Electronics and
Computer Science

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Agile Project Planning

COMP6204: Software Project Management and Secure Development

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Overview

- Objectives
- Agile Planning vs. Traditional Planning
- Minimum Viable Product (MVP) & Minimally Marketable Product (MMP)
- Requirements Gathering
- User Stories & Prioritisation Method
- Relative Sizing & Story Points
- Agile Estimating Methods
- Ideal Time and Real Time Estimation
- Integration Planning for an Agile/Hybrid Project
- Scope Planning for an Agile/Hybrid Project

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Objectives

- Summarise planning project schedule and cost management for agile/hybrid projects including the concepts of:
  - Timeboxing
  - The Kanban method
  - and relative sizing
- Understanding of Minimum Viable Product MVP and Minimally Marketable Product MMP concepts
- Requirements gathering techniques
- Requirements prioritisation techniques
- Techniques to estimate (do sizing) of requirements

Agile Planning vs. Traditional Planning

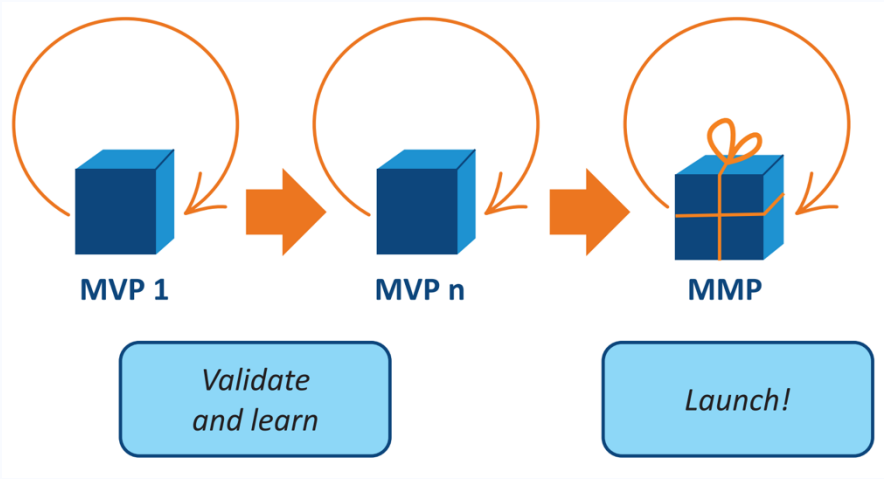
Traditional Plans	Agile Plans
• Created upfront at the start	• Only high-level plan created upfront with detailed planning only for the user stories in the next release or iteration
• Re-planning is lesser, only when changes happen	• Re-planning is the norm as we embrace changes
• Most requirements are known upfront	• True requirements are uncovered as we proceed
• Planning is mostly at the beginning of the lifecycle	• Planning is in lumps throughout the lifecycle
• Midcourse adjustments are few	• Midcourse adjustments are a norm

Minimum Viable Product (MVP)

- Minimum Viable Product (MVP) includes those set of features in the product that help get early customer feedback.
  - All the product features are not needed to get such a feedback.
  - Hence, MVP is only a subset of the total product features that are needed for selling the product.
  - Final product release will have a greater number of features than MVP
- MVP is similar to a mock-up or proof of concept, as the purpose is to get customer feedback.
  - This ensures that the final releasable or marketable product has all the required features as expected by the customer.

Minimally Marketable Product (MMP)

- Minimally Marketable Product (MMP) is the list of those features that form the core functionality of the product.
- These are the mandatory features that are needed to take the product to the market.
  - For example, for an ATM machine, the ability to withdraw money from it is its MMP. The ability to allow customised shortcuts to customers to perform their transactions faster, is not an MMP.



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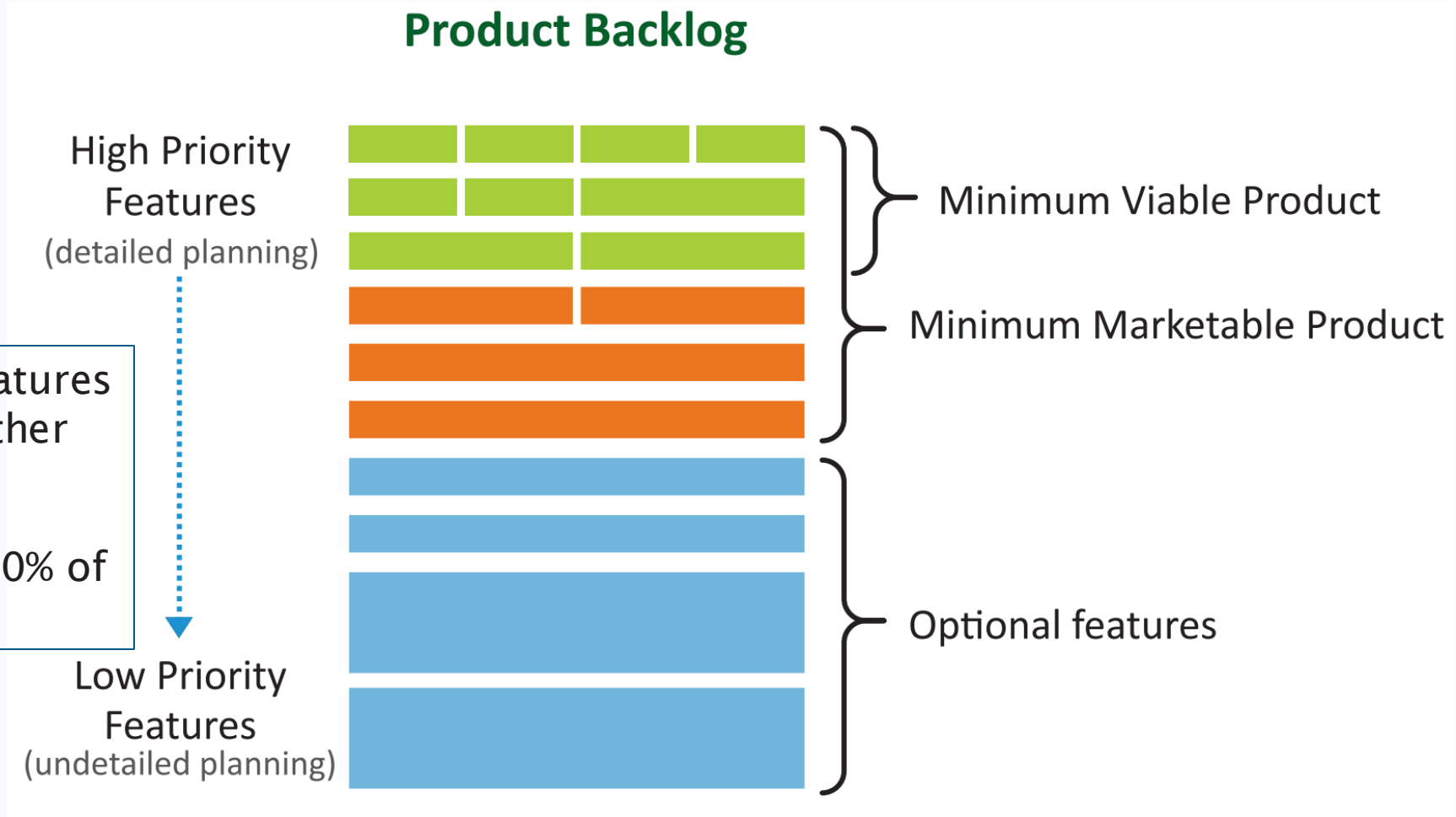
Product Backlog and MVP

- Several of the optional features might be dropped altogether as per the 80/20 rule
- 20% of features provide 80% of value in the product.



