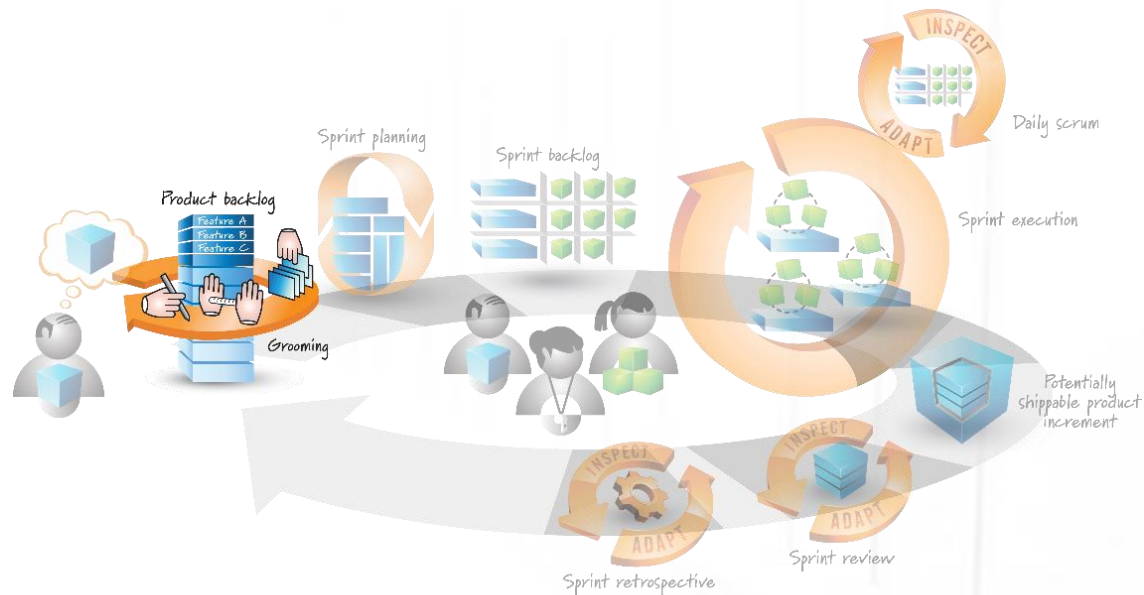# Product Backlog

CEN 4010 Intro to Software Engineering

Professor Alex Roque

What is Product Backlog?

- **Product Backlog:**
  - Is a **prioritized list** of desired product functionality (artifacts)
  - **Centralized & Shared** understanding of what to build and its build order
  - Is **highly visible** to all Scrum participants
  - **Exists** for **products** being built, enhanced, or supported

Product Backlog Items

- **Product Backlog** consists of **backlog items**, called PBIs, backlog items, or just items

- **Most** PBIs:
  - Are **features/functionalities** that will have **tangible value** to the user or customer
  - Often are written as **User Stories** (but Scrum does not dictate a format)

- Examples of PBIs include:
  - Features
  - Defects
  - Technical Work
  - Knowledge Acquisition (proof of concept)
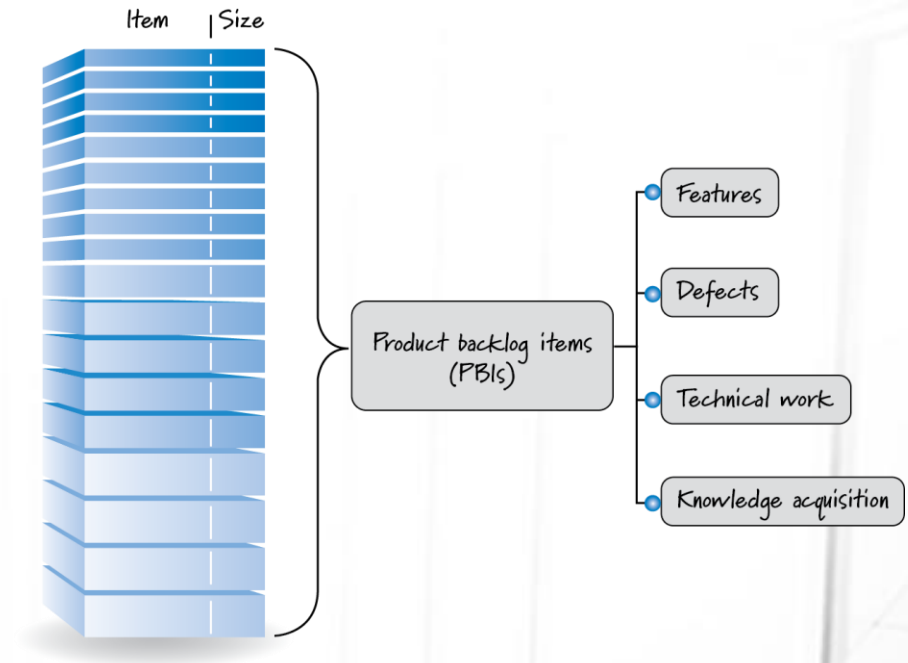
PBI Type
Feature
Change
Defect
Technical Improvement
Knowledge Acquisition

PBI Examples

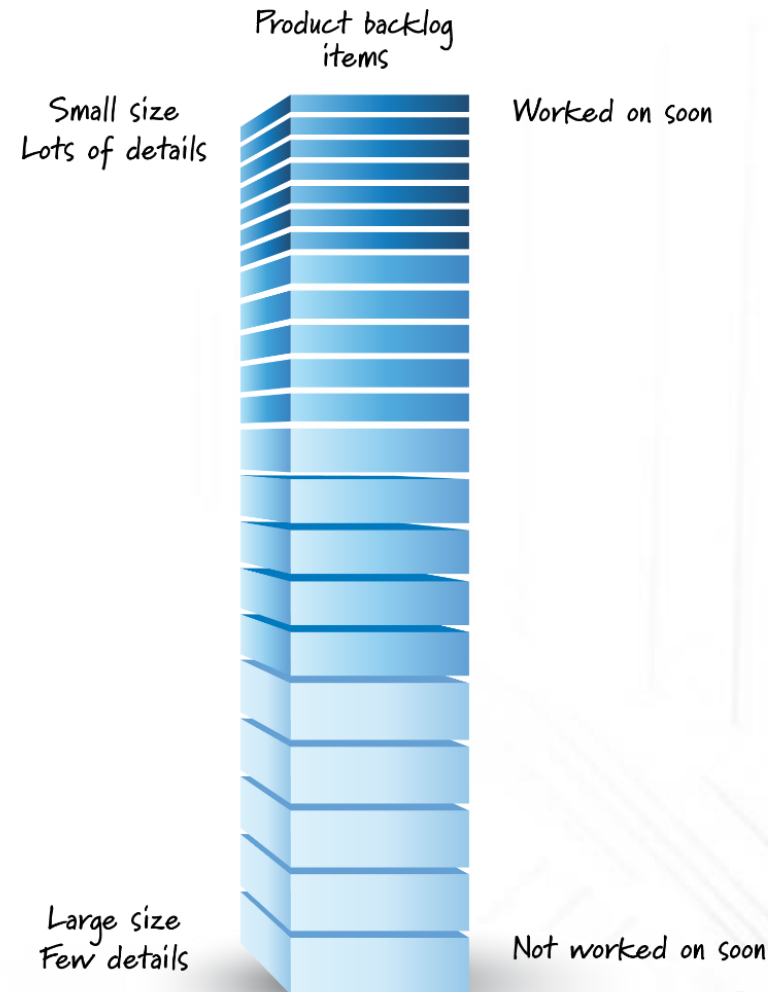| PBI Type	Example
Feature	As a customer service representative I want to create a ticket for a customer support issue so that I can record and manage a customers request for support.
Change	As a customer service representative I want the default ordering of search results to be by last name instead of ticket number so that it's easier to find a support ticket.
Defect	Fix defect #256 in the defect-tracking system so that special characters in search terms wont make customer searches crash.
Technical Improvement	Move to the latest version of the Oracle DBMS
Knowledge Acquisition	Create a prototype or proof of concept of 2 architectures and run three tests to determine which would be a better approach for our product.

