Scrum Master Workbook

Course presented by Joseph Phillips

PMP, PMI-ACP, PSM, ITIL, Project+, CTT+

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Passing the Exam is Our Goal

- First goal of the course is you passing the exam
- Second goal, is build a deep understanding of Scrum methodologies
- This is not a course on:
  - How to apply Scrum
  - How to be a good Scrum Master
  - Me helping you do your job

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Course Structure Details

- Watch the lectures
- Write down the key terms
- Repeat the exam until 100%
- Complete the final exam

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Resources from this course

- PDF of the course slides
- PDF of the course exam materials
- Ask questions about the course/exam content
- Nope:
  - Downloadable lectures
  - PowerPoint slides
  - Me helping you manage a project

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How to Navigate the Course

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Second to Final Lecture is the Certificate

- The last lecture of this course is a PDF certificate
- Add your name and completion date

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PSM I Exam Details

- 80 questions
- Multiple choice
- True and False
- $150 exam fee
- Take the exam online
- Scrum.org

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How to claim PDUs

- www.pmi.org
- Ccrs.pmi.org
- Instructing.com, LLC
- PMI REP #4082
- SCRUM82918

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Scrum and Agile

- Not always possible to gather all requirements up front
- Agile Frameworks
- Scrum is a project management method of the Agile group; it is the most famous and the most broadly used one

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Four Values of the Agile Manifesto

- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

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Individuals and Interactions Over Processes and Tools

- Individuals and interactions are most important
- Processes and tools will be needed on projects
- Projects are completed by people not processes and tools
- Agile projects are people driven

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Working Software Over Comprehensive Documentation

- Agile projects need to deliver value
- Value is about the business need the project aims to deliver
- Documentation is barely sufficient
- Documentation is done just in time – as the last responsible moment
- Documentation might also be just because
  - Industry requirements
  - Organizational requirements

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Customer Collaboration Over Contract Negotiation

- Agile is flexible, accommodating, and willing to change
- Contracts are often rigid and uncooperative
- Agile contracts must accommodate change
- There's a difference between being right and doing the right thing

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Responding to Change Over Following A Plan

- Agile welcomes change
- Predictive projects plan everything in advance
- Agile projects have lots of changes
- Agile projects have uncertainty up front

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Knowledge Work Projects

- Industrial work requires up-front planning
- Knowledge work expects change
- Knowledge work is invisible work
- Agile is best suited for software development projects

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Contrasting Project Types

Industrial projects

- Visible
- Stable
- Running things
- Structure
- Correct answers
- Task driven
- Command and control
- Standards
- Performance measurement
- Cost of workers for a task

Knowledge work projects

- Invisible
- Lots of changes
- Changing environment
- Less structure
- Lots of questions
- Value-driven
- Autonomy driven
- Innovation
- Learning and teaching
- Workers are an asset not a cost

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Defined Processes vs. Empirical Processes

- Empirical processes are interactive, incremental, change often, adapt, and pass through the reviews
- Industrial work relies on defined processes
- Knowledge work relies on empirical processes
- A defined process defines all steps in advance
- Empirical processes are change-driven

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Scrum or Predictive Project?

Predictive Projects

- Clearly defined scope
- Clear product description
- Historical information from similar projects
- Well-defined upfront requirements
- Few changes expected
- Well-defined activities
- Reliable estimates
- Process is long-term
- Multiple, logical phases
- KPIs equate to success
- Whole product needed for value

Scrum Projects

- Scope isn't clearly defined
- Product will emerge in project
- Changing requirements
- Requirements will emerge over time
- Activities are vague
- Cost and time estimates are challenging
- Processes are iterative
- New work is dependent on previous work
- Customer satisfaction equates to success
- Increments create useable value

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When to Use Scrum

- Many unknowns
- Complex projects with difficult to define detailed requirements
- Don't try to apply Scrum if the organization is not ready
- Training needed for all Scrum participants

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Scrum Fiction: Big Fat Lies About Scrum

- Developers can do whatever they desire
- No paper work and the team to can start developing immediately
- All requirements must be agreed before Development Team can start
- Scrum is very easy to implement, even without training
- Scrum is a set of simple rules

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Scrum Fiction: Big Fat Lies about Scrum

- Scrum Master is like a project manager
- Scrum does not require you to have a business case
- Scrum allows the Development Team to decide on deliverables
- Product Owner is the project manager
- Scrum tells us everything about managing projects
- Product Owner is a representative from the customer

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Scrum Basics

- A framework for complex adaptive problems
- Lightweight
- Simple to understand
- Difficult to master

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Scrum Details

- Evolved since 1990s
- Framework for processes, not a process itself
- Characteristics of product management, not just project management
- Rules and Roles of Scrum is what you need to know

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Scrum Utilizations

- Research and identify viable markets, technologies, and product capabilities
- Develop products and enhancements
- Frequently release products and enhancements
- Develop and sustain Cloud and operations for product use
- Sustain and renew products

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Theory of Scrum

- Empirical process control theory, or empiricism
- Empiricism asserts that knowledge comes from experience *and* making decisions based on what is known
- Scrum employs an iterative, incremental approach to optimize predictability and control risk

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Three Scrum Pillars: TIA

- Transparency
- Inspection
- Adaptation

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Transparency

- Transparency requires a common standard so observers share a common understanding of what is being seen
  - A common language shared by all participants
  - A common definition of “Done” (DoD)

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Inspection

- Frequently inspect Scrum artifacts and progress
- Inspection should not get in the way of the work
- Most beneficial when performed by skilled inspectors during the work

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Adaptation

- If the resulting product will be unacceptable, the process or the material being processed must be adjusted
- Adjustments are made ASAP to minimize additional deviations
- Scrum prescribes four formal events for inspection and adaptation:
  - Sprint Planning
  - Daily Scrum
  - Sprint Review
  - Sprint Retrospective

