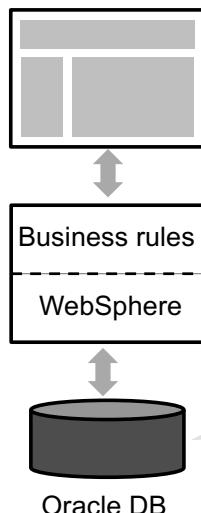
Feature Descriptions (for reference only)

Priority	Feature	Description
6	Book detail	Display book name, book cover (which can be enlarged when clicked), author and bio, book description, genre, publishing info (publisher, release date, etc.), Book Rating and Comments. Hyperlink author's name to a list of other books by the same author.
7	Book list sorting	Sort by book title, author, price, Book Rating, and release date. Allow for user to select the number of search results to appear on each page.
8	Book browsing	Allow user to browse books by genre, top sellers in our book store, Tech Valley Times best sellers, and book rating. When presenting books within a genre, place Tech Valley Times best sellers at the top and then sort the remaining by Book Rating.
9	Book rating	Use a five-star rating system. Users can only rate a book if they've purchased it, and may select whether they show their nickname (defined in their profile) or remain anonymous.
10	Commenting	A single comment should be limited to the number of characters which can fit within half the browser window (so that there are at least two comments which can appear at the same time). Users can only comment on a book if they've purchased it, and may select whether they show their nickname (defined in their profile) or remain anonymous.



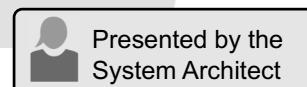
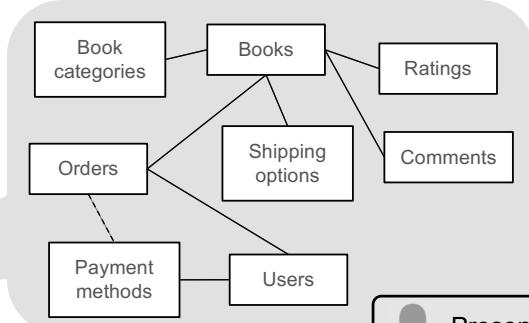
Architecture and UX briefing

UI: HTML 5 / CSS



NFRs:

- ▶ Security (see Wiki)
- ▶ Performance: Avg. response time < 2 sec



Architecture and UX briefing

- ▶ Platform: WebSphere Application Server and Java (environments already tested)
- ▶ Internationalization Strategy
 - Epic in analysis for PI 2
- ▶ Performance guidelines are located at:
internal.webserver.com/performanceguidelines
- ▶ Wireframes and CSS are defined at: internal.webserver.com/ux



Presented by the
System Architect

Development practices

- ▶ Automated system integration is not in place. We want to integrate twice per Iteration:
 - Start using Jenkins for continuous integration
 - Use a single program branch
- ▶ Don't forget: Upgrade Eclipse to latest version for stability



Presented by the
System Architect

Planning guidance

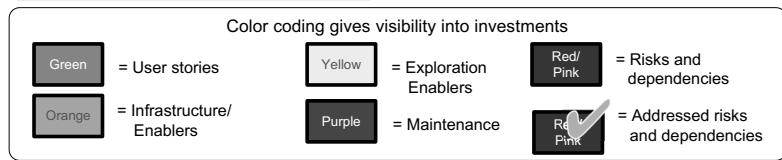
Expect this first PI Planning to feel a bit chaotic. Future PI Planning meetings will become more routine.

- ▶ 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 iteration and work out interdependencies with other teams



Planning requirements

This exercise

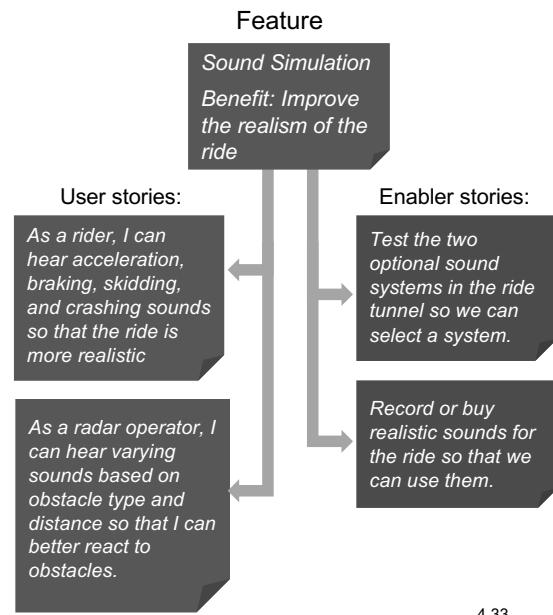


Features are implemented by Stories

Features are decomposed into Stories by the teams on the train.