Good Product Backlog Characteristics

- <u>D</u>etailed Appropriately

- <u>E</u>mergent

- <u>E</u>stimated

- <u>P</u>rioritized

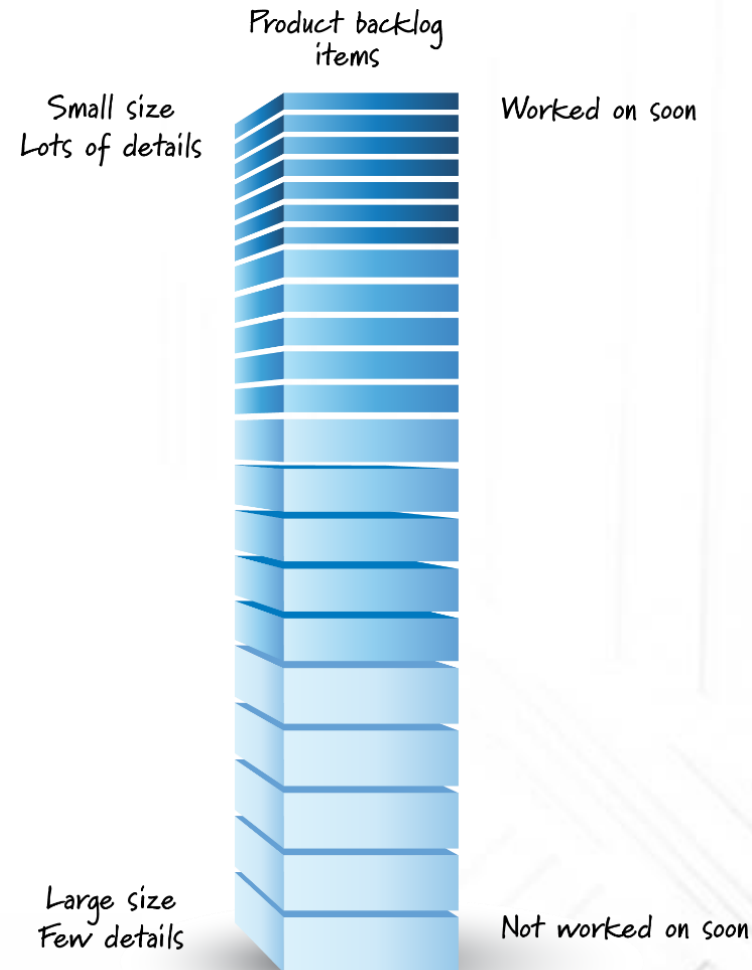- **DEEP** acronym coined by Roman Pichler (2010) & Mike Cohn

Product Backlog Characteristic – Detailed Appropriately

- Not all PBIs are at the **same level of detail** at the same time

- PBIs **being prepared to work on** should be small, very detailed, and near the top of the prioritized list

Product backlog items

Small size
Lots of details

Worked on soon

Large size
Few details

Not worked on soon

Product Backlog Characteristic – Detailed Appropriately

- **Other PBIs** are lower in the list, larger in size, and less detail

- Larger PBIs, **EPIC**s, are decomposed into sprint-ready items in a just-in-time fashion

Product backlog items

Small size
Lots of details

Worked on soon

Large size
Few details

Not worked on soon

Product Backlog Characteristic - Emergent

- While a **product** is being built, enhanced, or supported, its backlog is never complete or frozen

- Product Backlog is **continuously being updated** based on a stream of economically viable information

- Therefore, the Product Backlog's structure is fluid needing rebalancing and prioritizing based on new information

Product Backlog Characteristic - Estimated

- **Each PBI** has a size estimate associated with it

- Product Owner uses the **estimate** as one input to prioritization

- **Large PBIs** near the top of the list indicate refinement is necessary

- Most PBIs are estimated in either **story points** or **ideal days** (See Chapter 7 for details)

Item | Size

| 2
| 3   Each item has a size estimate
| 2
| 5   Most estimates are story point
| 13   or ideal day estimates
| 13
| 20
| 20
40
L   Very large items near the bottom may not have an estimate or may be estimated in T-shirt sizes
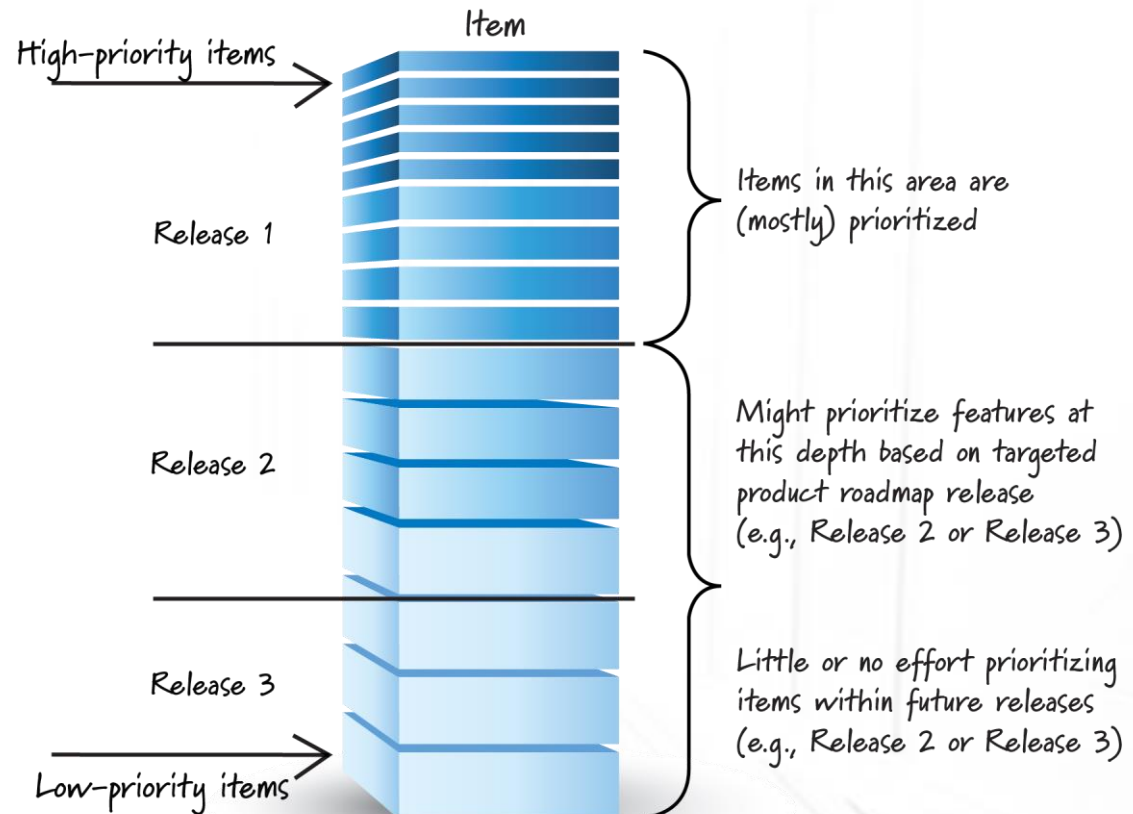XL

Product Backlog Characteristic - Estimated

- **Estimates** should be reasonably accurate without being overly precise

- **Smaller,** near top of the list **PBI**s will have smaller, more accurate size estimates

- **Epic**s, larger PBIs, are **more difficult to estimate accurately** so some teams use T-shirt size estimates (L, XL, XXL, etc.)