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Section quiz

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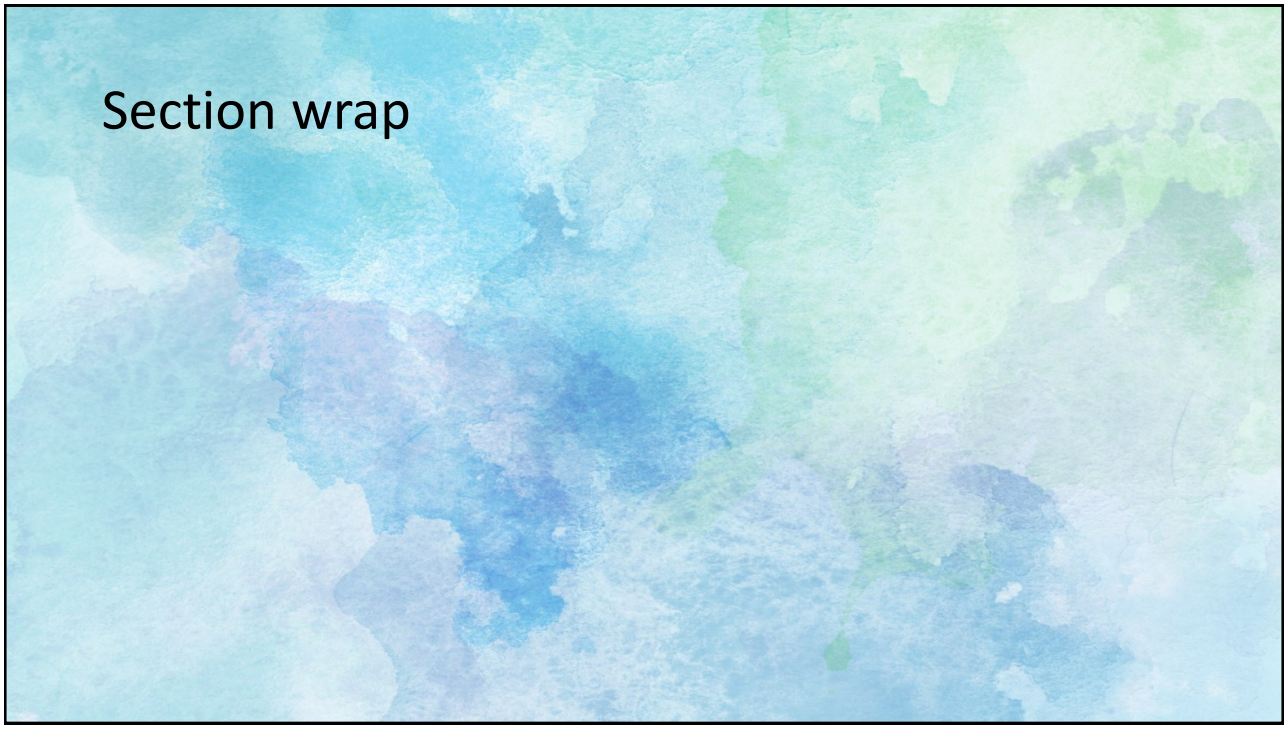

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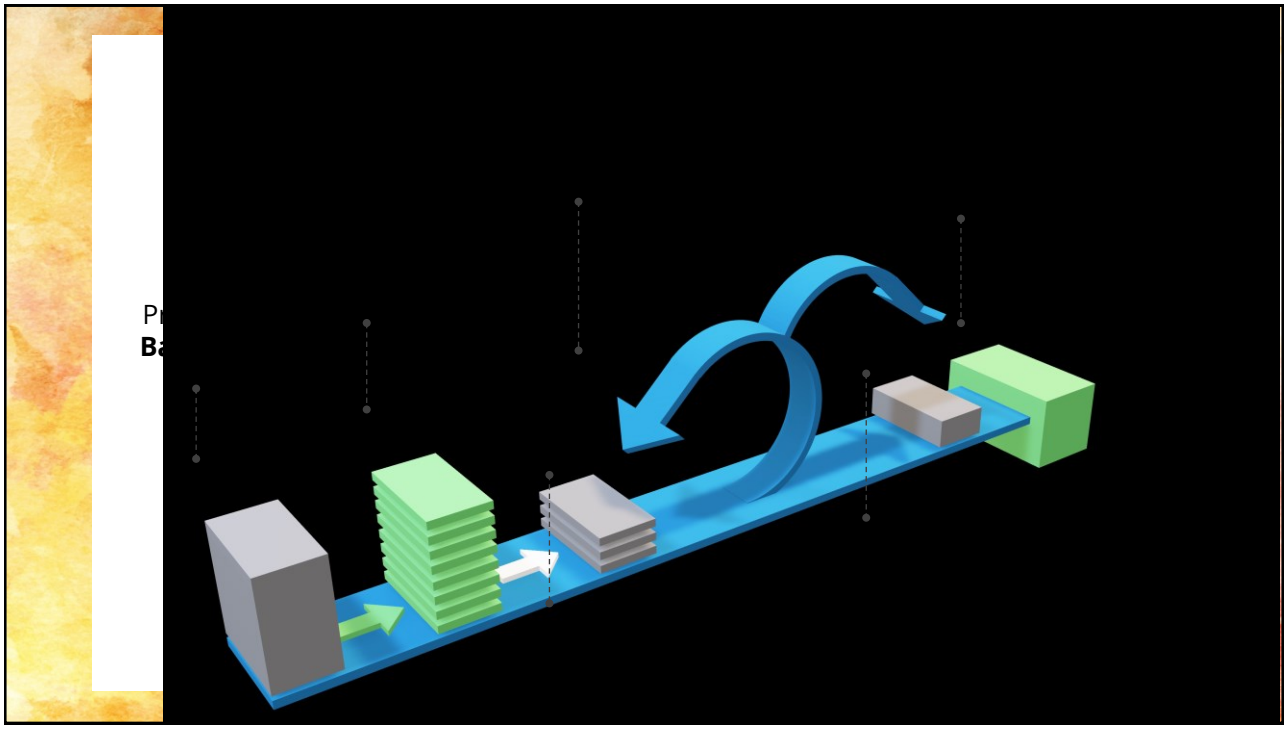