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Requirements Gathering

Agile **requirements gathering** is not a single stage. It happens throughout the lifecycle.

In the beginning, a few requirements that are already known are captured and work on them is begun.

While the work is carried out, more requirements emerge and are included in the Product Backlog.

Requirements are generally written as **User Stories**, which are discussed below.

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User Stories

User Stories are bite-sized, understandable chunks of business functionality.	• They are the preferred way of documenting requirements in Agile.
The most commonly used format for making a user story uses three pieces of information	• Role, functionality, and business benefit.
It is written	• "As a Role, I want Functionality, so that Business Benefit"
As an example, for an eCommerce portal, one of the user stories could be:	• "As an Online Shopper, I want to Search for products, so that I can make the right selection"

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User Stories for Non-Functional Requirements

- An alternative format of documenting user stories, especially used for non-functional requirements is:
  - "Given the pre-condition, when an action is performed by the user, then what is the action taken by the system"
- For example:
  - "Given the user is already registered, when he enters his login- id and password, then he should be logged-in within 3 seconds"
  - This is an example of a performance requirement of the system.

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User Story and Technical/Implementation Details

- A user story usually should not include technical or implementation details.
- For example, a user story like:
  - "As a User, I want My Name stored in the *database*, so that I can retrieve it later on"

  is not a good user story.
- A better user story would be,
  - "As a User, I want to enter my Name in the *system*, so that it will be available whenever I login to the system".

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Effective User Stories should have 6 characteristics called INVEST

I independent	Stories should be as independent as possible.
N negotiable	Remember a story is not a contract, it is a reminder to have conversation. The user story captures the essence of what is desired goal and is used as a collaboration tool the team uses.
V valuable	Stories should result in adding value to the user. Don't only think of customer value it could also be business value connected to organizational objective(s).
E estimable	Stories have to be estimated or sized so it can be properly selected and prioritized when conducting activities such as product backlog refinement or selecting user stories to include within a sprint.
S small	Stories are small chunks of work. I suggest two week iterations which allow for user stories to average 3-4 days of work. This includes all work to get the story to a "done" state.
T testable	Every story needs to be testable in order to be "done." I prefer to write high-level acceptance criteria soon after creating the user story.

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The Three C's of User Stories

Card

- Stories are traditionally concise so than can be written on note cards.

Conversation

- Details behind the story come out during conversations with product owner/customer before the implementation work starts

Confirmation

- The acceptance criteria for the user story should be included so that team now know when the story is completed

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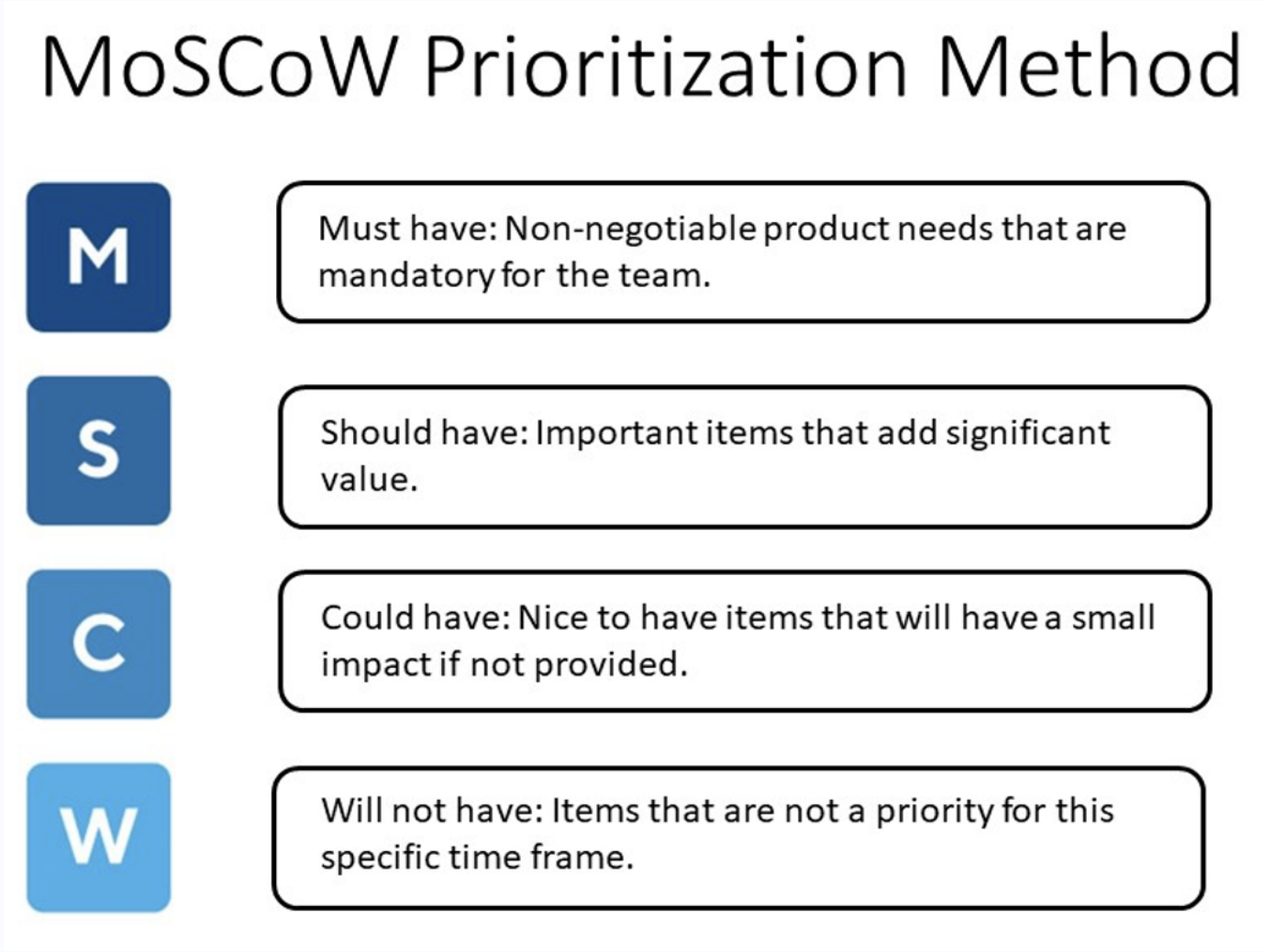
MoSCoW Prioritisation Method

In Agile, it is important to prioritise requirements as well.