Item | Size

2

3 — Each item has a size estimate

2

5 — Most estimates are story point
13   or ideal day estimates

13

20

20

40

L — Very large items near the bottom
       may not have an estimate or may
XL   be estimated in T-shirt sizes
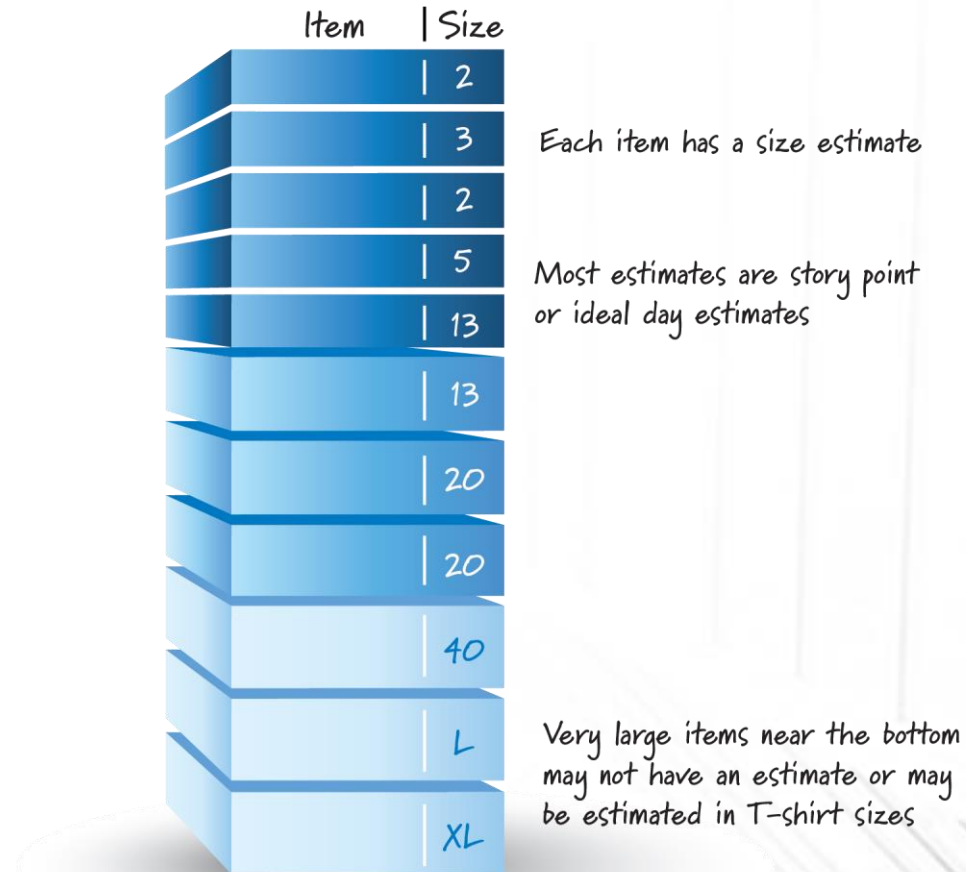
Product Backlog Characteristic - Prioritized

- Not necessary to prioritize items near bottom of the list

- Useful to prioritize PBIs that are candidates for the **next few sprints or to a first release**

- Too much time focus on the future is to be avoided
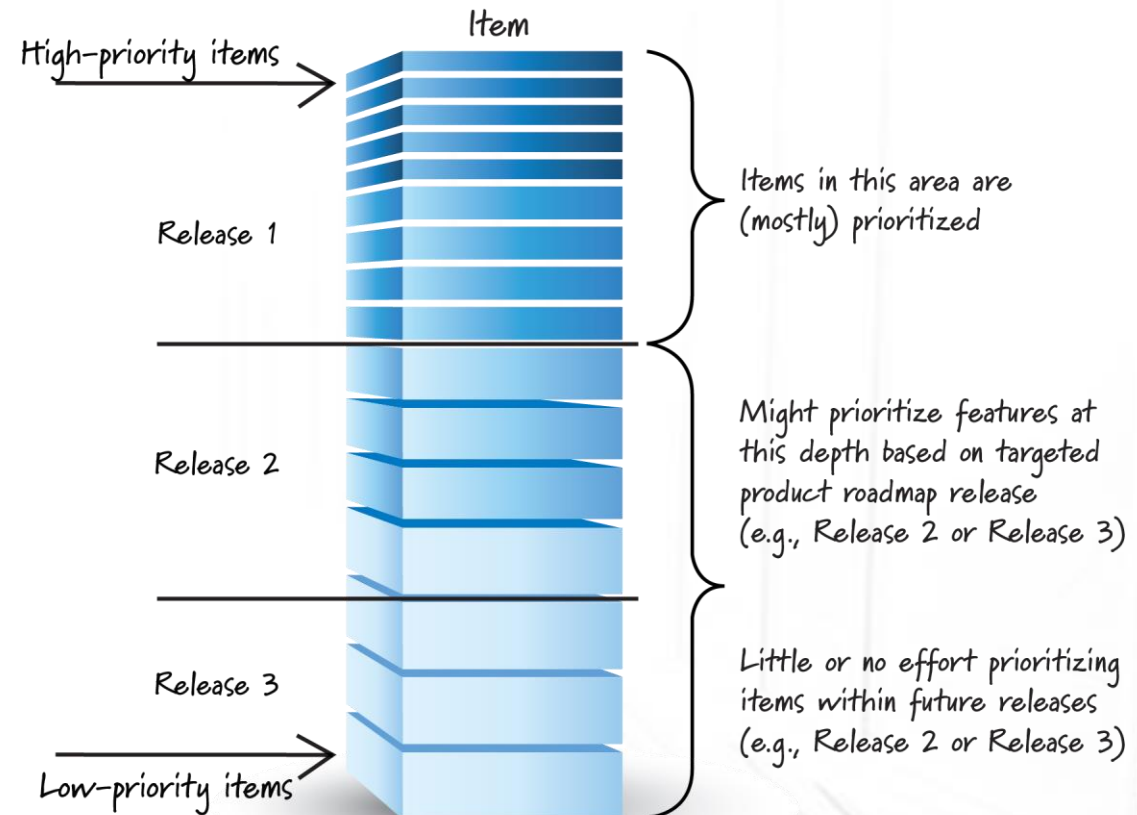
- Of course **changes** can shuffle PBIs

