Certified Scrum Master

Workshop by Nanda Lankalapalli

Nanda Lankalapalli

Nanda Lankalapalli has been involved in software development since 1992. He has unique combination of skills. As a Certified Scrum Trainer, he has expert level knowledge in Agile and Scrum and as a Software Architect, he has expert level technical skills on Agile Engineering Practices. With this combination, Nanda can help technology people as well as process people understand agile well.

Nanda's agile journey started in 2002, when he was part of a team with Mike Cohn and Lisa Crispin in Denver, Colorado, USA. He practiced Scrum and other Agile methods thoroughly over several years, and his teams are highly successful in delivering products using Agile techniques. Nanda is proficient in Agile Engineering practices (from XP) and Lean Software Development practices. He is a hands-on developer and architect and has been developing software for more than 20 years. He religiously follows key agile engineering practices like Test Driven Development, Ruthless Re-factoring, Technical Debt management, Continuous Integration etc.

Nanda moved back to India in 2008 and founded the user group "Agile Hyderabad ". He built this group single-handedly, and it now has more than 800 members representing over 60 organizations in Hyderabad. Nanda conducted several meet ups and knowledge sharing sessions under "Agile Hyderabad" to build agile community in Hyderabad. He has trained and coached teams in organizations of various sizes on Scrum as well as Engineering Practices. He coached a large-scale transformation using LeSS framework. He is also passionate about using games to teach, and his game with Jenga blocks is widely used to teach team-collaboration.

Check Upcoming Trainings: **www.poweragile.com/trainings**

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Agile Manifesto

Meeting at Snowbird resort by 17 software pundits and lightweight methodologists, February 2001. Created ‘Agile Manifesto’.

Agile Manifesto for Software Development

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

_____ and interactions over process and tools.

Working _____over comprehensive documentation.

Customer _____ over contract negotiations.

Responding to _____ over following a plan.

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

Ref: http://www.agilemanifesto.org/

Individuals **Collaboration**

Change **Software**

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Agile Principles

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

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

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

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

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

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

7. Working software is the primary measure of progress.

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

9. Continuous attention to technical excellence and good design enhances agility.

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

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

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

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Circle the words or phrases those are most relevant to Scrum

Transparency

Collaboration

Frequent Planning

Frequent Feedback

Detailed Plans

Self-Organization

Empowerment

Controlled

Iterative

Continuous Improvement

Cross-Functional

Functional Silos

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Introduction to Scrum

- Scrum is process framework
  - It's not a process or methodology

- Scrum is light-weight
  - That makes it easy to understand
  - But, hard to master
  - Scrum is flexible and allows other agile practices like XP and Lean to plug-in.

- Scrum is based in empiricism
  - All Scrum artifacts should be transparent to all stake holders
  - All Scrum roles are empowered to do their job right.
  - All Scrum meetings allow collaboration and opportunities for inspection and adaptation.
  - In scrum, the process is constantly adjusted (if needed) based on the short and continuous feedback loops.

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Defined Process

- Follows pre-defined steps to achieve an Output.
- Suitable when the output is well defined.
- Same output is expected every time the process is followed.
- Best suites for problems those fall into “Simple” and “Complicated” problem domains.

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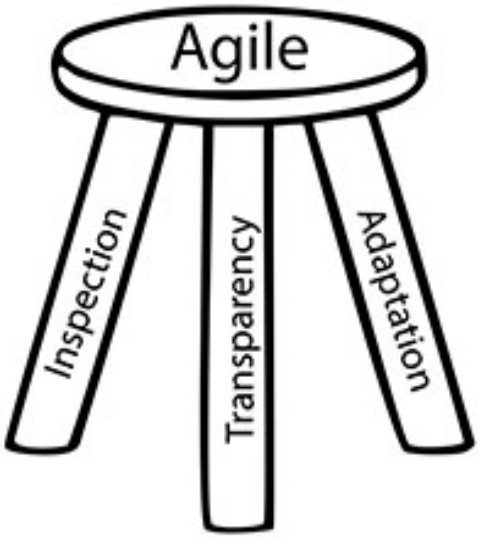
Empirical Process

- Is based on series of experiments.
- Suitable when the output can't be well defined.
- Definition of output is refined based on the results of experiments.
- Steps in the process are adjusted based on the feedback from the experiments.

Three legs of Empirical Process

- Transparency
  - All artifacts of the process are visible to all the stakeholders. This helps stakeholders to inspect the current state and take any required action.
- Inspection
  - Frequent inspection of artifacts helps stakeholders to make any changes to achieve the goal.
- Adaptation
  - Continuous improvement by adjusting the process based on the inspection.



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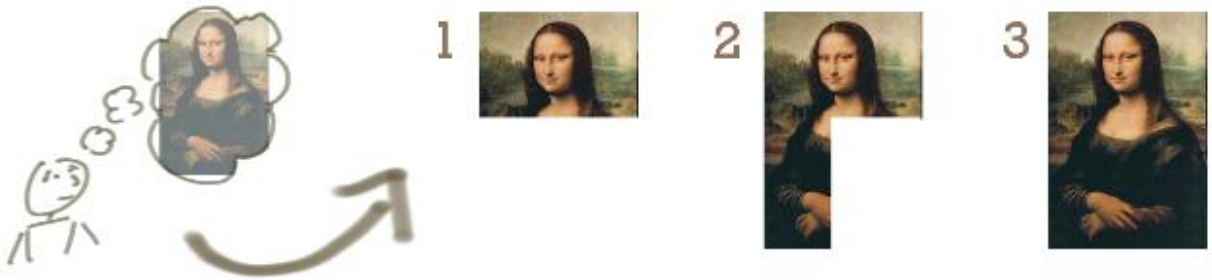
Scrum is Iterative and Incremental

Incremental Development

Incremental development is to build small increment of a full fledges product. Each increment adds more software - like adding bricks to a wall. After lots of increments, you've got a big wall.



Ref: http://jpattonassociates.com/

Iterative Development

Iterative development is to build something, get some feedback, then refine it to make better, keep doing that until the product is good enough.

Ref: http://jpattonassociates.com/

Scrum teams deliver value incrementally and iteratively.

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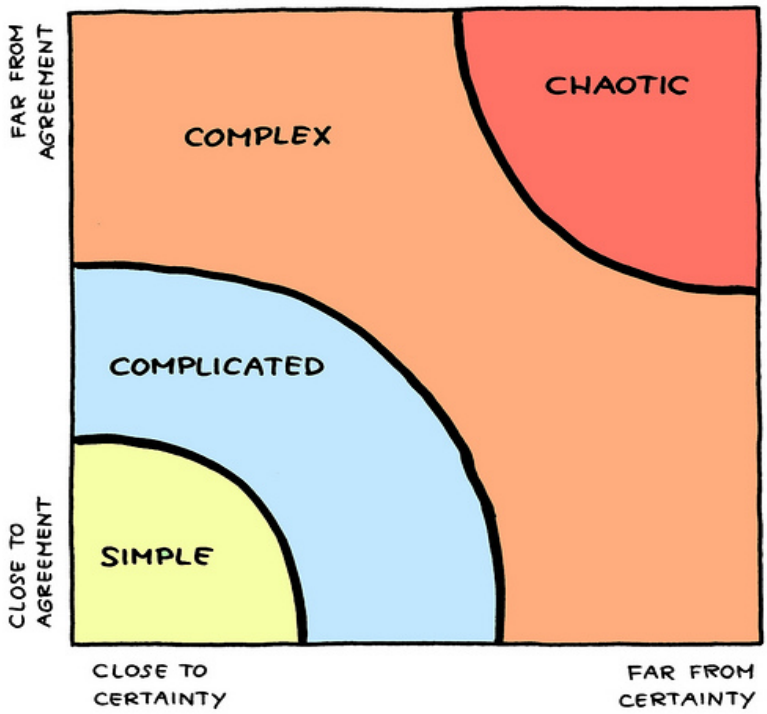
Ralph-Stacy Complexity Model

Ralph-Stacy complexity model shows the different problem domains and their nature. The model has four problem domains Simple, Complicated, Complex and Chaotic.

- Y-axis shows what is being done. This represents requirements of the work being done.

- X-axis captures how something is being done. This represents the technology or implementation method.



Problem domains

Simple: These problems are those we know what to do and how to do. Eg. Stuffing 1000 envelops with flyers.

Complicated: These problems require specialized skill. Once you have an expert, they know how to do this. Eg. Java developer, DBA etc.

Complex: There is no way to reduce uncertainty on what to do or how to do other than working iteratively. **Scrum works best in this problem domain. Eg. Software development.**

Chaotic: Problems in this region are out of control. First the problem need to be stabilized to one of the other problem domains and then apply the right method. Eg. Production database is down

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Scrum Values

All work performed in Scrum needs a set of values as the foundation for the team's processes and interactions. And by embracing these five values, the team makes them even more instrumental to its health and success.

Focus: Because we focus on only a few things at a time, we work well together and produce excellent work. We deliver valuable items sooner.

Courage: Because we work as a team, we feel supported and have more resources at our disposal. This gives us the courage to undertake greater challenges.

Openness: As we work together, we express how we're doing, what's in our way, and our concerns so they can be addressed.

Commitment: Because we have great control over our own destiny, we are more committed to success.

Respect: As we work together, sharing successes and failures, we come to respect each other and to help each other become worthy of respect.

As an organization applies Scrum it discovers its benefits. At the same time, it sees how these values inherently contribute to the success of Scrum and understands why they are both needed, and bolstered, by Scrum.

Reference: http://AgileAtlas.org

Discuss and Identify what would happen if a scrum team is missing each Scrum value

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Focus	
Courage	
Openness	
Commitment	
Respect	

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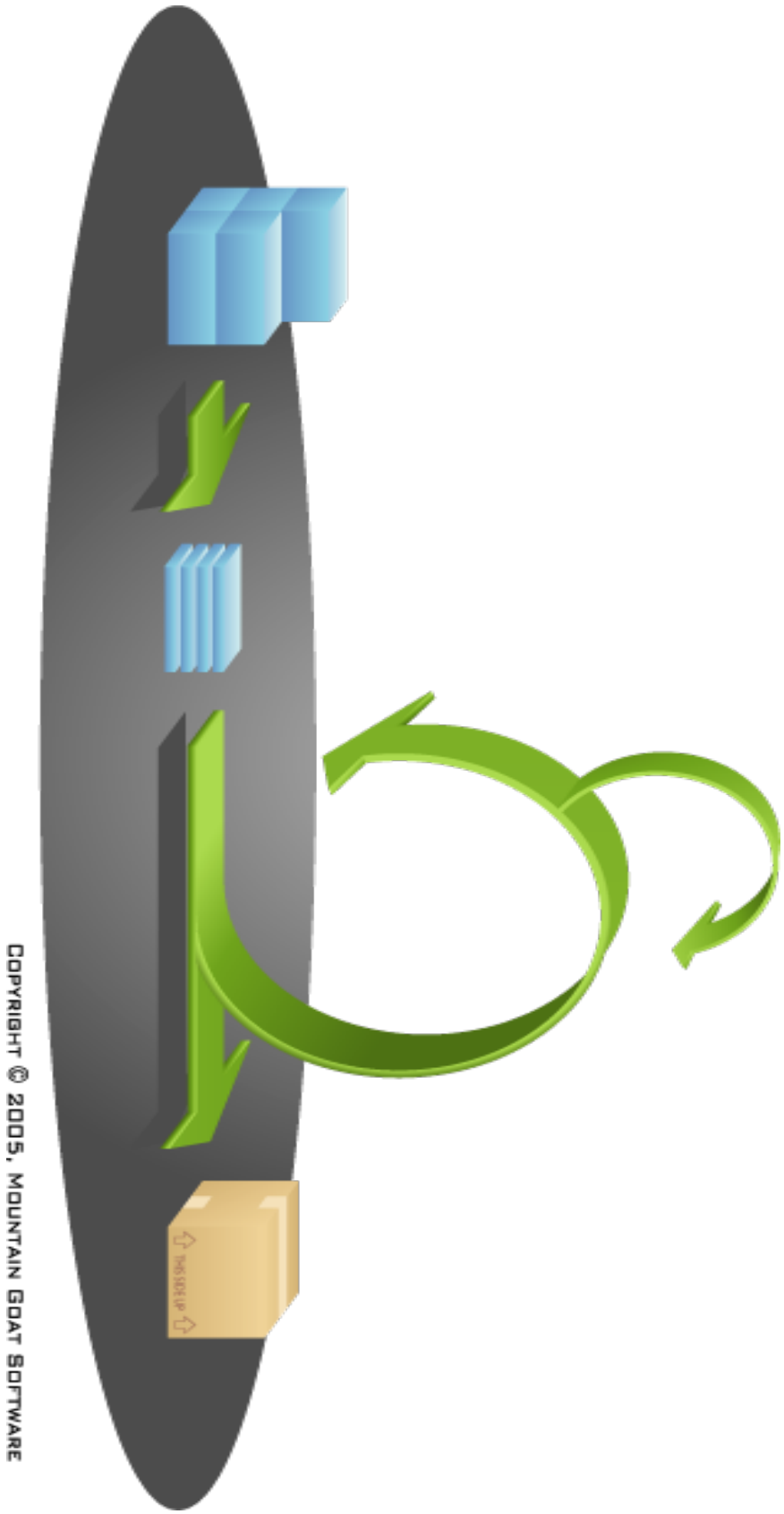
Scrum Framework



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Scrum is a simple process framework. Scrum has

- 3 Roles
  - The Scrum Master
  - The Product Owner
  - The Development Team
- 4 Meetings
  - Sprint Planning
  - Daily Scrum
  - Sprint Review
  - Sprint Retrospective
- 3 Artifacts
  - Product Backlog
  - Sprint Backlog
  - Product Increment
- 1 Activity
  - Product Backlog Refinement

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Match the items on the left side to the definitions on the right side:

Product Backlog	A meeting to create the sprint goal and plan the work for the sprint.
Sprint Backlog	A meeting for the Scrum Team to inspect and adapt the process, people and tools.
Product Increment	A daily 15-minute time-boxed event for the Development Team to synchronize activities and create a plan for the next 24 hours.
Product Backlog Refinement	A meeting to inspect the Product Increment and Adapt the Product Backlog if needed.
Sprint Planning	Ordered list of items to be worked on for the product.
Daily Scrum	A meeting to get the product backlog items ready for next few sprints.
Sprint Review	Completed product backlog items in a sprint, which are ready to be delivered to the customer.
Sprint Retrospective	Product backlog items selected to work in the sprint and the work plan to complete those items.