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Pre-Sprint Activities

- **Vision Statement:** concise description of the goals of the project
- **Product Roadmap:** visual timeline of major product features to be delivered and is normally created by the Product Owner
- **Stories:** requirements normally written by the Product Owner and come from customer requirements
- **Product Backlog:** made up of stories and prioritized

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Sprint Activities

- Sprint Planning meetings plan what will go into a Sprint
- The Product Owner prioritizes requirements and decides contents of the Sprint Backlog
- Stories make up Sprint Backlog
- Team breakdown stories into tasks

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Sprint Activities

- Team takes 30 days or so to deliver an agreed amount of stories
- Daily Scrum of 15 minutes for team to collaborate with each other
- Sprint review team demonstrates the completed stories to customer in a Sprint Demo
- Scrum Retrospective team reviews Sprint and looks for improvement (lessons learned)
- Scrum Master makes sure the Scrum process is followed entirely and offers coaching

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Sprint Duration Considerations

- Risk of being disconnected from stakeholders
- Ability to go to market with a product release
- Frequency that team composition can be changed
- All Sprints should be of same duration
- No such thing as Sprint Zero

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Scrum Ceremonies

- Sprint planning meeting
- Daily Scrum
- Sprint review meeting
- Sprint retrospective

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Sprint Planning Meeting

- Timebox: Eight hours for a four-week sprint; less for shorter sprints
- Attendees: Complete Scrum team, including all roles
- Goal: Team capacity, Sprint Goal/Definition of Done, Sprint Backlog

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Daily Scrum

- Timebox: Fifteen minutes
- Attendees: Complete Scrum team (not for management, customers)
- Goal: Progress and impediments

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Sprint Review Meeting

- Timebox: Four hours for a four-week sprint, less for shorter sprints
- Attendees: Complete Scrum team and key stakeholders
- Goal: Demo of project work and assessing feedback

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Sprint Retrospective Meeting

- Timebox: Three hours for a four-week sprint; less for shorter sprints
- Attendees: Complete Scrum team, including all roles; the product owner's attendance is optional
- Goal: Brainstorm and agree on what is working and what is not

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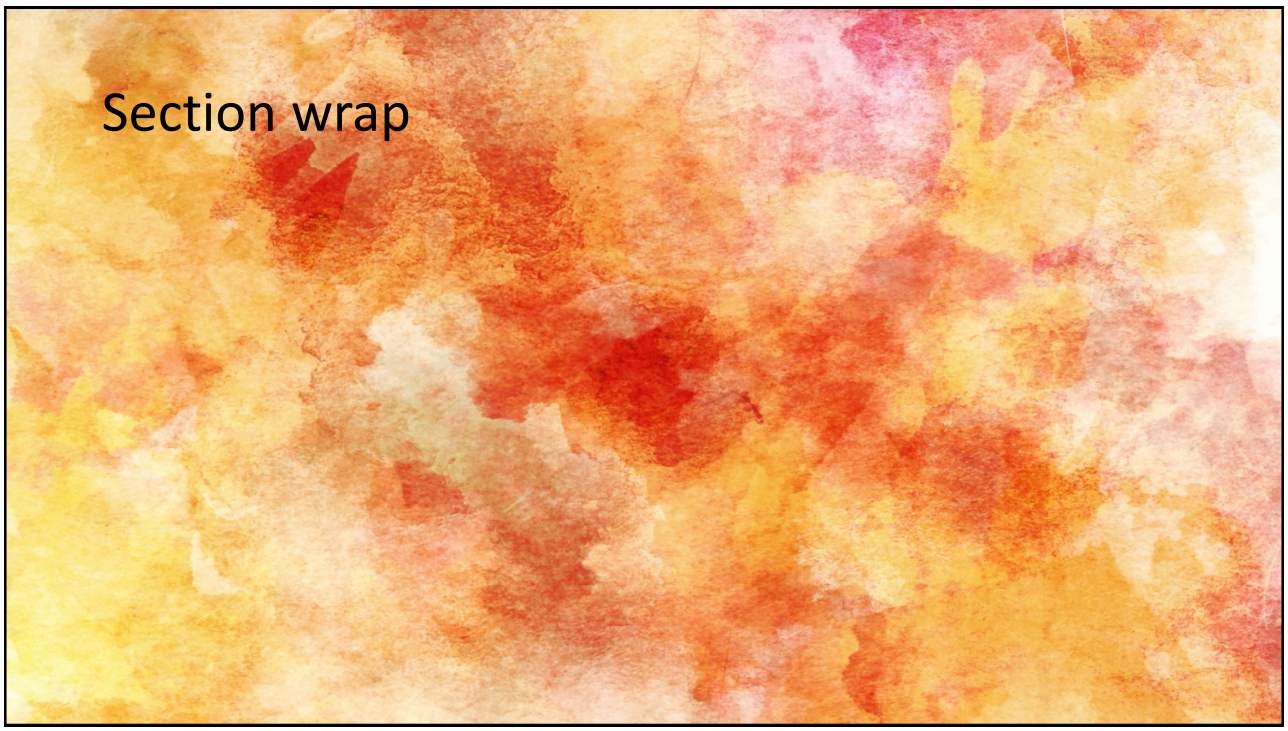

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Section overview

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Scrum Team

- Only three roles in a Scrum project
  - Additional roles harmful to team unity
  - Not compatible with Scrum philosophy
- "Scrum Team" refers to all the project team members
  - Product Owner
  - Scrum Master
  - Development Team members
- Stakeholders can be involved in project, they are not considered internal
- When the project is not internal, the customer is a stakeholder
- Always have external stakeholders

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Scrum Team Characteristics

- Self-organized: Scrum Team manages own efforts
  - Not managed or directed by others
  - Management and specialist efforts are not separated in Scrum
- Cross-functional: Scrum Team has expertise and competencies
  - Get the job done without help from outside the team
- If work is too large for current team:
  - Remove or change selected items
  - Recruit additional Development Team members before the work begins

