

# PROJECT SCRUM MASTER



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## Overview

The Vets2PM Professional Scrum Master (“PSM”) course covers the principles and empirical process theory underpinning the mechanics, rules, and roles of the agile Scrum framework, one of the most popular versions of this project planning and delivery. The Professional Scrum Master is for effective Scrum Masters or anyone supporting a software or product development team's efficiency and effectiveness.

## Course Objectives

Students are challenged to think within the Scrum Framework and the underlying values and principles to better understand what to do when returning to the workplace and facing complex decisions.

Theoretical and experiential training to provide:

- The “WHY” and rules of Scrum through the empirical foundation of Scrum.
- The ability to effectively start up Scrum or increase its effectiveness if already underway.
- The ability to navigate the “grey areas” of a Scrum implementation.
- Real-world examples from attendees’ experiences

## PSM Study Plan

1. View the Vets2PM PSM Course at least once.
2. Read the accompanying Vets2PM PSM Course Study Guide at least once as it contains Scrum.Org’s Scrum Guide.
3. Take a minimum of 6 open assessments at <https://www.scrum.org/open-assessments/> (3 Scrum, 3 Product Owner).
4. Understand Scrum.Org’s Scrum Professional Competencies here <https://www.scrum.org/professional-scrum-competencies>
5. Purchase and complete your Professional Scrum Master I (“PSM”) exam here <https://www.scrum.org/professional-scrum-certifications/professional-scrum-master-assessments>Curriculum Approach

## PSM Course Flow

Example PSM® Boot Camp – Course Flow: Onsite/Live-Virtual

Course is intended to be delivered in two training days or less!

Section 1: Course Introduction:

- Logistics
- Introductions
- Course & Resource Overview
- Exam Mapping
- Scrum.org overview

Section 2: Introduction to Agile

- Learn about the Scrum Framework
- Develop an agile mindset for project delivery
- Prepare and pass the PSM Exam

Section 3: Waterfall vs. Agile

- Project Delivery Methods
- Agile Project Management
- Traditional Project Management

Section 4: Scrum Overview

- Scrum Overview
- Scrum Pillars
- Scrum Principles

Section 5: Understanding and Applying the Scrum Framework

- Empiricism
- Scrum Values
- Scrum Team
- Events
- Artifacts
- Done

Section 6: Developing People and Teams

- Self-Organizing Team
- Facilitation
- Leadership Styles
- Coaching and Mentoring
- Teams

Section 7: Managing Products With Agility

- Forecasting & Estimating
- User Stories
- Velocity
- Release Planning
- Sprint Planning
- Product Value
- Product Backlog Management

Section 8: Developing and Delivering Products Professionally

- Emergent Development
- Managing Risk
- Continuous Quality
- Technical Debt

Section 9: Course Review and Closing

- Review
- Final Thoughts
- Thank You

## Student Support

At Vets2PM we are not check-the-box trainers. We enter a one-year to a lifetime relationship with our students. For one full year, students will have Student Portal access (multiple study and work related resources) and may retake or reattend any OnDemand or Live-Webinar courses. For the onsite courses we allow reattendance on a space available basis. Students also have access to our staff and instructors through our contact us form on our website. There are also the following benefits built-in:

1. Live Instructor Support – Our highly trained instructors have the answers to your questions!
2. LIFETIME Job Placement Assistance – We measure our success by your chapter members achieving meaningful, lucrative careers!

## Past Clients

Past performance is important to some, so we thought we would throw a few of our clients we have served over the years.

Sharp Decisions, OSPO International, COLSA Corporation, HigherEchelon, Apex Systems, Granite Construction, Management Concepts, The PMO Squad, IOMAXIS, Goldbelt Frontier, Sentar, MEE Consulting, Parallon / HCA, 7Eagle Group, Bastian Solutions, AEVEX Aerospace, Alluvionic, Draper Aden Associates, Force Multiplier Talent, and Lockheed Martin. We have also served countless DoD Service units.

## Instructors

We are stacked with talent and ready to share information with your members. For more information feel free to look at our website [www.vets2pm.com/about/](http://www.vets2pm.com/about/) but we will highlight a few here:

1. Eric “Doc” Wright, PhD, PMP, CSM, CSPO, PSM (CEO and Founder) He is a two-era, two-service branch disabled veteran, who built the company to serve veterans, civilians, commercial, and government customers. From service, Eric went into health care, helping a private medical devices company go public, then into civil service at the Department of Defense’s Defense Finance and Accounting Service, supporting the Deputy Director of Operations’ (COO) multi-million dollar project portfolio as a senior supervisory project manager, followed by a career in academia as a full Professor and College of Business Chair, standing up a project management curriculum at one campus, and then into private sector, founding Vets2PM, LLC and the nationally-recognized 501(c)3 Veteran Project Manager Mentor Alliance.
2. Garrik Dennis, PMP, MA, CSM, CSPO (Lead Instructor) He is a US Army veteran, having earned his PMP® certification through Vets2PM in 2017. His project experience ranges from small-unit tactical planning to brigade-level communications upgrades. Garrik is passionate about assisting veterans in their pursuit of earning project management certifications, as well as helping them through the military transition process altogether.

## Test Pass Guarantee

No one can guarantee another human will retain, perform, try-hard, or stick with a program. Most states prevent the word “guarantee” from brochures, advertisements, and websites, this is why you don’t see colleges and universities throw guarantees around like infomercials. Beware of companies that do guarantee. We are transparent with students and clients, there are no guarantees unless you consider the following guarantees:

- We have found it is better to obtain your intended certification than to fall back on a failure guarantee; but, if we cannot resolve an issue, we refund eligible portions of money expended.
- We will provide all students with a proven method for certification obtainment.
- We will support students in their journey toward certification or professional development for up to a year from the original purchase date.

## Refund Policy

Vets2PM makes every attempt to help our customers and clients reach their goals. We have found reaching the intended goal is better than a refund. However, we do realize there will be unresolvable issues.

1. 100% Refund: If notified two-weeks or greater from course start date.
2. 100% Refund Less \$99 administrative fee: If notified inside two weeks from course start date.
3. 75% Refund: Any student that withdraws on or after course start date but before the second session.
4. 50% Refund: Any student that completes 40% of the course (onsite = 2 sessions; online = 4 sessions) will receive a prorated refund.
5. 0% Refund: If the student completes the course or attends greater than 40% of scheduled course.

## Contact Us

If you need more information or are ready to sign-up for our Chapter Solution please reach out to us via email [administrator@vets2pm.com](mailto:administrator@vets2pm.com) or 1-888-551-4251. If you have any issues with that contact our Chief Operating Officer is Jeremy Burdick and can be reached directly at [jeremy@vets2pm.com](mailto:jeremy@vets2pm.com).

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Melbourne, FL 32902	Tax ID # 47-2889448	SDVOSB	

## Study Guide

The next section is the meat of the course and some notes you will want handy during the exam.

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## Introduction

### What is the PSM?



- ▶ The Professional Scrum Master® exam is situationally-based, thus also testing the test-taker's command of applying the framework
- ▶ Passing the exam results in the globally recognized Professional Scrum Master credential the PSM®
- ▶ In the mind of Civilian hiring managers, the PSM® 'validates' the Member's or Veteran's specific framework of scrum knowledge and experience

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Welcome to class, this study guide is NOT intended to be the complete slide deck. It IS intended to keep information at your fingertips for the test.

## Section 1

### Course Introduction

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## Learning Objectives

- Learn about the Scrum Framework
- Develop an agile mindset for project delivery
- Prepare and pass the PSM® exam

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## The PSM Exam

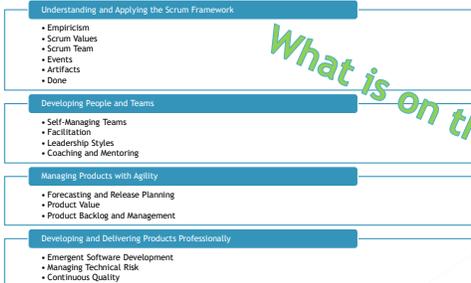


- ▶ **No Prerequisites**
- ▶ 85% on an 80 question Exam
- ▶ Time Box (we will cover that) of 60 Mins
  - ▶ The time goes fast!
- ▶ Take a few practice tests first! <https://www.scrum.org/open-assessments>
- ▶ Open Book (i.e. you can use the study guide & Ctrl + F)
- ▶ Go to <https://www.scrum.org/professional-scrum-certifications/professional-scrum-master-assessments>
  - ▶ Or just go to [www.scrum.org](http://www.scrum.org)
- ▶ Lifetime Cert. No retest, No fees, No PDU's

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## The PSM Exam Mapping

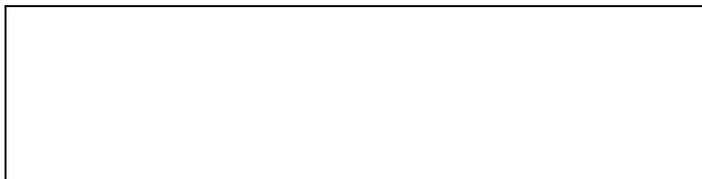


*What is on the test?*

- Understanding and Applying the Scrum Framework**
  - Empiricism
  - Scrum Values
  - Scrum Team
  - Events
  - Artifacts
  - Done
- Developing People and Teams**
  - Self-Managing Teams
  - Facilitation
  - Leadership Styles
  - Coaching and Mentoring
- Managing Products with Agility**
  - Forecasting and Release Planning
  - Product Value
  - Product Backlog and Management
- Developing and Delivering Products Professionally**
  - Emergent Software Development
  - Managing Technical Risk
  - Continuous Quality

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  - Forecasting and Release Planning
  - Product Value



Product Backlog and Management

- Developing and Delivering Products Professionally

Emergent Software Development  
Managing Technical Risk  
Continuous Quality

### Who is Scrum.org?

- ▶ **Ken Schwaber**, the co-creator of Scrum, founded Scrum.org in 2009 as a global organization, dedicating himself to improving professionalism.
- ▶ **Certifications offered include:**
  - ▶ PSM I, II, III – Professional Scrum Master
  - ▶ PSPO I, II, III – Professional Scrum Product Owner
  - ▶ PSD I – Professional Scrum Developer
  - ▶ SPS – Scaled Professional Scrum
  - ▶ PSK I – Professional Scrum with Kanban
  - ▶ PAL I – Professional Agile Leadership
  - ▶ PAL EBM – Professional Agile Leadership Evidence-Based-Management
  - ▶ PSU I – Professional Scrum User Experience

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- ▶ Scrum Masters spend their time:
  - ▶ Coaching (Servant Leader) the team self-organize and self-manage
  - ▶ Coaching the team resolve problems and impediments
  - ▶ Coach engagement of stakeholders
  - ▶ Coach team members and members of the organization on Scrum principles

### A Scrum Master Thinking?

- ▶ Scrum Masters spend their time:
  - ▶ Coaching (Servant Leader) the team self-organize and self-manage
  - ▶ Coaching the team resolve problems and impediments
  - ▶ Coach engagement of stakeholders
  - ▶ Coach team members and members of the organization on Scrum principles
- ▶ The Agile approach stipulates:
  - ▶ Plan at the high level up-front, and execute releases and iterations, help the team manage work, communicate with stakeholders
  - ▶ Planning actions are done by Product Owner working with the team; decisions are made by the self-organized team
  - ▶ Changes to the plan are sought after, and embraced

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### PMP® vs. PMI-ACP® vs. PSM®

PMP®	PMI-ACP®	PSM I
Traditional Waterfall	Agile Mindset (Values & Mindset)	Scrum Framework
Over 900,000 hold this credential	Less than 30,000 hold this credential	Over 361,719 hold this credential
Project Manager Average Salary \$95,000	Agile Coach Average Salary \$133,199	Scrum Master Average Salary \$97,319
Focuses on Delivering a Product, Service, or Result	Focuses on Delivering Value	Focuses on Scrum Guide understanding & Mindset
Concerned about Project and Results	Concerned about People	Dedicated to the process and framework
Defines Project all up Front	Defines Project Incrementally	Defines Projects in Sprints

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PSM is a Scrum focused certification based on your knowledge and application of the lightweight framework.