- ▶ Small increments of value that can be developed in days and are relatively easy to estimate
- ▶ Teams on the train collaborate to deliver features incrementally via user Stories
- ▶ Features fit in one PI for one ART, stories fit in one Iteration for one Team
- ▶ Enabler stories represent different types of work:
 - ▶ Exploration
 - ▶ Architecture
 - ▶ Infrastructure
 - ▶ Compliance

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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 ... But not always.

For example:

- ▶ Aggregation of a set of features, stated in more concise terms
- ▶ A milestone like a trade show
- ▶ An Enabler Feature needed to support the implementation
- ▶ A major refactoring

<u>Objectives for PI 1</u>	<u>Business Value</u>
<ul style="list-style-type: none"> › Structured location and validation of locations › Build and demonstrate a proof of concept for context images › Implement negative triangulation by: tags, companies and people › Speed up indexing by 50% › Index 1.2 B more web pages › Extract and build URL abstracts 	
Stretch Objectives for PI 1	
<ul style="list-style-type: none"> › Fuzzy search by full name › Improve tag quality to 80% relevance 	

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Maintain predictability with stretch objectives

Stretch objectives do count in velocity/capacity.

- ▶ They are planned, and aren't extra things teams to do, "just in case you have time"
- ▶ But, 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 stretch
- ▶ If an item has many unknowns, consider moving it to stretch, and put in early spikes

Exercise: Calculate initial velocity

Use the "Starting fast with capacity-based planning" slide on the next page to calculate your team's starting velocity.

- ▶ Calculate your estimated velocity for the next two, two-week iterations
- ▶ The first iteration starts Monday
- ▶ Use your real availability
- ▶ Each team should have their estimated velocity for two iterations



Starting fast with capacity-based planning

Normalized estimation technique:

- ▶ For every full-time developer and tester on the team, give the team eight points (adjust for part timers)
- ▶ Subtract one 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
- ▶ Never look back (don't worry about recalibrating)



Example: Assuming a 7-person team composed of 3 developers, 2 testers, 1 Product Owner and 1 Scrum Master, with no vacations etc.

Exclude Scrum Master and Product Owner from the calculation

$$\text{Estimated Capacity} = 5 * 8 \text{ pts} = 40 \text{ pts/iteration}$$

Simulation

Setup your team area

- ▶ Setup team area as shown below. Enter the velocity for each iteration.
- ▶ Acceptance criteria
- ▶ Team area setup

Iteration 1.1 Velocity: _____ Load: _____	Iteration 1.2 Velocity: _____ Load: _____	PI OBJECTIVES - - - - ----- Stretch Objectives - -	RISKS
---	---	--	--------------

Velocity (Capacity): _____
Load: _____

10 min

Exercise: Team breakout #1

- ▶ You will be planning a short program increment with two iterations
- ▶ You will need to resolve ambiguities and manage dependencies
- ▶ You will need to negotiate with:
 - Your Product Owner
 - Other teams
 - Business Owners
- ▶ RTE conducts Scrum of Scrums sync after 30 minutes (see next exercise)

Make sure:

- ▶ Team velocity (capacity) entered for iterations 1 and 2
- ▶ All stories estimated, no story bigger than 8 story points.
- ▶ Iteration loaded and entered for iterations 1 and 2; load less-than or equal-to velocity
- ▶ PI Objectives are written in clear business language
- ▶ Stretch objectives identified
- ▶ Program risks are identified on red sticky notes



Exercise: Scrum of Scrums (SoS) sync

- ▶ The RTE conducts the SoS sync. The entire class will observe for learning
- ▶ Each Scrum Master will respond to each of the questions for the team
- ▶ RTE holds a “Meet After” the sync (limited to 1–2 topics for the simulation)

Sync Question	Team 1	Team 2	...
Have you identified the velocity 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”			



Exercise: Draft plan review

One team will present the summary of their first two iterations and one or more draft PI Objectives.