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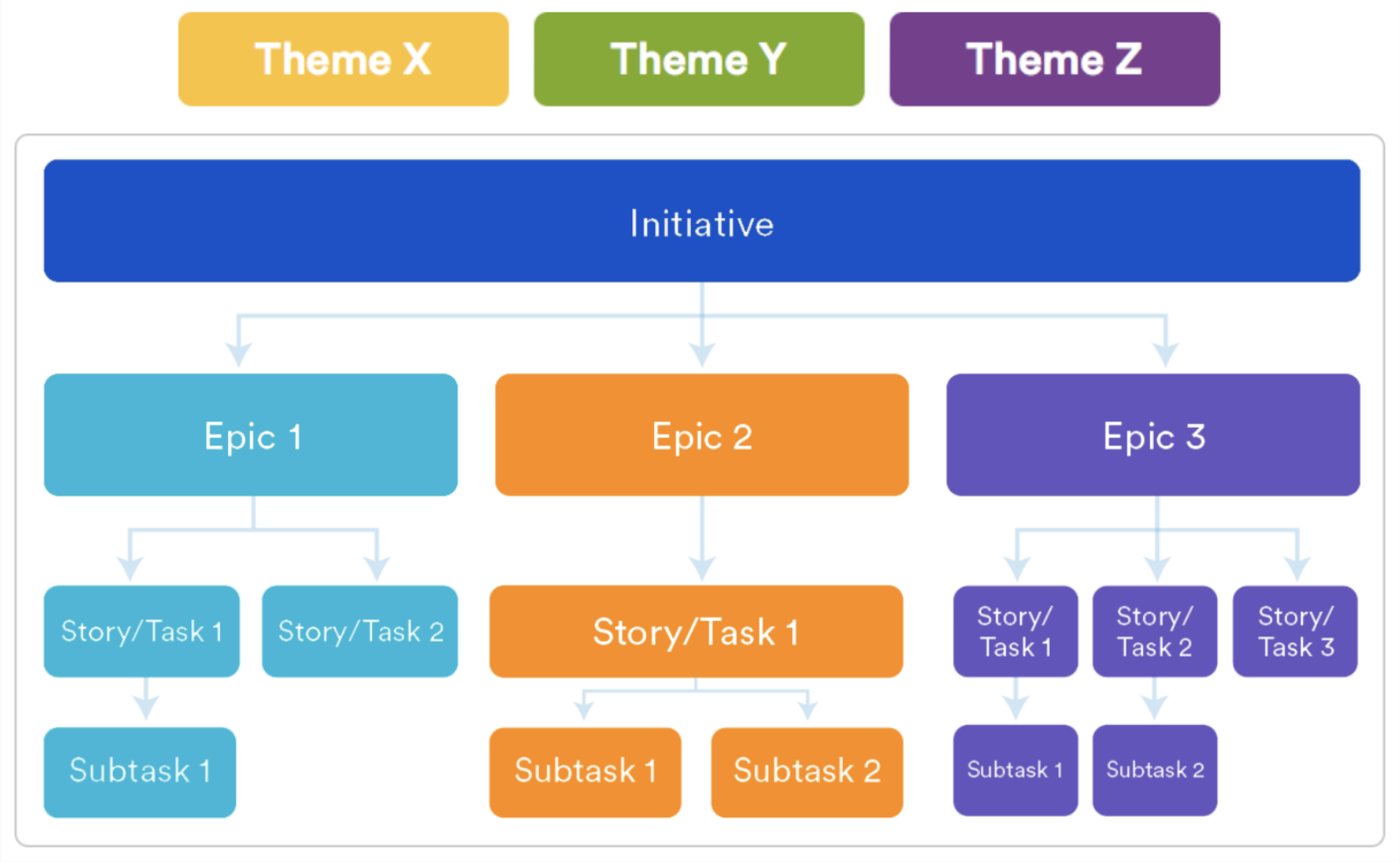
Requirements Hierarchy – Themes, Initiatives, Epics and Story



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Themes, Initiatives, Epics and Story Cards

- In agile projects, we use the Agile work structure:
  - Themes are large focus areas that span the organisation.
  - Initiatives are collections of epics that drive toward a common goal.
  - Epics are large bodies of work that can be broken down into a number of smaller tasks (called stories).
  - Stories, also called ‘user stories,’ are short requirements or requests written from the perspective of an end user.

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An Example

Themes	Initiative	Epic	Tasks
To increase revenue	Penetrating the PM software market	Develop a new module for workflow performance reports	PM tools research New features design Features development

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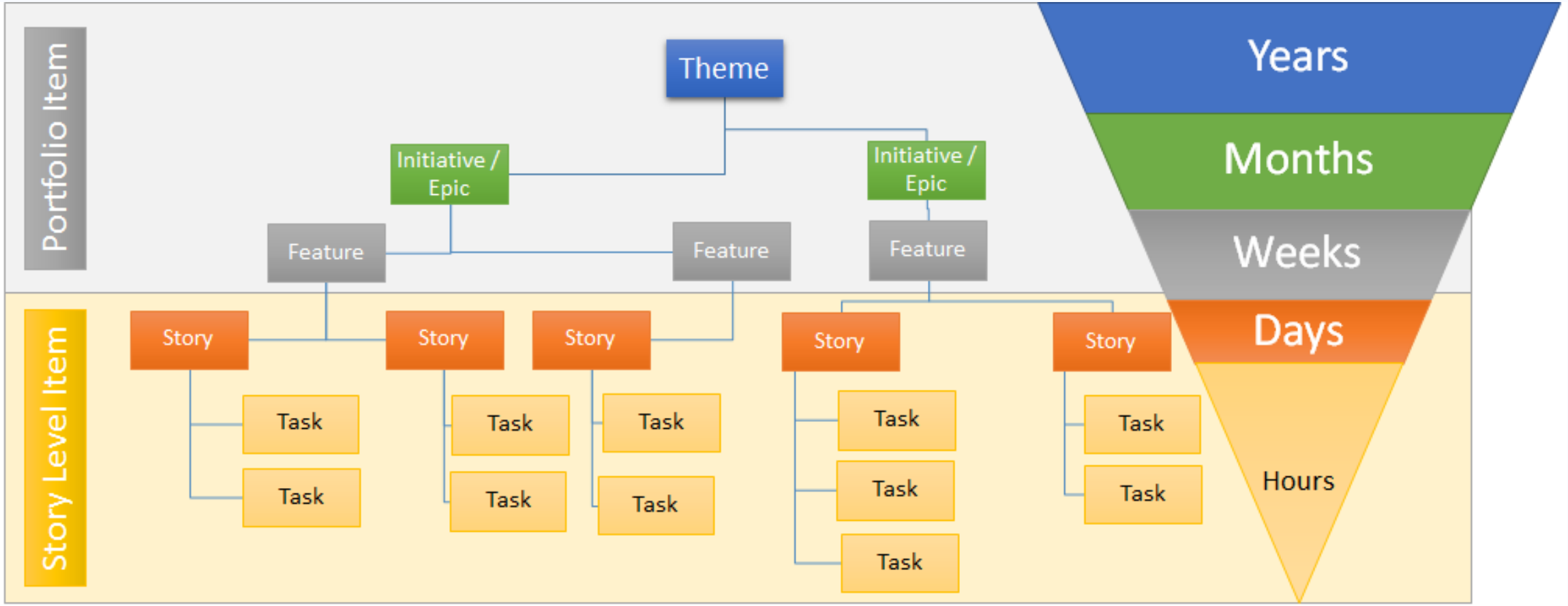
Requirements Hierarchy