▶ **Section 2**  
Introduction to Agile

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**Learning Objectives**

- Origins of Agile
- Agile in Practice
- Agile Values
- Agile Manifesto
- Agile Principles
- Declaration of Interdependence
- Different Agile Methods

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**Origins of Agile**

- ▶ In 2001, 17 individuals went to The Lodge at Snowbird Ski Resort in Utah.
  - ▶ Jeff Sutherland, Ken Schwaber, Alistair Cockburn, Dave Thomas, Kent Beck, etc.
- ▶ Leaders in Programming, Software Development, and Architecture.
- ▶ The purpose was to find a simpler way of doing Software Development.
- ▶ The Agile Manifesto was born.

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**Agile Manifesto / Values**

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals & Interactions	OVER	Processes & Tools
Working Products	OVER	Comprehensive Documentation
Customer Collaboration	OVER	Contract Negotiation
Responding to Change	OVER	Following a Plan

That is, while there is value in the items on the right, we value the items on the left more.

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Working software changed to working product because we can use scrum in multiple industries.

1. Individuals & Interactions over Processes & Tools
2. Working Products over Comprehensive Documentation
3. Customer Collaboration over Contract Negotiation
4. Responding to Change over Following a Plan

There is value in the “right side” just more value in the left.

**Agile Principles**

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter time scale.

Business people and developers must work together daily throughout the project.

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**Agile Principles**

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Working software is the primary measure of progress.

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

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**Agile Principles**

Continuous attention to technical excellence and good design enhances agility.

Simplicity – the art of maximizing the amount of work not done – is essential.

The best architectures, requirements, and designs emerge from self-organizing teams.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

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### Declaration of Interdependence



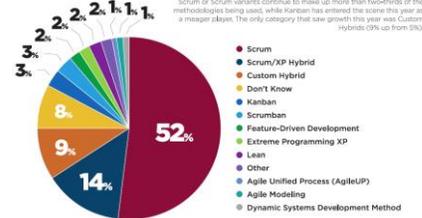
- ▶ Increase return on investment by making continuous flow of value our focus.
- ▶ Deliver reliable results by engaging customers in frequent interactions and shared ownership.
- ▶ Expect uncertainty and manage for it through iterations, anticipation and adaptation.
- ▶ Unleash creativity and innovation by recognizing that individuals are the ultimate source of value, and creating an environment where they can make a difference.
- ▶ Boost performance through group accountability for results and shared responsibility for team effectiveness.
- ▶ Improve effectiveness and reliability through situationally specific strategies, processes, and practices.

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### AGILE METHODOLOGY USED



Credit: <https://www.researchgate.net/figure/fig1/figure-data-table/351202204> Pie chart showing the state of agile survey. Adapted from Herold/Ortiz Herold/Ortiz\_201302204

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There are many agile methodologies; however, scrum seems to be the most prevalent.

## Section 3

Waterfall vs. Agile

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### Learning Objective

- Project Delivery Methods
- Agile Project Management
- Traditional Project Management

### Project Delivery Methods

 Analyze> Design> Execute> Test> Evaluate...Once  <b>Predictive</b> (plan-driven)	 Analyze> Design> Execute> Test> Evaluate...Iteratively  <b>Incremental</b>	 Plan Just Enough> Deliver Quickly> Evaluate Often> Improve  <b>Adaptive</b> (change-driven)
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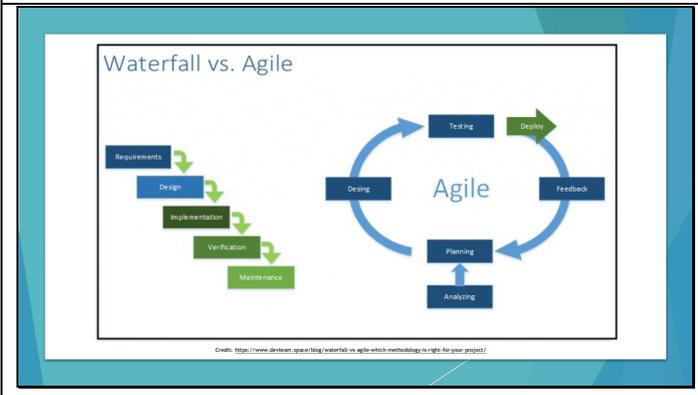
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Project Delivery Methods

Predictive/waterfall – Plan driven

Incremental – Deliver portions of a project and repeat

Adaptive – Change driven



### Agile Project Management

- ▶ The focus is on the team, adapting to change, and progressive elaboration
- ▶ Risk decreases as time passes
- ▶ Planning is done iteratively
- ▶ Change is encouraged and could help the project
- ▶ The main goal is to deliver value

Credit: <https://www.pinterest.co/jen/757810743645463/>

### Agile Project Management Overview

- ▶ The focus is on the team, adapting to change, and progressive elaboration
- ▶ Risk decreases as time passes
- ▶ Planning is done iteratively
- ▶ Change is encouraged and could help the project
- ▶ The main goal is to deliver value

### Traditional Project Management

- ▶ The focus is on the project, planning, stakeholders, and a fixed scope
- ▶ Risk increases as time passes
- ▶ All planning is done up front
- ▶ Change is detrimental and could derail the project
- ▶ The main goal is to deliver the project

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### Traditional/Predictive/Waterfall Project Management

- ▶ The focus is on the project, planning, stakeholders, and a fixed scope
- ▶ Risk increases as time passes
- ▶ All planning is done up front
- ▶ Change is detrimental and could derail the project
- ▶ The main goal is to deliver the project

▶ **Section 4**  
Scrum Overview



**Learning Objectives**

- Scrum Overview
- Scrum Pillars
- Scrum Principles



**What is Scrum?**

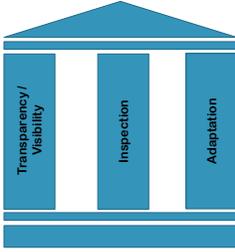
- Scrum is an agile *lightweight* framework for completing complex projects.
- Origins can be traced back to 1986 study done by Takeuchi and Nonaka which was published in the Harvard Business Review (HBR).
- Rugby term for when a team gathers together and all attack the goal.



What is Scrum

- Scrum is an agile *lightweight* framework for completing complex projects.
- Origins can be traced back to 1986 study done by Takeuchi and Nonaka which was published in the Harvard Business Review (HBR).
- Rugby term for when a team gathers together and all attack the goal.
- Goal is to increase empiricism

**The 3 Scrum Pillars**



- ✓ Transparency / Visibility
  - In Work, Performance, Communication
- ✓ Inspection
  - In Processes, Product, Continuous Improvement
- ✓ Adaptation
  - In Progress, Situation, Abilities



The work product and the way it is created should be visible, inspected, and adapted.

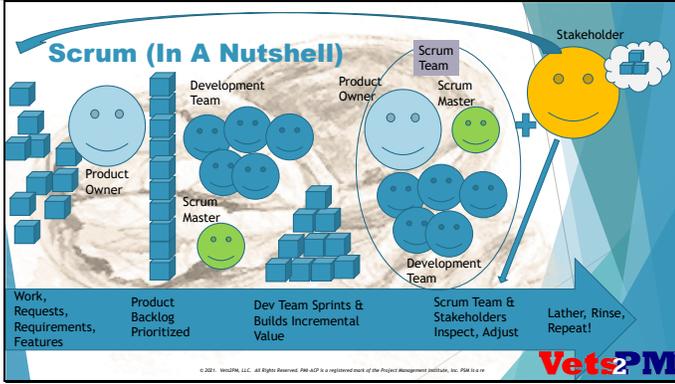
**Transparency** means the work must be visible to those performing, inspecting and receiving the work. Important decisions are based on the perceived state (transparency aids this) of its three formal artifacts: Product Backlog, Sprint Backlog, and Increment. Transparency also enables true inspection.

**Inspection** frequent and complete, to detect undesirable variances or problems. To help with inspection, Scrum provides cadence in the form of its five events: The Sprint, Sprint Planning, Daily Scrum, Sprint Review, and the Sprint Retrospective.

**Adaptation**

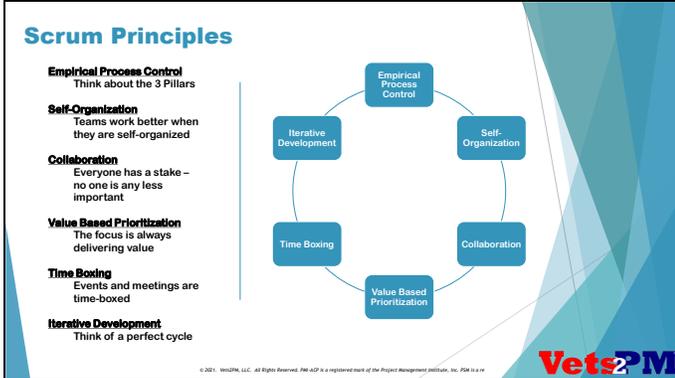
process deviation outside acceptable limits or unacceptable products means the process applied or the materials being produced require adjustment ASAP to reduce further deviation. Team empowerment and self-management helps a Scrum Team adapt the moment it learns through inspection.

The 3 Scrum Pillars



In a nutshell, Scrum requires a Scrum Master to foster an environment where:

1. A Product Owner orders the work for a complex problem into a Product Backlog.
2. The Scrum Team turns a selection of the work into an Increment of value during a Sprint.
3. The Scrum Team and its stakeholders inspect the results and adjust for the next Sprint.
4. Repeat



**Scrum Principles**

**Empirical Process Control**

Think about the 3 Pillars – Observation of results

**Self-Organization**

Teams work better when they are self-organized

**Collaboration**

Everyone has a stake – no one is any less important

**Value Based Prioritization**

The focus is always delivering value

**Time Boxing**

Events and meetings are time-boxed

**Iterative Development**

Think of a perfect cycle

**Section 5**

Understanding and Applying the Scrum Framework

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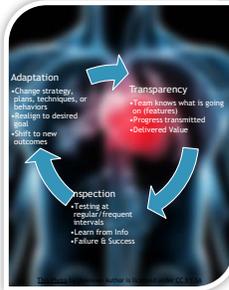
**Learning Objectives**

- Empiricism
- Scrum Values
- Scrum Team
- Events
- Artifacts
- Done

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## Empiricism

- ▶ Bedrock of Scrum, think about the pillars
- ▶ Learn by doing and practicing skills
- ▶ Understand the why and how
- ▶ Your team has the skills and knowledge
- ▶ Execute and apply improvements learned



Merriam-Webster - Originating in or based on observation or experience. Not logic or theory can be verified

Transparency - Merriam-Webster.com Dictionary, Merriam-Webster, <https://www.merriam-webster.com/dictionary/empiricism>. Accessed 20 Jan 2021.

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Scrum consists of: Roles, Events, and Artifacts all working within a lightweight framework to deliver “done” in iterative (repeating), increments (something added or increase like value delivered) to produce valuable products.