- ▶ Velocity (capacity) and load for each iteration
- ▶ Draft PI Objectives
- ▶ Program risks and impediments



Management review and problem-solving

At Day 1 end, 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? Resources?
- ▶ 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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4.3 Finalize plans and establish Business Value

Day 2

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



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

Make planning adjustments

Based on the previous day's management review and problem-solving meeting, adjustments are discussed.

Possible changes:

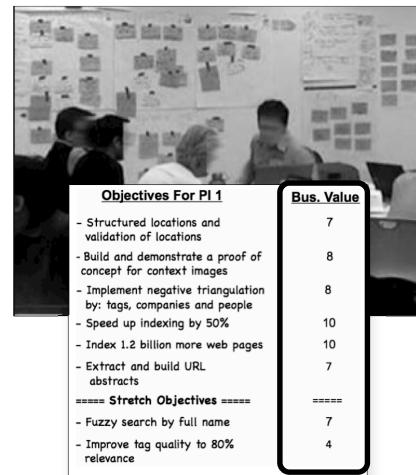
- ▶ Business priorities
- ▶ Adjustment to plan
- ▶ Changes to scope
- ▶ Movement of people



Team breakout #2

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

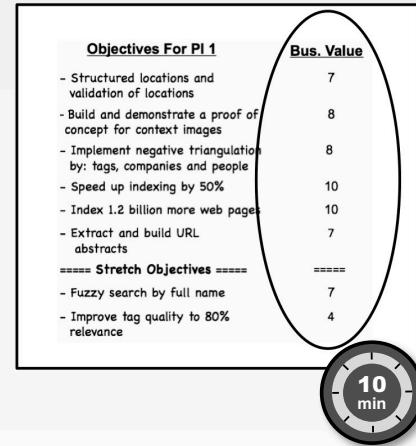
- ▶ In the second team breakout, Business Owners circulate and assign business value to PI Objectives from low (1) to high (10)
- ▶ Teams finalize the Program Increment plan
- ▶ Teams also consolidate program risks, impediments, and dependencies
- ▶ Stretch objectives provide the capacity and guard band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



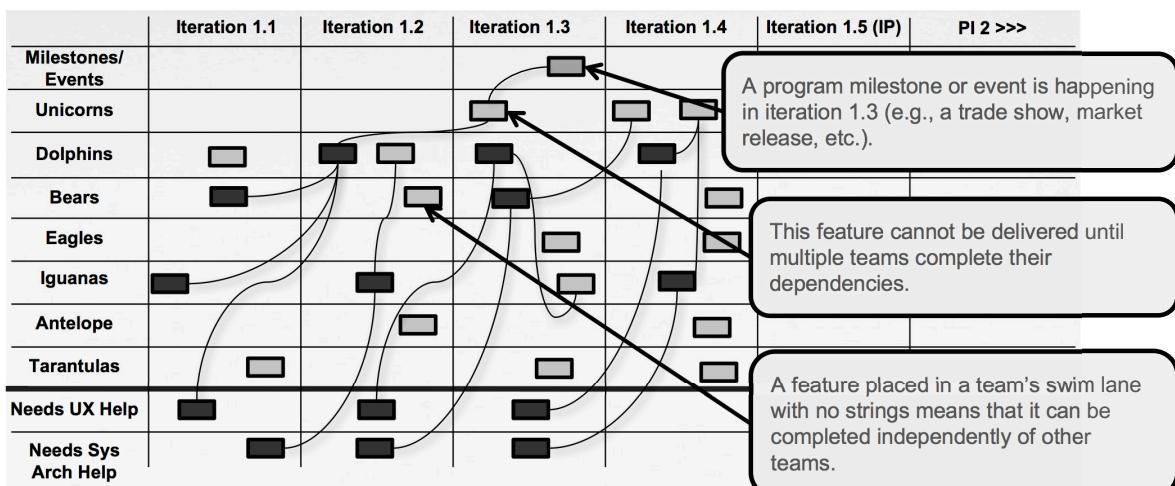
Objectives For PI 1	Bus. Value
- Structured locations and validation of locations	7
- Build and demonstrate a proof of concept for context images	8
- Implement negative triangulation by: tags, companies and people	8
- Speed up indexing by 50%	10
- Index 1.2 billion more web pages	10
- Extract and build URL abstracts	7
===== Stretch Objectives =====	=====
- Fuzzy search by full name	7
- Improve tag quality to 80% relevance	4