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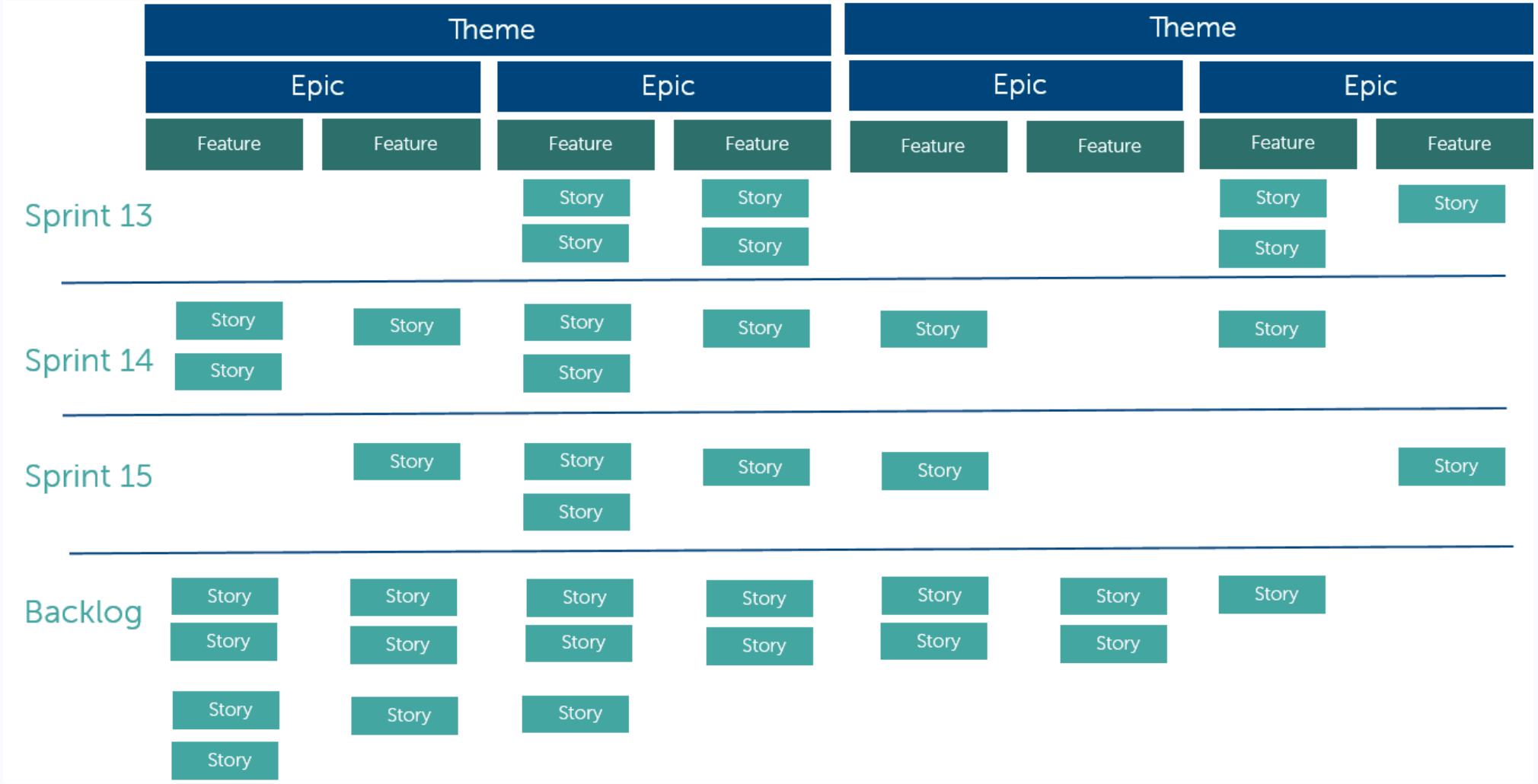
Work Structure vs Sprints



Relative Sizing & Story Points

- It is usually considered difficult to estimate the amount of work on a standalone basis. But it is comparatively easier to do relative estimation.
  - For example, if you are asked to say how much time a particular user story will take to build, it might be difficult to give an answer.
  - However, if you are asked to compare the size of two user stories, it is somewhat easier to come up with a more confident answer.
- Story Point Estimation is a relative estimation technique where the team estimates a story relative to another story.
- For this, the team selects a baseline user story, which is generally a small one, and its size is called 1 Story Point.
- Story Point is a unit that is unrelated to time. It is about the size of the work.

Agile Estimating Methods

- T-shirt sizing: S, M, L, XL, XXL
- Planning poker: Each team member estimates user stories with numbered cards (1, 2, 3, 5, 8, 13, 21)
- The bucket system: Extension of planning poker when there are many user stories, and the team is large
- Affinity estimates: Three steps:
  1. Silent relative estimates (Sticky note “small” on the left and “large” on the right)
  2. Editing the wall (discussion done by group)
  3. Placing items into more specific sizes (S, M, L, XL, XXL)

Sample Relative Sizing Estimates

Team	User Story Name	Relative Size
A. Incentives	Determine new hire assessment content	M
	Develop hiring days event plan	L
	Develop hiring and retention survey	M
	Administer hiring and retension survey	S
	Analyze hiring and retention survey	S
	Research hiring and retention strategies	L
	Summarize hiring and retention research and survey results	M
	Draft new hiring policies	M
	Draft retention policies	M
B. Education	Determine content for Course 1 for new hires	L
	Develop content for Course 1 for new hires	XL
	Deliver Course 1 for new hires	XL
	Determine content for Course 2 for new hires	L
	Develop content for Course 2 for new hires	XL
	Deliver Course 2 for new hires	XL
	Research potential education partners	L
	Summarize education partner research	S
C. Adoption	Create website for hiring information	M
	Create assessment quiz for new hires	S
	Create website for Course 1	XXL
	Create website for Course 2	XXL
	Advertise for hiring days event on website and social media	M
	Advertise for hiring days event via radio, TV, signage, etc.	L

Ideal Time and Real Time Estimation

- When a user story is picked up for delivery in an iteration, it is usually broken down into tasks to make it easy to track.
- Each task may have a time-based estimate associated to it.
- When estimating time for each task, we may use Ideal Time Estimation or Real Time Estimation.
- In Ideal Time Estimation the entire day (8 hours) is available to perform productive work without factoring in any interruptions.
  - When we received the estimation from the team members, we calculate duration by factoring in unproductive time.
- In Real Time Estimation, we inform the team to consider interruptions in their work.
  - Hence, we do not need to do any further calculations once the estimate is received from the team.

Integration Planning for an Agile/Hybrid Project

- Planning for agile projects remains at a high-level for the long-term, but more detailed plans are created for the short-term.
  - Why? Because change is expected, and requirements can change after every iteration.
- Instead of putting detailed plans in writing, agile teams write down only what is necessary and have discussions to make sure everyone understands what is happening.
  - The daily Scrum meetings, the sprint planning meeting, the sprint review, and sprint retrospectives allow for necessary discussions and interactions.

Scope Planning for an Agile/Hybrid Project

- For predictive projects, the scope is defined at the beginning of the project.
- For agile projects, the scope is not completely known until the end of the project because the customer can add and remove features from the overall scope at the start of every iteration.
- During backlog refinement teams *progressively* elaborate and reprioritise the work to determine what can be accomplished during that iteration.
- New features can be added at any time to ensure that projects deliver the most value.

Schedule Planning for an Agile/Hybrid Project

- Instead of creating a detailed schedule for all of the activities required to complete an entire project, agile teams focus on the *most valuable work* they can complete within each iteration.
- This approach is often called *time-boxing*.
  - A *timebox* is a previously agreed upon time period during which a team works towards completion of a goal.
  - A sprint, for example is a timebox of 30 days or less.