Empiricism -

- ▶ Bedrock of Scrum, think about the pillars
- ▶ Learn by doing and practicing skills
- ▶ Understand the why and how
- ▶ Your team has the skills and knowledge
- ▶ Execute and apply improvements learned

TEAMWORK – teams must collaborate to create complex solutions, measure the results and then adapt based on the feedback

## Empiricism in Action

### Product Owner (PO)

- ▶ Only 1 Product Owner and they:
- ▶ Communicate the vision regularly
- ▶ They know the product and voice of the customer
- ▶ Knows how the product aligns to business value
- ▶ Intercedes for Development Team with Stakeholder
- ▶ Is available to the Development Team

### Scrum Team (ST)

- ▶ Empowered to make changes (process/tools)
- ▶ Reduces Waste

### Sprint Planning

- ▶ We do it & we Time-Box it
- ▶ Scrum Team creates clear goal/purpose
- ▶ Scrum Team can build it from the Product Backlog
- ▶ Scrum Team knows they met the goal

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- Cross-functional – they have all the skills
- Self-organizing – i.e., they must feel the ownership and accountability. They have to feel like the experts
- Collaborative – Each team member helping and sharing
- Stable – Need to stay together so they can form a High-Performance Team

- Transparency

Team knows what is going on (features)

Progress transmitted

Delivered Value

- Inspection

Testing at regular/frequent intervals

Learn from Info

Failure & Success

- Adaptation

Change strategy, plans, techniques, or behaviors

Realign to desired goal

Shift to new outcomes

### Scrum Values

- ▶ **Courage**
  - ▶ Scrum Team members have courage to do the right thing and work on tough problems.
- ▶ **Focus**
  - ▶ Everyone focuses on the work of the Sprint and the goals of the Scrum Team
- ▶ **Commitment**
  - ▶ People personally commit to achieving the goals of the Scrum Team
- ▶ **Respect**
  - ▶ Scrum Team members respect each other to be capable, independent people
- ▶ **Openness**
  - ▶ The Scrum Team and its stakeholders agree to be open about all the work and the challenges with performing the work

Credit: <https://www.scrumalliance.org/learn/about-scrum/scrums-values>

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Scrum Values can create an environment where empirical process, self- organization, and continual improvement will be more successful.

Courage - Scrum Team members have courage to do the right thing and work on tough problems.

Focus -Everyone focuses on the work of the Sprint and the goals of the Scrum Team

Commitment - People personally commit to achieving the goals of the Scrum Team

Respect - Scrum Team members respect each other to be capable, independent people

Openness - The Scrum Team and its stakeholders agree to be open about all the work and the challenges with performing the work

### Scrum TEAM (Roles)

10 or less total

- Product Owner (PO)**
- Scrum Master (SM)**
- Development Team (DevOps)**

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These 3 Roles combine to create the “SCRUM TEAM”; Product Owner (PO), Scrum Master (SM), and Development Team (Dev Team) Member, form the foundation for clear responsibilities and focus.

Being able to help organizations understand these roles as they apply to existing HR practices and as they apply to self-organization that is reinforced by the role separation will assist in companies adopting and being successful with scrum.

The Scrum Team is 10 or less including the PO and SM.

- ▶ The Team’s Scrum Framework Coach
- ▶ Ensures that the integrity of Scrum and the rules are maintained
- ▶ Acts as a Servant Leader to the team
- ▶ Protects the team to ensure they can focus on their job
- ▶ Organizational Change Leader
- ▶ Removes obstacles from the team and their environment
- ▶ Ensures that the team is productive and taken care of
- ▶ Promotes Scrum Values and Principles

### Scrum Master

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### Scrum Master

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- ▶ Removes obstacles from the team and their environment
- ▶ Ensures that the team is productive and taken care of
- ▶ Promotes Scrum Values and Principles

### A Great Scrum Master...

- ▶ Always looks for possible distractions or obstacles and seeks to eliminate them
- ▶ Creates and Promotes a collaborative environment full of transparency and communication
- ▶ Listens to their team during meetings
- ▶ Will continuously hold the team accountable
- ▶ Helps guide the team through disfunction into a self-directing/managed team
- ▶ Will seek to make themselves dispensable, not indispensable

Remember: Scrum is a Framework

**\*\*\*FOR THE EXAM\*\*\*  
YOU MUST UNDERSTAND THE MENTALITY AND THE PURPOSE OF A SCRUM MASTER**



- ▶ Always looks for possible distractions or obstacles and seeks to eliminate them
- ▶ Creates and Promotes a collaborative environment full of transparency and communication
- ▶ Listens to their team during meetings
- ▶ Will continuously hold the team accountable
- ▶ Helps guide the team through disfunction into a self-directing/managed team
- ▶ Will seek to make themselves dispensable, not indispensable

Scrum is a lightweight framework, meaning follow the few rules to be successful.

- ▶ Creates, Sets, and maintains the product vision
- ▶ Act as the middle-man between the business (user) and the team
- ▶ Provides the team with information on what the user wants
- ▶ Prioritizes features according to business value and needs
- ▶ Maximized the Value of the work produced
- ▶ Responsible to the team and the business (user)
- ▶ Ultimately, acts as the Voice of the Customer (VoC)
- ▶ Maintains the product backlog
- ▶ Updates stakeholders and the team



### Product Owner (PO)



### Product Owner (PO)

The Product Owner is accountable for maximizing the value of the product (work of the Scrum Team).

PO is accountable for effective Product Backlog (PB) management, which includes:

- Developing and explicitly communicating the Product Goal;
- Creating and clearly communicating Product Backlog items;
- Ordering PB items; and,
- Ensuring that the PB is transparent, visible and understood.

PO may delegate but will be accountable.

- ▶ Creates, Sets, and maintains the product vision
- ▶ Middle-man between the business (user) and the team
- ▶ Provides the team with information on what the user wants
- ▶ Prioritizes features according to business value and needs
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- ▶ Responsible to the team and the business (user)
- ▶ Ultimately, acts as the Voice of the Customer (VoC)
- ▶ Maintains the product backlog
- ▶ Updates stakeholders and the team

- ▶ The workers and producers of value
- ▶ Size of teams 3 – 9 people
- ▶ Comprised of generalists who are good at everything
- ▶ The team makes local decisions and changes processes as necessary
- ▶ Team is Role Free (no one person is better than another)
- ▶ Work collaboratively
- ▶ Team members are dedicated to each other and the team
- ▶ They decide what they are going to do, how they are going to do it, and when
- ▶ A Scrum team is Self-Organizing, Cross Functional, Empowered, Collaborative, Stable, and engages in Constructive Disagreements



**Development Team (DevOps)**

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Development Team/Dev Team/DevOps

- The workers and producers of value (3 – 9 people)
- Comprised of generalists who are good at everything
- The team makes local decisions and changes processes as necessary
- Team is Role Free (no one person is better than another)
- Work collaboratively
- Team members are dedicated to each other and the team
- They decide what they are going to do, how they are going to do it, and when
- A Scrum team is Self-Organizing, Cross Functional, Empowered, Collaborative, Stable, and engages in Constructive Disagreements this shortens the development life cycle while delivering features, fixing bugs, and managing updates.
- Accountable for: Sprint Planning, Sprint Backlog, Definition of Done (quality), Adapting daily to meet Sprint Goal, and holding each other accountable!



**SPRINT PLANNING**      **SPRINT REVIEW**      **SPRINT RETROSPECTIVE**      **DAILY SCRUM**

**Scrum Ceremonies / Events (Meetings)**

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Scrum Ceremonies/Events/Meetings

The Scrum framework describes 5 events: The Sprint, Sprint Planning, Daily Scrum, Sprint Review, and the Sprint Retrospective. All events are time-boxed and enable progress through adaptation and transparency.

The events are used to uphold empirical process control, through the three pillars of Scrum: transparency, inspection, and adaptation.

**Sprint Planning**

What is it?	Decides what is going to be worked on during the Sprint
How long is it?	Lasts 8 hours or less/1 month Sprint
Who needs to be there?	Development Team, Scrum Master, Product Owner
What does it produce?	Sprint Backlog

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**Sprint Planning** initiates the Sprint and lays out the work to be performed for the Sprint. This resulting plan is created by the collaborative work of the entire Scrum Team.

- What is it? Decides what is going to be worked on during the Sprint
- How long is it? Lasts 8 hours or less/1 month Sprint
- Who needs to be there? Development Team, Scrum Master, Product Owner (PO)
- What does it produce? Sprint Backlog
- The PO prepares attendees to discuss the most important Product Backlog items and how they map to the Product Goal.
- The Scrum Team (ST) may also invite other people to attend Sprint Planning to provide advice.

Topic Three: How will the chosen work get done?

For each selected Product Backlog item, the Developers plan the work necessary to create an Increment that meets the Definition of Done. This is often done by decomposing or disaggregating the Product Backlog items into smaller work items of one day or less. How this is done is at the sole

Sprint Planning addresses the following topics:

Topic One: Why is this Sprint valuable?

discretion of the Developers. No one else tells them how to turn Product Backlog items into Increments of value.

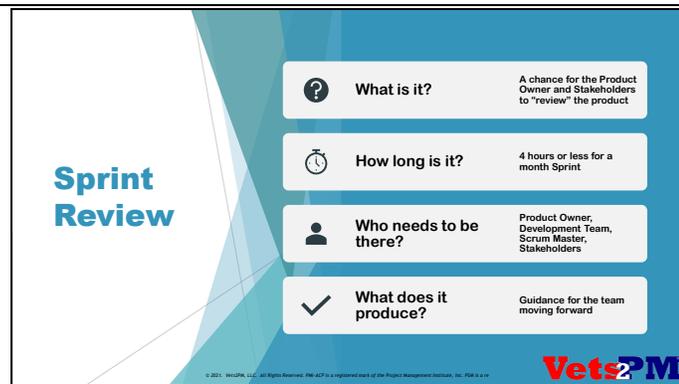
The Sprint Goal, the Product Backlog items selected for the Sprint, plus the plan for delivering them are together referred to as the Sprint Backlog.

Sprint Planning is timeboxed to a maximum of eight hours for a one-month Sprint. For shorter Sprints, the event is usually shorter.

The PO proposes how to increase the product value in the sprint. The ST collaborates to define a Sprint Goal valuable to stakeholders. The Sprint Goal must be finalized prior to the end of Sprint Planning.

Topic Two: What can be Done this Sprint?

Through discussion with the PO, the Developers select items from the Product Backlog to include in the current Sprint. The ST may refine, increases understanding and confidence. Then selecting how much can be completed within this sprint (may be challenging). Developers will base Sprint forecasts off past performance, capacity, and their Definition of Done.



**Sprint Review** is used to inspect the outcome of the Sprint and determine future adaptations. The Scrum Team presents the results of their work to key stakeholders and progress toward the Product Goal is discussed.

During the event, the Scrum Team and stakeholders review what was accomplished in the Sprint and what has changed in their environment. Based on this information, attendees collaborate on what to do next. The Product Backlog may also be adjusted to meet new opportunities. The Sprint Review is a working session and the Scrum Team should avoid limiting it to a presentation.

The Sprint Review is the second to last event of the Sprint and is timeboxed to a maximum of four hours for a one-month Sprint. For shorter Sprints, the event is usually shorter.