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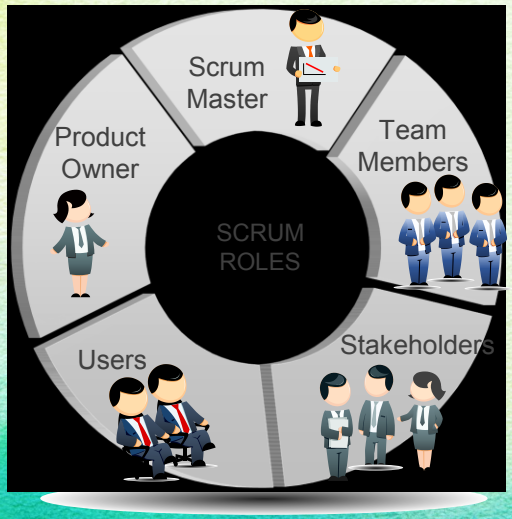
Scrum Stakeholders



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Product Owner

- Role belongs to one person
  - Can be a committee, but should be one person representing committee
  - Do not need to be developers
  - Well-versed in how the business operates
- One Product Owner for entire project
- One Product Backlog for entire project

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Product Owner

- Product Owner is responsible for the Product Backlog
  - Ensures each user story is easy to understand
  - Communicates with customers to keep the Product Backlog updated
  - Measures the performance of the project
  - Forecasts completion date and makes this information transparent
- Team and Product Owner work together:
  - Too much work a Sprint
  - Product owner can cancel a Sprint, not the Development Team

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Product Owner

- Entire organization must respect the Product Owner decisions
- No one, even the CEO, should try to override decisions
- No one should tell the Development Team what item to deliver, except for the Product Owner
- Product Owner might delegate some responsibilities to the Development Team, but stays accountable for them

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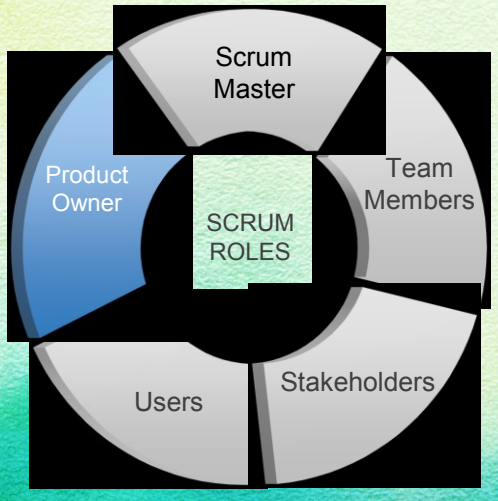
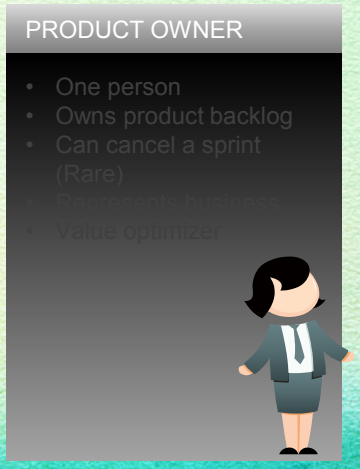
Product Owner and Customers





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Scrum Master

- Scrum Master fully understands Scrum
- Coaches the Scrum team to ensure all Scrum processes are implemented (eg, Daily Scrum)
- Management position, which manages the Scrum process, rather than the Scrum Team
- Servant-leader for the Scrum Team
- Leads the organization in its effort to adopt Scrum

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Scrum Master

- Removes impediments to the Development Team, facilitates events, and trains and coaches team
- Helps Product Owner by consulting on finding techniques, communicating information, and facilitating related events
- Helps those outside the Scrum Team understand the appropriate interactions with the Scrum Team
- Possible for a single person to be Scrum Master and a team member, although this is not recommended

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Scrum Master

- Acts as a shield for team
- Can remove team members that are causing conflicts
- Keep stakeholders abiding by rules
- For example, only inspecting an increment at the Sprint Review

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Scrum Master and Impediments

- When there are serious or many impediments:
  - Alert management to the impediments and impact
  - Consult with the Development Team
  - Prioritizing the impediments list and address each in order

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Scrum Master and Product Owner

- Scrum Master is a servant leader
- Product Owner engages stakeholders
- Product Owner must be available to the Development Team:
  - Scrum Master can Inform the Product Owner's functional manager
  - Scrum master can address the problem in the Sprint Retrospective

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Development Team

- Experts that are responsible for delivering backlog items, and managing their efforts
  - Cross-functional: capable of the creation of each Product Backlog item
  - Self-organized: find their own way instead of receiving orders
- Whole Development Team responsible and accountable; no individual owns any task
- Development Team delivers the final product of the project in step by step Increments, as defined in the Product Backlog

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Development Team

- Works full-time in a single project
- Development Team members should not change often
  - Team member changes should not happen during a Sprint
  - There will be a short-term decrease in productivity
- Scrum is effective when there are 3-9 Development Team members

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Self-Organizing Development Team

- Boost to creativity
- Team and project commitment
- Accuracy of estimates
- When new teams are starting a project:
  - Ensure the team understands they need a definition of done
  - Scrum Team members introduce themselves and give a brief background of their skills and work history
  - Product Owner discusses the product or project, its history, goals, and context, as well as answer questions

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Development Team Considerations

- Bring the team together and let them self-organize
- Existing teams can propose how they want to organize
- Large projects use a scaled model with multiple Scrum Teams
  - Multiple Scrum teams are not common
  - Adding new Scrum teams won't affect current productivity
  - Multiple Dev Teams should be self forming based on vision and Scrum rules
  - All teams need a common definition of done
  - All teams should have same Sprint starting date

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Development Team and DoD

- Development Team should deliver additional features in a useable state that complement those delivered in previous iterations
- If the team can't finish all Sprint Backlog items:
  - They do not include the items in the increment of current Sprint
  - They do not show it in the Sprint Review
  - They must estimate it and return it to the Product Backlog for the Product Owner to decide what to do with it the item(s)

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Other roles

- Scrum does not allow this!
- Members have the same role and title: Development Team member
- Different titles or roles shifts focus to specific role and individuals might not pay enough attention to the final product
- Development Team members are responsible for all the outputs created in the Development Team

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Who's the project manager?