High-priority items

Item

Release 1

Items in this area are (mostly) prioritized

Might prioritize features at this depth based on targeted product roadmap release (e.g., Release 2 or Release 3)

Release 2

Release 3

Little or no effort prioritizing items within future releases (e.g., Release 2 or Release 3)

Low-priority items

Product Backlog Grooming

- Think about the following: When does an item in the Product backlog guarantee that it will be worked on by a team?
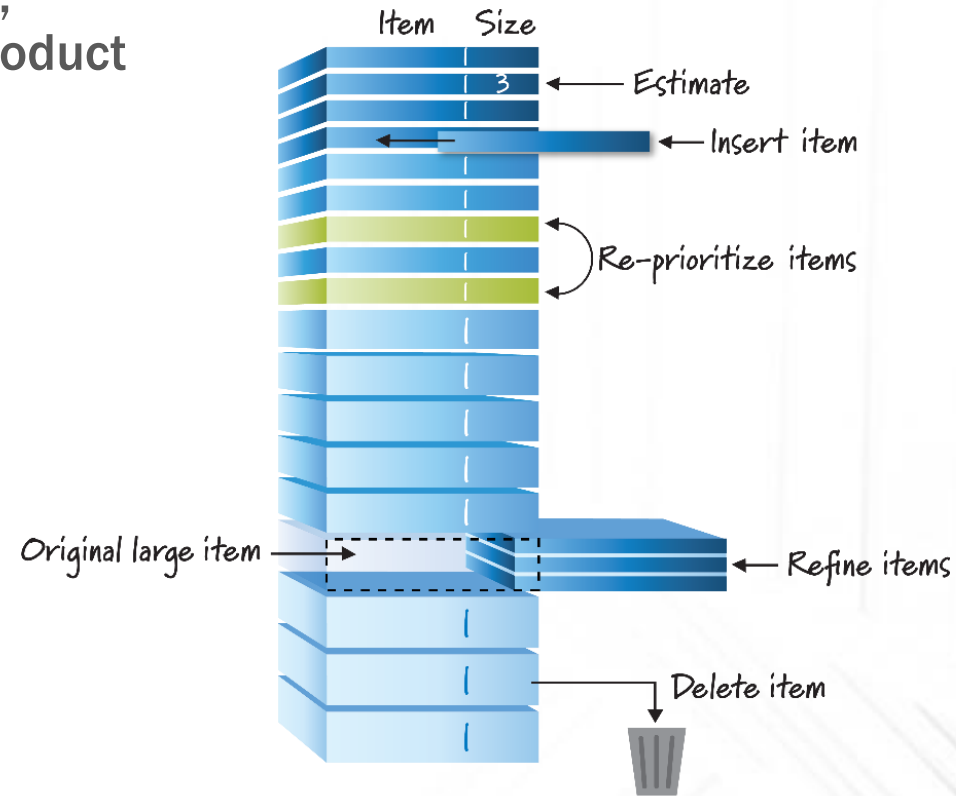
Product Backlog Characteristic - Prioritized

- <u>Answer:</u> Everything in the product backlog is projected or scheduled but NOT committed.

- Only when a scrum team pulls it onto a sprint can we say that it has been committed to and will be completed.

High-priority items

Item

Items in this area are (mostly) prioritized

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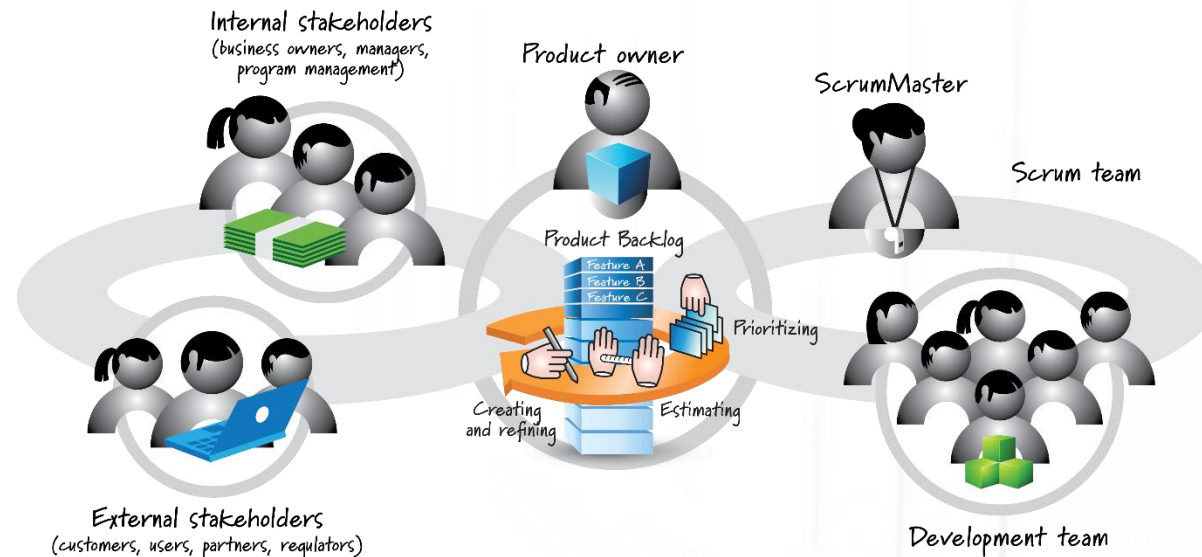
Release 3

Low-priority items

Product Backlog Grooming

- **Grooming** - Proactively manage, organize, and administer the Product Backlog to accomplish **DEEP** characteristics

- **Grooming activities:**
  - **Creating & Refining** PBIs
  - **Estimating** PBIs
  - **Prioritizing** PBIs

Item   Size

3 ← Estimate

← Insert item

Re-prioritize items

Original large item ← ⋯ → Refine items

Delete item

Product Backlog Grooming

- **Product Owner** leads grooming & is the **final decision maker**

- Input from stakeholders, ScrumMaster, Dev. Team

- Dev. Team should allocate **up to 10%** of its time each sprint for grooming

Internal stakeholders (business owners, managers, program management)

Product owner

ScrumMaster

Scrum team

Product Backlog

Feature A
Feature B
Feature C

Prioritizing

Creating and refining

Estimating

External stakeholders (customers, users, partners, regulators)

Development team

Product Backlog Grooming

- Scrum framework does not specify **when** grooming should take place

- Waterfall development tries to capture detailed requirements up front so little or no grooming is scheduled (yet it always occurs!)