Exercise: Setting Business Value

- ▶ The instructor will demonstrate setting business value for one team's objectives.
- ▶ Bring the Business Owners to one team's draft plans
- ▶ The Business Owners will set value on a scale of 1-10 for each identified objective
- ▶ Short discussions will illustrate the larger purposes and thought processes



Program board - Feature delivery, dependencies and Milestones



Exercise: Identifying problems

- ▶ Find a partner from another table and together review the program boards on the following two slides
- ▶ What problems can you identify? What can you do during PI planning? What can you do after PI planning?

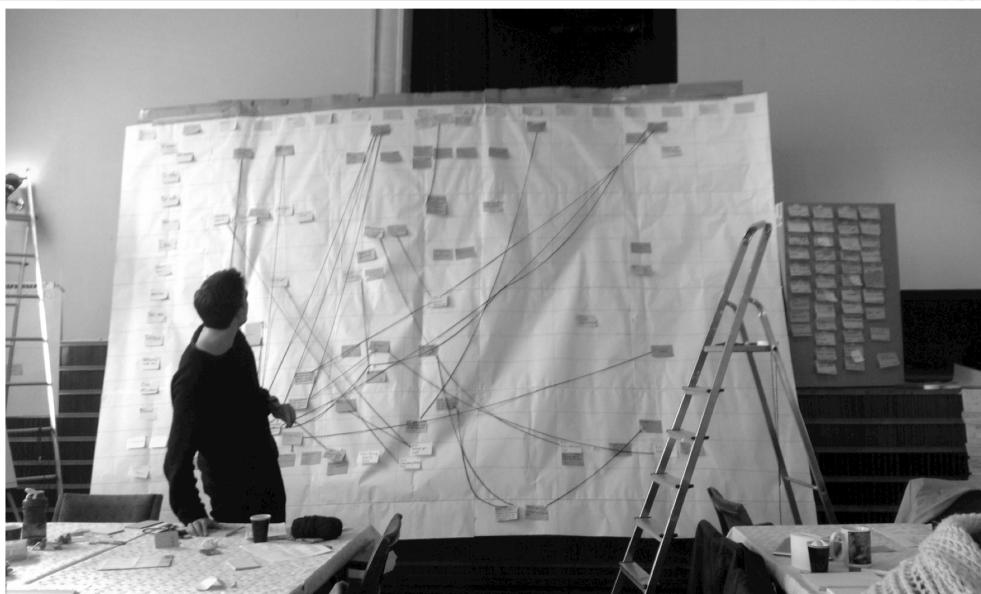
Problems	Solutions during planning	Solutions after planning

PREPARE | SHARE
6 min | 4 min

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A real Program Board



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4.50

Another real Program Board



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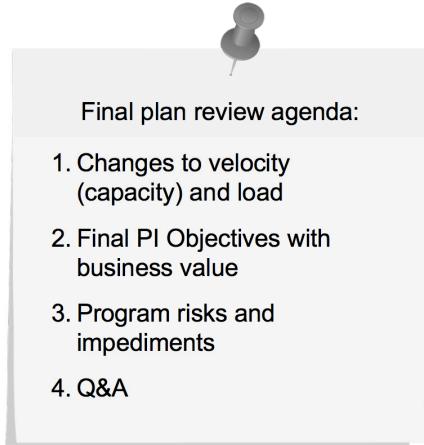
4.4 Review final plans and commit to a set of PI Objectives

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Final plan review

Teams and Business Owners peer review all final plans.