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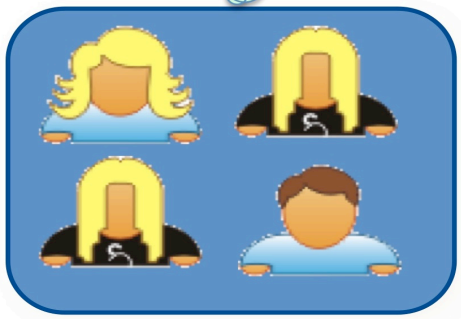
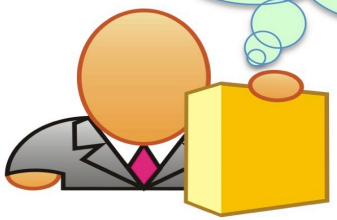
Scrum Team - Roles

We strive to build highest quality products by self-organizing and being cross-functional.



High value products are my goal. I identify such features and help building them.



I am a teacher, coach, facilitator and impediment buster. My focus is to help build products faster.

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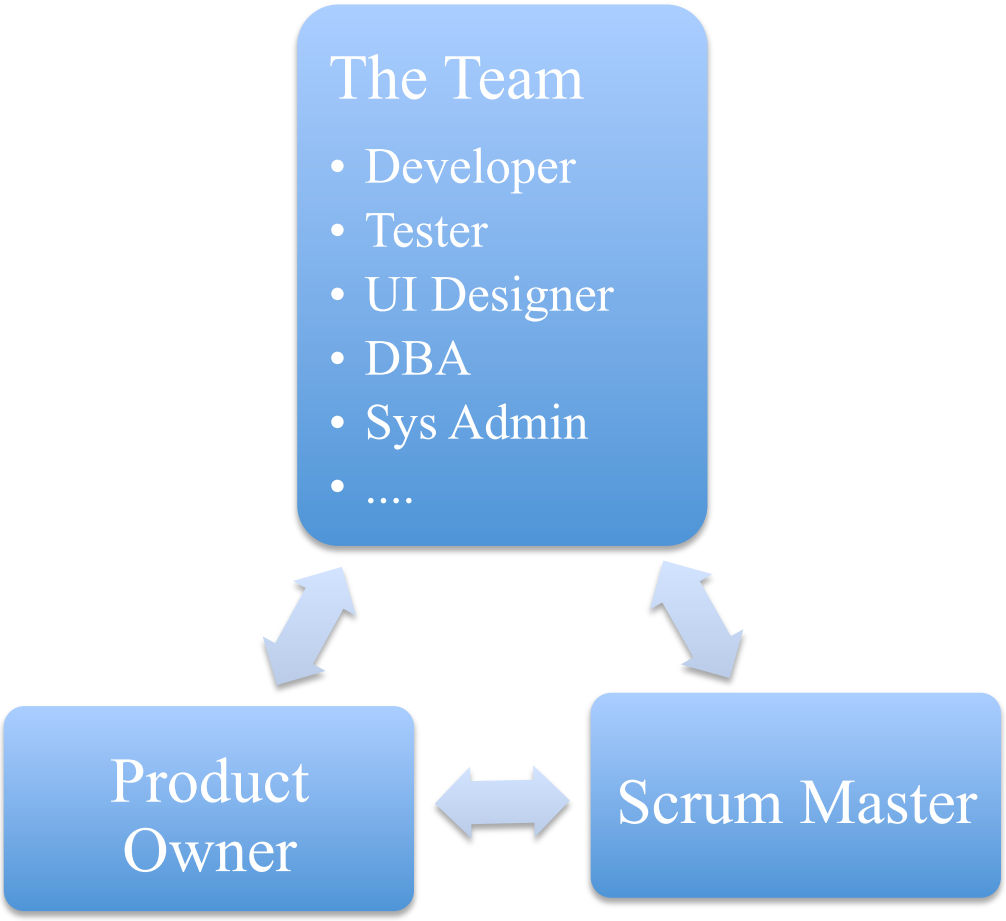
The Scrum Team

The Scrum Team consists of a Product Owner, the Development Team, and a Scrum Master. Scrum Teams are self-organizing and cross-functional. Self-organizing teams choose how best to accomplish their work, rather than being directed by others outside the team. Cross-functional teams have all competencies needed to accomplish the work without depending on others not part of the team. The team model in Scrum is designed to optimize flexibility, creativity, and productivity.

Scrum Teams deliver products iteratively and incrementally, maximizing opportunities for feedback. Incremental deliveries of "Done" product ensure a potentially useful version of working product is always available.



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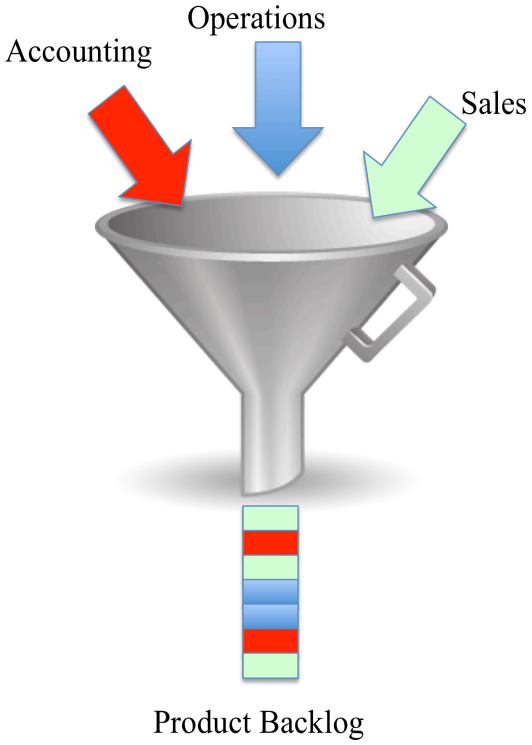
Product Owner

The Product Owner is a single person who is responsible for maximizing the value of the product and the work of the Development Team. How this is done may vary widely across organizations, Scrum Teams, and individuals. The Product Owner is the sole person responsible for managing the Product Backlog. Product Owner's responsibilities include:

Product Owner's responsibility to Stakeholders

Product owner collaborates with stakeholders of the product to understand their vision and market conditions and regularly update them on the progress of the product development. Product owner



- Creates the product vision if it doesn't exist.
- Creates and manages product backlog to fulfill the product vision.
- Reviews the product with stakeholders in Sprint Review meetings to solicit feedback.
- Updates stakeholders about progress of the product development typically every sprint.
- Represents single voice of stakeholders.
- Prioritizes product backlog items based on business needs with the consensus of all stakeholders.
- Orders the product backlog items to maximize the value delivery.

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Product Owner's responsibility to the Team

- Establishes the shared vision between stakeholders and the team.
- Details out the product backlog items as appropriate. Makes sure that high value items are ready for implementation in upcoming sprints.
- Helps team estimate by clarifying any questions.
- Available to the team to answer any questions regarding the product domain during the sprint.
- Optimizes the value of the work the development team performs.
- Keeps the Product Backlog transparent, clear and visible to all.
- Attends scrum meetings.
    - Sprint Planning: Helps the team plan the sprint
    - Sprint Review: Reviews the product increment with stakeholders
    - Sprint Retrospective: Contributes to come up with improvement areas.

Other responsibilities

- Responsible for deciding whether to release the product increment at the end of the sprint.
- Creates and manages the release plans.
- Tracks the release progress.

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Effective Product Ownership

For product owner to be effective he/she needs to be available to the team, is accountable for the product, is empowered to make decisions and has knowledge in the product domain.

Discuss what could happen if product owner doesn't have each of these trait needed to be effective:

Available	
Accountable	
Empowered	
Domain-Aware	

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Scrum Master

The Scrum Master is the process champion. Scrum Master is responsible for ensuring that Scrum is understood and enacted. Scrum Masters do this by ensuring that the Scrum Team adheres to Scrum theory, practices, and rules.

The Scrum Master is a servant-leader for the Scrum Team. The Scrum Master helps those outside the Scrum Team understand which of their interactions with the Scrum Team are helpful and which aren't. The Scrum Master helps everyone change these interactions to maximize the value created by the Scrum Team.

General Responsibilities

- Teaches Scrum to the team and the rest of the organization.
- Ensures that Scrum is understood and enacted.
- Facilitates all scrum meetings as needed and requested. Makes sure that the meetings are happening. Coaches the team on how to complete the time within the timebox for that meeting.
- Responsible for building the product fast by eliminating the waste.
- Makes sure that collaboration is happening in the scrum team.
- A servant-leader for the Scrum Team.
- Acts as a change agent that increases the productivity of the Scrum Team.

Responsibilities to Product Owner

- Helps product owner prioritize the work. Teaches PO and stakeholders value based prioritization.
- Finds and teaches techniques for effective Product Backlog management to Product Owner.
- Helps the Scrum Team understand the need for clear and concise Product Backlog items.
- Helps Product Owner understanding product planning in an empirical environment.
- Ensures the Product Owner knows how to order the Product Backlog

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items to maximize value.

Responsibilities to Development Team

- Identifies the impediments those are blocking the team to progress and help resolve them as quickly as possible. Scrum master goal is to make sure the team is productive.
- Coaches the Development Team for self-organization and cross-functionality.
- Coaches the Development Team in organizational environments in which Scrum is not yet fully adopted and understood.
- Acts as a change agent that increases the productivity of the Scrum Team.
- Coaches teams on how to become hyper productive.

Responsibilities to the organization

- Assess the readiness of the organization to implement scrum.
- Leads and coaches the organization in its Scrum adoption.
- Works with other Scrum Masters to increase the effectiveness of the application of Scrum in the organization.
- Helps employees and stakeholders of the organization understand and enact Scrum and empirical product development.
- Helps optimize the external interactions with the scrum team to maximize the value created.

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What skills and traits a Scrum Master should have to be effective in that role:

- ❖
- ❖
- ❖
- ❖
- ❖
- ❖
- ❖
- ❖
- ❖

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Effective Scrum Master

For a Scrum Master to be effective, there various important are skills he/she needs to acquire. Here are some of those skills:

Facilitation

Facilitation is the process of designing and conducting a successful meeting or event that has a particular objective. Facilitation serves the needs of any group, who are meeting with a common purpose. The person who facilitates the meeting is called a “Facilitator”.

Facilitator Characteristics:

- Facilitator does not stand in front of the group and lecture
- Facilitator is an active unbiased member of the learning process
- Facilitator has to skillfully assist the group to understand their common objectives, and to help them to achieve these objectives without taking sides in any arguments
- Facilitator guides and helps to achieve consensus

Basic Skills of a Facilitator:

- Follows good meeting practice
- Time keeping
- Run the meeting on agreed agenda
- Assisting the group to brainstorm and problem solve
- Ability to intervene in a way that adds creativity to a discussion rather than leading the discussion
- Ability to understand the group dynamics include:
    - Who is dominating the group? How to stop him/her
    - Who is withdrawn? How to involve him/her
    - Who looks bored? How to get their attention

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Facilitation for Decision Making

Fist of Five: Fist of Five is a facilitation technique to quickly get team members' feedback. In this technique, team members show their hand with fingers open to show their rating for the question. They might show 0 - 5 fingers open. Eg. How do you like the food in this restaurant? (0 - worst, 5- Best)

Dot Voting: This technique could be used for prioritisation of items. All participants are given few (2 or 3) votes and they pick the items which they feel are high priority. Once everyone voted, items are prioritised base on number of votes they got. Eg. This technique could be used while prioritising improvements in Sprint Retrospective.

Thumbs Up/Down: Here are the steps in Thumbs Up/Down:

- Ask a question that has Yes/No or True/False answer.
- All members have to vote :
- Thumb up : yes, I fully support the idea.
- Thumb down : no, I do not support the idea and I give a counter proposal.

This facilitation technique could be used to get a quick feedback if the answer is Boolean.

When ScrumMaster should not facilitate?

A ScrumMaster facilitates Scrum events as well as any other events the Scrum team requests. ScrumMaster need to exhibit characteristics of a good facilitator like:

- **Establish ground rules for the facilitation**
- **Has no opinion on the content of the facilitation**
- **Unbiased and treats all the participants equally**
- **Has skill required to facilitate the event**

If there are situations where the ScrumMaster can't follow the above stated guidelines, it is not a good idea for ScrumMaster to act as a facilitator.

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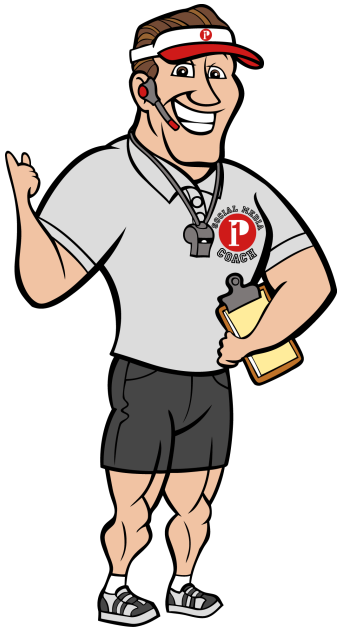
Coaching



According to Tim Gallwey "*Coaching is unlocking a person's potential to maximize their own performance. It's helping them to learn rather than teaching them*"
Coaching is a useful way of developing people's skills and abilities, and of boosting performance. It can also help deal with issues and challenges before they become major problems.
A coaching session will typically take place as a conversation between the coach and the coachee (person being coached), and it focuses on helping the coachee discover answers for themselves.
Occasionally, *coaching* may mean an informal relationship between two people, of whom one has more experience and expertise than the other and offers advice and guidance as the latter learns

Coaching is clearly different from consulting. Here are some key differences between Coaching and Consulting:

- Consultants usually identify and correct the problems. Coaches help to find solutions.
- Consulting is treated like a silver bullet whereas Coaching helps the organizations to change for the better
- Consulting is often short term based and Coaching is long term and sustainable results
- Consulting may give sudden spike in improvement and Coaching gives progressive elaboration
- Consulting is more of implementing some other's (Consultant) solution but Coaching helps you to review and refine your own solution to make it work

What is the role of an Agile coach?