- What is it? - A chance for the Product Owner and Stakeholders to “review” the product
- How long is it? - 4 hours or less for a month Sprint
- Who needs to be there? - Product Owner, Development Team, Scrum Master, Stakeholders
- What does it produce? - Guidance for the team moving forward



**Sprint Retrospective**

- What is it? A chance for the Product Owner and Stakeholders to “review” the product, see how the team performed, and make improvements for future sprints.
- How long is it? 3 hours or less for a month Sprint
- Who needs to be there? Product Owner, Development Team, Scrum Master, Stakeholders
- What does it produce? Guidance for the team moving forward

**Daily Scrum**

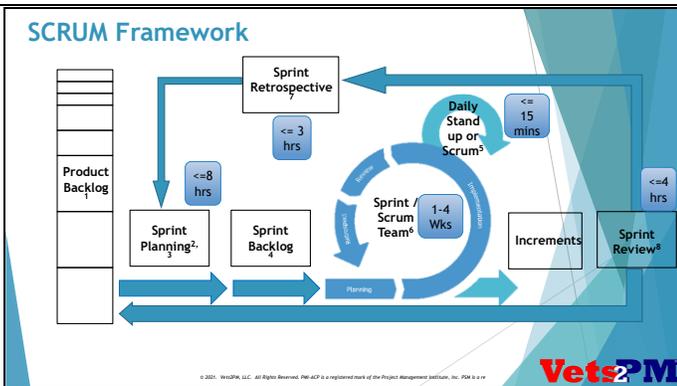
- What is it?** Discusses: what did we do yesterday, what are we doing today, any obstacles
- How long is it?** 15 minutes or less
- Who needs to be there?** Scrum Master, Development Team
- What does it produce?** Overall Transparency

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- What is it?
- Discusses: what did we do yesterday, what are we doing today, any obstacles
- How long is it?
- 15 minutes or less
- Who needs to be there?
- Scrum Master, Development Team
- What does it produce?
- Overall Transparency

**Daily Scrum** is designed to inspect progress toward the Sprint Goal and adapt the Sprint Backlog as necessary, adjusting the upcoming planned work.

- The Daily Scrum is a 15-minute event for the Developers of the Scrum Team.
- To reduce complexity, it is held at the same time and place every working day of the Sprint.
- If the Product Owner or Scrum Master are actively working on items in the Sprint Backlog, they participate as Developers.
- The Developers can select whatever structure and techniques they want, as long as their Daily Scrum focuses on progress toward the Sprint Goal and produces an actionable plan for the next day of work. This creates focus and improves self-management.
- Daily Scrums improve communications, identify impediments, promote quick decision-making, and consequently eliminate the need for other meetings.
- The Daily Scrum is not the only time Developers are allowed to adjust their plan. They often meet throughout the day for more detailed discussions about adapting or re-planning the rest of the Sprint's work.



**SCRUM Framework**

**Sprints** - They are fixed length events of one month or less to create consistency. A new Sprint starts immediately after the conclusion of the previous Sprint.

All the work necessary to achieve the Product Goal, including Sprint Planning, Daily Scrums, Sprint Review, and Sprint Retrospective, happen within Sprints.

**Scrum Artifacts (Documents)**

- Product Backlog**
  - All of the of items for the Development Team to deliver the product
- Sprint Backlog**
  - List of items agreed upon by the team to work on during a Sprint
- Product Increment**
  - The product or sum of the work accomplished at the end of a Sprint

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- **Product Backlog** - All of the of items for the Development Team to deliver the product
- **Sprint Backlog** - List of items agreed upon by the team to work on during a Sprint
- **Product Increment** - The product or sum of the work accomplished at the end of a Sprint

The Scrum framework describes 3 artifacts. The Product Backlog, Sprint Backlog, and Increment.

**Scrum Artifacts** represent work or value. They are designed to maximize transparency of key information. Thus, everyone inspecting them has the same basis for adaptation.

Each artifact contains a commitment to ensure it provides information that enhances transparency and focus against which progress can be measured:

- For the Product Backlog it is the Product Goal.
- For the Sprint Backlog it is the Sprint Goal.
- For the Increment it is the Definition of Done.



## Facilitation

Identity Creation	Purpose of the team? Values that are shared? Vision wanted?
Framework Adherence	Guides roles definition, artifacts, and event goals
Environmental Control	Build an conversational atmosphere targeted toward goals at hand
Ideas are Free	Stay neutral but stay focused, creative, and productive

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## Facilitation

Facilitation is a set of practices that help support the collaboration, communication, and creativity of teams and individuals.

Identity Creation - Purpose of the team? Values that are shared? Vision wanted?

Framework Adherence - Guides roles definition, artifacts, and event goals

Environmental Control - Build an conversational atmosphere targeted toward goals at hand

Ideas are Free - Stay neutral but stay focused, creative, and productive

## Leadership Styles

👁️ Autocratic (rarely effective)	Rarely Effective – Decisions without input
🏢 Bureaucratic (rarely effective)	By the books, policy, or past practices
📄 Transactional (sometimes effective)	Rewards employees for goal obtainment
🧠 Strategic (commonly effective)	Business and growth minded with stable employee environment
👍 Laissez-Faire (sometimes effective)	"let them do" it, authority goes to employees
🌟👤 Servant (commonly effective)	Similar to Coach-Style, focus is on making the team better

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Similar to Coach-Style, focus is on making the team better

## Servant Leadership

"True leadership must be for the benefit of the followers, not to enrich the leader."  
-John C. Maxwell

- ✓ Servanthood is about putting others ahead of yourself so THEY may gain.
- ✓ Servant Leadership is about helping others achieve MORE than you.
- ✓ Having a Servant's Heart is about giving to OTHERS without any reservation or expectations.
- ✓ Being a Servant to those around you requires HUMILITY, empathy, and compassion.

Credit: <https://www.indeed.com/blog/2018/04/16/10-quotes-about-servant-leadership-from-john-maxwell/>

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## Coaching & Mentoring

### Coaching

- ▶ Positive support and feedback
- ▶ Goal oriented and conflict reduction
- ▶ The coach allows the team to lead (in Scrum)

### Mentoring

- ▶ Experienced leads the inexperienced
- ▶ Relationship based
- ▶ Psychosocial support
- ▶ Catalyst in organizational change and acceptance of Scrum

The Scrum Master is NOT a consultant – Scrum focuses on the Scrum Team Leading, not the Scrum Master doing/leading.

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Coaching and Mentoring – The key to being servant leader is the ability to coach and mentor the organization, the team, and the business. Not do it for them but guide them how to do it. The objective of coaching and mentoring is to help people get better at their work, deliver more value, or resolve a conflict or problem.

### Mentoring

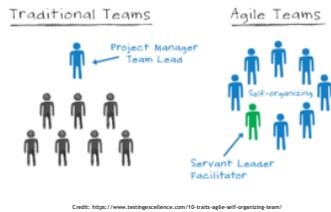
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## Scrum Teams

- ✓ Cross-Functional
  - Generalists capable of handling various tasks
- ✓ Self-Organizing
  - Independently managed and controlled
- ✓ Empowered
  - Capable of making local decisions themselves
- ✓ Constructive Disagreement
  - Respectfully challenge each other for the betterment of the product and team
- ✓ Collaborative
  - Breakdown silos to prevent handoffs & gaps
- ✓ Stable
  - A new entity is born – high-performing team



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## Selecting Team Members

### Key Criteria

- ▶ Maturity (mental & emotional)
- ▶ Technical Knowledge and Competency
- ▶ Familiarity with Agile Concepts and Techniques
- ▶ Flexibility
- ▶ Humility
- ▶ Cooperativeness
- ▶ \*Generalists\*



If at all possible - the Scrum Team should remain a team until the project is completed (stable).

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### Selecting Team Members

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### Team Space



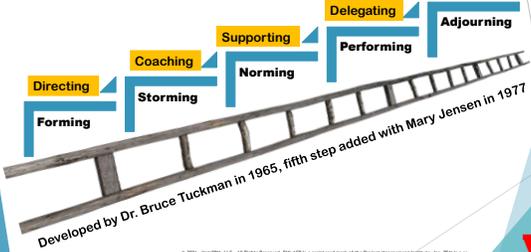
- ▶ Creating an environment which increases productivity and collaboration is critical to the success of any agile team
- ▶ It should:
  - ▶ Allow for osmotic communication
  - ▶ No walls or anything dividing people from each other
  - ▶ Allow space for information radiators
  - ▶ Free from distractions
  - ▶ Provide the team with everything they may need to work together

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### Tuckman's Ladder



Developed by Dr. Bruce Tuckman in 1965, fifth step added with Mary Jensen in 1977

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### Tuckman's Ladder

- Forming - Directing
- Storming - Coaching
- Norming - Supporting
- Performing - Delegating
- Adjourning

### Speed Leas' Conflict Levels



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### Five Levels of Conflict

#### Level 1: Problem to Solve

constructive disagreement that characterizes high-performing teams.

#### Level 2: Disagreement

At level 2, self-protection becomes as important as solving the problem.

#### Level 3: Contest

At level 3, the aim is to win. Factions emerge. In this combative environment, talk of peace may meet resistance. People may not be ready to move beyond blaming.

#### Level 4: Crusade

At level 4, resolving the situation isn't good enough. Team members believe the people on the "other side" of the issues will not change.

#### Level 5: World War

It's not enough that one wins; others must lose.

What Should You Do About It? - "Do I have to respond?"

Analyze and Respond

# Section 7

## Managing Products With Agility



This helps produce products with business value, increases flexibility and response to change, and transparency.

## Learning Objectives

- Forecasting & Estimating
- User Stories
- Velocity
- Release Planning
- Sprint Planning
- Product Value
- Product Backlog Management



The key is to continuously define value, measure actual value realized, validate assumptions, and analyze trends

## Forecasting and Estimating

When will I get it? & How much will it cost?

Can I still ask this? YES!

- Stakeholders
  - Want to know when and how much \$
  - The answers should be relayed as estimates not commitments
- Estimation
  - Dev Team Owns Estimation
    - Size, Effort, Complexity
    - Relative Sizing
  - Product Owner Clarifies
    - Purpose & Value of Item
  - Scrum Master Ensures Full Collaboration
    - Prevent over analysis



## Forecasting and Release Planning

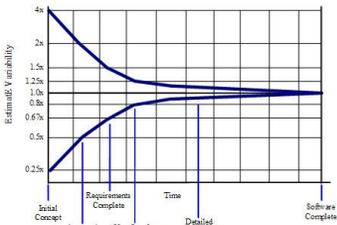
Complex problems and the application of an empirical process requires planning, estimating, and forecasting.

- Stakeholders - Want to know when and how much \$ The answers should be relayed as estimates not commitments
- Estimation- Dev Team Owns Estimation based on Size, Effort, Complexity, they can also use Relative Sizing
- Product Owner Clarifies - Purpose & Value of Item
- Scrum Master Ensures Full Collaboration and Prevents over analysis

## Cone of Uncertainty

Key Takeaway:

- As the project progresses, we learn more and uncover additional information
- This decreases our "Cone" and allows us to hone in on specific topics




## Cone of Uncertainty

- As the project progresses, we learn more and uncover additional information
- This decreases our "Cone" and allows us to hone in on specific topics

### Estimate

Does the Return on Investment (ROI) say we should do it? It is an assumption (educated guess) based on information at hand.

- Product Owner**
  - Product Backlog Management
- Dev Team**
  - Sprint Planning – How much and what goes into the Sprint

Based on: **Effort** (size, complexity) **OR** **Relative Sizing** (more typical in scrum)

Dev Team "Owns" Estimates Because They Are Doing The Work!

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Estimate

Product Owner - Product Backlog Management

Dev Team - Sprint Planning – How much and what goes into the Sprint

Dev Team “Owns” Estimates Because They Are Doing The Work!

Does the Return on Investment (ROI) say we should do it? It is an assumption (educated guess) based on information at hand.