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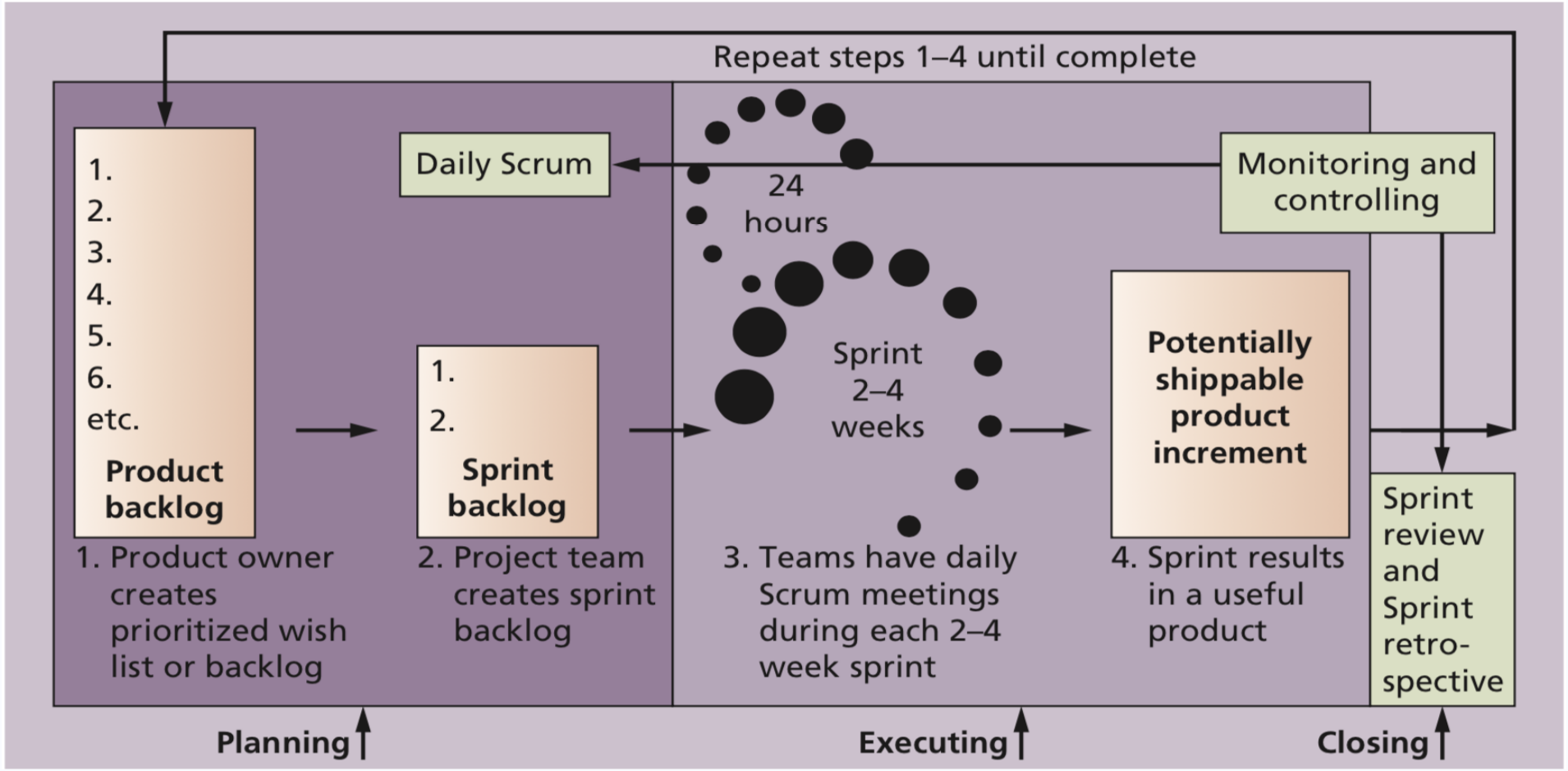
Scrum Framework and Process Groups



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What About Dependencies?

- Ideally, one Scrum team can perform all the work in their *scrum backlog*.
  - If there are dependencies within backlog items, the team should identify those and work on them accordingly.
- When there are multiple Scrum teams, you can hold a Scrum of Scrums, where representatives from each team meet to *coordinate efforts* and dependencies.

Kanban Method

- The term *kanban* is a Japanese term meaning *visual board*.
- The Kanban method is a means to design, manage, and improve flow systems for knowledge work.
- It also allows organisations to start with their existing workflow and drive evolutionary change by visualising their flow of work, limit work in progress (WIP), and stop starting and start finishing.
- The Kanban method does not use time-boxing, does not define any specific roles for the team, and focuses on cycle time.

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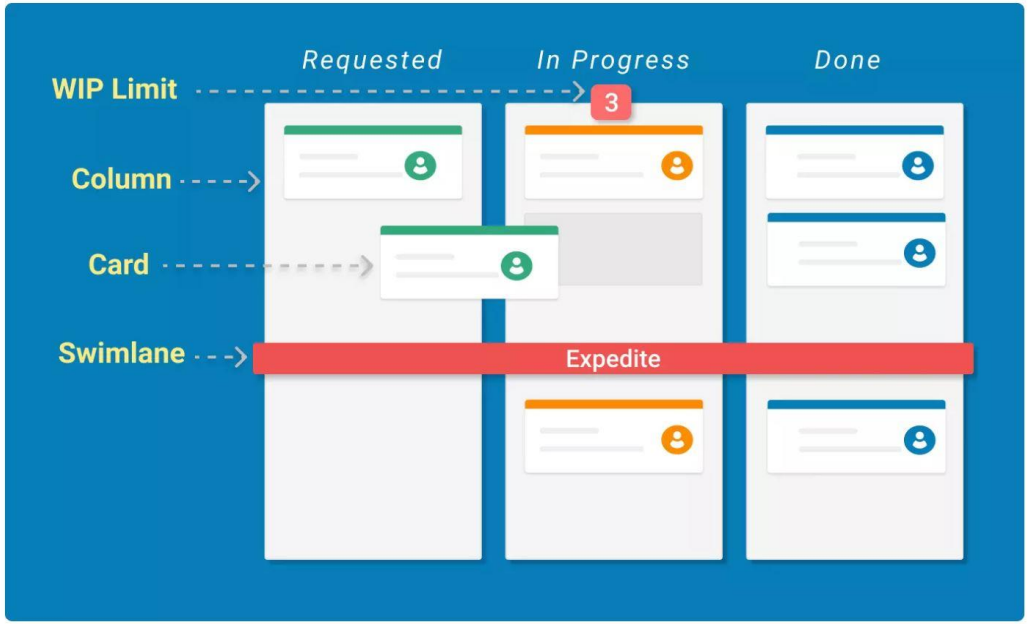
Sample Kanban Board

Main Components of the Kanban board

Kanban boards use Card, Column, Swimlanes, and WIP Limits to enable teams to visualize and manage their workflows effectively. Let us introduce you to the main components more closely:



Source: https://kanbanize.com/kanban-resources/getting-started/what-is-kanban-board (2021)

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Kanban Board – Elements

- Kanban Cards – This is the visual representation of tasks. Each card contains information about the task and its status, such as deadline, assignee, description, etc.
- Kanban Columns – Each column on the board represents a different stage of your workflow. The cards go through the workflow until their full completion.
- Work-in-Progress Limits – They restrict the maximum number of tasks in the different stages of the workflow. Limiting WIP allows you to finish work items faster by helping your team focus only on current tasks.
- Kanban Swimlanes – These are horizontal lanes you can use to separate different activities, teams, classes of service, and more.