- Scrum expects an **uncertain environment** so team must be prepared to **constantly** inspect and adapt

- Initial grooming occurs as part of the release-planning activity (Ch. 18)

- On-going grooming can occur **once-a-sprint**, **every week**, or even **daily**
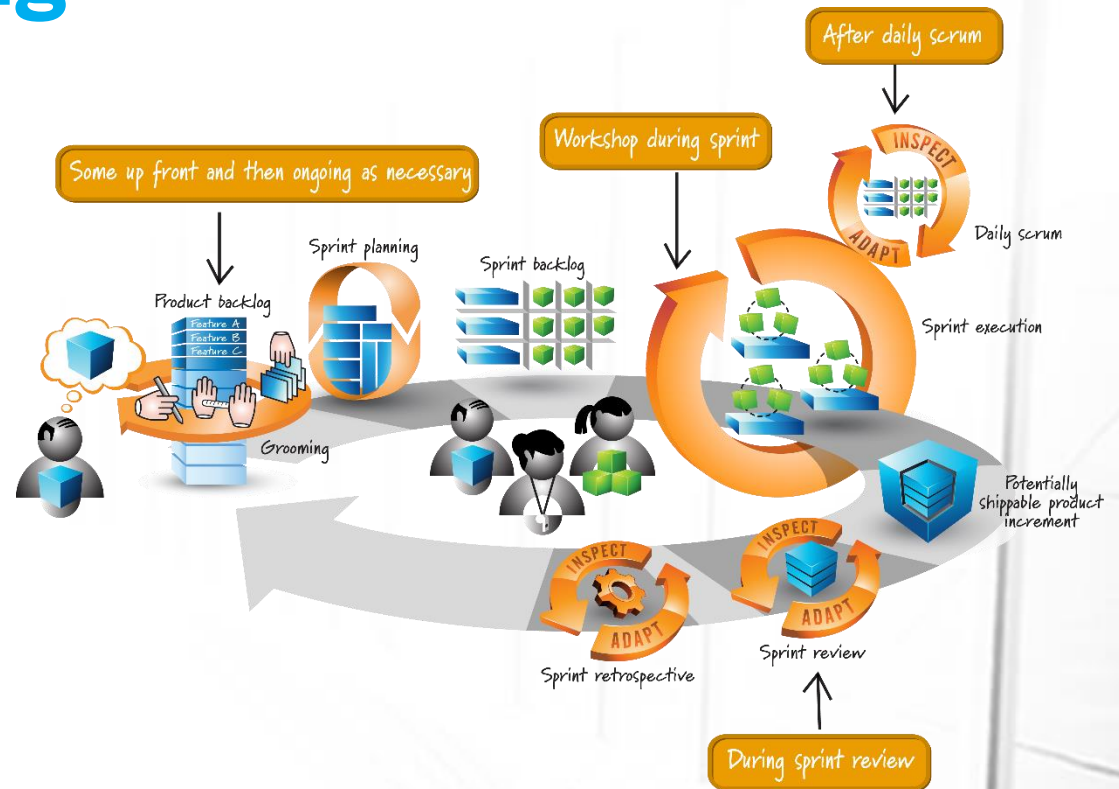
Product Backlog Grooming

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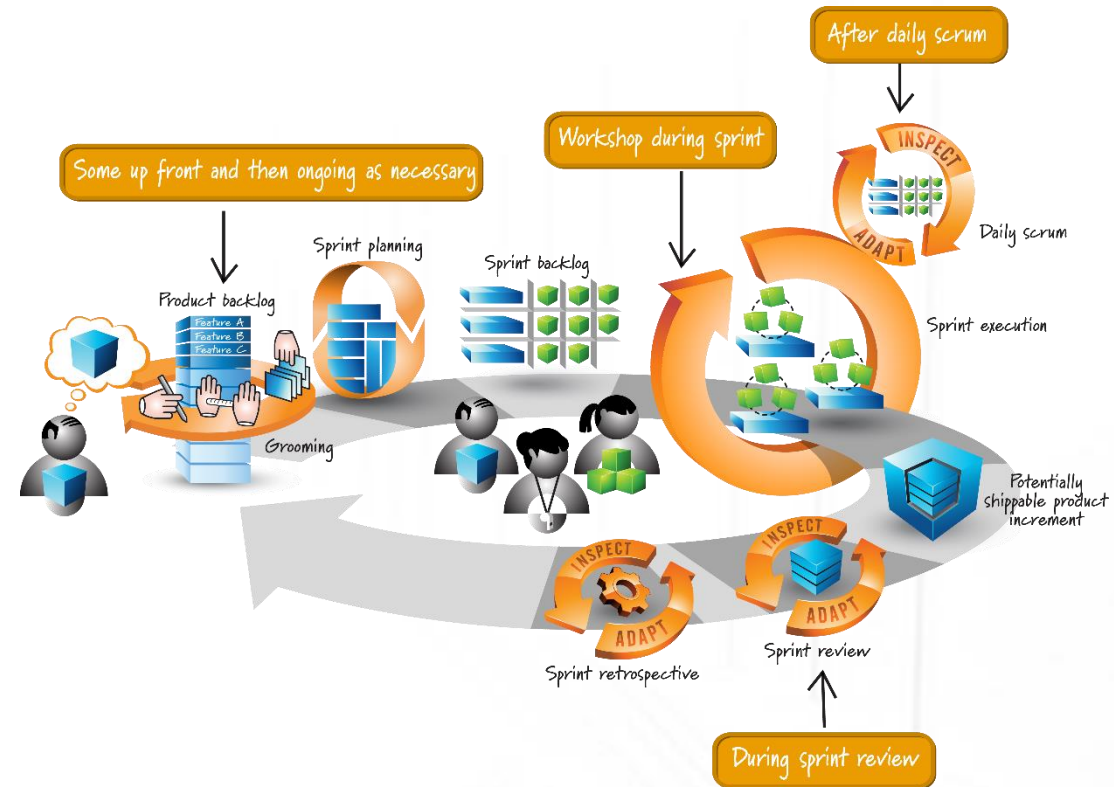
Product Backlog Grooming

- **Grooming** the backlog should ensure that **PBIs** at the top of it are ready to move into a sprint

- Some teams establish a Definition for **Ready** similar to **Done** to help formalize grooming

- Example of a **Ready** Checklist
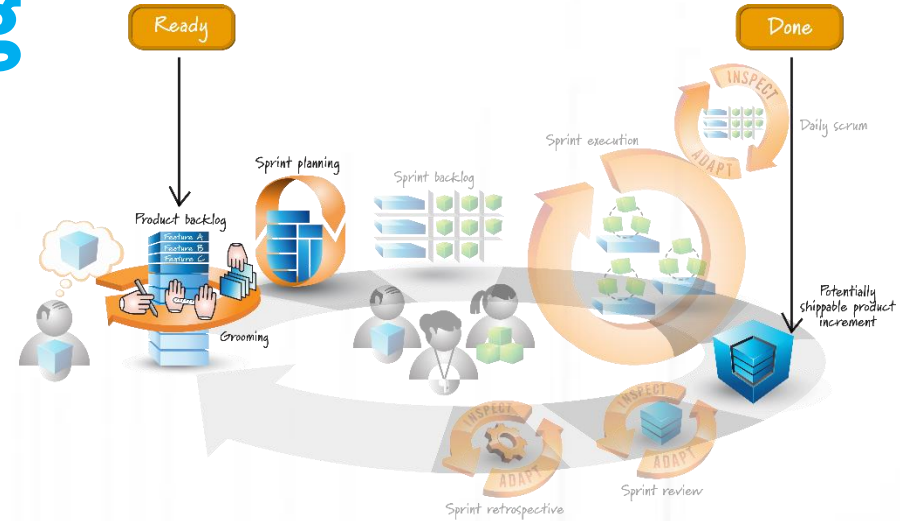
| Definition of Ready |
| --- |
| Team is staffed appropriately to complete the PBI |
| The PBI is estimated and small enough to comfortably be completed in one sprint |
| Acceptance criteria are clear and testable |
| Performance criteria, if any, are defined and testable |
| Scrum team understands how to demonstrate the PBI at the sprint review |

Product Backlog Grooming

- What are some of the challenges of pulling in a backlog item that is not ready?