### One way to Estimate: User Stories

- ▶ “Relative Sizing” a comparison based on a reference point
  - ▶ Since effort is subjective, we use Relative Sizing to other User Stories
- ▶ Fibonacci Sequence – 1, 2, 3, 5, 8, 13, 21+
  - ▶ We try to keep it under 13 so we can better categorize Stories
- ▶ T-Shirt Sizing is popular
  - ▶ XS, S, M, L, XL, XXL
- ▶ The number assigned to these are called “Story Points”
  - ▶ Story Points can be thought of as “Effort Points” – more points = more effort

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User Stories and Estimating

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### User Stories

- ▶ **I.N.V.E.S.T.**
  - ▶ Independent
  - ▶ Negotiable
  - ▶ Valuable
  - ▶ Estimable
  - ▶ Small
  - ▶ Testable

As a <user role>

I want <goal>

so that <benefit>.

Credit: <https://www.scrumwithstyle.com/courses/effective-user-stories/>



- ▶ **I.N.V.E.S.T.**
  - ▶ Independent
  - ▶ Negotiable
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  - ▶ Small
  - ▶ Testable

As a “user role”

I want “goal”

So that “benefit”

## Estimating with Velocity

- ▶ Velocity = The number of Product Backlog Items being converted into "done" during an Sprint (or iteration)
  - ▶ ONLY added if the Backlog Item or User Story is 100% complete - Done
  - ▶ Cumulative average and NOT an individual performance metric
  - ▶ It will take several iterations for Velocity to stabilize – take an average
  - ▶ It will reset if you change the team – Don't use to compare teams
  - ▶ Velocity will naturally fluctuate (a little) "reasonable amount"
  - ▶ The more broken down a Feature can be, the better the estimates will be
  - ▶ It can include ANY task so long as there are User Stories (placeholders)

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- Velocity = The number of Product Backlog Items being converted into "done" during an Sprint (or iteration)
- ONLY added if the Backlog Item or User Story is 100% complete - Done
- Cumulative average and NOT an individual performance metric
- It will take several iterations for Velocity to stabilize – take an average
- It will reset if you change the team – Don't use to compare teams
- Velocity will naturally fluctuate (a little) "reasonable amount"
- The more broken down a Feature can be, the better the estimates will be
- It can include ANY task so long as there are User Stories (placeholders)

## Iteration "0"

- ☰ Iteration 0 Is Used As A Planning Iteration
- ✓ It Is Often Used Before The First Real Iteration
- 🛠️ Helps The Team Prepare Their Environment And Gather Tools
- 👤 Allows The Team To Set Rules And Introduce Themselves
- 🔗 Team Can Practice And Learn New Technology
- 📉 Reduces Risk
- 🗺️ The Project Charter Or Product Vision Is Discussed

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## Release Planning

- Who Does it?** Product Owner (based on done increments)
- How Often Is It Done?** When the PO decides deliver value to the customer
- Why Is It Done?** To manage expectations, communicate, deliver value!
- How do they Decide?** Risk and Cost of Change

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### Release Planning

- Who Does it? - Product Owner (based on done increments)
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- How do they Decide? Risk and Cost of Change

**MMP v. MMF v. MVP**

Minimal Marketable Product (MMP)	Minimal Marketable Feature (MMF)	Minimal Viable Product (MVP)
The first release or edition of a product to the general public	The smallest feature that still provides value to the customer/user	The most basic product that can be released to a test group
Used to ensure "first to market"	Used to provide instant value	Used as a Beta test
Aimed at early adopters	Can be used for feedback	Used to see Market Acceptance
Think of the first iPhone	Being able to reset passwords on websites	Think of the first food delivery app/service

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MM – Minimum Marketable; MV – Minimum Viable;

P-Product

MMP - The first release or edition of a product to the general public Used to ensure “first to market” Aimed at early adopters

MMF - The smallest feature that still provides value to the customer/user Used to provide instant value Can be used for feedback

MVP - The most basic product that can be released to a test group, used as a Beta test, used to see Market Acceptance

**Sprint Planning Event**

Sprint Planning	Who	Entire Scrum Team Collaboration (and Guests if invited)
Sprint Value	Who	PO – Connects Sprint Value to the Product
Sprint Goal	Who	Whole Team Agrees on Goal – Based on SH Value (Must Finalize)
What can be done?	Who	Dev Team (w/PO Discussions) select Product Backlog Items
How Will It Get Done?	Who	Dev Team Decides (can decompose) and turns items to increments of value
Sprint Backlog	What	Sprint Goal, Selected Product Backlog Items, & The Sprint Plan = Sprint Backlog

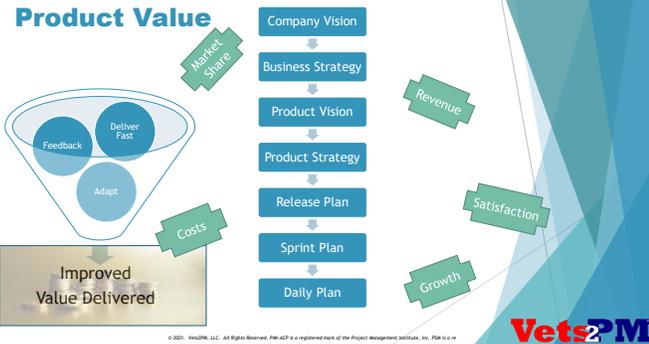
8 hours or less!

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- Sprint Planning, who, Entire Scrum Team Collaboration (and Guests if invited)
- Sprint Value, who, PO – Connects Sprint Value to the Product
- Sprint Goal, who, Whole Team Agrees on Goal – Based on SH Value (Must Finalize)
- What can be done?, who, Dev Team (w/PO Discussions) select Product Backlog Items
- How Will It Get Done?, Who, Dev Team Decides (can decompose) and turns items to increments of value
- Sprint Backlog, WHAT, Sprint Goal, Selected Product Backlog Items, & The Sprint Plan = Sprint Backlog

**Product Value**



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**Product Value**

The ultimate goal is to deliver value to the customer and stakeholders. But value is complex, made up of long-term and short-term impact, internal and external value, and indirect and direct value. The value should be the driving factor of the Product Vision. The value chain from top to bottom

- Company Vision
- Business Strategy
- Product Vision
- Product Strategy
- Release Plan
- Sprint Plan
- Daily Plan



### Benefits to Refining A Product Backlog

Can I forecast it?

Can we remove a dependency?

Refining The Backlog

Is it transparent?

Is it clear?

Is it small enough?

**Are we Refined?**

- Refining The Backlog

Is it transparent?  
Is it clear?  
Is it small enough?  
Can we remove a dependency?  
Can I forecast it?

You reorganize as you learn more as we learn what is more valuable as time goes.

Key artifact, ordered list for what is in required in the product. It provides transparency for the Scrum Team and Organization (including stakeholders).

### Product Backlog Management -Grooming -Refining -Etc.

Who Does it?	Product Owner (with the help of the Team)
How Often Is It Done?	Average 8 hours/week
Why Is It Done?	To keep the Team producing only the Highest Value items the customer wants
When Can It Be Done?	At ANY TIME (Ideally during Sprint Planning)

Product Backlog Management

- Who Does it?  
Product Owner (with the help of the Team)
- How Often Is It Done?  
Average 8 hours/week
- Why Is It Done?  
To keep the Team producing only the Highest Value items the customer wants
- When Can It Be Done?  
At ANY TIME (Ideally during Sprint Planning)

### Charts & Information Tools

- Push/Pull
- Kanban
- Burnup & Burndown Charts
- Information Radiator
- Cumulative Flow Diagram

- Push/Pull
- Kanban
- Burnup & Burndown Charts
- Information Radiator
- Cumulative Flow Diagram

Customer ICT

Old assignments PUSH Plan board

New Whiteboard with ideas PULL Plan board max:3

- ✓ Reduces Waste
- ✓ Better Communication
- ✓ Just in Time
- ✓ Optimized Workflow
- ✓ Sustainable

**Push vs. Pull**

Push versus Pull

ICT = Intentionally Controlled Throughput

- ✓ Reduces Waste
- ✓ Better Communication
- ✓ Just in Time
- ✓ Optimized Workflow
- ✓ Sustainable

## Benefits of Kanban

- Increased Visibility and Understanding
- Responsiveness and Adaptability
- Improved Flow
- Optimize Throughput
- Collaboration and Communication
- Exposes Problems, Bottlenecks, and Utilization

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## Kanban vs. Task Board

<p><b>Kanban</b></p> <ul style="list-style-type: none"> <li>▶ Focuses on WIP and Throughput</li> <li>▶ Empowers the Team</li> <li>▶ No Timeframes</li> <li>▶ Allows for the Team to swarm</li> <li>▶ Is a living breathing representation of the work being performed</li> </ul>	<p><b>Task Board</b></p> <ul style="list-style-type: none"> <li>▶ Focuses on Doing Work</li> <li>▶ Teams are responsible for their own task</li> <li>▶ Typically changes every Iteration</li> <li>▶ No Swim Lanes</li> <li>▶ Act as a static Status board</li> </ul>
--	--

**Kanban is concerned with the flow and the work in progress (it adapts accordingly based off of this)**

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- ### Kanban or Scrum Board
- ▶ Focuses on WIP and Throughput
  - ▶ Empowers the Team
  - ▶ No Timeframes
  - ▶ Allows for the Team to swarm
  - ▶ Is a living breathing representation of the work being performed
- ### Task Board
- ▶ Focuses on Doing Work
  - ▶ Teams are responsible for their own task
  - ▶ Typically changes every Iteration
  - ▶ No Swim Lanes
  - ▶ Act as a static Status board

Credit: <https://www.myupbizness.com/2018/04/understanding-benefits-kanban-team-startup.html>

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- ▶ Create a Kanban Board
- ▶ Think of a product you want to create
- ▶ Everyone create 1 User Story for that product
- ▶ Place all User Stories on the Board
- ▶ Use Dot-Voting to select the top 4
- ▶ Estimate the size
- ▶ Groom the Backlog
- ▶ Walk through the Kanban Board

### Burnup Charts

- ✓ Burnup Charts tell more than a Burndown Chart
- ✓ A Burnup Chart will show changes in Scope
- ✓ These Charts are more complex, but tell a complete story



Credits: <https://www.projectman.com/real-project-management/2016/02/value-of-burndown-and-burnup-charts/>



### Burnup Charts

- ✓ Burnup Charts tell more than a Burndown Chart
- ✓ A Burnup Chart will show changes in Scope
- ✓ These Charts are more complex, but tell a complete story
- ✓ Updated at the end of an iteration

### Burndown Charts

- ✓ Burndown Charts are most common and user friendly
- ✓ These Charts are simple and easy to use, but can be lack vital information



Credits: <https://www.projectman.com/real-project-management/2016/02/value-of-burndown-and-burnup-charts/>



### Burndown Charts

- ✓ Burndown Charts are most common and user friendly
- ✓ These Charts are simple and easy to use, but can be lack vital information
- ✓ Updated almost daily

### Information Radiators



Credits: <http://www.safepficiency.com/systems/information-radiators/>

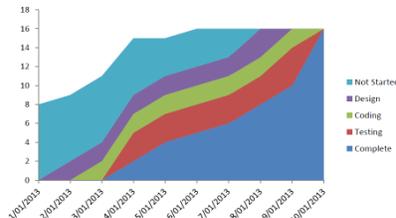
Visible charts and figures that display project progress and current status for all team members and stakeholders to use.



### Information Radiators

Visible charts and figures that display project progress and current status for all team members and stakeholders to use.