As an agile coach, your goal is to develop productive agile teams that think for themselves rather than relying on you to lay down the path for them. You need to help them understand the agile from the value point of view rather than practice point of view. You need to help them change the way

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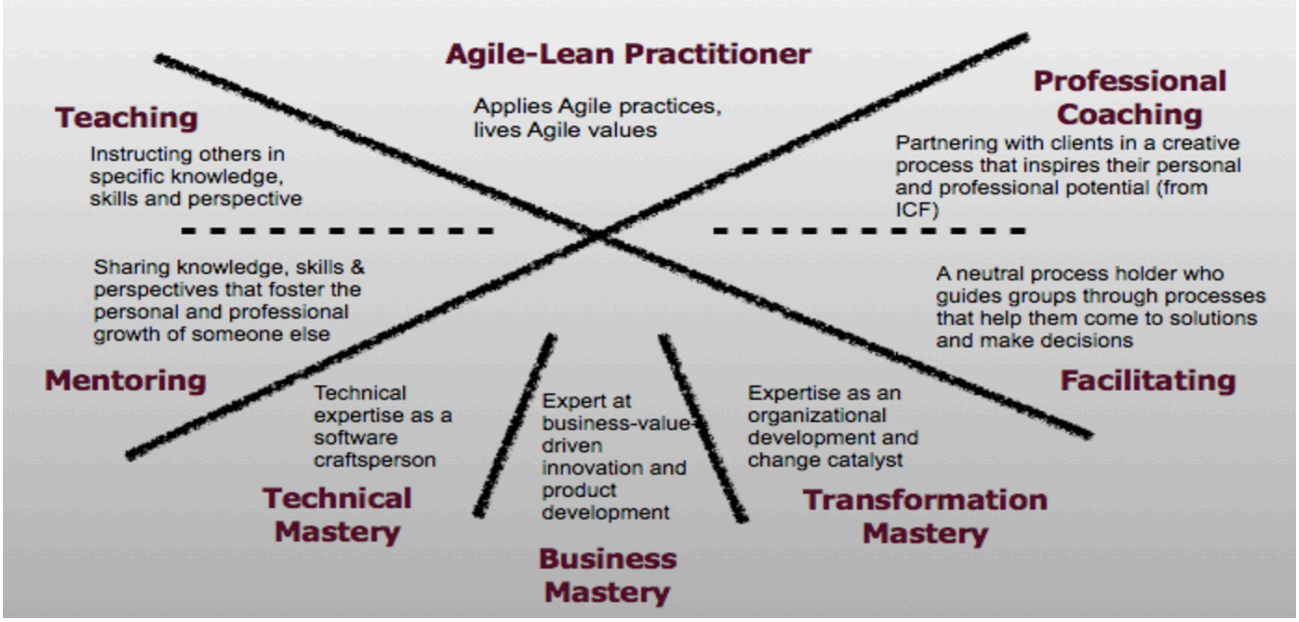
they work, communicate, collaborate and understand team based value delivery. During this process you need to help them unlearning some of their old habits, using your coaching skills, tools and techniques.

You need to understand, each team is different as they have different levels of skills, attitude, knowledge. That means your coaching strategy depends on what the teams need from you.



Reference: http://www.agilecoachinginstitute.com/agile-coaching-resources/

How Scrum Master can become a good coach?

First of all, you need to develop a positive attitude and have patience. Also, passion is key characteristic you need to have towards the Scrum Master role. You first have to believe in yourself and you should be the change agent. You have to trust that the change begins with you. You need to give the confidence to your team that you will be there to assist and support them. As part of this, you need to have some important habits in your way of working as Scrum Master:

- **Lead by example:** You have to practice how to be agile for yourself first. Practice the agile values and principles first before telling the team to follow.

- **Keep up the balance:** When team overreacts for change be patient and keep the balance. Never take criticism personally and do not incline towards consulting to get quick results.

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- **Set realistic pace:** Don’t expect results overnight. Remember, changes take time and they get results slowly. Don’t ever blame the team if their learning is slow.

- **Be cautious about your language:** Make yourself part of the team. Do not ever use “I/You/They” rather use “We/our/Us” so that you will get quick buy-in with your team and then will be open to listen.

- **Open to learn:** Don’t be panic if things do not work they way you want. Take time, retrospect and identify gaps. Most powerful lessons are learned from mistakes. Let the teams experiment, if they fail help them to learn from those failures.

- **Accept feedback:** You have to be open to receive feedback as and when it comes through. It helps you to become more robust coach.

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Servant Leadership

"You must be the change you wish to see in the world."

- Mahatma Gandhi

Servant leadership is a philosophy and set of practices that enriches the lives of individuals, builds better organizations and ultimately creates a more just and caring world.

While servant leadership is a timeless concept, the phrase "servant leadership" was coined by Robert K. Greenleaf in "*The Servant as Leader"*, an essay that he first published in 1970. In that essay, Greenleaf said:

"The servant-leader *is* servant first… It begins with the natural feeling that one wants to serve, to serve *first*. Then conscious choice brings one to aspire to lead. That person is sharply different from one who is *leader* first, perhaps because of the need to assuage an unusual power drive or to acquire material possessions…The leader-first and the servant-first are two extreme types. Between them there are shadings and blends that are part of the infinite variety of human nature."

To further define Greenleaf's paradigm shift, Larry C. Spears identified ten characteristics of a servant-leader in his paper titled "On Character and Servant Leadership: Ten Characteristics of Effective, Caring Leaders:

Listening: Servant leader must listen to verbal and non-verbal signals and interpret what the others are saying. In addition, the servant leader must listen to their inner thoughts and feelings and interpret them.

Empathy: The most successful servant-leaders are those who have become skilled empathetic listeners." "One assumes the good intentions of co-workers and colleagues and does not reject them as people, even when one may be forced to refuse to accept certain behaviors or performance.

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Healing: Servant-leaders recognize that they have an opportunity to help make whole those with whom they come in contact.

Awareness: Servant leaders should "view most situations from a more integrated, holistic position." Robert Greenleaf said awareness "is a disturber and an awakener. Able leaders are usually sharply awake and reasonably disturbed".

Persuasion: The servant leader should rely "on persuasion, rather than on one's positional authority, in making decisions within an organization." The technique of convincing rather than coercion should be used. This is in contrast to the "authoritarian model " of leadership. "The servant-leader is effective at building consensus within groups".

Conceptualization: The ability to look at a problem or an organization from a conceptualizing perspective means that one must think beyond day-to-day realities.

Foresight: a characteristic that enables the servant-leader to understand the lessons from the past, the realities of the present, and the likely consequence of a decision for the future.

Stewardship: a commitment to serving the needs of others. It also emphasizes the use of openness and persuasion, rather than control.

Commitment to the growth of people: “Deeply committed to the growth of each and every individual within his or her organization." An example is "taking personal interest in the ideas and suggestions from everyone, encouraging worker involvement in decision making”.

Building community: A servant-leader should "seek to identify some means for building community among those who work within a given institution".

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Development Team

The Development Team consists of professionals who do the work of delivering a potentially releasable Increment of "Done" product at the end of each Sprint. The size of a development team is **3 to 9** members. Teams less than 3 are too small to call a team where as greater than 9 are too big to self organize.

Development teams are self-organizing

Self-organizing teams are proven to be hyper productive. A self-organizing team knows how to do their work. No one from outside the team is allowed to tell them how to do the work. The team decides:

- What backlog items to work on in a given sprint?
- How to implement the items with regards to technology and design etc?
- Work allocation and capacity planning.

Development teams are cross-functional

The development team members contain all the skills required to deliver product increment. This way team is not dependent on some external expertise, which could make the team to slow down. If the team needs to have too many skills to deliver the product increment, the team members need to acquire secondary and tertiary skills to reduce the dependency on external help.

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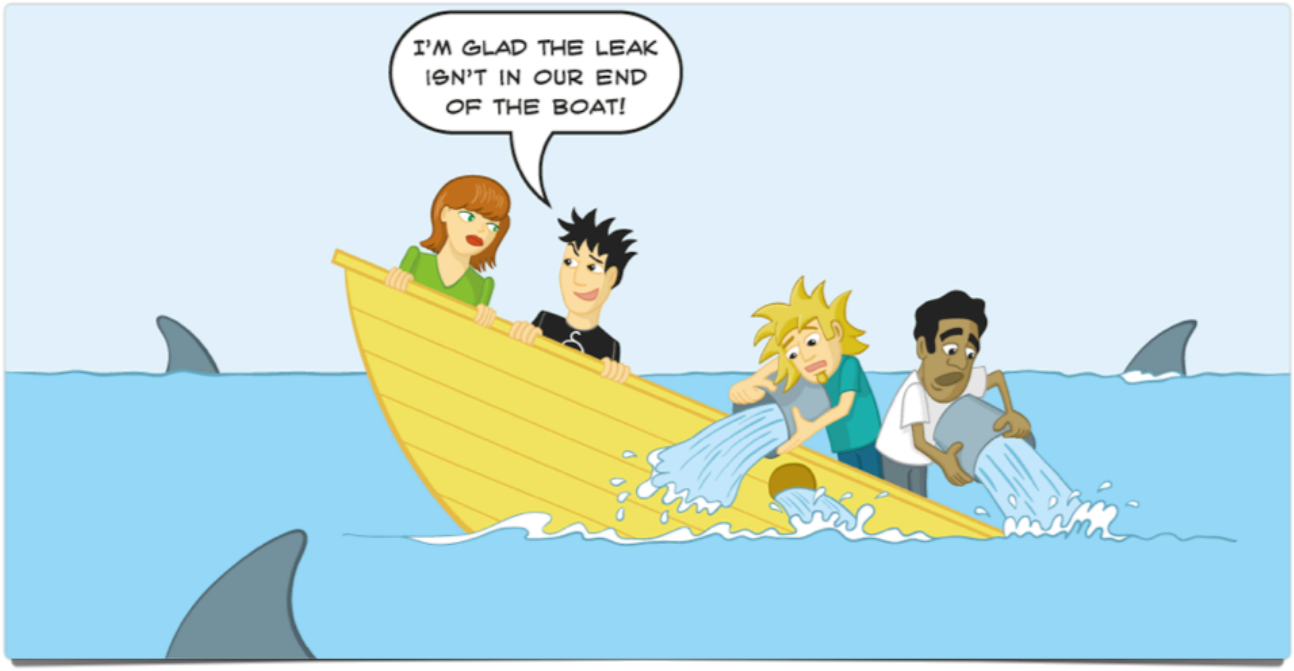
Team has common goal



Ref: http://www.mountaingoatsoftware.com

- A development team has a common goal of delivering the product increment at the end of the sprint to achieve the sprint goal.
- There are no functional silos like programmers, testers, UI designers etc.
- Everyone in the team is expected to contribute to best of their ability to achieve the goal.
- A hyper productive scrum development teams are cross-skilled and are usually able to perform several different tasks.

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Team’s responsibilities includes but not limited to:

- Quality of the product increment.
- Create the product increment.
- Participate in all Scrum meetings.
- Implement good engineering practices like Continuous Integration, Automation, Collective Ownership, Clean code, Simple design etc.
- Create and manage the sprint backlog.
- Identify and eliminate “Technical Debt”.
- Track progress of the sprint.
- Helps product owner in backlog management by explaining technical constraints.
- Estimates Product Backlog items.

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Other Roles?

Scrum has only 3 roles where as traditional software development has many other roles. A new scrum team suffers from not knowing how those other roles fit in scrum.

Discuss what happens to other specialty roles in scrum?

- Project Manager
- Architect
- Business Analyst
- UI Designer
- Database Administrator
- System Administrator

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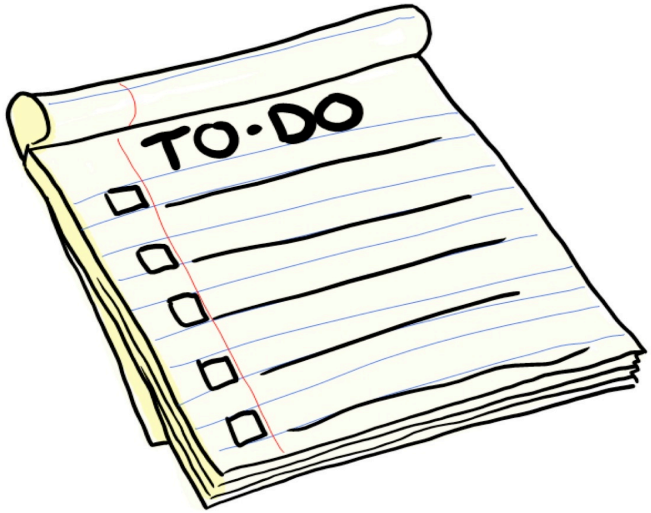
Scrum Artifacts

Story	To Do	In Process	To Verify	Done
As a user, I... 8 points	Code the... 9 Test the... 8 Code the... 2 Code the... 8 Test the... 8 Test the... 4	Code the... DC 4 Test the... SC 8	Test the... SC 6	Code the... Test the... Test the... Test the... Test the... SC 6
As a user, I... 5 points	Code the... 8 Test the... 8 Code the... 4 Code the... 6	Code the... DC 8		Test the... Test the... Test the... SC 6



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Product Vision

Product vision statement is few sentences that talks about the motivation behind the product. Since the product owner is responsible for success of the product, he/she leads the creation of Product Vision.

Tips to create Product Vision?