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Cost Planning for an Agile/Hybrid Project

- Unlike predictive projects, there is no *total project budget* or *detailed cost estimate* for the entire project for agile project.
- There is some estimating involved when using an agile approach, but instead of using *hours* or *Pounds*, most estimates are done in a *relative* fashion.
- Relative estimates are created by comparing work or grouping it by equivalent difficulty based on factors like *risk*, *complexity*, and *required labour*.

Monitoring And Controlling Agile/Hybrid Projects

- In agile, work progress and results are monitored in each Daily Scrum and in each Sprint Review.
- In case of deviations from the plan, one can quickly initiate actions , i.e. controls, such as rescheduling, possibly adapt the procedure and learn from it (inspect, adapt and learn).
- Burn charts show project team velocity.
- Velocity measures the productivity rate at which the deliverables are produced, validated, and accepted within a predefined interval.

Monitoring And Controlling Agile/Hybrid Projects

- You can create the following types of burn charts:
  - Burndown charts show the amount of work (number of tasks) remaining compared to the plan. They are often used for each sprint and discussed during sprint retrospectives.
  - Burnup charts show the amount of work (tasks) completed compared to the plan. They can be used during each sprint, and they can also show progress for several sprints.
  - Combined burn charts show how much work has been completed and how much remains.

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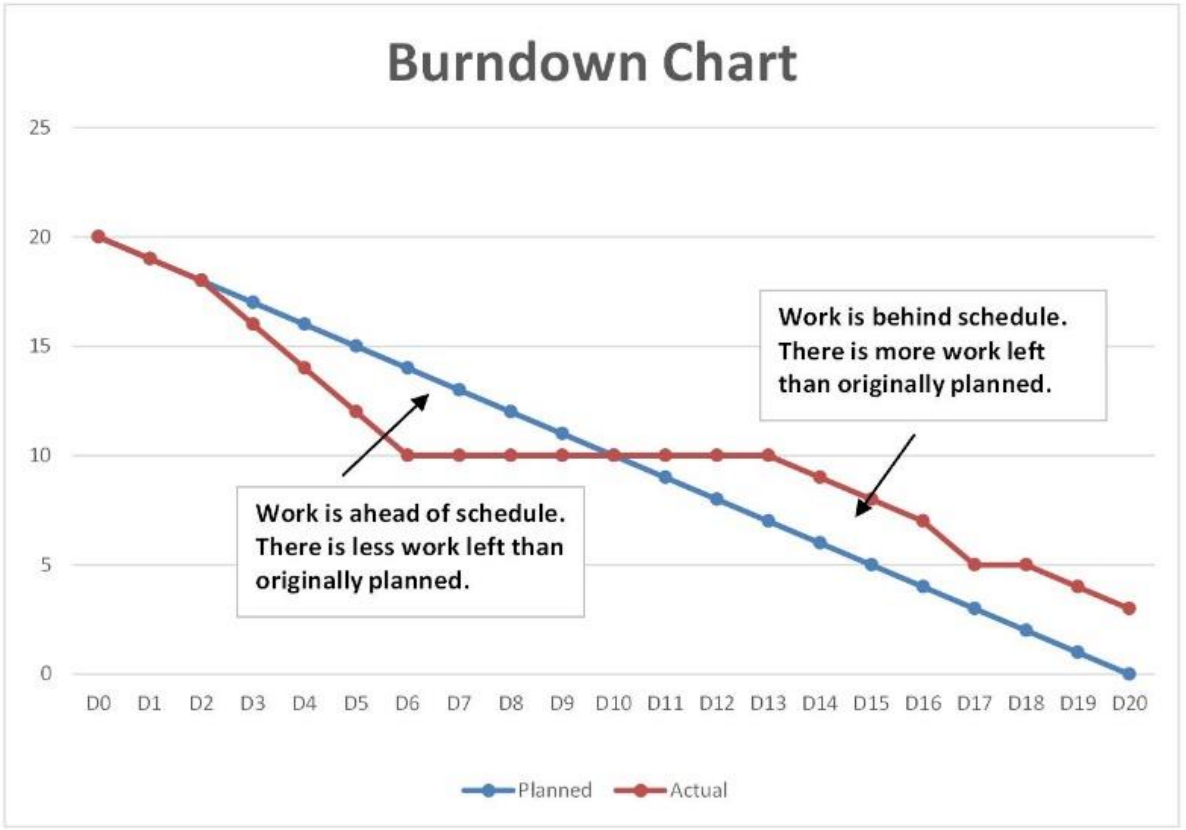
Sprint Burndown Chart

Number of Tasks

Days	Planned	Actual
D0	20	20
D1	19	19
D2	18	18
D3	17	16
D4	16	14
D5	15	12
D6	14	10
D7	13	10
D8	12	10
D9	11	10
D10	10	10
D11	9	10
D12	8	10
D13	7	10
D14	6	9
D15	5	8
D16	4	7
D17	3	5
D18	2	5
D19	1	4
D20	0	3



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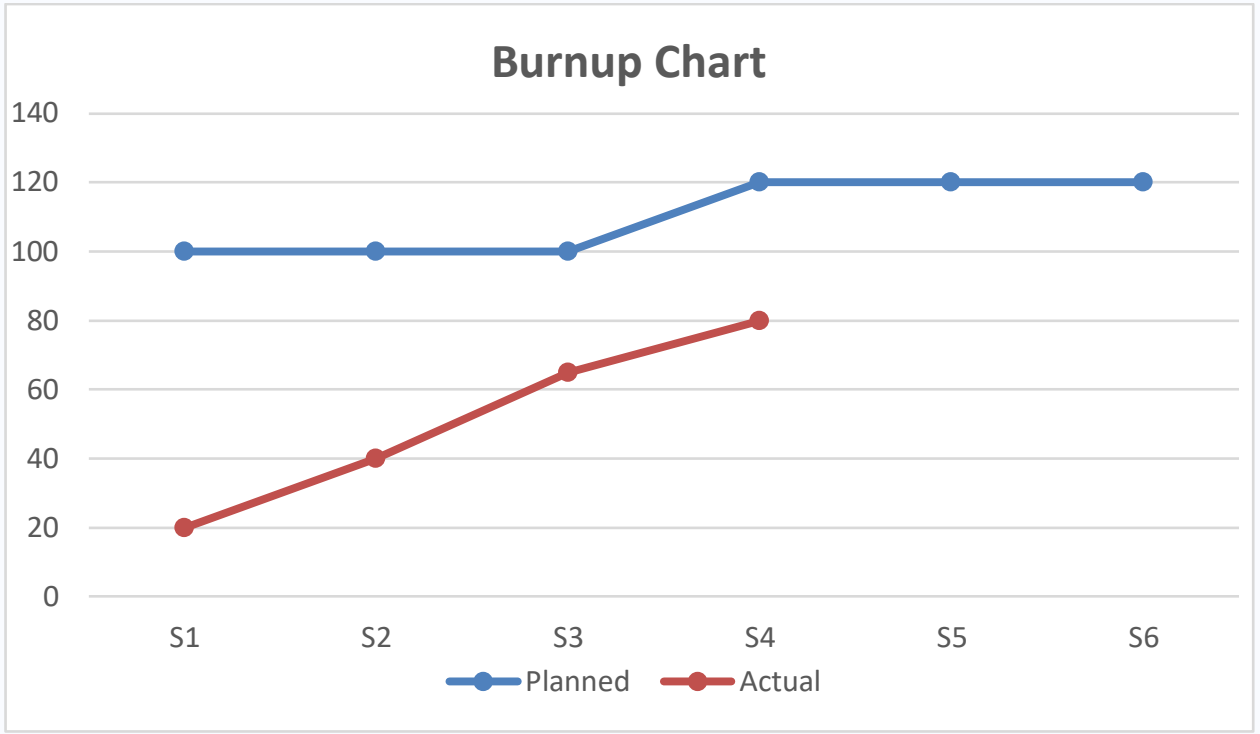
Sample Burnup Chart

Number of Tasks

Sprints	Planned	Actual
S1	100	20
S2	100	40
S3	100	65
S4	120	80
S5	120	
S6	120	



Velocity Charts

- Sprint teams use velocity to measure how much work they can complete in each iteration.
- It is widely used to help teams create accurate and efficient timelines.
- Sprint team velocity is not constant; rather, it varies.
  - Note that velocity charts are not intended to be a tool for monitoring the team.
  - They are most useful as a tool for release planning.
- The velocity chart is created after the first sprint and updated after each completed sprint.