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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



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Addressing program risks

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

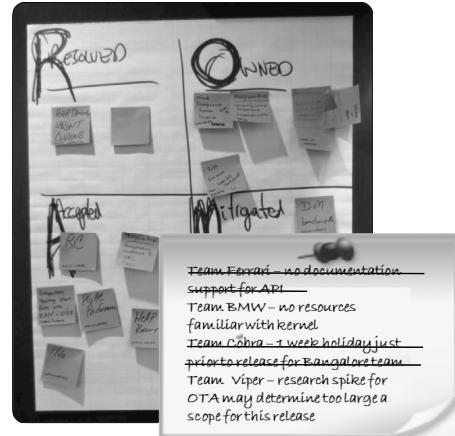
ROAMing risks:

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



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Simulation

Exercise: Manage program risks

- ▶ The Instructor will demonstrate “ROAMing” 1–2 risks for one team
- ▶ Pick 1–2 risk examples
- ▶ Read them in front of all teams and stakeholders
- ▶ See if anyone can own, help mitigate, or resolve the risks. Otherwise accept as is.
- ▶ Put each risk in to a correspondent quadrant of the ROAM sheet for the program



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Confidence vote: Team and Program Levels

After dependencies are resolved and risks are addressed, a confidence vote is taken at the Team and Program Levels.

“Fist of five” confidence vote

- ▶ Range of 1-5
- ▶ 1 = No confidence
- ▶ 5 = Very high confidence

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



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Run a Planning Meeting retrospective

The PI Planning Meeting will evolve over time. Ending with a retrospective will help it continuously improve.



The Planning Meeting retrospective

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



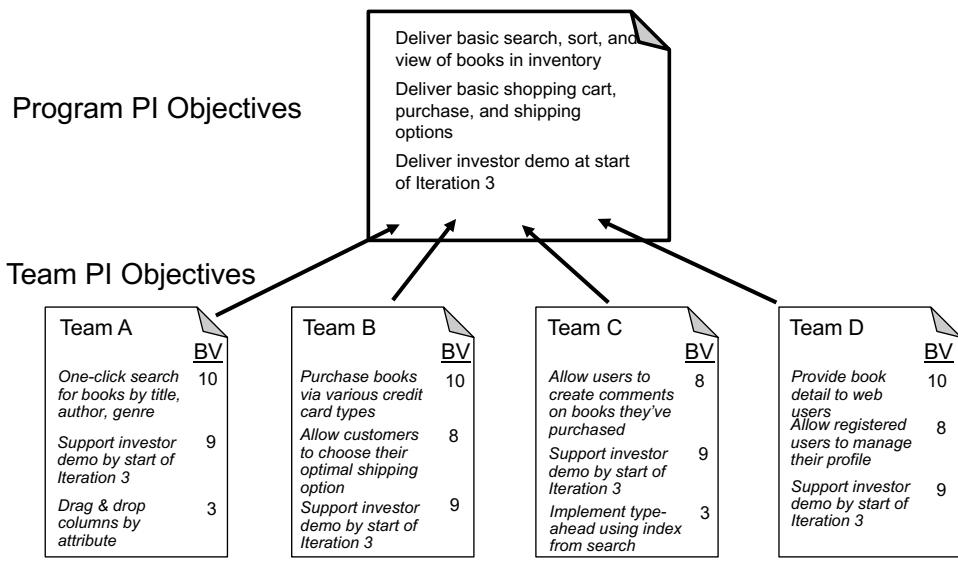
Add the action items to your Program Backlog and take action!

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RTE take-a-way: Integrated PI Objectives

Program PI objectives are the synthesis of each team's PI objectives



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Simulation

Exercise: Simulation debriefing

Discussion of the lessons learned from the PI Planning simulation



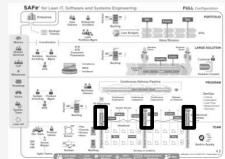
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Lesson summary

In this lesson, you experienced PI Planning via an exercise where you:

- ▶ Created and reviewed draft PI Plans
- ▶ Finalized plans and established Business value
- ▶ Reviewed final plans and committed to a set of PI Objectives



*Suggested Scaled Agile Framework reading:
“PI Planning” article*