- Describe the Motivation behind the Product
- Look beyond the Product
- Distinguish between Vision and Product Strategy
- Employ a Shared Vision
- Choose an Inspiring Vision
- Think Big
- Keep your Vision Short and Sweet
- Use the Vision to Guide your Decisions

Few Examples

“Put joy in kids’ hearts and a smile on parents’ faces” - Toys R Us

"Our [Amazon's] vision is to be earth's most customer centric company; to build a place where people can come to find and discover anything they might want to buy online." (Quoted from Amazon.com)

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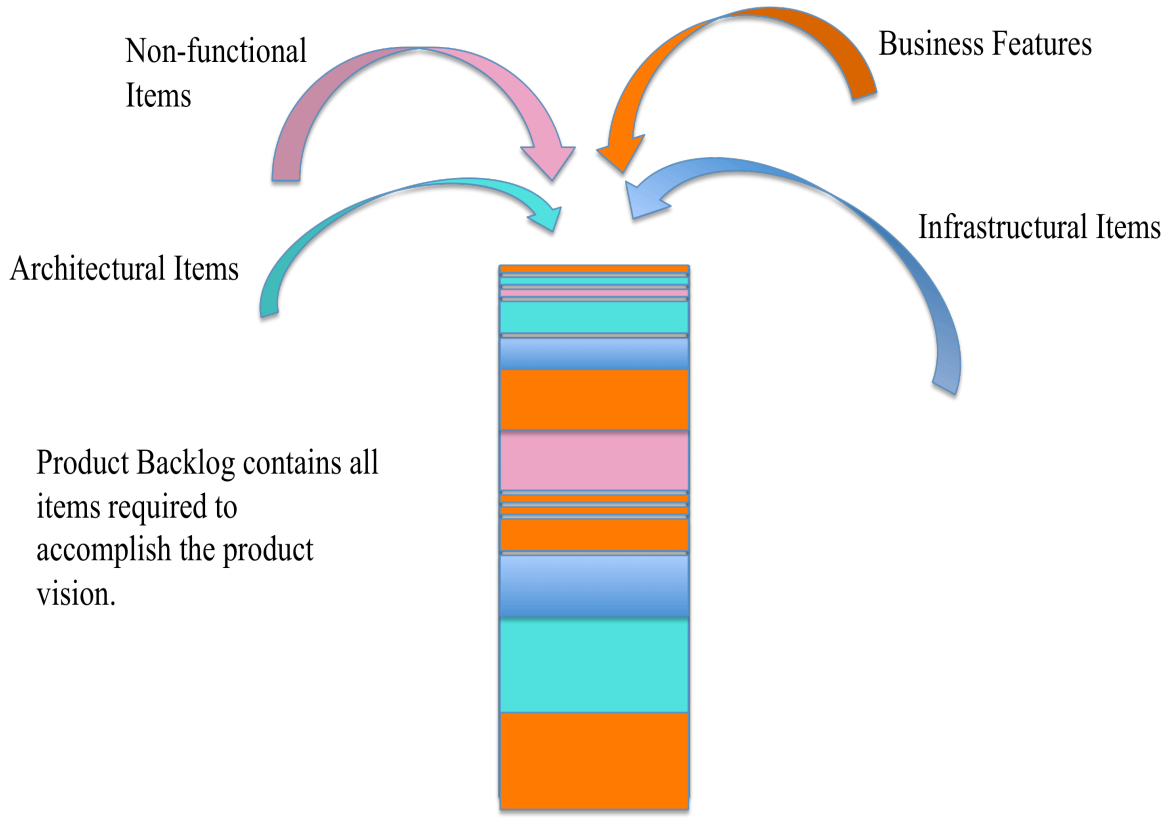
Product Backlog (PB)

The Product Backlog (PB) is an ordered list of all items that might be needed in the product and is the single source of requirements for any changes to be made to the product. The Product Owner is responsible for the Product Backlog, including its content, availability, and ordering. Items in the product backlog are called “Product Backlog Items (PBI)”.

Each Product Backlog Item would have:

- **Description** – Details of the item.
- **Value** – What business value this item would provide.
- **Estimate** – Effort estimate to build this item.
- **Order** – The order in which the items should be worked on



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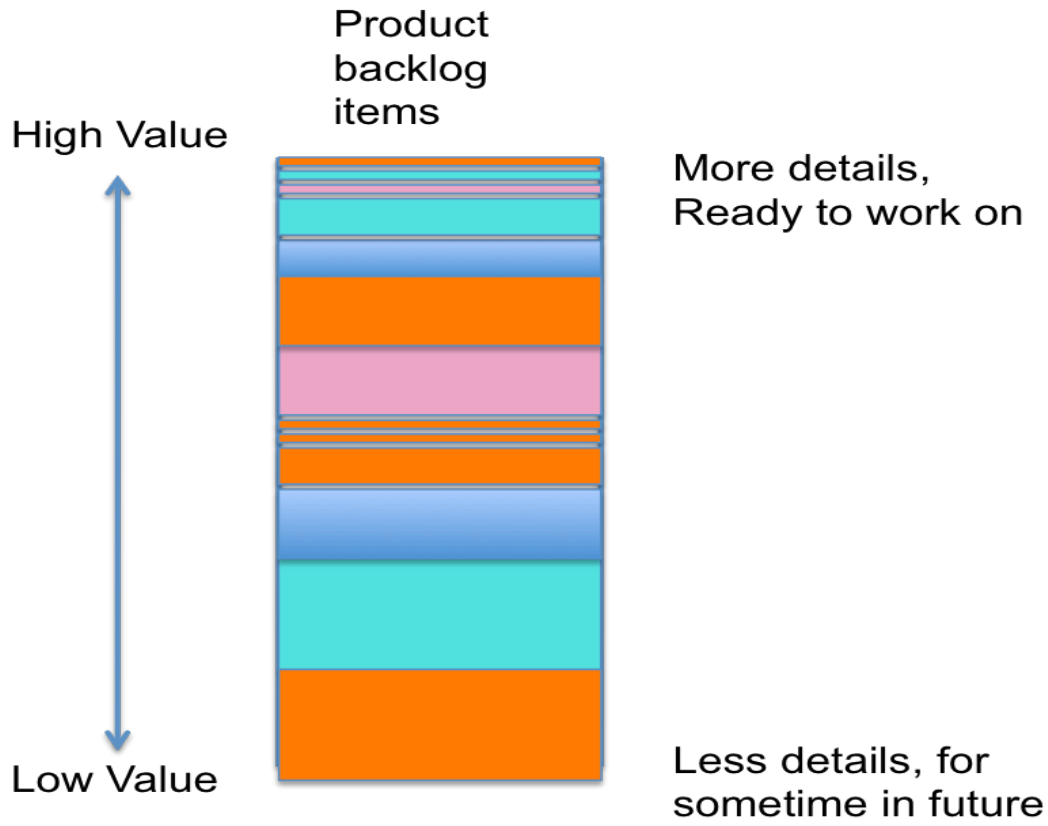
A product backlog is best described as DEEP



- **D**etailed Appropriately: Higher order items are more detailed and well understood compared to lower order items.

- **E**stimated: Product backlog items are estimated in relative sizes by development team. Product owner orders the items based on value and the cost.

- **E**mergent: Product backlog is a living artifact. It is always updated for details, estimates and order. The life of the product backlog is same as life of the product itself.

- **P**rioritized: Product backlog items are ordered based on the priority. The order is force ranking (1,2,3..) so that there are no competing priorities.

Product Backlog Refinement (PBR)

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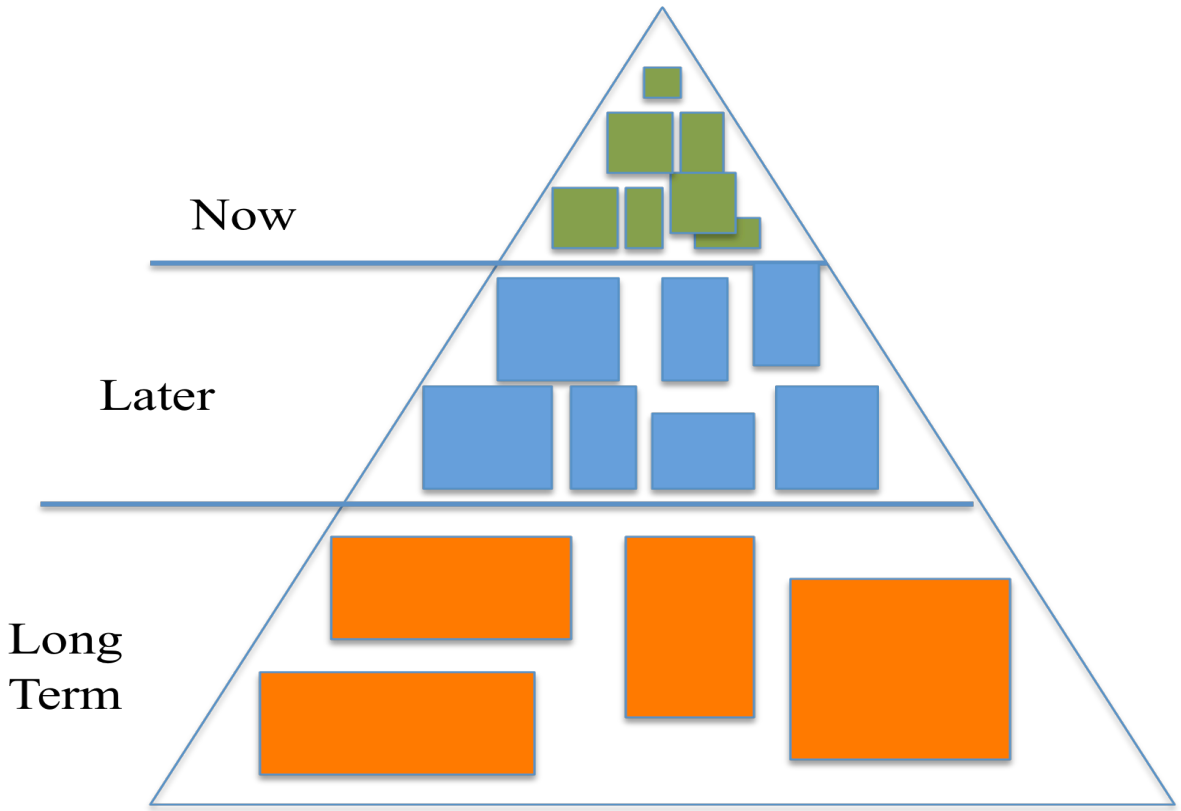
When product backlog is initially created it would have items of various sizes, clarity and value. But a scrum team needs clarity on few most important to get started. Backlog could be depicted as the following picture. Items at the top are important right now and should be smaller in size and more details so that team could start implementing them in up coming sprints.



As you go lower the product backlog, the items are less important and less detailed. Product owner elaborates them as they become important.

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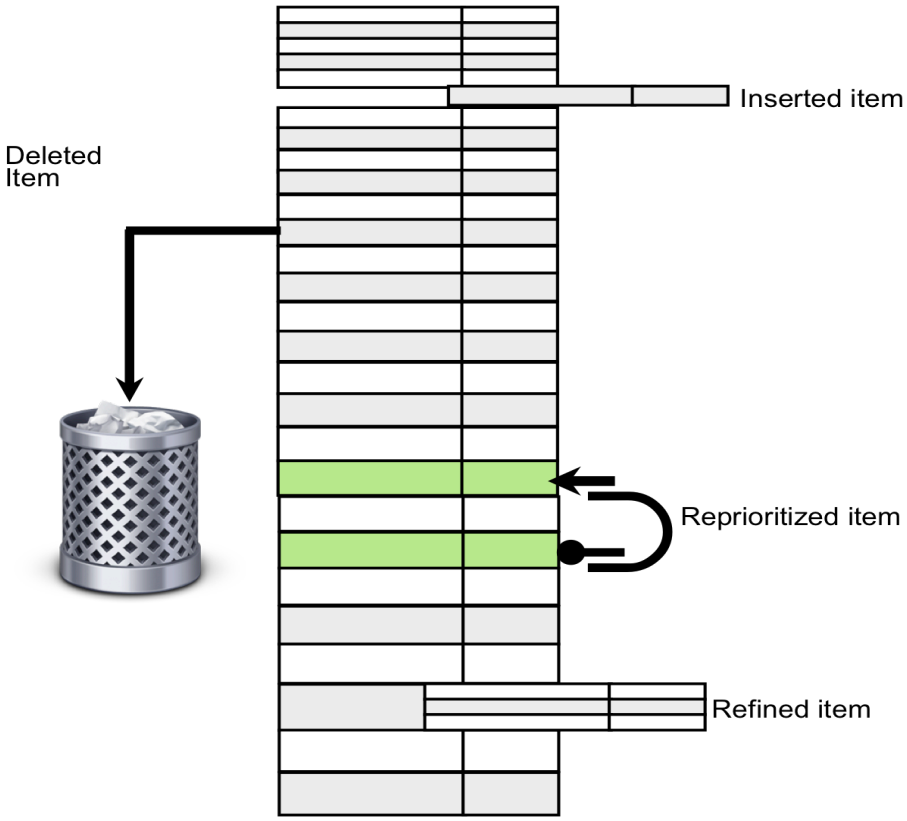
Scrum has an activity called “Product Backlog Refinement to progressively elaborate the product backlog.



- Primary goal of product backlog refinement is to get ready with few items for upcoming one or two sprints.
- Product Backlog items that are refined are deemed “Ready” for selection in a Sprint Planning.
- Product Backlog Refinement is the act of adding detail, estimates, and order to items in the Product Backlog.
- Product Backlog Refinement is an ongoing activity throughout a Scrum project.
- Team and PO decide the frequency and duration of backlog refinement meeting. However, it is timeboxed at 10% of total available time.

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Product Owner is responsible for establishing the product vision.		A single team works from multiple product backlogs.	
Higher ordered Product Backlog items are usually clearer and more detailed than lower ordered ones.		Product Owner keeps the product backlog somewhere secretly so that no one can touch it.	
Anyone can create product backlog items, but Product owner has overall responsibility to manage it.		The product backlog is sorted from small items (at the top) to large (at the bottom).	
Life of the product backlog is same as life of the product itself.		The product backlog should be updated only in backlog refinement meeting.	
The Development Team is responsible for estimating of backlog items.		In backlog refinement, team goes through the entire backlog and refines it.	
Product Backlog Refinement is the act of adding detail, estimates, and order to items in the Product Backlog.		Development team may work on critical engineering items without placing them in product backlog.	
Team and PO decide the frequency and duration of backlog refinement meeting. However, it is timeboxed at 10% of total available time.		Once a product backlog is created it usually doesn't change.	
Product Backlog Refinement is an ongoing activity throughout a Scrum project.		Scrum Master tells product owner what should be the priority in backlog refinement meeting.	
Having a Product Backlog Refinement meeting helps sprint planning to go smoother.		Once an item is placed in the product backlog, it is never re-ordered.	