### Cumulative Flow Diagram



Credits: <http://www.clarabatechnology.com/product/blog/whatscumulativeflowdiagram>

A Burnup Chart that tracks all activities and can be used to find bottlenecks or delays



### Cumulative Flow Diagram

A Burnup Chart that tracks all activities and can be used to find bottlenecks or delays



### Agile Games

- ▶ Designed to promote collaboration
- ▶ Have fun
- ▶ Gamify the process
- ▶ Spark innovation and creativity
- ▶ Encourages participation
- ▶ Generate organic conversations
- ▶ Brings the team closer together
- ▶ Promotes diversity

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### Examples Of Games

- ▶ **Planning Poker** – Used to estimate the size of a User Story
- ▶ **Prune the Product Tree** – Used to prioritize User Stories on a “tree”
- ▶ **Product Box** – Used to have stakeholders show what they want and value
- ▶ **Buy a Feature** – Used to “buy” features based on priority
- ▶ **Draw a House** – Used to encourage reasoning and communication
- ▶ **Chair Game** – Used to promote communication and have fun
- ▶ **SO MANY MORE...**

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## Section 8

### Developing and Delivering Products Professionally

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### Learning Objectives

- Emergent Development
- Managing Risk
- Continuous Quality
- Technical Debt

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### Emergent Development

- ▶ Complexity & Uncertainty = Risk
- ▶ Use the Empirical Process:
  - ▶ Try it, Learn from it, Adjust it, Repeat it!
  - ▶ Respond to change as it comes
- ▶ Business Agility
  - ▶ Fast Return on Investment (ROI)
  - ▶ Flexibility & Control over Investment
  - ▶ Ability to Shift to New Opportunities

**Don't be a slave to the framework: Stay agilely minded, use empiricism, and use teamwork!**

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- ### Emergent Software Development
- In solving complex problems, the idea of a detailed up-front design has been replaced with an approach that encourages design to emerge and change within the boundaries of an architecture.
- ▶ Complexity & Uncertainty = Risk
  - ▶ Use the Empirical Process:
    - ▶ Try it, Learn from it, Adjust it, Repeat it!
    - ▶ Respond to change as it comes
  - ▶ Business Agility
    - ▶ Fast Return on Investment (ROI)
    - ▶ Flexibility & Control over Investment
    - ▶ Ability to Shift to New Opportunities

### Managing Risk

- ▶ Risk – The possibility of loss, injury, adverse or unwelcome situations “Uncertainty”
- ▶ Types – Financial, Business, Technical
  - ▶ Technical – can we even build this or is the cost or complexity too much?
    - ▶ Can we build it with an acceptable ROI?
      - ▶ Effort vs. Value
    - ▶ Can we keep the product maintained after we build it?
  - ▶ If we encounter technical hurdles, try to fix them early and don’t acquire TECHNICAL DEBT



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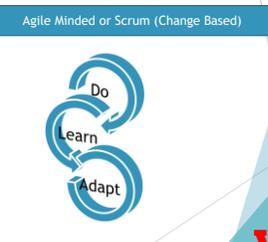
### Managing Risk

All products have an inherent set of risks to manage. These risks range from the ability to deliver to technical risks associated with performance and security.

- Risk – The possibility of loss, injury, adverse or unwelcome situations “Uncertainty”
- Types – Financial, Business, Technical
- Technical – can we even build this or is the cost or complexity too much?
- Can we build it with an acceptable ROI?
- Effort vs. Value
- Can we keep the product maintained after we build it?
- If we encounter technical hurdles, try to fix them early and don’t acquire TECHNICAL DEBT

### Managing Risk

- ▶ Traditional – Tries to plan risk away but complex problems cannot be anticipated
- ▶ Agile – Do, Deliver and Learn, Adapt to remove or reduce the risk “Empiricism”

Traditional or Predictive (Plan Based)	Agile Minded or Scrum (Change Based)
	

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### Managing Risk

- ▶ Traditional – Tries to plan risk away but complex problems cannot be anticipated
- ▶ Agile – Do, Deliver and Learn, Adapt to remove or reduce the risk “Empiricism”

### Continuous Quality

- ▶ If we Do, Learn, Adapt where do we add quality?
- ▶ Quality up-front: build it from the beginning.
  - ▶ Small product = small automation
- ▶ Automate testing: keeps team doing
  - ▶ Deliver faster with higher quality
  - ▶ Make it part of the sprint (i.e. less new work in sprint)

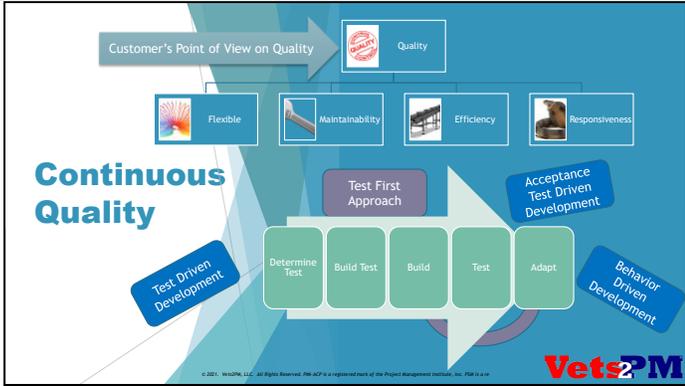


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### Continuous Quality

Working in an agile way does not change the importance of product quality.

- ▶ If we Do, Learn, Adapt where do we add quality?
- ▶ Quality up-front: build it from the beginning.
  - ▶ Small product = small automation
- ▶ Automate testing: keeps team doing
  - ▶ Deliver faster with higher quality
  - ▶ Make it part of the sprint (i.e. less new work in sprint)



Test Driven Development – automated tests are written before the code is written

- Single decoupled test designed to test the code
- Running the test should fail because the program does not have the code yet
- Write just enough code to get a test pass
- Refactor until it conforms to “DoD”

Acceptance Test Driven Development – Users and Dev Team define acceptance criteria prior to building functionality. This means validation is priority

Behavior Driven Development – General principle of TDD but adds functionalities are built and guided by expected behavior

### Technical Debt

- ▶ What is it? – Basically it is work not done
  - ▶ Delayed, Deferred, etc.
  - ▶ Dev Team traded quality for speed
  - ▶ Not always bad but you need a plan to pay it off!
    - ▶ Example: Prototype or Market testing
  - ▶ Prevents releasable increments of value
  - ▶ Definition of Done (DoD) should tackle debt upfront

The image shows a calculator, several coins, and a ruler, symbolizing the financial and measurable nature of technical debt. The Vets2PM logo is at the bottom right.

Technical Debt

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## Need To Know Bullets of Scrum

### *Scrum General*

- ✓ Scrum is a lightweight framework that can generate value if organizations adopt it to find adaptive solutions for complex problems, complex problems, and complex environments.
- ✓ Scrum is grounded in the empirical process, in other words, observe and adapt from the results of decisions made and action taken.
- ✓ Every event is an opportunity to inspect and adapt.
- ✓ Sprints are the container for all events.
- ✓ Upper management sets the vision, direction, and strategy for the organization; but, they don't have an active role in product development in Scrum.
- ✓ It is NOT just a methodology for creating software.
- ✓ Trendlines on Burn Down charts only remain accurate if nothing changes.
- ✓ Technical debt results in lower velocity of completed increments and increases budget spent on maintenance.
- ✓ Releasing increments are the only way to validate value assumptions, this means frequent releases and Product Owner's refining the Product Backlog increase value.

### *Daily Scrum*

- ✓ The Daily Scrum is utilized by "DevT", it is their meeting, to assess progress toward the Sprint Goal and checking on Sprint Backlog completion within the Sprint.
- ✓ The Daily Scrum: a 15-min event in the same time and place each day to reduce complexity.
- ✓ The Daily Scrum is attended only by people working on Product Backlog items (needing inspection or adaptation) like the DevT; however, if the Scrum Master or Product Owner are working on Sprint Backlog items they participate as a member of the DevT.
- ✓ Simply put, the DevT must attend the Daily Scrum.

### *Definition of Done*

- ✓ DoD is based organizational standard (or standards established by the organization) or the Scrum Team's created definition if one doesn't exist.
- ✓ All Scrum Teams have the same DoD regardless of how many teams there are.
- ✓ Increments that are done should meet the DoD and Work should be ready for the customer.
- ✓ The main benefits of "DONE" are shared understanding of completed work, it aids the DevT on how many Product Backlog Items to select for a Sprint

### *Development Teams or Developers (DevT)*

- ✓ The DevT should have all the skills to produce an increment of done at the end of each Sprint.
- ✓ DevT's should ensure every increment meets functional and non-functional requirements.
- ✓ Try to keep DevT's stable, meaning when member changes productivity will temporarily decrease.
- ✓ Stable and Mature DevT's will produce more, improved DoD, and have a more stringent criteria.
- ✓ DevT's should self-organize not be assigned.
- ✓ To make non-functional requirements visible DevT's should add items to the Product Backlog through the Product Owner and ensure the DoD is updated to reflect the changes.
- ✓ If the DevT cannot complete everything in the Sprint, they will need to renegotiate the Product Backlog Items with the Product Owner.

### *Product Owner (PO)*

- ✓ The Product Owner is the only person accountable for prioritizing the Product Backlog and making it visible and transparent.
- ✓ Product Owners are responsible for maximizing and optimizing the value (value maximizer) of work and the product.
- ✓ Product Increments should be releasable and usable and created every Sprint; however they do not need to be released, the Product Owner will decide when to release or batch an Increment.
- ✓ Product Owners are not called project managers because Scrum doesn't utilize that role.
- ✓ Product Owners can name a proxy PO if they are unable to meet the DevT's needs, original PO is still Responsible.
- ✓ Product Owners should be notified before a non-Scrum Team person (including Stakeholders or Customers) try to add something to a Sprint.
- ✓ Product Owners and DevTs should collaborate often ensuring DevTs build the increments stakeholders, customers, and end users value. This helps the PO balance effort and value in the Product Backlog.
- ✓ Product Owners represent the stakeholder, customers, or end-users (i.e. Product Backlog Items or Requirements) then collaborates and works with DevTs to refine the Product Backlog Items.
- ✓ The Product Owner's authority and decisions on the Product Backlog must be final and respected by the whole organization.

### *Product Backlog*

- ✓ The Product Backlog is a prioritized list of everything that may be needed for the product and is a single source utilized by the Scrum Team or Teams. It is always evolving as long as the product exists.
- ✓ The Product Owner owns, refines, prioritizes the emergent Product Backlog and is the singular source for work taken on by the Scrum Team or multiple Scrum Teams.
- ✓ Products have a singular Product Backlog regardless of complexity or number of Scrum Teams.
- ✓ Product Backlog estimates should be calculated by developers doing the work, keeping in mind that the Product Owner should clarify and explain the item.
- ✓ Minimize dependencies on Product Backlog Items especially if there are more than on Scrum Team involved.
- ✓ Stakeholder concerns about the Product may be introduced as a Product Backlog Item then ensure there is communication between the Product Owner and the DevT.
- ✓ The Product Backlog may be updated anytime the Product Owner chooses to.
- ✓ Product Backlogs are dynamic and constantly changing to meet the needs of the product.
- ✓ Product Owners manage the Product Backlog, regardless of technique, based on assumed value generation but it is only a prediction until it is delivered and validated by users and market.

### *Sprints*

- ✓ Sprints are designed to produce and deliver value in increments according to the Scrum Team's DoD.
- ✓ The Sprint: 1 month or less, useful and valuable product increment is created and they create consistency.
- ✓ A new Sprint starts directly after the conclusion of a Sprint, no excuses to not start, other than complete.
- ✓ Sprints can be canceled, only by the Product Owner, usually because the Sprint Goal is obsolete.
- ✓ During an active Sprint, the scope can be clarified and adjusted by collaboration between the Product Owner and DevT.
- ✓ Sprints should be short enough to reduce business risk from the Product Owner perspective, be 1-month or less, and be able to sync with business events.