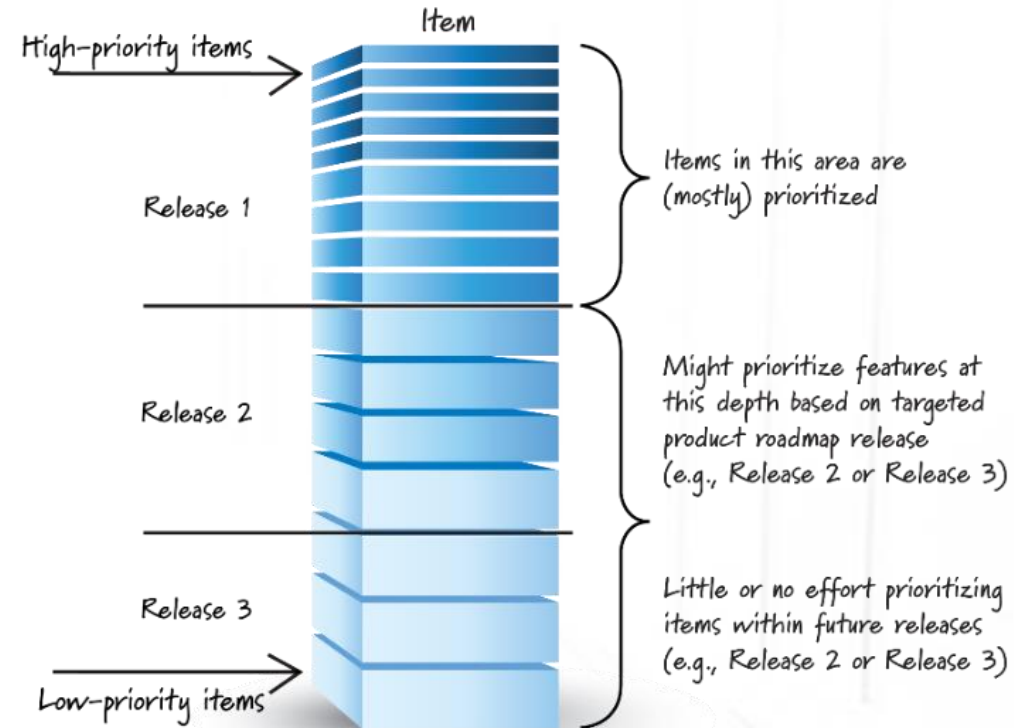# Product Backlog Grooming

- **Pulling an item that is not ready to be worked on can cause:**

  - Slow down the implementation: If the work item is not clearly defined, the scrum may have to constantly stop to ask questions which will slow down the implementation.

  - Future rework of the item: The work item may be implemented incorrectly if the required details are not answered.

  - Item might be closed at the end of sprint: If the work item doesn't have the correct acceptance criteria, it will not be closed and it will be pushed to the next sprint.
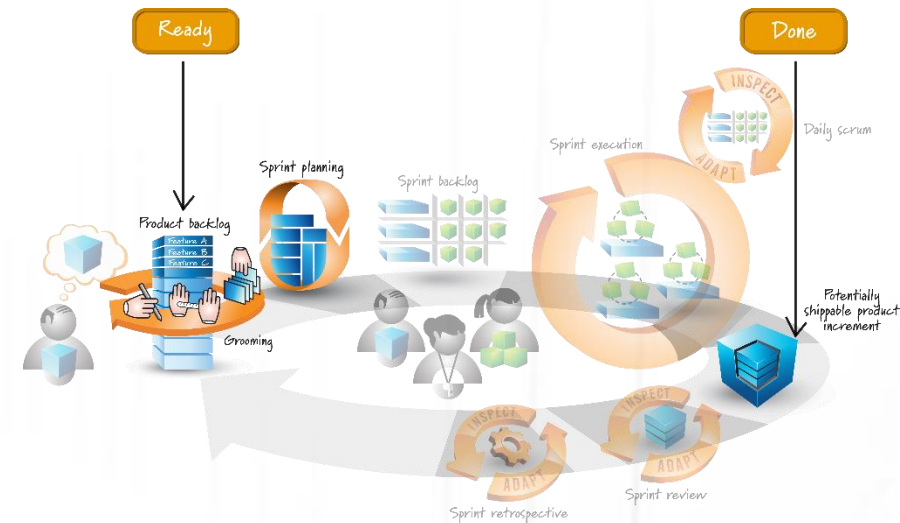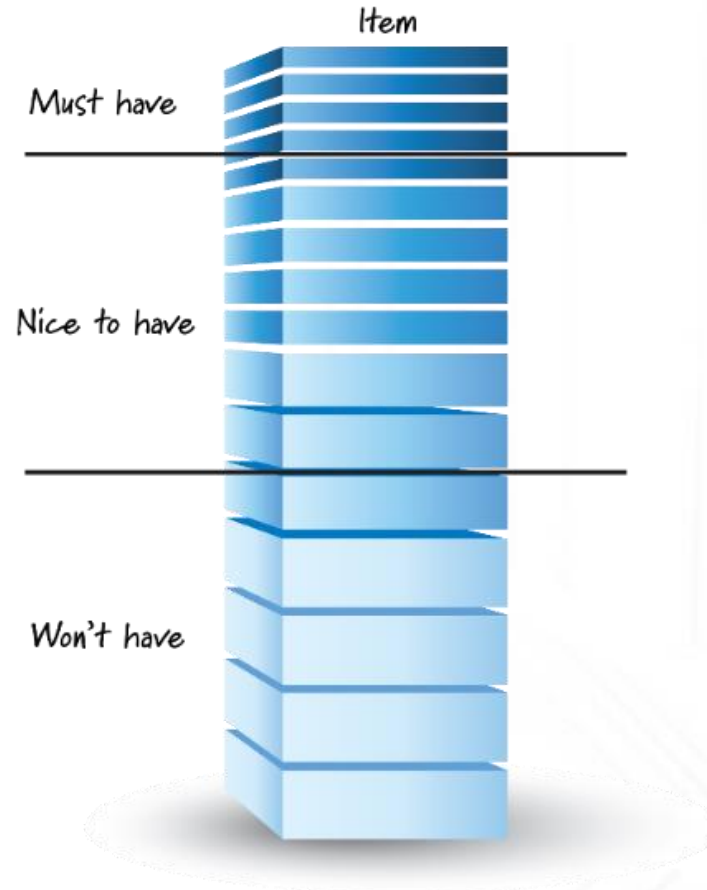
Product Backlog Flow Management

- Product Backlog is crucial to achieving fast, flexible value-delivery in the face of uncertainty which always exists in projects

- Release planning can be visualized as a line through the product backlog

High-priority items

Item

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Release 3

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Low-priority items

Product Backlog Flow Management

- **Specific release** can be partitioned into 2 more lines – **must have** and **nice to have**

- **Won't have** is below the release cut-off line

Item

Must have

Nice to have

Won't have

Product Backlog Flow Management

- For a Sprint, the Product Backlog can be viewed as a **pipeline of requirements** that are flowing into the Sprint

- A problem arises if there is a **mismatch** or unevenness between **inflow** and **outflow** in this pipeline
  - Too slow – pipeline could run dry
  - Too fast – may cause rework/throw away as more is learned