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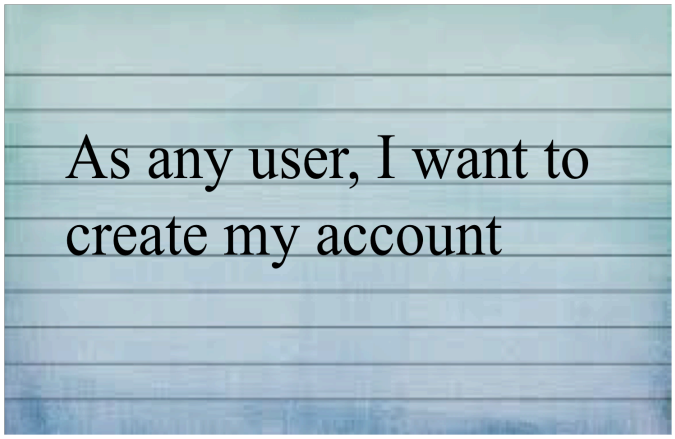
User Stories

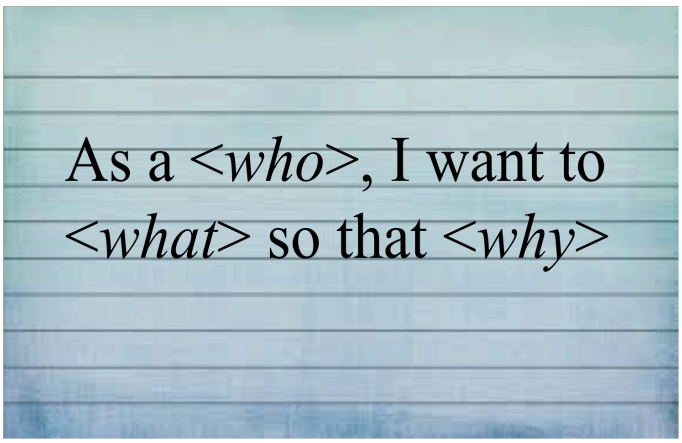
User stories are well suited as product backlog items. User story is not a concept from Scrum but commonly used in Scrum projects to manage requirements. User story is:



- Token for the feature.
- Usually written on a small index card.
- Captures intent of the feature.
- Captures conditions of satisfaction or acceptance test criteria.

User story is written in a format

- **Who:** User of the product
- **What:** Activity user wants to perform using the feature
- **Why:** Purpose the feature is going to serve.



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3Cs of User story

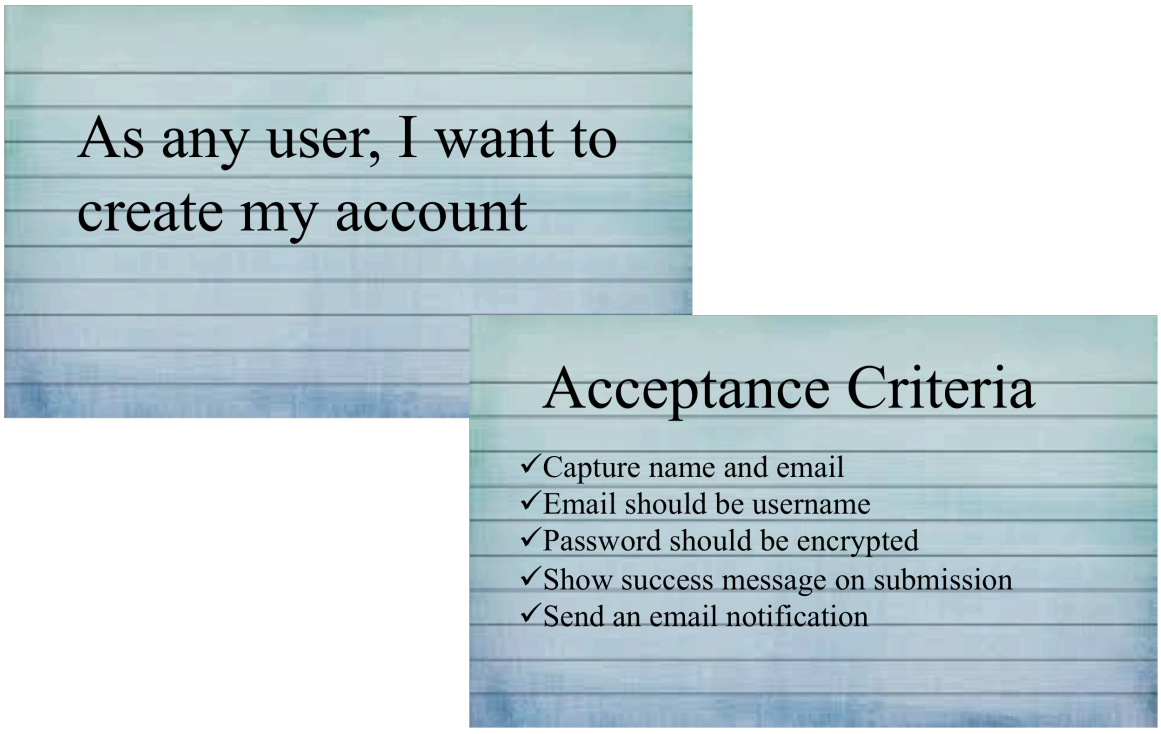
Card: User story should be short enough to fit on a card

Conversation: A conversation is needed by all stakeholders to understand the story

Confirmation: How is the user story validated for its completion is specified in the form of "Acceptance Criteria"

Acceptance Criteria

Acceptance criteria is the criteria if the product satisfies, the user story is considered done. Acceptance criteria is basis for high level test cases.



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How to write good user stories

It is essential to write user stories, which are small and independent enough to be worked on in each sprint. For a good product backlog, the team should INVEST in good user stories:

Independent: Stories should be independent enough so that the team doesn't have to pull in many other stories along with that story.

Negotiable: Team should be able to negotiate stories in and out of a sprint. This way the team can maximize the value.

Valuable: Valuable to the customer directly or indirectly. A technical story may not add a direct value to the customer.

Estimable: Team should be able to estimate the stories. This requires clarity on detail and the stories are independent.

Sized Appropriately: Higher order stories are smaller in size such that they could be completed in a sprint.

Testable: A story should cover one piece of functionality that could be tested in isolation.

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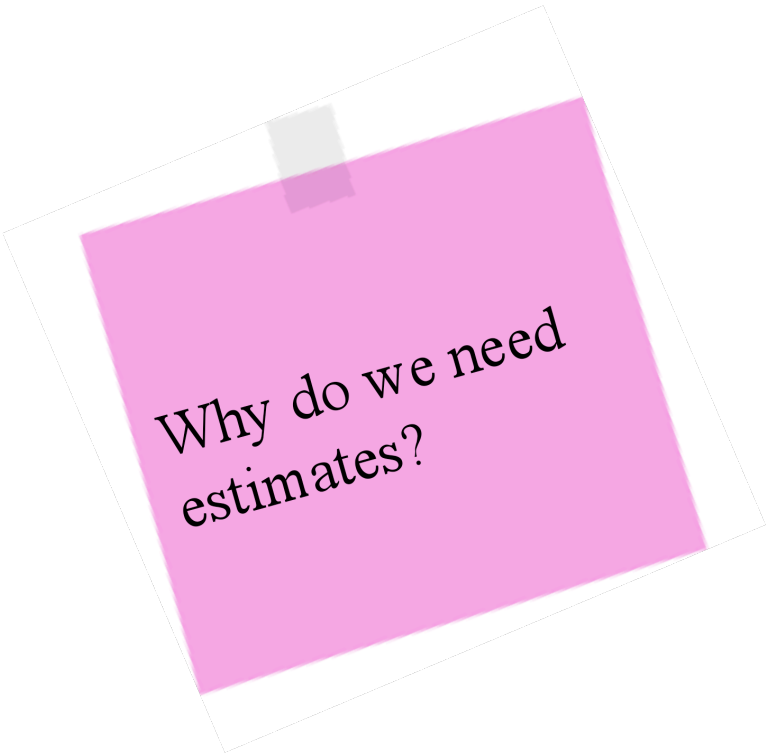
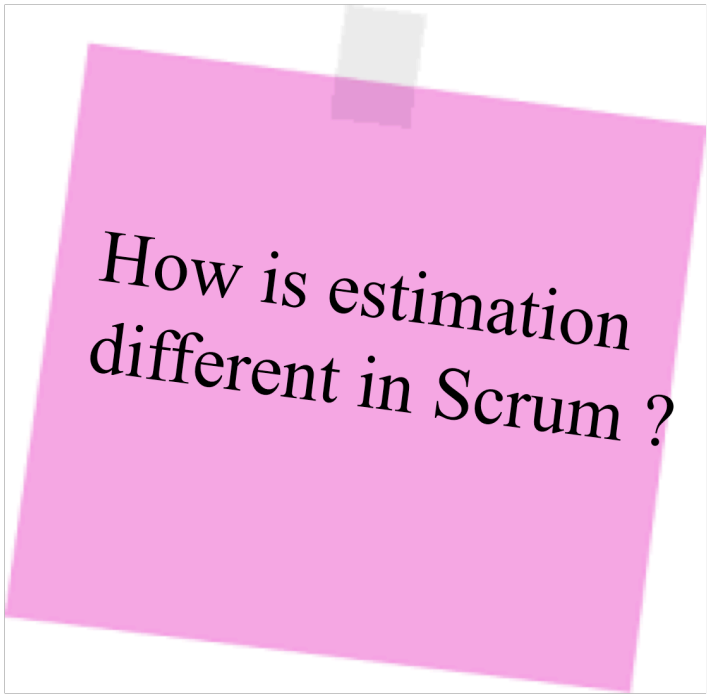
Agile Estimation





Product backlog items are estimated so that the product owner can make trade of decisions in prioritizing the items. Estimates are also required for release or long term planning. In scrum, the product backlog items are progressively elaborated, so estimating then in hours (or some other time unit) is difficult.

Estimates are relative sizes

- Humans are good at estimating by comparison
- Backlog items are estimated in relative sizes
  - Size 4 item is roughly two times bigger than size 2 item
- Size represents the relative effort it takes to complete the item
  - Size 4 item takes two time longer than size 2 item
- Estimates are influenced by
  - How much is there?
  - How hard is it?
- Estimates are at the right granularity
  - Estimates should be roughly accurate than precisely wrong

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Common units of estimation

- Indicates how big an item is.
- A 4-point item is two times bigger than a 2-point item.
- Unit less

How long it will take in days if

- It's all you worked on
- No interruptions
- No impediments

Advantages of story points

- Story points are additive, time-based estimates may not be.
- Story points avoids unit confusion

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Planning Poker

Ref: http://www.mountaingoatsoftware.com

Planning poker is an activity development team uses to estimate relatives size of product backlog items.

- Each estimator is given a deck of cards that contains numbers 1, 2, 3, 5, 8, 13, 20. This number series is a modified Fibonacci series. There could be other series some teams use.
- Team combs through the product backlog item and picks an item that is well understood and assigns a 2 or 3 to it. This is the reference story for other items. Team might pick another item with is 5 or 8 so that there are two reference stories. Now the team is ready to estimate.
- Product owner reads the product backlog item/story. Team asks any questions to understand the item better.
- All team members pick their number, but keep it face down at this point.
- All members show the number at once so that there is no influence on each other.
- Members with who picked low and high numbers give their point of view
- Team estimates again based on new learning from the discussion.
- After 2 or 3 rounds, the estimates are expected to converge. Team finally agrees to a number.

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Estimate the painting project

Master Bedroom 20ft x 16 ft – Walk in closet	
Store Room – 4ft x 6ft	
Kid's Bedroom – 12ft x 12ft	
Guest Bedroom – 10ft x 10ft	
Study Room – 10ft x 10ft – book shelves	
Living Room – 14ft x 14ft	
Family Room - 20ft x 18 ft - High Ceiling	
Foyer – 6ft x 12 ft	
Servant Room – with bathroom	
Exterior Painting	

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Definition of Done (DoD)

- "Definition of Done" is a list of activities agreed by Product Owner and the Development Team to call a backlog item is done.
- Definition of Done consists of activities needed for functional and quality requirements.
- Team comes up with the DoD and adheres to it while creating the product increment.
- Different teams may have different DoD but all teams should follow minimal DoD that includes all critical activities required.
- If there are standards at organization level, a common DoD can capture those and the teams should have separate DoD in addition to one at the organization level.
- A stronger DoD leads to higher quality product.

Sample DoD:

- ✓ Code complete
- ✓ Unit tests written
- ✓ Code Review
- ✓ Manual functional testing
- ✓ Automation
- ✓ Documents updated
- ✓ User acceptance Testing
- ✓ Deployment

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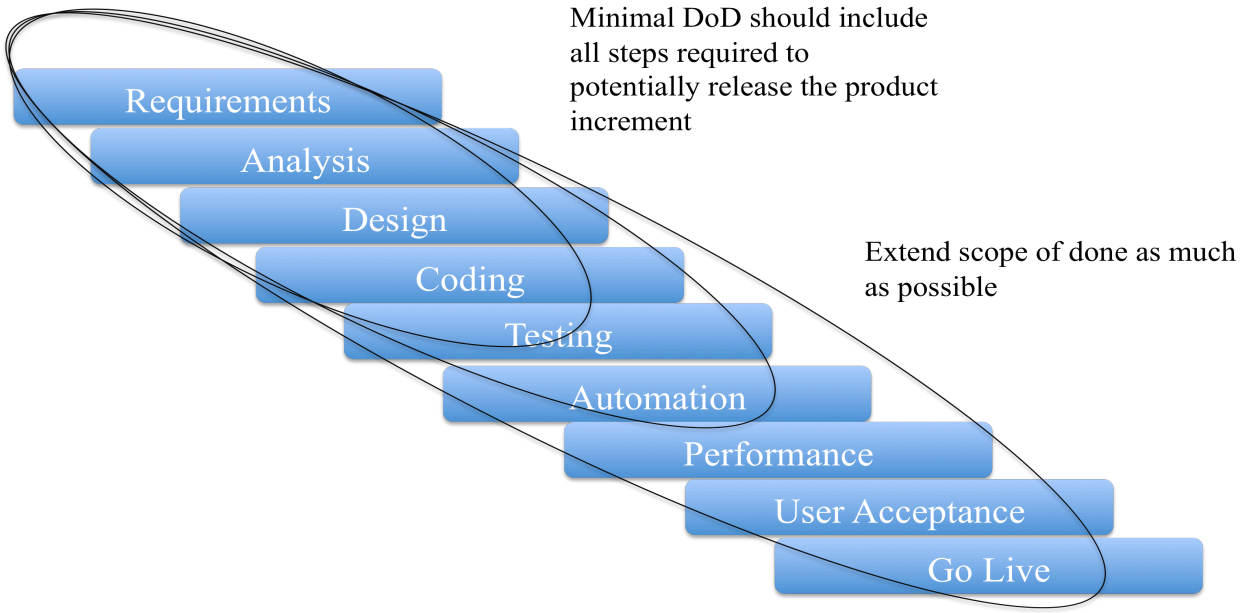
Weak Definition of Done



- If the DoD is missing essential activities, it is called a weak DoD. For example, load testing may not be done for every sprint and is deferred to later time.
- A weak DoD causes unfinished work in every sprint. The unfinished work is added back to product backlog. This increases the risk. If a major bug is found during load testing, that could risk the release.
- Weak DoD also increases the Technical Debt. This might include automation or code reviews.