- No such role in Scrum
- None of the roles act as a traditional project manager
- Scrum Master responsibilities are different than traditional PM

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What happens to project management?

- PM responsibilities are distributed among the three roles
- There is no centralized project management in Scrum

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Section quiz

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Nature of Scrum Events

- Sprint
  - Each Scrum project is a set of Sprints
  - A Sprint is a container for the four other events, development effort, and the maintenance of the Product Backlog

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Purpose of Definition of Done

- Creates transparency over the work inspected at the Sprint Review
- Defines requirements for increment to be releasable
- Guides Development Team in forecasting at the Sprint Planning

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Nature of Scrum Events

- Sprint Planning
  - Sprint Planning is the first event in a Sprint
  - Scrum Team plans the items they are going to deliver in the Sprint
  - Scrum Team plans the way they will deliver them

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Nature of Scrum Events

- Daily Scrum
  - Development Team starts working as soon as Sprint Planning is completed
  - Development Team holds a daily meeting (normally 15 minutes) to coordinate the work for the next 24 hours

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Nature of Scrum Events

- Sprint Review
  - Development Team demonstrates the outcome of the Sprint to the customer
  - Customer provides feedback to the Development Team
  - Called Sprint Review (also known as Sprint Demo)

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Nature of Scrum Events

- Sprint Retrospective
  - After Sprint Review and before the Sprint is over
  - Development Team holds internal meeting to review the Sprint
  - Goal is to improve the process (lessons learned) in the next Sprint
- This meeting is the Sprint Retrospective

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Architecture and Infrastructure Concerns

- Added to the Product Backlog and addressed in early Sprints, while always requiring at least some business functionality
- Implemented along with functional development of the product
- Security, uptime, and non-functional requirements should be added to Product Backlog and Dod

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Time-boxed Concepts

- Time-box is a fixed period
- Freeze the target and work with full focus on certain tasks or objectives
- Duration of a time-box should be agreed upon and fixed
- Free to change the duration based on lessons learned, but not frequently, and never based on single occasions

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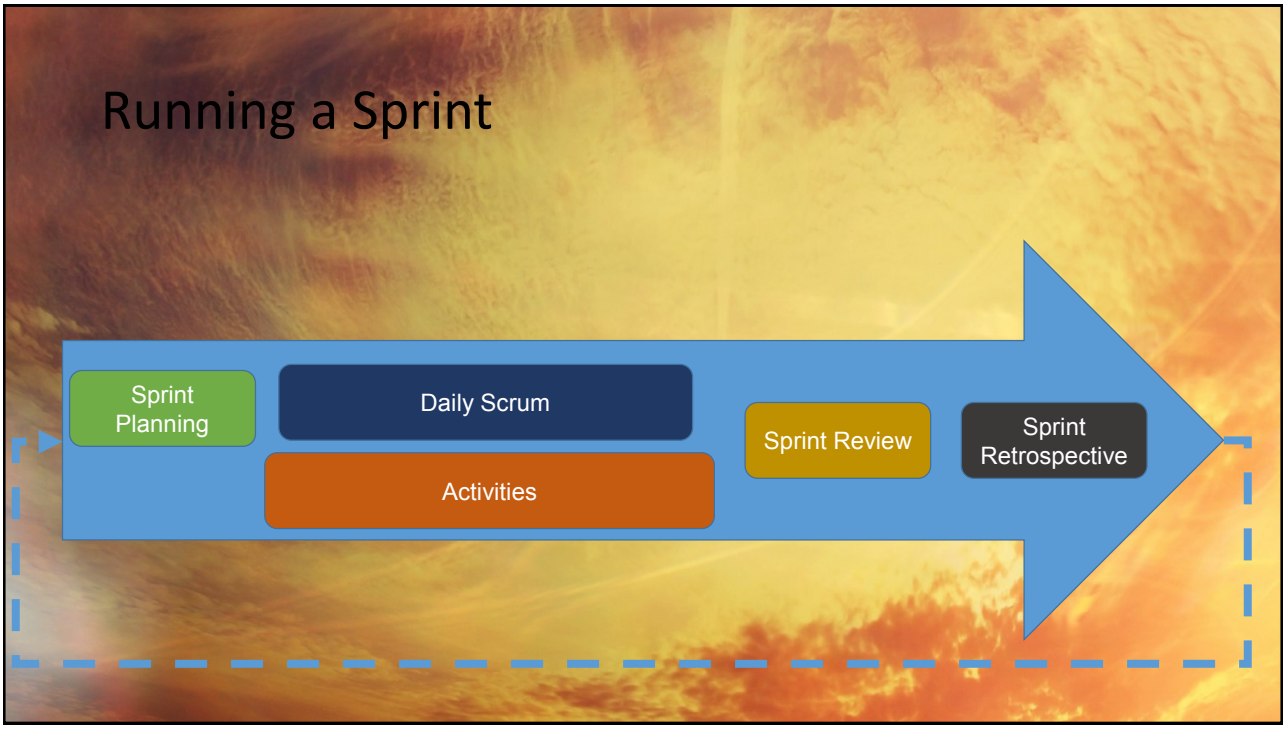
Running a Sprint



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Sprint Details

- Delivers final product after a *number* of Sprints
- Increment is developed in each Sprint
- Increment is a potentially releasable part of the final product
- Increment is a sum of all Product Backlog items completed so far in a project

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Sprint Details

- Increment increases after each Sprint
- Customers usually request changes during the Sprint Review
- Sprint Backlog doesn't change once the Sprint is started
- Sprint Goal should not change

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Sprint

- Each story in the Product Backlog should normally be developed in a single Sprint
- Product Owner and Development Team select items from the top of the prioritized Product Backlog
- Must agree on a definition of “Done” at the beginning of the project

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Sprint

- Sprint Time boxes: usually 2 to 4 weeks
- Sprints are no more than one calendar month
- Avoid short sprints as goal is to avoid splitting a single item among several Sprints

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Cancelling a Sprint

- Product Owner has the authority to cancel a Sprint
- Can happen when the Sprint Goal becomes obsolete
  - Changes in the Product Backlog, strategies, or approach
- When a Sprint is cancelled, the items that are “Done” will be reviewed and accepted, and the rest of the items will be put back into the Product Backlog