- Heuristic (rule of thumb) for many teams is to have **2 to 3 sprint's worth** of user stories ready to go
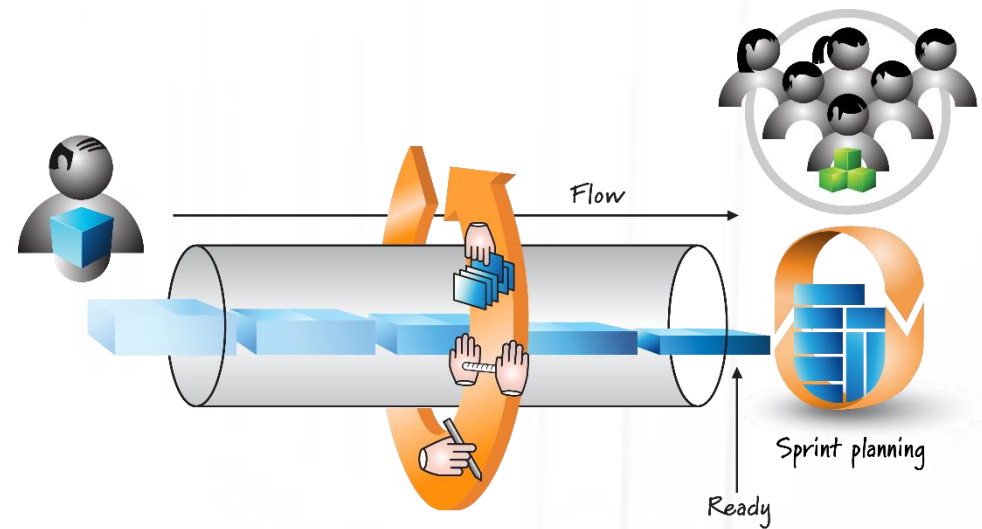
Flow

Sprint planning

Ready

Product Backlog – What is a Product

- What constitutes a product?

  - MS Office vs MS Excel, Word, etc.

- Simple definition usually works…

  - A product is something of **value** that a customer would be **willing to pay for** and something "we" would be willing to **"package" up and sell**

- **Component** teams bump up against this simple definition

  - Customer buying the component?

 - Component going into multiple products?

Product Backlog – What is a Product?

- **Large Products** utilize **Hierarchical** Product Backlogs

- Multiple, **interchangeable** teams can utilize one Product Backlog

- Multiple, **non-interchangeable** teams need to have a team-specific view of the single Product Backlog
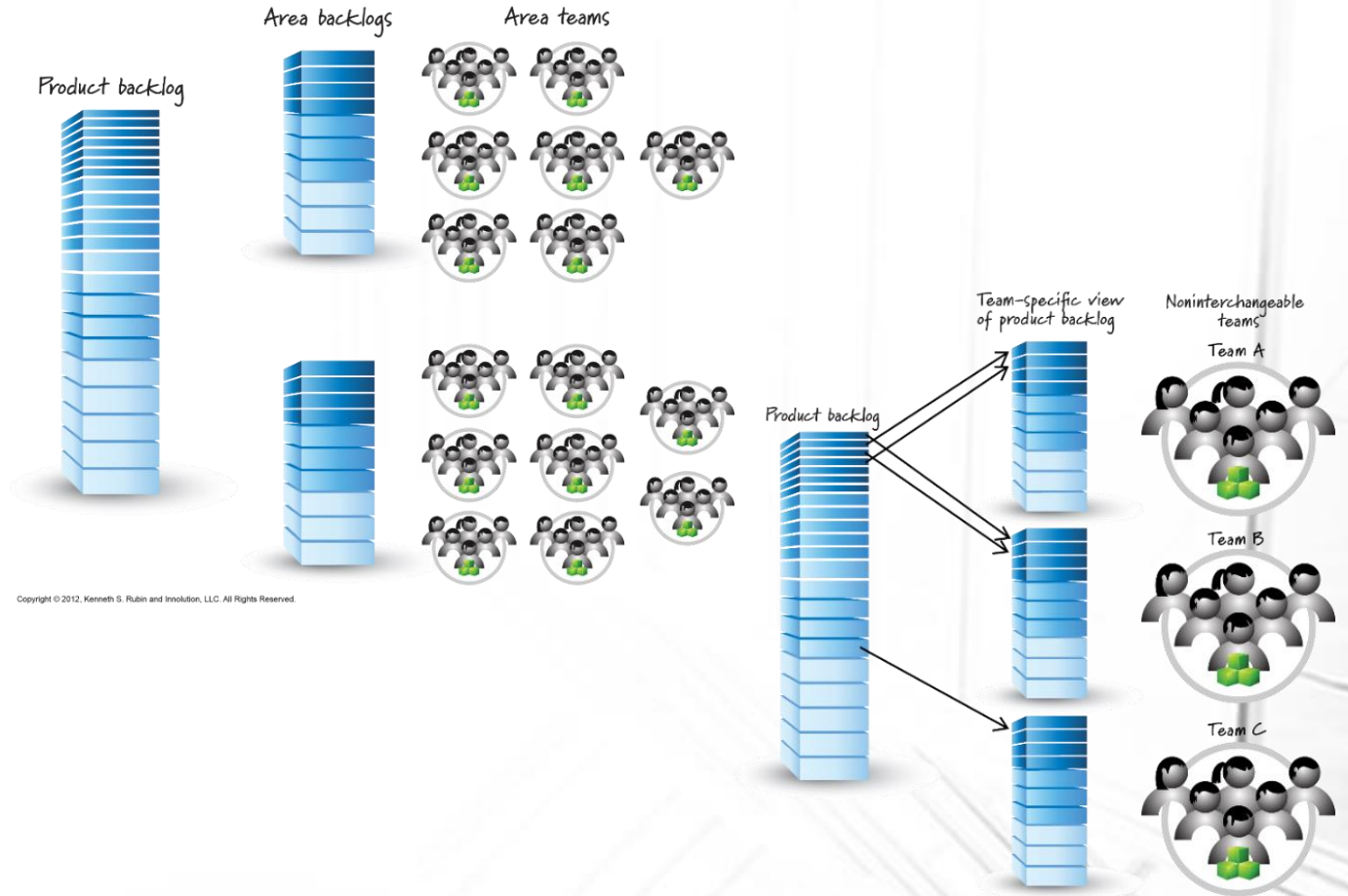
Product Backlog – What is a Product?