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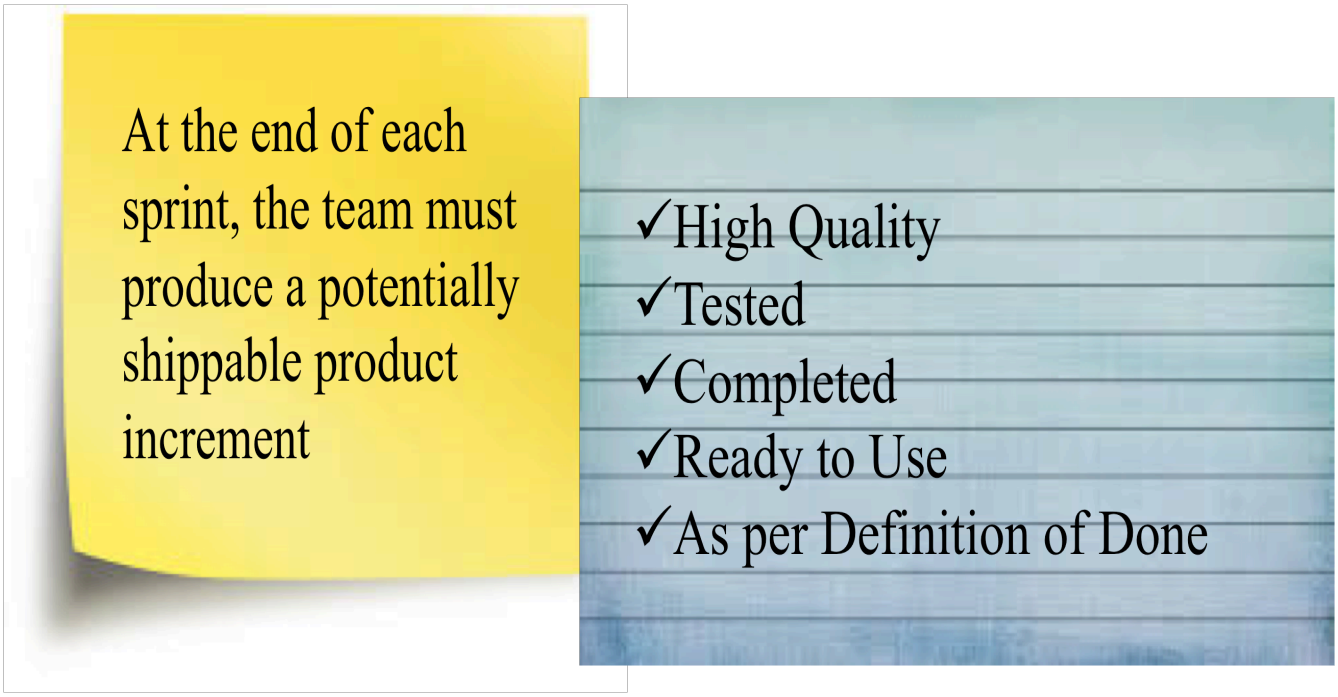
Product Increment



Should the team always release the Product Increment?

- It depends. If the product increment that is produced is usable and adds value to the business, Product owner may choose to release it right away.
- Though the product increment is working, it may not be feature complete and product owner may not want to release it.
- Some businesses don't want to surprise their customers too often by frequent release.
- Whether the product increment is shipped or not, building working software every sprint eliminates the technical uncertainty.

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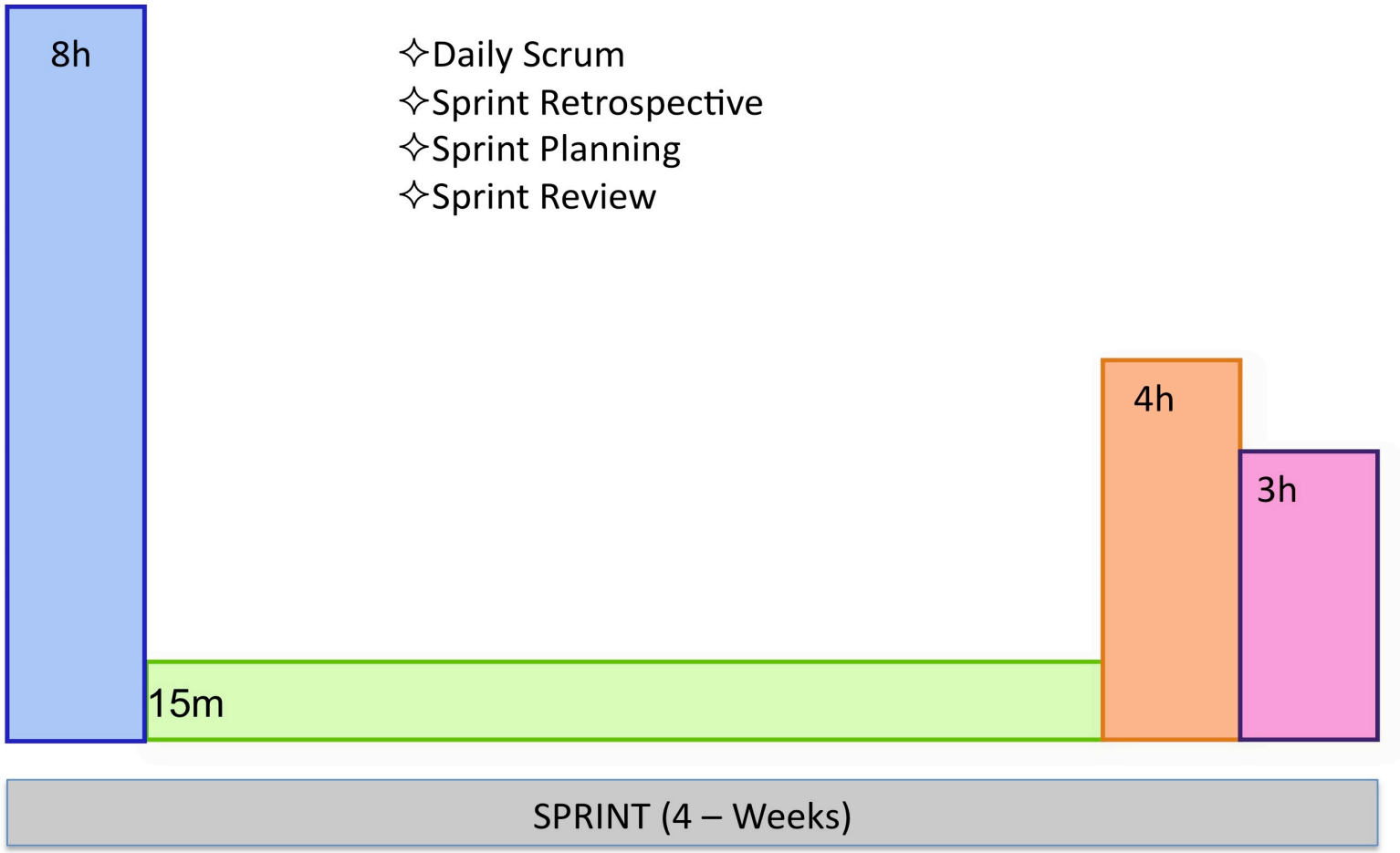
Scrum Meetings

- ✧Daily Scrum
- ✧Sprint Retrospective
- ✧Sprint Planning
- ✧Sprint Review



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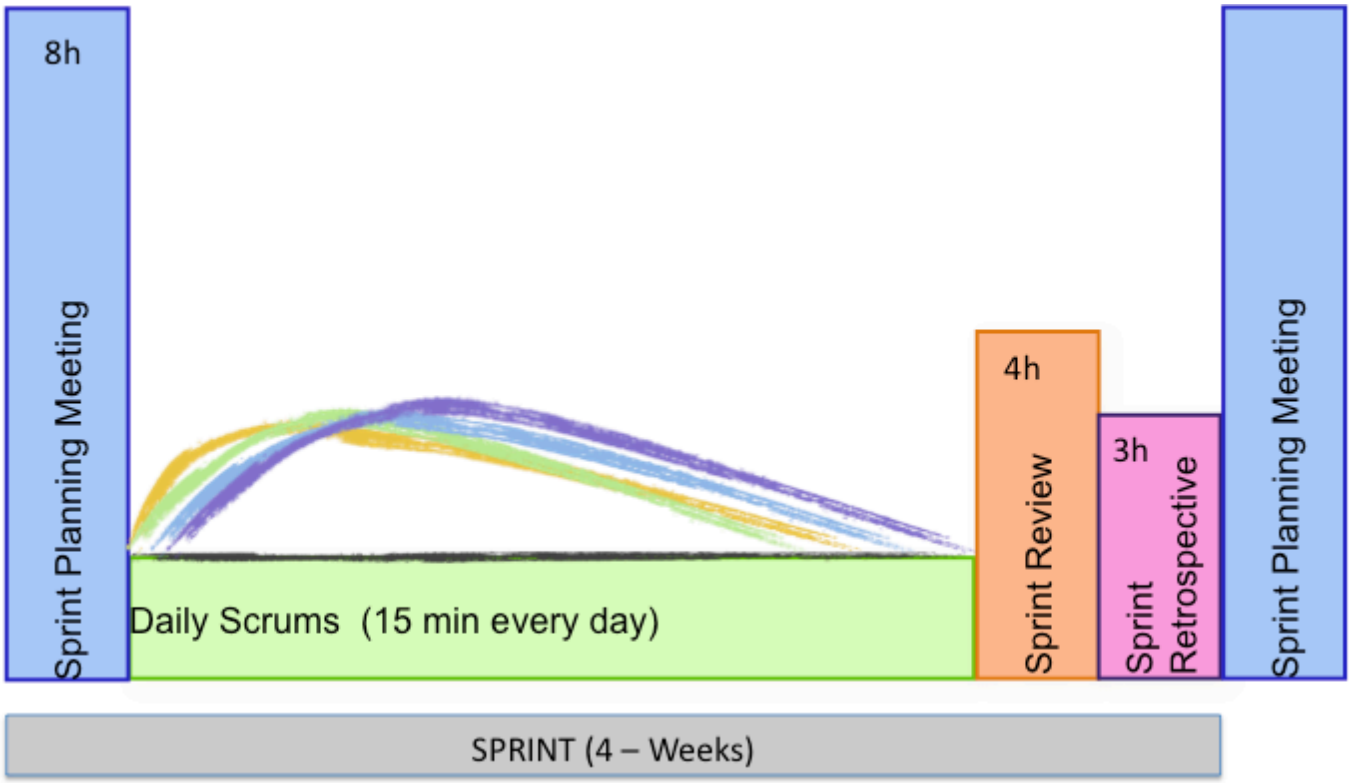
Scrum Meetings

Prescribed events are used in Scrum to create regularity and to minimize the need for meetings not defined in Scrum. All events are time-boxed events, such that every event has a maximum duration. Once a Sprint begins, its duration is fixed and cannot be shortened or lengthened. The remaining events may end, whenever the purpose of the event is achieved, ensuring an appropriate amount of time is spent without allowing waste in the process.

Other than the Sprint itself, which is a container for all other events, each event in Scrum is a formal opportunity to inspect and adapt. These events are specifically designed to enable critical transparency and inspection. Failure to include any of these events results in reduced transparency and is a lost opportunity to inspect and adapt.



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Timebox

- Time boxing is maximum time allowed for an event.
- Time boxing makes teams focus on most important things first.
- All Scrum events are time boxed. Sprints are time boxed at 1 – 4 weeks.
- Other Scrum events are time boxed based on sprint duration.

Factors Influencing Duration of a Sprint

❖

❖

❖

❖

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The Sprint

The heart of Scrum is a Sprint, a time-box of 1 – 4 weeks. Sprints best have consistent duration throughout a development effort. A new Sprint starts immediately after the conclusion of the previous Sprint.

Sprints contain and consist of:

- Sprint Planning
- Daily Scrums
- Development work
- Sprint Review
- Sprint Retrospective

The development team works on one item at a time to completely build it such that each item could be usable and releasable. Team does all the functions required to complete each item.

Sprint is Protected

- No changes are made that would endanger the Sprint Goal.
- Quality goals do not decrease.
- Scope may be clarified and re-negotiated between the Product Owner and Development Team as more is learnt.