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Sprint Planning

- Development Team does not wait until the Product Backlog is completely planned
- When Product Backlog has the necessary number of stories, Product Owner and Development Team can start the first Sprint
- First action is Sprint Planning
  - Time-boxed meeting
  - Usually fixed to 8 hours for a one-month Sprint
  - All three roles should attend this meeting
- Development Team estimates the capacity of work it can deliver in a single Sprint

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Sprint Planning

- Product Owner has already ranked and ordered the Product Backlog
- Product Owner ensures that the stories are easy to understand
- Development Team selects appropriate number of items from the top of the Product Backlog, and puts them in the Sprint Backlog
- Work for each item is estimated by the Development Team
- Total amount of work items is close to estimated capacity of the Development Team

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Sprint Planning

- Plan the Sprint Backlog, then Plan the Sprint Goal
- Sample Sprint Goal:
  - *We are going to create the basic functions of the Restaurant Finder app so that the app can begin to be used by customers.*

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Sprint Planning

- When Sprint Goal is agreed upon team delivers the items into a "Done" product Increment
- Sprint planning isn't always completed in one meeting
  - Detailed plan for the first few days is enough
  - Development Team can prepare detailed plans for the rest of the work later
- Detail plan is a breakdown of a Product Backlog item into detailed tasks. Each task might have estimates, dependencies, and similar information for tracking.

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Sprint Planning

- Sprint Goal (To Do, Doing, Done)
- The goal of sprint is:
  - To make the purchasing part of the website mature enough to be able to handle the whole process and users can experience a full purchasing process, through which other functionalities of the website will be more meaningful.
- Post-its are tasks created by breaking down each user story
  - Tasks define what the Development Team will do
  - Whole team is responsible for preparing them
  - Some tasks are created at the Sprint Planning meeting, and others throughout the Sprint

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Sprint Planning

- The Sprint Backlog consists of:
  - The Sprint Goal
  - Selected items from the Product Backlog
  - Detailed plan for turning stories into “Done” Increment of the product

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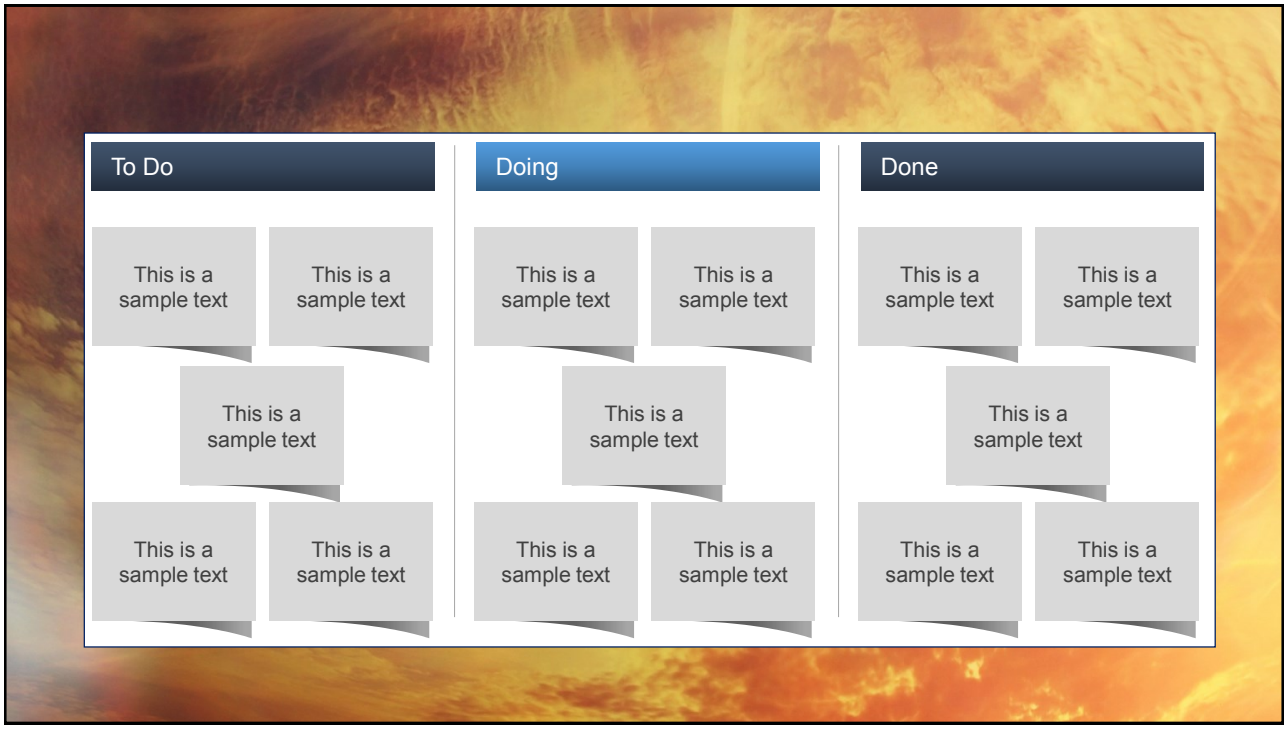

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Daily Scrum

- 15-minute meeting for the Development Team to inspect the work since the last meeting
- Synchronize work and plan for the next 24 hours
- Three questions:
  - What has been accomplished since the last meeting?
  - What will be done before the next meeting?
  - What obstacles are in the way?