- ✓ Sprints are considered finished when the selected timebox expires!

#### *Scrum Teams*

- ✓ The Scrum Team is comprised of 1 Product Owner, 1 SM, and up to 8 DevT members with a singular goal the Product Goal.
- ✓ The whole Scrum Team is accountable for the value created each Sprint and the value of a Product Backlog Item.
- ✓ Keep Scrum Teams small enough to be agile but big enough to produce significant Increments of value and use. Too big means complex coordination, too small equals small productivity gains and decreases interactions.
- ✓ Scrum Team members don't have titles, or functional areas like operations, testing, quality. The entire Scrum Team is accountable regardless of specialization or skillset.

#### *Scrum Master*

- ✓ Scrum Master ensures the Daily Scrum takes place and are positive, timeboxed, and productive, they do not have to attend unless they are invited or working Sprint Backlog item.
- ✓ When a Scrum Master is coaching a newly formed team it is good to assist them through team formation like starting with introductions, DoD creation, and have the Product Owner give an overview, goals, values, vision of the product.

#### *Sprint Retrospectives*

- ✓ Sprint Retrospectives are 3-hours or less.
- ✓ Sprint Retrospectives are required and prescribed by the Scrum Guide.
- ✓ Topics that might come up in a Sprint Retrospective are communication, how to perform Sprint Planning, DoD, Skills needed to deliver increments of value.
- ✓ The whole Scrum Team has a mandatory attendance at the retrospective.

#### *Sprint Backlog*

- ✓ Scrum Teams are not required to place one improvement from the Sprint Retrospectives into the Sprint Backlog but it is a good idea and you might find value in the practice.
- ✓ Sprint Backlog is collectively owned by the DevT; thus, no individual ownership this would diminish communication and collaboration.
- ✓ The Sprint Backlog will immediately and continuously change as existing items decompose or if new work is added.
- ✓ DevT modify the Sprint Backlog during the Sprint; thus, the Sprint Backlog is the visible work to meet the Sprint Goal

#### *Sprint Review*

- ✓ Sprint Reviews are conducted to inspect the product increment and collect stakeholder feedback, then adapt based on the feedback.
- ✓ The Sprint Review is to discuss the closing Sprint's results
- ✓ Product Owners should invite product stakeholders to verify the marketplace influences what is the next valuable thing to do
- ✓ Product Owners updated the Product Backlog based on the inspection of the increment during the Sprint Review, this should produce an updated Product Backlog.

- ✓ This is the formal area stakeholders have role in the process and interact with the DevT, this keeps the DevTs from getting distracted or disturbed. However, Product Owners actively and regularly engage stakeholders.

#### *Sprint Planning*

- ✓ Sprint Planning: 8 hours or less (for 1 month Sprint) timebox.
- ✓ Sprint Planning is for Scrum Teams to craft the Sprint Goal based on the Product Backlog Items selected for the Sprint. It is the DevT's job to identify the work needed to achieve the Sprint Goal.
- ✓ To begin Sprint Planning the Product Owner needs to communicate the Sprint Goal, this means the PO must make sure to prepare attendees to discuss the most important Product Backlog Items.
- ✓ Sprint Planning by the whole Scrum Team initiates the Sprint and the work to be performed in the Sprint.

#### *Timeboxing*

- ✓ Maximum durations for events or ceremonies are called timeboxed (or timeboxing).
- ✓ Timeboxed events are events that have a maximum duration.
- ✓ Scrum timeboxes:
  - Sprint Planning=8 hours or less,
  - Sprint Retrospectives=3 hours or less,
  - Sprint Reviews=4 hours or less,
  - Daily Scrum=15-min,
  - Sprint 1-month or less

## Scrum Guide

The next section is a copy of the scrum guide.

Intentionally Blank

Ken Schwaber & Jeff Sutherland

# The Scrum Guide

The Definitive Guide to Scrum: The Rules of the Game

November 2020

## Purpose of the Scrum Guide

We developed Scrum in the early 1990s. We wrote the first version of the Scrum Guide in 2010 to help people worldwide understand Scrum. We have evolved the Guide since then through small, functional updates. Together, we stand behind it.

The Scrum Guide contains the definition of Scrum. Each element of the framework serves a specific purpose that is essential to the overall value and results realized with Scrum. Changing the core design or ideas of Scrum, leaving out elements, or not following the rules of Scrum, covers up problems and limits the benefits of Scrum, potentially even rendering it useless.

We follow the growing use of Scrum within an ever-growing complex world. We are humbled to see Scrum being adopted in many domains holding essentially complex work, beyond software product development where Scrum has its roots. As Scrum's use spreads, developers, researchers, analysts, scientists, and other specialists do the work. We use the word "developers" in Scrum not to exclude, but to simplify. If you get value from Scrum, consider yourself included.

As Scrum is being used, patterns, processes, and insights that fit the Scrum framework as described in this document, may be found, applied and devised. Their description is beyond the purpose of the Scrum Guide because they are context sensitive and differ widely between Scrum uses. Such tactics for using within the Scrum framework vary widely and are described elsewhere.

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## Scrum Definition

Scrum is a lightweight framework that helps people, teams and organizations generate value through adaptive solutions for complex problems.

In a nutshell, Scrum requires a Scrum Master to foster an environment where:

1. A Product Owner orders the work for a complex problem into a Product Backlog.
2. The Scrum Team turns a selection of the work into an Increment of value during a Sprint.
3. The Scrum Team and its stakeholders inspect the results and adjust for the next Sprint.
4. *Repeat*

Scrum is simple. Try it as is and determine if its philosophy, theory, and structure help to achieve goals and create value. The Scrum framework is purposefully incomplete, only defining the parts required to implement Scrum theory. Scrum is built upon by the collective intelligence of the people using it. Rather than provide people with detailed instructions, the rules of Scrum guide their relationships and interactions.

Various processes, techniques and methods can be employed within the framework. Scrum wraps around existing practices or renders them unnecessary. Scrum makes visible the relative efficacy of current management, environment, and work techniques, so that improvements can be made.

## Scrum Theory

Scrum is founded on empiricism and lean thinking. Empiricism asserts that knowledge comes from experience and making decisions based on what is observed. Lean thinking reduces waste and focuses on the essentials.

Scrum employs an iterative, incremental approach to optimize predictability and to control risk. Scrum engages groups of people who collectively have all the skills and expertise to do the work and share or acquire such skills as needed.

Scrum combines four formal events for inspection and adaptation within a containing event, the Sprint. These events work because they implement the empirical Scrum pillars of transparency, inspection, and adaptation.

## Transparency

The emergent process and work must be visible to those performing the work as well as those receiving the work. With Scrum, important decisions are based on the perceived state of its three formal artifacts. Artifacts that have low transparency can lead to decisions that diminish value and increase risk.

Transparency enables inspection. Inspection without transparency is misleading and wasteful.

## Inspection

The Scrum artifacts and the progress toward agreed goals must be inspected frequently and diligently to detect potentially undesirable variances or problems. To help with inspection, Scrum provides cadence in the form of its five events.

Inspection enables adaptation. Inspection without adaptation is considered pointless. Scrum events are designed to provoke change.

## Adaptation

If any aspects of a process deviate outside acceptable limits or if the resulting product is unacceptable, the process being applied or the materials being produced must be adjusted. The adjustment must be made as soon as possible to minimize further deviation.

Adaptation becomes more difficult when the people involved are not empowered or self-managing. A Scrum Team is expected to adapt the moment it learns anything new through inspection.

## Scrum Values

Successful use of Scrum depends on people becoming more proficient in living five values:

### ***Commitment, Focus, Openness, Respect, and Courage***

The Scrum Team commits to achieving its goals and to supporting each other. Their primary focus is on the work of the Sprint to make the best possible progress toward these goals. The Scrum Team and its stakeholders are open about the work and the challenges. Scrum Team members respect each other to be capable, independent people, and are respected as such by the people with whom they work. The Scrum Team members have the courage to do the right thing, to work on tough problems.

These values give direction to the Scrum Team with regard to their work, actions, and behavior. The decisions that are made, the steps taken, and the way Scrum is used should reinforce these values, not diminish or undermine them. The Scrum Team members learn and explore the values as they work with the Scrum events and artifacts. When these values are embodied by the Scrum Team and the people they work with, the empirical Scrum pillars of transparency, inspection, and adaptation come to life building trust.

## Scrum Team

The fundamental unit of Scrum is a small team of people, a Scrum Team. The Scrum Team consists of one Scrum Master, one Product Owner, and Developers. Within a Scrum Team, there are no sub-teams or hierarchies. It is a cohesive unit of professionals focused on one objective at a time, the Product Goal.

Scrum Teams are cross-functional, meaning the members have all the skills necessary to create value each Sprint. They are also self-managing, meaning they internally decide who does what, when, and how.

The Scrum Team is small enough to remain nimble and large enough to complete significant work within a Sprint, typically 10 or fewer people. In general, we have found that smaller teams communicate better and are more productive. If Scrum Teams become too large, they should consider reorganizing into multiple cohesive Scrum Teams, each focused on the same product. Therefore, they should share the same Product Goal, Product Backlog, and Product Owner.

The Scrum Team is responsible for all product-related activities from stakeholder collaboration, verification, maintenance, operation, experimentation, research and development, and anything else that might be required. They are structured and empowered by the organization to manage their own work. Working in Sprints at a sustainable pace improves the Scrum Team's focus and consistency.

The entire Scrum Team is accountable for creating a valuable, useful Increment every Sprint. Scrum defines three specific accountabilities within the Scrum Team: the Developers, the Product Owner, and the Scrum Master.

## Developers

Developers are the people in the Scrum Team that are committed to creating any aspect of a usable Increment each Sprint.

The specific skills needed by the Developers are often broad and will vary with the domain of work. However, the Developers are always accountable for:

- Creating a plan for the Sprint, the Sprint Backlog;
- Instilling quality by adhering to a Definition of Done;
- Adapting their plan each day toward the Sprint Goal; and,
- Holding each other accountable as professionals.

## Product Owner

The Product Owner is accountable for maximizing the value of the product resulting from the work of the Scrum Team. How this is done may vary widely across organizations, Scrum Teams, and individuals.

The Product Owner is also accountable for effective Product Backlog management, which includes:

- Developing and explicitly communicating the Product Goal;
- Creating and clearly communicating Product Backlog items;
- Ordering Product Backlog items; and,
- Ensuring that the Product Backlog is transparent, visible and understood.

The Product Owner may do the above work or may delegate the responsibility to others. Regardless, the Product Owner remains accountable.

For Product Owners to succeed, the entire organization must respect their decisions. These decisions are visible in the content and ordering of the Product Backlog, and through the inspectable Increment at the Sprint Review.

The Product Owner is one person, not a committee. The Product Owner may represent the needs of many stakeholders in the Product Backlog. Those wanting to change the Product Backlog can do so by trying to convince the Product Owner.

## Scrum Master

The Scrum Master is accountable for establishing Scrum as defined in the Scrum Guide. They do this by helping everyone understand Scrum theory and practice, both within the Scrum Team and the organization.

The Scrum Master is accountable for the Scrum Team's effectiveness. They do this by enabling the Scrum Team to improve its practices, within the Scrum framework.

Scrum Masters are true leaders who serve the Scrum Team and the larger organization.