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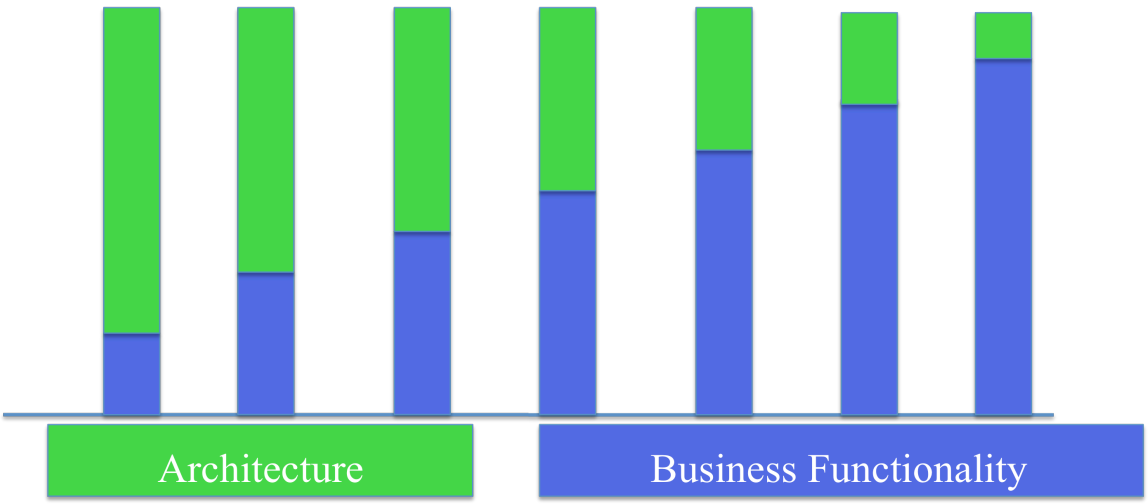
Architecture is built incrementally



Test small test often

- Testers are involved right from the beginning.
- Developers check in code in smaller testable chunks.
- Testers try the functionality to see it is working.
- Testers and developers collaborate through out the sprint.
- The goal is to deliver usable product increment at the end of every sprint.

What else happens in a sprint?

- DBAs, Sys Admins, Technical writers and any other supporting members are involved as early as possible.
- Data models and database design done incrementally.
- Documentation evolves as the stories are implemented.
- Executable tests document the test cases.

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Sprint Cancellation

A Sprint can be cancelled before the Sprint time-box is over. A Sprint would be cancelled if the Sprint Goal becomes obsolete.

Only the Product Owner has the authority to cancel the Sprint, although he or she may do so under influence of the stakeholders, the Development Team, or the Scrum Master.

- This might occur if the company changes direction or if market or technology conditions change.
- When a Sprint is cancelled, any completed and “Done” Product Backlog items are reviewed.
- If part of the work is potentially releasable, the Product Owner typically accepts it.
- All incomplete Product Backlog Items are re-estimated and put back on the Product Backlog.
- Sprint cancellations are often traumatic to the Scrum Team, and are very uncommon.

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Sprint Planning

Who Attends?	Team, Product Owner and ScrumMaster
When Happens?	First day of the sprint
Time-box	8 hours for 4 weeks sprint
Input	➢ Refined product backlog ➢ Latest product increment ➢ Projected team's capacity ➢ Team's prior performance
Outcome	✓ Sprint Goal ✓ Sprint Backlog

What Happens?



The purpose of the sprint-planning meeting is to arrive at a commitment to a sprint goal or set of product backlog items. The purpose of the meeting is not to come up with a list of tasks and hours. The tasks and estimates are a tool for determining what we can commit to.

Sprint Planning answers the following:

- What can be delivered in the Increment resulting from the upcoming Sprint?

- How will the work needed to deliver the Increment be achieved?

Topic 1: What can be done this Sprint?

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- The Product Owner discusses the objective that the Sprint should achieve.
- Product owner discusses the details of the items those need to be worked on in the sprint.
- Team forecast backlog items they think could implement in the sprint.
- Once the items are forecasted Team and Product owner crafts the sprint goal.

Topic 2: How will the chosen work gets done?

- Once the items for the sprint are selected, team discussed how it is going to implement them.
- Team talks about solutions, design, automation strategy and everything that is required to implement the items based on the “Definition of Done”.
- Team writes tasks required to implement each backlog item. Size of the tasks is generally smaller such that they could be completed in a day.
- During this time, Product Owner should be available to answer any questions team might have.
- It is completely up to the team to decide on how to implement the items.
- Team only can decide how many items it can implement in

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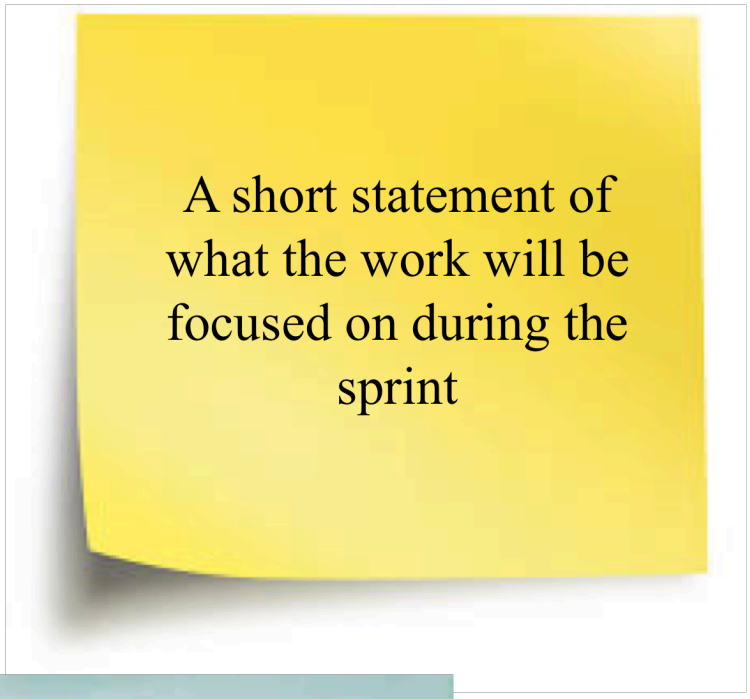
Sprint Goal



Sprint 5

Deliver basic user account setup functionality like registration and login

Sprint 6

Deliver basic user home page functionality like view, update account details

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How much to take on?

Calculate capacity of the team

- Add available hours of all members.
- Exclude holidays and time off.
- Leave some room for unforeseen work.

Write down the tasks for first item

- Tasks should cover all activities based on Definition of Done.
- Tasks are estimated in hours and are small enough to be completed in a day.
- Ask the team if they can commit completing this item

Tasks	Hours
Create UI template	4
Code controller	2
Code Service	8
Automate UI	2
Create database table	3
Manual Testing	6
Re-factor existing model	4
TOTAL	29

Repeat

Repeat the previous step until the team feels that they can't take on anymore items.

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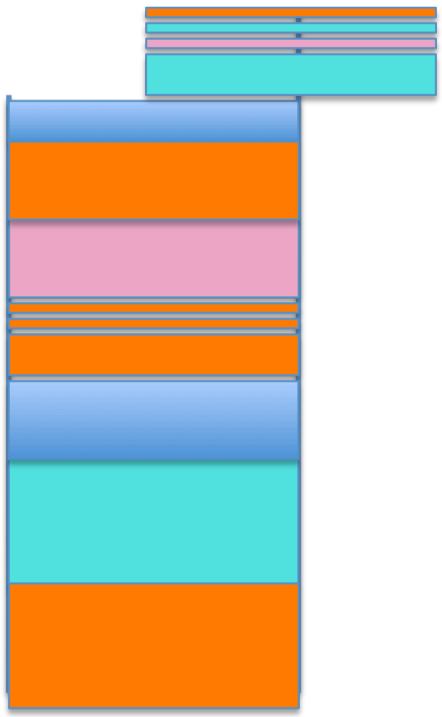
Sprint Backlog



- Highest priority items taken into the sprint for implementation and the plan to deliver those items is sprint backlog.
- Sprint Backlog is created during Sprint planning.
- Helps team see the total work involved in achieving the sprint goal.
- Development team creates and manages the sprint backlog. This includes updating the time left on each task, create any forgotten tasks, update the status of each task etc.

- Team should keep the status of the items up to date so that the sprint progress is transparent.
- All items should be updated at least once day.
- Team uses Daily Scrum meeting to inspect and adapt sprint backlog.

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Visual management of sprint backlog

Sprint backlog should be transparent and visible to all stakeholders. Many teams use physical task board which are very visible all the time. However, distributed teams use some kind of electronic tool to share the sprint backlog. However, it's preferable to have a physical task board over electronic tool for betted information radiation.

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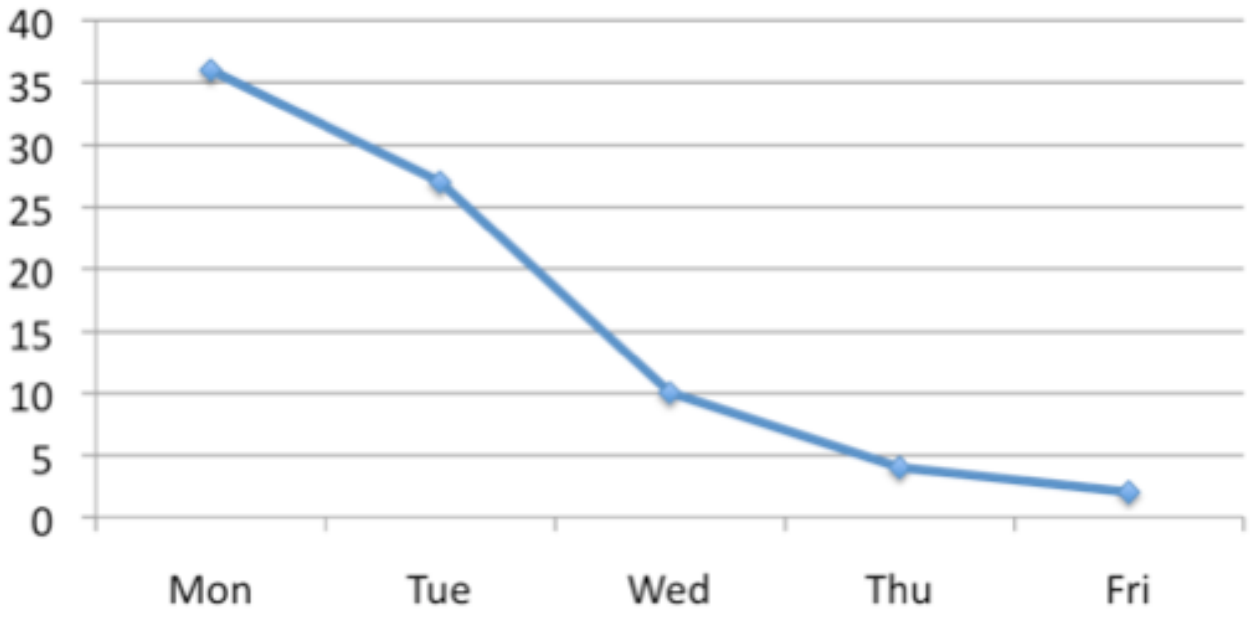
Tracking Progress

Task boards are great information radiators. It is preferred to have a physical board over an electronic tool. Task boards give better feel for the progress of the sprint.

Sprint Burndown Chart

- Primary method of tracking progress
- A burndown chart shows how much work is left as of a date.
- Scrum Master encourages team to use burndown chart as guidance in managing the sprint work.

Tasks	Mon	Tue	Wed	Thu	Fri
Design & Code UI	8	6	2		
Code Middle Tier	12	4			
Test Middle tier	12	16	8	4	2
Documentation	4	1			
Total work left	**36**	**27**	**10**	**4**	**2**



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Daily Scrum

Who Attends?	Team and ScrumMaster
When Happens?	Every day of the sprint
Time-box	15 minutes regardless of length of the sprint
Input	➢ Sprint backlog ➢ Sprint Goal
Outcome	✓ Plan for next 24 hours ✓ List of impediments if any

What Happens?

The purpose of the daily scrum meeting is for development team to sync up. The way team does this is by inspect and adapt the sprint backlog. Scrum master makes sure that the meeting is happening and facilitates if needed. Scrum master teaches the team how to stick to the timebox. Whole development team gets together and answers 3 questions:

- What did I do yesterday that helped the Development Team meet the Sprint Goal?
- What will I do today to help the Development Team meet the Sprint Goal?
- Do I see any impediment that prevents me, or the Development Team from meeting the Sprint Goal?

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Sprint Review

Who Attends?	Product Owner, Team and ScrumMaster
When Happens?	Last day of the sprint
Time-box	4 hours for 4 week sprint
Input	➢ Product backlog ➢ Product Increment ➢ Market Conditions
Outcome	✓ Feedback on product ✓ Updated product backlog ✓ Direction for the product

What Happens?



The purpose of the sprint review meeting is to inspect and adapt the product itself. Product owner invites few key stakeholders. Scrum master makes sure that the meeting is happening and teaches the team on how to complete it with in the timebox.

- Development team demonstrates the product increment built in the sprint to all attendees.
- Team talks about any impediments they have to work through while building the product.
- Stakeholders could give feed back if any.
- Product owner presents the product backlog as it is and discusses what is done and what is not.
- Stakeholders talk about market conditions, future direction etc.
- Product owner updates product backlog based on new learning.

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Sprint Retrospective

Who Attends?	Product Owner, Team and ScrumMaster
When Happens?	Last day of the sprint
Time-box	3 hours for 4 week sprint
Input	➢ Experiences in the sprint ➢ Current practices
Outcome	✓ Prioritized list of improvements

What Happens?



The purpose of the sprint retrospective meeting is to inspect and adapt the process, practices, tools and behaviors of scrum team members. Scrum master attends the accountability standpoint as well as helps the team complete the meeting with in the timebox.

- Scrum team talks about
  - What went well?
  - What didn't go well?
  - What are the improvements?

- Sprint retrospective is extremely important meeting and great opportunity for the team to inspect and adapt how they are working as a team?

- Great teams are important for scrum projects to succeed.

- Team comes up with list of improvements. If there are many improvements, Scrum Master help the team choose few high priority improvements.

- Team comes up with an action plan for chosen improvements.