Velocity Charts – Cont.

- The velocity of the sprints helps managers to calibrate the release plan.
- The Velocity Chart shows the amount of value delivered in each sprint, enabling you to predict the amount of work the team can get done in future sprints.
- It is useful during your sprint planning meetings, to help you decide how much work you can feasibly commit to.

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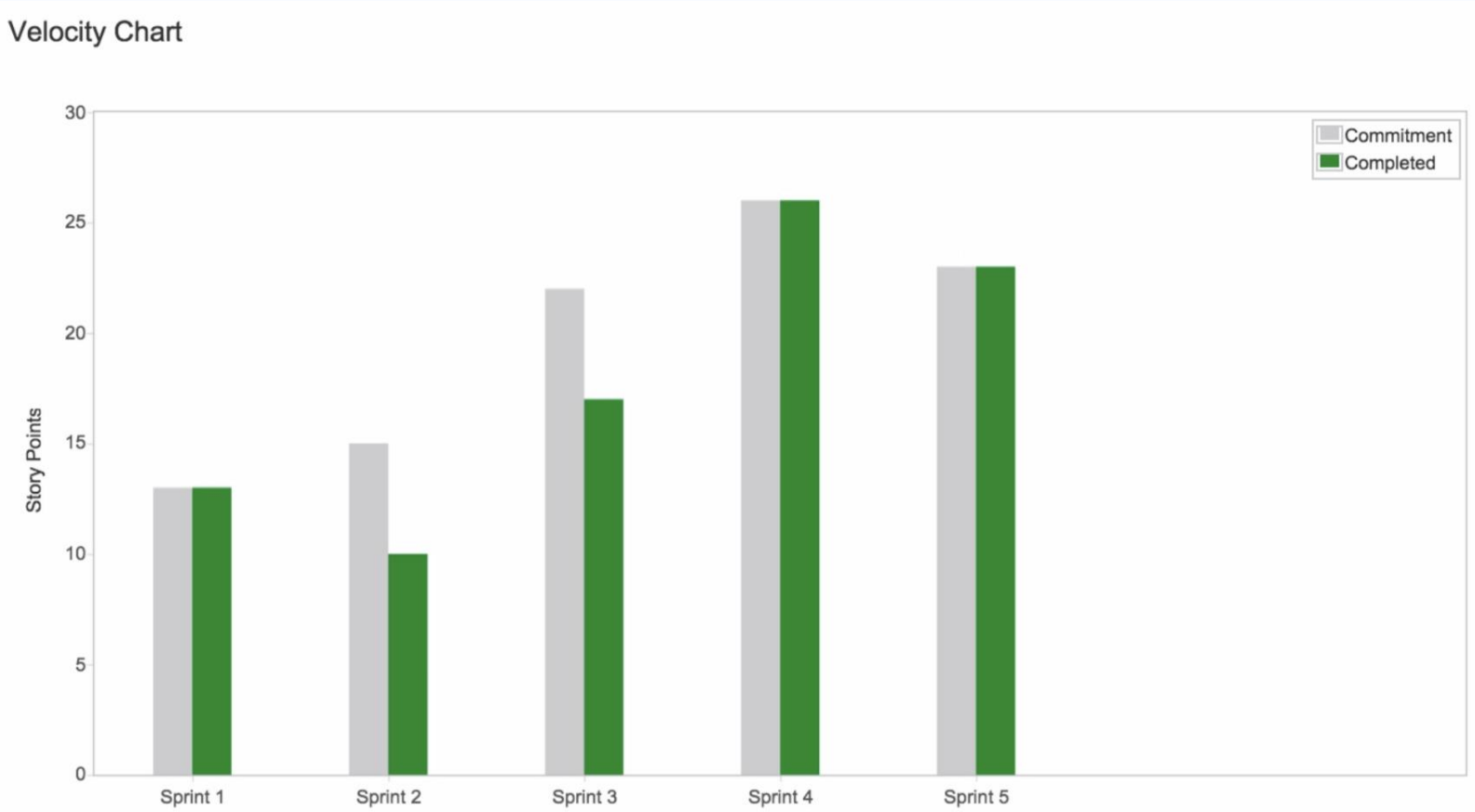
Sample Velocity Chart



Sprint	Commitment	Completed
Sprint 1	13	13
Sprint 2	15	10
Sprint 3	22	17
Sprint 4	26	26

Closing Agile/Hybrid Projects

- Just like predictive projects, agile and hybrid projects should be closed.
  - Hybrid projects can use any of the project closing processes listed earlier.
- A strength of the Scrum events, if used on agile projects, is an intentional moment of closure, as follows:
  - Daily Scrum: You can think of these meetings as providing closure for the day before.
  - Sprint reviews: Sprint reviews provide closure for sprints, and sometimes entire projects.
  - Sprint retrospectives: This event is similar to a lessons-learned, but it only focuses on a particular sprint. When a project ends, teams should hold a final retrospective to focus on all lessons learned.
- Teams should still hold a close-out meeting and celebrate!

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Reference

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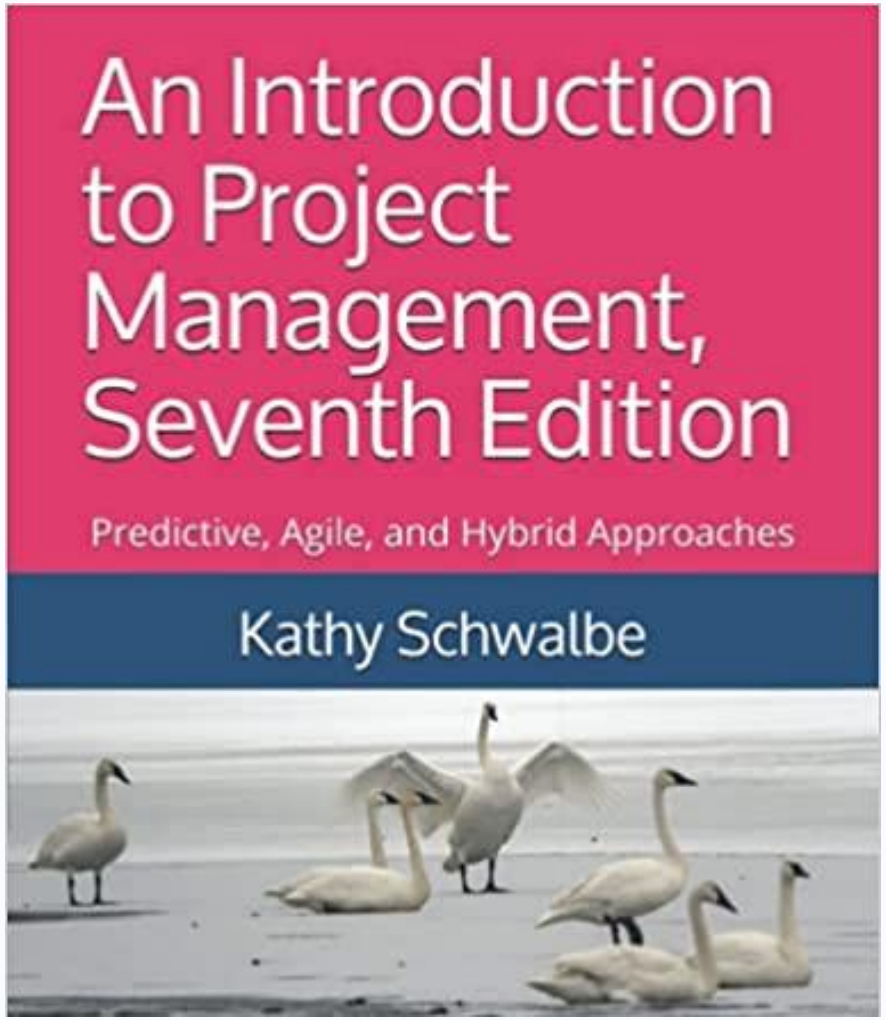