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Daily Scrum

- Team assess progress towards Sprint Goal
- Forecasts likelihood of completing items before the Sprint is over
- Held at the same time and place throughout the Sprint
- For the Development Team; not a status meeting for all stakeholders
- Good idea for the Sprint board (wall chart) to be visible
- Burn-down chart can be used to track remaining work

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Sprint Review

- Four hours for a one-month Sprint
- Scrum Team and other stakeholders
- Present and inspect the “Done” items
- Collect feedback and change requests

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Sprint Review

- Development Team does not present an item, unless it is 100%
- Product Owner makes sure (before the Scrum Review) that presented items are “Done”
- Development Team demonstrates and explains the items.
- Product Owner discusses the status of the Product Backlog and the likely completion dates
- Whole Scrum Team collaborates on Product Backlog

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Sprint Retrospective

- Three hours for a one-month Sprint
- After the Sprint Review, and before the end of the Sprint, another meeting will be held, aimed at process improvement
- This is learning lessons and is the Sprint Retrospective
- Usually required, but optional if Product Owner, Scrum Master, and Development Team agree

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Sprint Retrospective

- Always look for ways to improve
- Does not matter how little there should be an improvement
- Formal opportunity for improvement
- Participants reviews (inspects) the Sprint
  - People
  - Relationships
  - Processes and tools
  - Identify ways of improvement

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Product Backlog Grooming

- Reviewing and revising Product Backlog items
  - Adding detail
  - Creating estimates
  - Ordering items
- Product Owner is responsible for prioritizing
- Development Team is responsible for estimating

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Product Backlog Grooming

- Main difference between grooming and the five Scrum events:
  - Scrum events are time-boxed
  - Grooming is an ongoing activity
- Grooming should not consume more than 10 percent of the Development team's time

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Slack in Scrum

- Does not matter how much the Development team works
- What is produced is what's important
- Team should be product-oriented, not activity-oriented
  - Limit the work time to a reasonable amount, and have frequent off times
  - Recommended to have a slack between each two Sprints
  - A day or two off to recharge batteries
  - Read some relevant articles
  - Check out what other teams are doing

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Slack in Scrum

- Slacks can also be used for reading articles, taking part in courses or workshops, spending time on creative projects, etc.
- After the slack, repeat the same cycle until the final product of the project is delivered, and the client is completely satisfied
- Slack is not an event and the official Scrum.org does not mention it

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Section quiz

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Section overview

- **Product Backlog**: An ordered list of everything (aka stories) that might be needed in the final product
- **Sprint Backlog**: Selected items (stories) from the Product Backlog to be delivered through a Sprint, along with the Sprint Goal and plans for delivering the items and realizing the Sprint Goal
- **Increment**: The set of all the Product Backlog items completed so far in the project (up to the end of a certain Sprint)
- **Definition of "Done"**: The shared understanding of what it means for a piece of work to be considered complete
- **Monitoring Progress towards a Goal**: The performance measurement and forecast for the whole project
- **Monitoring Sprint Progress**: The performance measurement and forecasts for a single Sprint

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Product backlog

- Ordered list of everything that might be needed in the final product
- All items are described in simple business language
- All items estimated in story points
- Every requirement and every change in the project will be reflected in the Product Backlog
- Dynamically changing and improving
- Team does not wait until the Product Backlog is complete to start delivering the items

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Product backlog

- First Sprint can be started as soon as the Product Backlog has a sufficient number of stories
- Product Owner sets a number of factors to determine the value of each item for the business
- Return on investment is one of the factors
- All factors will be summarized into one value
- Product Backlog ordered based on item value
- Higher-valued items be delivered sooner by the Development Team

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Sprint Backlog

- Created during the Sprint Planning which is the first event in a Sprint
- Sprint Backlog includes:
  - Number of items selected from the top of the Product Backlog
  - Sprint Goal to help describe the real meaning of the items and direct the efforts of the Development Team
  - Detailed plan for delivery of the items and realization of the Sprint Goal

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Sprint Backlog

- Sprint Backlog is frozen after the Sprint Planning
- Development Team focuses on delivering an Increment of “Done”
- Stories in the Sprint Backlog cannot be added or removed
- Might be necessary to get more information, justify, or clear some of the items during the Sprint, which should be done in the presence of the Product Owner
- Detailed plan will become more complete as the Sprint continues

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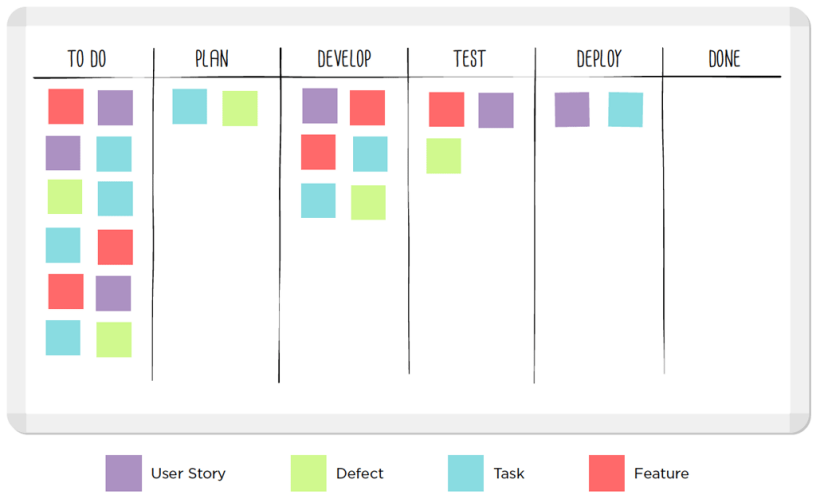
Kanban Board



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Increment Details

- The product increment is the outcome of an iteration
- The product increment is a chunk of the project work
- The development team and the product owner must agree what done means for an increment

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Increment Details

- Sum of all completed Product Backlog items at the end of a Sprint
- Each Increment must be “Done”
- Must be releasable
- Product Owner may/may not release a certain Increment

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Definition of Done

- Shared understanding of what it means for a piece of work to be “Done”
- Definition of “Done” must be discussed and agreed upon at the beginning of the project so that future Increments would be releasable
- Over time, the team will improve their definition of "Done" to include more stringent criteria

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Definition of Done

- Multiple Scrum Teams on a single project:
  - Might not be possible to use the same definition of “Done” for all teams, because they might be working on items of different natures
  - Each Scrum Team will define its own definition of “Done” and delivers its items based on that definition
  - Integration of definitions of “Done” should be capable of creating a potentially releasable Increment at the project level