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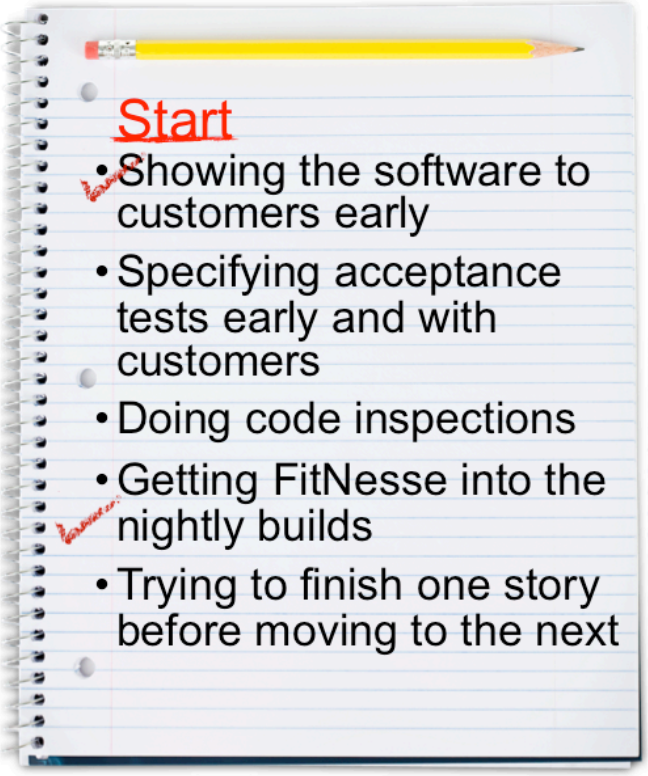
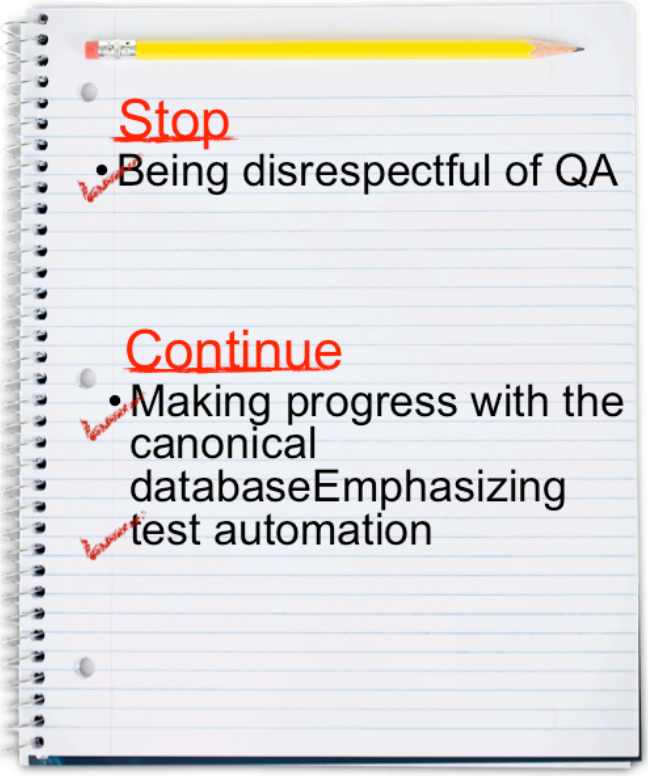
Simple technique for sprint retrospective

- There are many techniques to conduct sprint retrospective

- In Start/Stop/Continue technique, team talks about what went well that should continue, what didn't go well that should stop, what else we could start doing





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Sprint Planning

Who	
When	
Timebox	
What	
Input	
Outcome	

Daily Scrum

Who	
When	
Timebox	
What	
Input	
Outcome	

Sprint Review

Who	
When	
Timebox	
What	
Input	
Outcome	

Sprint Retrospective

Who	
When	
Timebox	
What	
Input	
Outcome	

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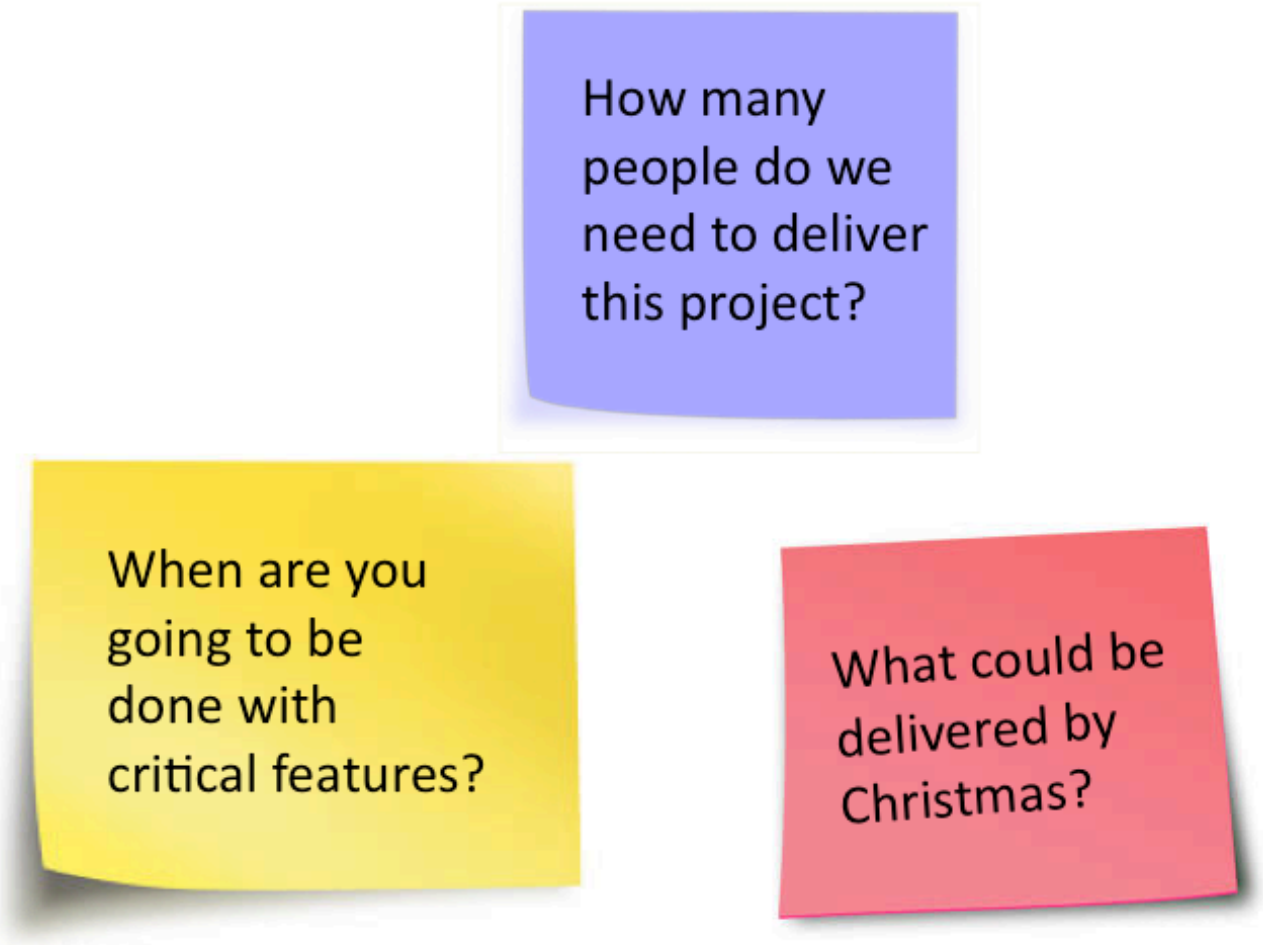
Release Planning



To answer such questions team needs to do some kind of long term planning. The release planning is a tentative plan for the whole release that covers several sprints.

Inputs for a release plan are:

- Estimated product backlog (or release backlog) that gives total size of the release.
- Velocity of the team, which represents productivity.
- Assumptions, Constraints and Risks.

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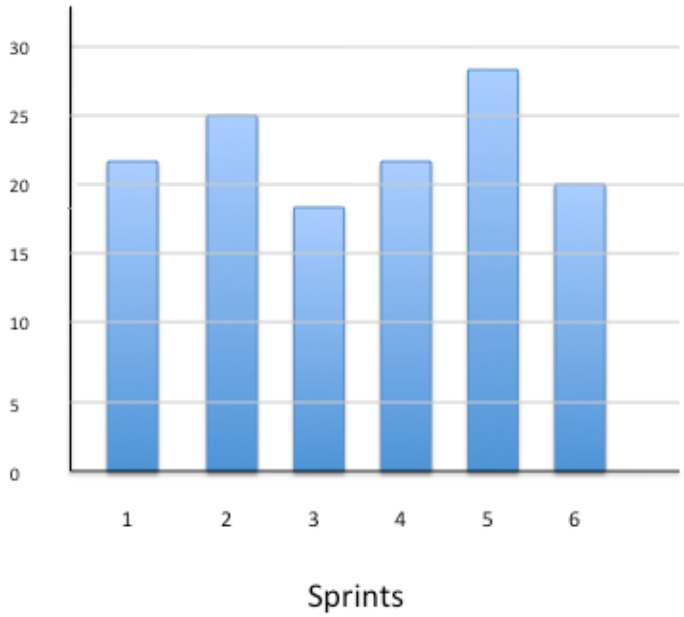
Total size of the backlog

- Development team estimates items in the backlog. Since all items won't be clear, the team makes their best guess.
- Any estimation technique like Planning Poker or Affinity Estimation could be used.
- Team can iterate over estimates until they feel that the over all estimate is roughly accurate.

Velocity

- A long-term measure that indicates how much work is "done" per sprint.
- Velocity is number of points completed per sprint.
- Partially finished stories don't count.
- Velocity varies in every sprint



How do we know team's velocity?

- If the team is in place for some time, look at the history of the team's velocity.
- If the team is new, run couple of sprints to establish the initial velocity.
- Use the average velocity over several sprints to predict the completion date.

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Let's plan a release

Let's say the release backlog of size 100 points. The team ran 4 sprints and had velocities of 8, 11, 9, 10.

Average velocity for 4 sprints: 38/4 = 9.5

Best velocity : 11

Worst velocity: 8

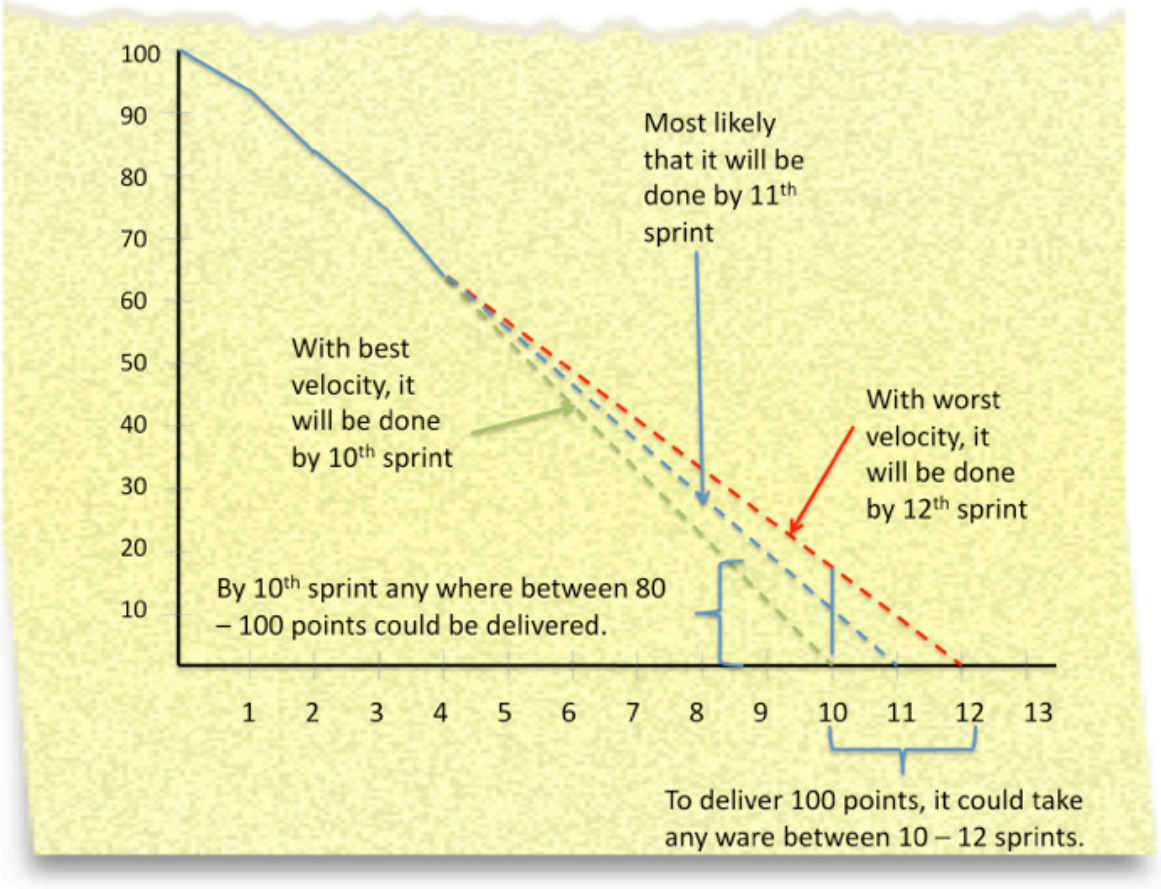
Remaining points after 4 sprints: 62

Required sprints to complete 62 points

@ Average velocity : 62/9.5 = 7 sprints (rounded up)

@ Best velocity : 62/11 = 6 sprints (rounded up)

@ Worst velocity: 62/8 = 8 sprints (rounded up



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Reading List

- Succeeding with Agile: Software Development Using Scrum by Mike Cohn
- Agile Estimating and Planning by Mike Cohn
- Agile Game Development with Scrum by Clinton Keith
- Agile Product Management with Scrum by Roman Pichler
- Agile Project Management with Scrum by Ken Schwaber
- Agile Retrospectives by Esther Derby and Diana Larsen
- Agile Testing by Lisa Crispin and Janet Gregory
- Coaching Agile Teams by Lyssa Adkins
- The Leaders' Guide to Radical Management by Stephen Denning
- The Software Project Manager's Bridge to Agility by Michele Sliger and Stacia Broderick
- User Stories Applied for Agile Software Development by Mike Cohn

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