The Scrum Master serves the Scrum Team in several ways, including:

- Coaching the team members in self-management and cross-functionality;
- Helping the Scrum Team focus on creating high-value Increments that meet the Definition of Done;
- Causing the removal of impediments to the Scrum Team's progress; and,
- Ensuring that all Scrum events take place and are positive, productive, and kept within the timebox.

The Scrum Master serves the Product Owner in several ways, including:

- Helping find techniques for effective Product Goal definition and Product Backlog management;
- Helping the Scrum Team understand the need for clear and concise Product Backlog items;
- Helping establish empirical product planning for a complex environment; and,
- Facilitating stakeholder collaboration as requested or needed.

The Scrum Master serves the organization in several ways, including:

- Leading, training, and coaching the organization in its Scrum adoption;
- Planning and advising Scrum implementations within the organization;
- Helping employees and stakeholders understand and enact an empirical approach for complex work; and,
- Removing barriers between stakeholders and Scrum Teams.

## Scrum Events

The Sprint is a container for all other events. Each event in Scrum is a formal opportunity to inspect and adapt Scrum artifacts. These events are specifically designed to enable the transparency required. Failure to operate any events as prescribed results in lost opportunities to inspect and adapt. Events are used in Scrum to create regularity and to minimize the need for meetings not defined in Scrum. Optimally, all events are held at the same time and place to reduce complexity.

## The Sprint

Sprints are the heartbeat of Scrum, where ideas are turned into value.

They are fixed length events of one month or less to create consistency. A new Sprint starts immediately after the conclusion of the previous Sprint.

All the work necessary to achieve the Product Goal, including Sprint Planning, Daily Scrums, Sprint Review, and Sprint Retrospective, happen within Sprints.

During the Sprint:

- No changes are made that would endanger the Sprint Goal;
- Quality does not decrease;
- The Product Backlog is refined as needed; and,
- Scope may be clarified and renegotiated with the Product Owner as more is learned.

Sprints enable predictability by ensuring inspection and adaptation of progress toward a Product Goal at least every calendar month. When a Sprint's horizon is too long the Sprint Goal may become invalid, complexity may rise, and risk may increase. Shorter Sprints can be employed to generate more learning

cycles and limit risk of cost and effort to a smaller time frame. Each Sprint may be considered a short project.

Various practices exist to forecast progress, like burn-downs, burn-ups, or cumulative flows. While proven useful, these do not replace the importance of empiricism. In complex environments, what will happen is unknown. Only what has already happened may be used for forward-looking decision making.

A Sprint could be cancelled if the Sprint Goal becomes obsolete. Only the Product Owner has the authority to cancel the Sprint.

## Sprint Planning

Sprint Planning initiates the Sprint by laying out the work to be performed for the Sprint. This resulting plan is created by the collaborative work of the entire Scrum Team.

The Product Owner ensures that attendees are prepared to discuss the most important Product Backlog items and how they map to the Product Goal. The Scrum Team may also invite other people to attend Sprint Planning to provide advice.

Sprint Planning addresses the following topics:

### Topic One: Why is this Sprint valuable?

The Product Owner proposes how the product could increase its value and utility in the current Sprint. The whole Scrum Team then collaborates to define a Sprint Goal that communicates why the Sprint is valuable to stakeholders. The Sprint Goal must be finalized prior to the end of Sprint Planning.

### Topic Two: What can be Done this Sprint?

Through discussion with the Product Owner, the Developers select items from the Product Backlog to include in the current Sprint. The Scrum Team may refine these items during this process, which increases understanding and confidence.

Selecting how much can be completed within a Sprint may be challenging. However, the more the Developers know about their past performance, their upcoming capacity, and their Definition of Done, the more confident they will be in their Sprint forecasts.

### Topic Three: How will the chosen work get done?

For each selected Product Backlog item, the Developers plan the work necessary to create an Increment that meets the Definition of Done. This is often done by decomposing Product Backlog items into smaller work items of one day or less. How this is done is at the sole discretion of the Developers. No one else tells them how to turn Product Backlog items into Increments of value.

The Sprint Goal, the Product Backlog items selected for the Sprint, plus the plan for delivering them are together referred to as the Sprint Backlog.

Sprint Planning is timeboxed to a maximum of eight hours for a one-month Sprint. For shorter Sprints, the event is usually shorter.

## Daily Scrum

The purpose of the Daily Scrum is to inspect progress toward the Sprint Goal and adapt the Sprint Backlog as necessary, adjusting the upcoming planned work.

The Daily Scrum is a 15-minute event for the Developers of the Scrum Team. To reduce complexity, it is held at the same time and place every working day of the Sprint. If the Product Owner or Scrum Master are actively working on items in the Sprint Backlog, they participate as Developers.

The Developers can select whatever structure and techniques they want, as long as their Daily Scrum focuses on progress toward the Sprint Goal and produces an actionable plan for the next day of work. This creates focus and improves self-management.

Daily Scrums improve communications, identify impediments, promote quick decision-making, and consequently eliminate the need for other meetings.

The Daily Scrum is not the only time Developers are allowed to adjust their plan. They often meet throughout the day for more detailed discussions about adapting or re-planning the rest of the Sprint's work.

## Sprint Review

The purpose of the Sprint Review is to inspect the outcome of the Sprint and determine future adaptations. The Scrum Team presents the results of their work to key stakeholders and progress toward the Product Goal is discussed.

During the event, the Scrum Team and stakeholders review what was accomplished in the Sprint and what has changed in their environment. Based on this information, attendees collaborate on what to do next. The Product Backlog may also be adjusted to meet new opportunities. The Sprint Review is a working session and the Scrum Team should avoid limiting it to a presentation.

The Sprint Review is the second to last event of the Sprint and is timeboxed to a maximum of four hours for a one-month Sprint. For shorter Sprints, the event is usually shorter.

## Sprint Retrospective

The purpose of the Sprint Retrospective is to plan ways to increase quality and effectiveness.

The Scrum Team inspects how the last Sprint went with regards to individuals, interactions, processes, tools, and their Definition of Done. Inspected elements often vary with the domain of work. Assumptions that led them astray are identified and their origins explored. The Scrum Team discusses what went well during the Sprint, what problems it encountered, and how those problems were (or were not) solved.

The Scrum Team identifies the most helpful changes to improve its effectiveness. The most impactful improvements are addressed as soon as possible. They may even be added to the Sprint Backlog for the next Sprint.

The Sprint Retrospective concludes the Sprint. It is timeboxed to a maximum of three hours for a one-month Sprint. For shorter Sprints, the event is usually shorter.

## Scrum Artifacts

Scrum's artifacts represent work or value. They are designed to maximize transparency of key information. Thus, everyone inspecting them has the same basis for adaptation.

Each artifact contains a commitment to ensure it provides information that enhances transparency and focus against which progress can be measured:

- For the Product Backlog it is the Product Goal.
- For the Sprint Backlog it is the Sprint Goal.
- For the Increment it is the Definition of Done.

These commitments exist to reinforce empiricism and the Scrum values for the Scrum Team and their stakeholders.

## Product Backlog

The Product Backlog is an emergent, ordered list of what is needed to improve the product. It is the single source of work undertaken by the Scrum Team.

Product Backlog items that can be Done by the Scrum Team within one Sprint are deemed ready for selection in a Sprint Planning event. They usually acquire this degree of transparency after refining activities. Product Backlog refinement is the act of breaking down and further defining Product Backlog items into smaller more precise items. This is an ongoing activity to add details, such as a description, order, and size. Attributes often vary with the domain of work.

The Developers who will be doing the work are responsible for the sizing. The Product Owner may influence the Developers by helping them understand and select trade-offs.

### Commitment: Product Goal

The Product Goal describes a future state of the product which can serve as a target for the Scrum Team to plan against. The Product Goal is in the Product Backlog. The rest of the Product Backlog emerges to define “what” will fulfill the Product Goal.

*A product is a vehicle to deliver value. It has a clear boundary, known stakeholders, well-defined users or customers. A product could be a service, a physical product, or something more abstract.*

The Product Goal is the long-term objective for the Scrum Team. They must fulfill (or abandon) one objective before taking on the next.

### Sprint Backlog

The Sprint Backlog is composed of the Sprint Goal (why), the set of Product Backlog items selected for the Sprint (what), as well as an actionable plan for delivering the Increment (how).

The Sprint Backlog is a plan by and for the Developers. It is a highly visible, real-time picture of the work that the Developers plan to accomplish during the Sprint in order to achieve the Sprint Goal.

Consequently, the Sprint Backlog is updated throughout the Sprint as more is learned. It should have enough detail that they can inspect their progress in the Daily Scrum.

### Commitment: Sprint Goal

The Sprint Goal is the single objective for the Sprint. Although the Sprint Goal is a commitment by the Developers, it provides flexibility in terms of the exact work needed to achieve it. The Sprint Goal also creates coherence and focus, encouraging the Scrum Team to work together rather than on separate initiatives.

The Sprint Goal is created during the Sprint Planning event and then added to the Sprint Backlog. As the Developers work during the Sprint, they keep the Sprint Goal in mind. If the work turns out to be different than they expected, they collaborate with the Product Owner to negotiate the scope of the Sprint Backlog within the Sprint without affecting the Sprint Goal.

### Increment

An Increment is a concrete stepping stone toward the Product Goal. Each Increment is additive to all prior Increments and thoroughly verified, ensuring that all Increments work together. In order to provide value, the Increment must be usable.

Multiple Increments may be created within a Sprint. The sum of the Increments is presented at the Sprint Review thus supporting empiricism. However, an Increment may be delivered to stakeholders prior to the end of the Sprint. The Sprint Review should never be considered a gate to releasing value.

Work cannot be considered part of an Increment unless it meets the Definition of Done.

### Commitment: Definition of Done

The Definition of Done is a formal description of the state of the Increment when it meets the quality measures required for the product.

The moment a Product Backlog item meets the Definition of Done, an Increment is born.

The Definition of Done creates transparency by providing everyone a shared understanding of what work was completed as part of the Increment. If a Product Backlog item does not meet the Definition of Done, it cannot be released or even presented at the Sprint Review. Instead, it returns to the Product Backlog for future consideration.

If the Definition of Done for an increment is part of the standards of the organization, all Scrum Teams must follow it as a minimum. If it is not an organizational standard, the Scrum Team must create a Definition of Done appropriate for the product.

The Developers are required to conform to the Definition of Done. If there are multiple Scrum Teams working together on a product, they must mutually define and comply with the same Definition of Done.

## End Note

Scrum is free and offered in this Guide. The Scrum framework, as outlined herein, is immutable. While implementing only parts of Scrum is possible, the result is not Scrum. Scrum exists only in its entirety and functions well as a container for other techniques, methodologies, and practices.

## Acknowledgements

### People

Of the thousands of people who have contributed to Scrum, we should single out those who were instrumental at the start: Jeff Sutherland worked with Jeff McKenna and John Scumniotales, and Ken Schwaber worked with Mike Smith and Chris Martin, and all of them worked together. Many others contributed in the ensuing years and without their help Scrum would not be refined as it is today.

### Scrum Guide History

Ken Schwaber and Jeff Sutherland first co-presented Scrum at the OOPSLA Conference in 1995. It essentially documented the learning that Ken and Jeff gained over the previous few years and made public the first formal definition of Scrum.

The Scrum Guide documents Scrum as developed, evolved, and sustained for 30-plus years by Jeff Sutherland and Ken Schwaber. Other sources provide patterns, processes, and insights that complement the Scrum framework. These may increase productivity, value, creativity, and satisfaction with the results.

The complete history of Scrum is described elsewhere. To honor the first places where it was tried and proven, we recognize Individual Inc., Newspaper, Fidelity Investments, and IDX (now GE Medical).

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