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Monitoring Project Progress

- Product Owner responsible to monitor the progress of the project
- Should be done at least once per Sprint Review
- Product Owner determines the amount of remaining work and compares it to the remaining work of the previous Sprints
- Forecasts the completion date of the project
- All stakeholders should have access to this information

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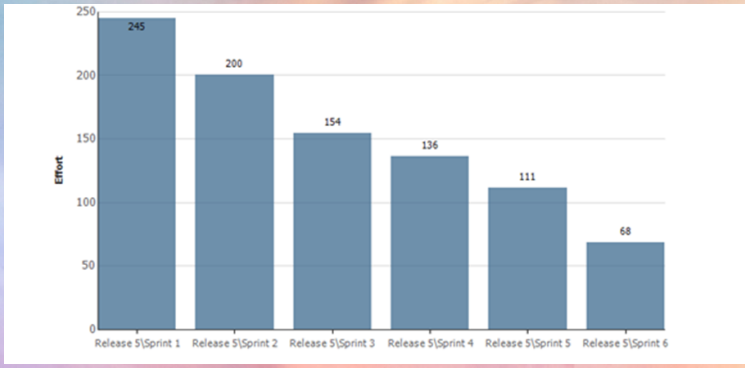
Utilizing Burndown Chart

- Track the work that remains to be done on a project
- Measures the team progress in completing the project work



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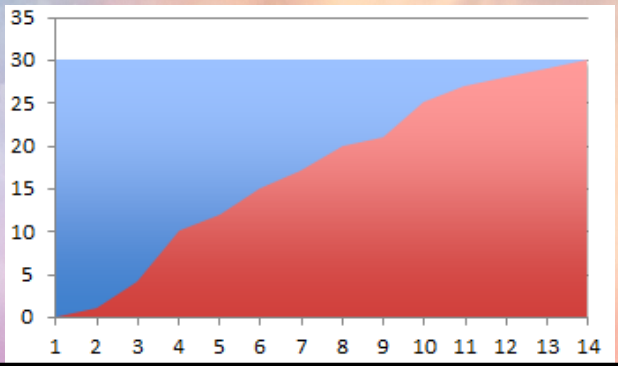
Utilizing Burn Up Chart

- Track the work that has been completed
- As work is done the line moves upward
- Provides additional insight into the project status



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Understanding Team Velocity

- Velocity is the measure of a team's capacity for work per iteration
- Measured in the same unit that the team estimates the work
- Velocity very early and then stabilizes
- Velocity tends to plateau

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Calculating Completion Time

- The team's velocity has been 20 story points per iteration
- There are 200 story points left
- Each iteration is two weeks
- 200 divided by 20 is 10
- 10 times 2 is 20
- There are 20 weeks left in the project

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Monitoring Sprint Progress

- Monitor the progress of each Sprint throughout its life
- Responsibility of the Development Team
- Should be done in each Daily Scrum
- Used to calculate the likelihood of achieving the Sprint Goal and completing all items of the Sprint Backlog

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Monitoring Sprint Progress

- Utilize a Sprint board for transparency
  - Sprint burndown chart
  - Sprint goal
  - Kanban of user stories

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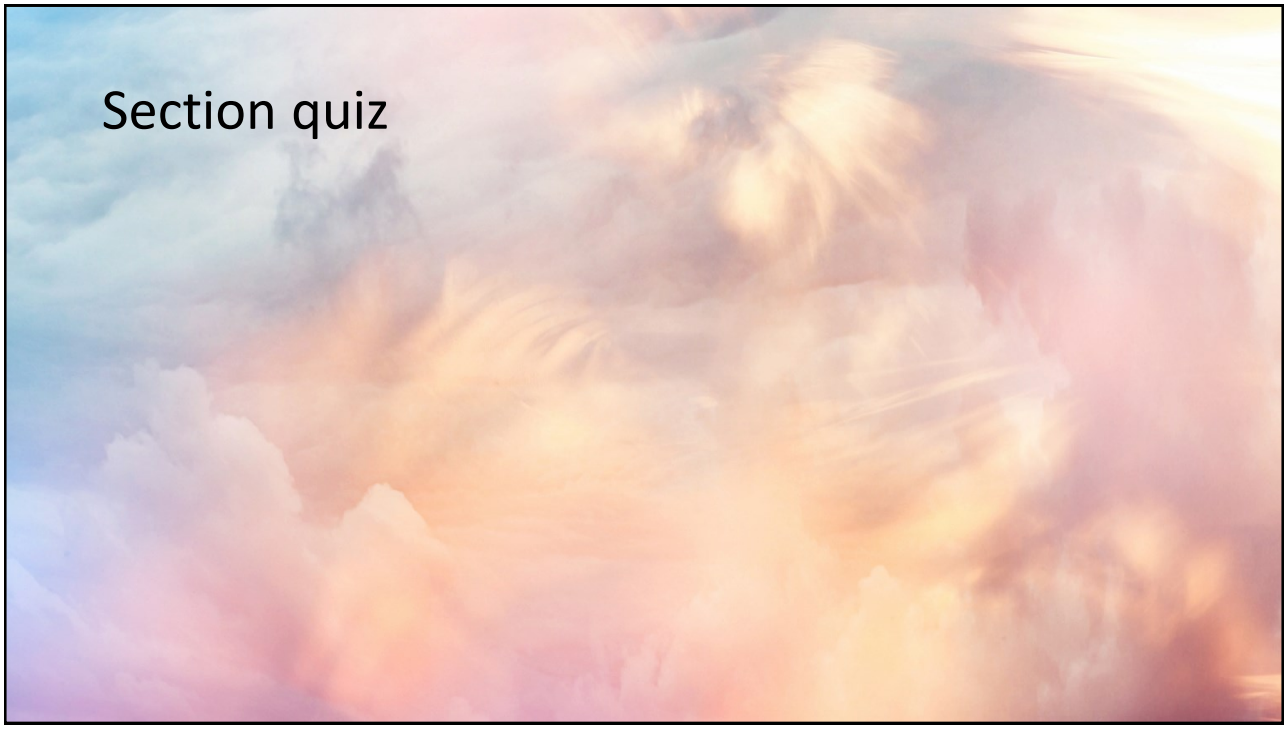

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