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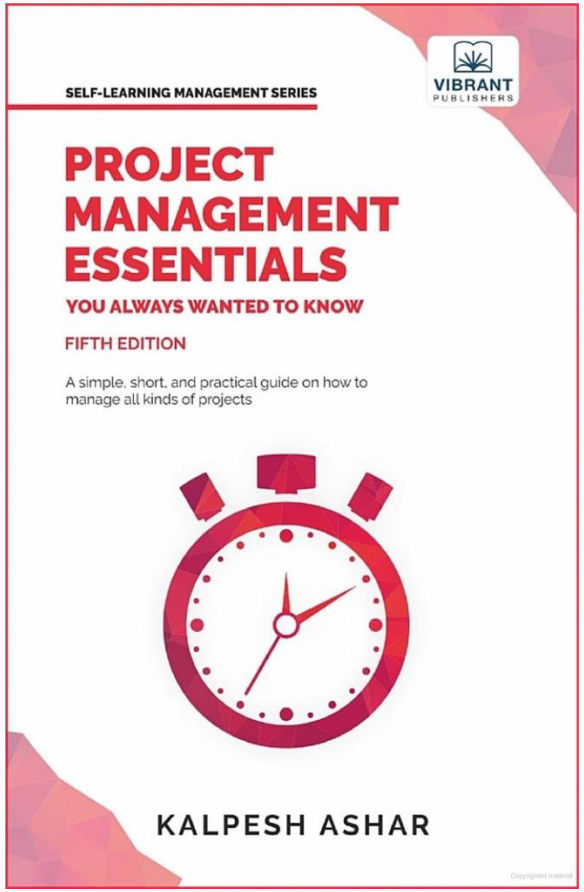
  Project Management Essentials You Always Wanted To Know, 5ed



Resources

- Soton Linkedin Learning - Learn new skills with LinkedIn Learning

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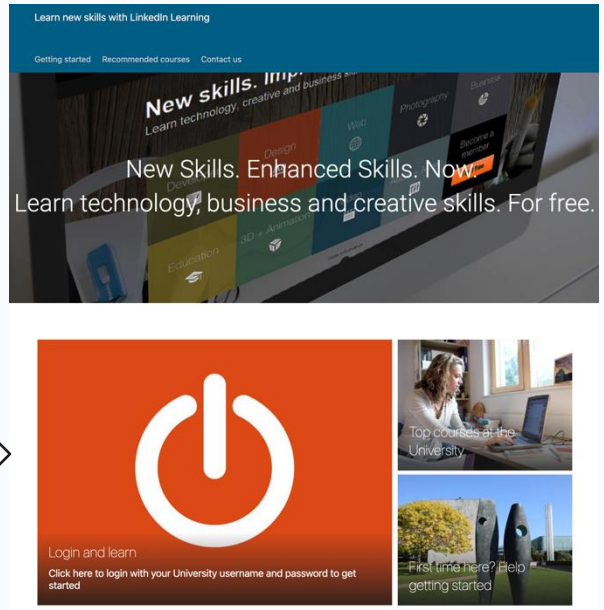
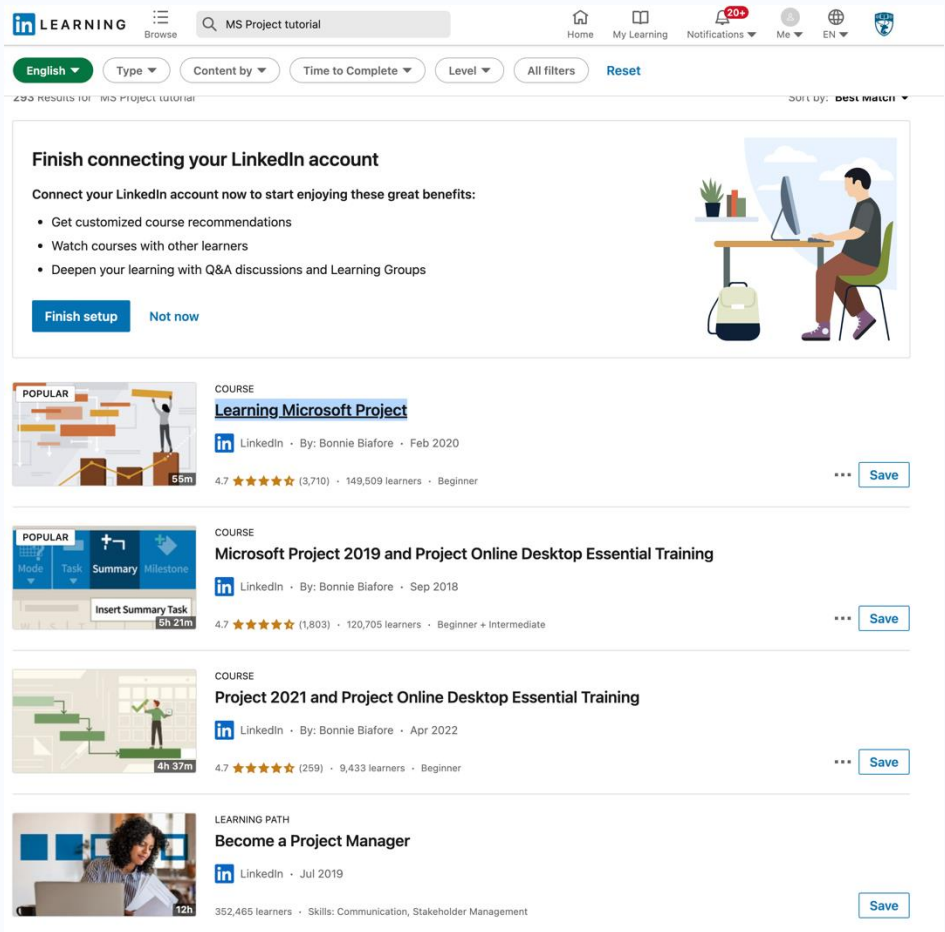


Search For Project Managment



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YOUR QUESTIONS