- Multiple Products best handled by one or more teams working **exclusively** on a **single** product backlog (Fig. 6.16 left side)

- Occasionally, **not ideal**, one team works on multiple Product Backlogs (Fig. 6.16 right side)
  - Organizational impediments aside, try to merge into a single backlog

Product backlogs   Product teams

Product A

Product B

Product C

Product backlogs

Product A

One team
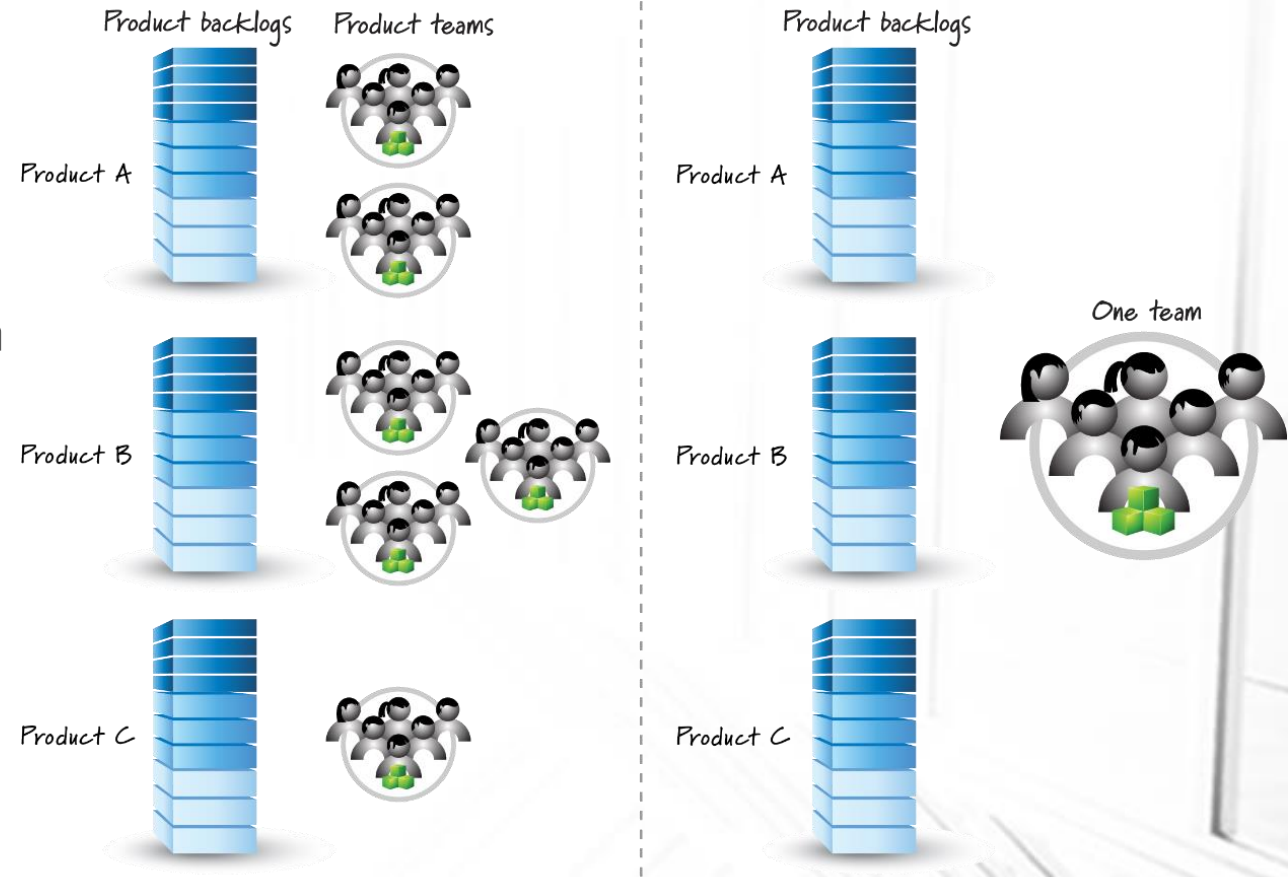
Product B

Product C

Product Backlog Examples

- The following are examples of the functionality used to build the Scrum Alliance Website in 2004:

- Some stories are well written, others need work.

  - https://www.mountaingoatsoftware.com/agile/scrum/scrum-tools/product-backlog/example

- Profiles:

  - As a site member, I want to describe myself on my own page in a semi-structured way so that others can learn about me. That is, I can fill in predefined fields, but also have room for a free-text field or two. (It would be nice to let this free text be HTML or similar.)

  - As a site member, I can fill out an application to become a Certified Scrum Practitioner so that I can earn that designation. [Note: Certified Scrum Practitioner was the initial name of what became known as Certified Scrum Professional.]

  - As a Practitioner, I want my profile page to include additional details about me (i.e., some of the answers to my Practitioner application) so that I can showcase my experience.
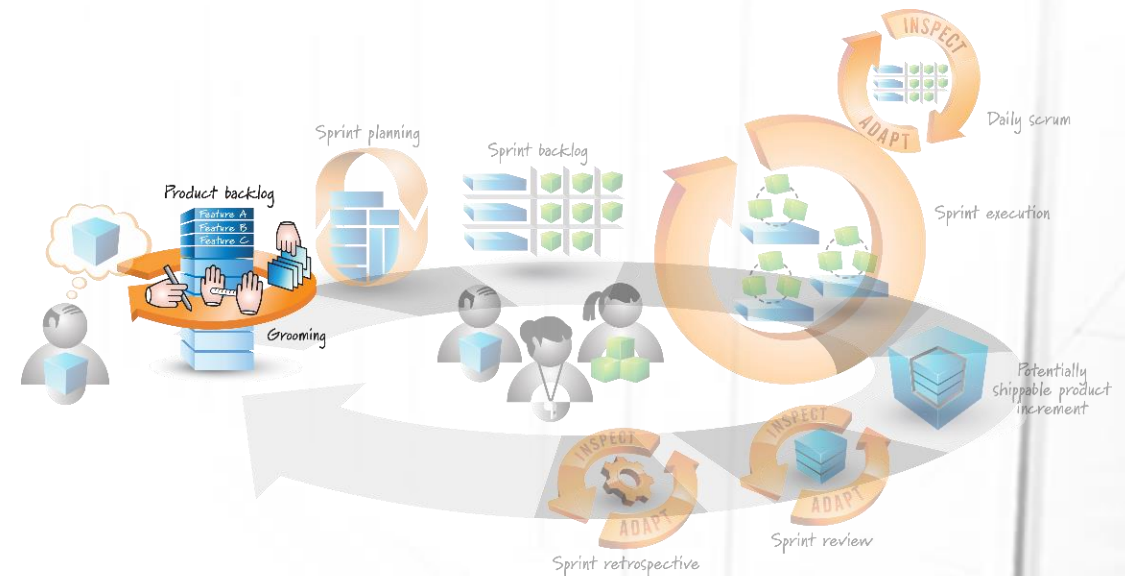
Product Backlog Examples

- News:

  - As a site visitor, I can read current news on the home page so that I stay current on agile news.

  - As a site visitor, I can access old news that is no longer on the home page, so I can access things I remember from the past or that others mention to me.

  - As a site visitor, I can email news items to the editor, so they can be considered for publication. (Note: this could just be an email link to the editor.)

- Course and Events:

  - As a site visitor, I can see a list of all upcoming "Certification Courses" and can page through them if there are a lot, so I can choose the best course for me.

  - As a site visitor, I can see a list of all upcoming "Other Courses" (non-certification courses) and can page through them if necessary, so I can choose the best course for me.

Product Backlog Examples

- Course and Events:

  - As a trainer, I can copy one of my courses or events so that I can create a new one. When copying it I am asked for the date(s) of the new course or event.

  - As a site admin, I can delete any course or event, so I can remove things that will no longer occur.

  - As a site editor, I can update any course or event so that I can fix things the original author hasn't.

Summary

- Crucial Role of the Product Backlog in achieving fast, flexible value-delivery in the presence of uncertainty

- Structural and Process issues surrounding the Product Backlog

  - Types of items

  - How to groom

- Which and how many Product Backlogs