Agile Project Development Method

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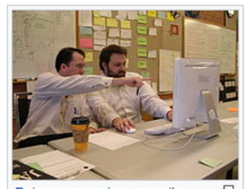
Overview [edit]

Iterative, incremental and evolutionary [edit]

Most agile development methods break product development work into small increments that minimize the amount of up-front planning and design. Iterations, or sprints, are short time frames (timeboxes) that typically last from one to four weeks. Each iteration involves a cross-functional team working in all functions: planning, analysis, design, coding, unit testing, and acceptance testing. At the end of the iteration a working product is demonstrated to stakeholders. This minimizes overall risk and allows the product to adapt to changes quickly.[22] An iteration might not add enough functionality to warrant a market release, but the goal is to have an available release (with minimal bugs) at the end of each iteration.[23] Multiple iterations might be required to release a product or new features. Working software is the primary measure of progress.[21]



Pair programming, an agile development technique used by XP. Note information radiators in the background.

Efficient and face-to-face communication [edit]

The principle of co-location is that co-workers on the same team should be situated together to better establish the identity as a team and to improve communication.[24] This enables face-to-face interaction, ideally in front of a whiteboard, that reduces the cycle time typically taken when questions and answers are mediated through phone, persistent chat, wiki, or email.[25]

No matter which development method is followed, every team should include a customer representative ("Product Owner" in Scrum). This person is agreed by stakeholders to act on their behalf and makes a personal commitment to being available for developers to answer questions throughout the iteration. At the end of each iteration, stakeholders and the customer representative review progress and re-evaluate priorities with a view to optimizing the return on investment (ROI) and ensuring alignment with customer needs and company goals.

In agile software development, an **information radiator** is a (normally large) physical display located prominently near the development team, where passers-by can see it. It presents an up-to-date summary of the product development status.[26][27] A build light indicator may also be used to inform a team about the current status of their product development.

Very short feedback loop and adaptation cycle [edit]

A common characteristic in agile software development is the daily stand-up (also known as the *daily scrum*). In a brief session, team members report to each other what they did the previous day toward their team's iteration goal, what they intend to do today toward the goal, and any roadblocks or impediments they can see to the goal.[28]

Quality focus [edit]

Specific tools and techniques, such as continuous integration, automated unit testing, pair programming, test-driven development, design patterns, behavior-driven development, domain-driven design, code refactoring and other techniques are often used to improve quality and enhance product development agility.[29] This is predicated on designing and building quality in from the beginning and being able to demonstrate software for customers at any point, or at least at the end of every iteration.[30]

What are the principles of an agile way of working?

The agile philosophy concentrates on empowered people and their interactions and early and constant delivery of value into an enterprise. Agile project management focuses on delivering maximum value against business priorities in the time and budget allowed, especially when the drive to deliver is greater than the risk. Principles include:

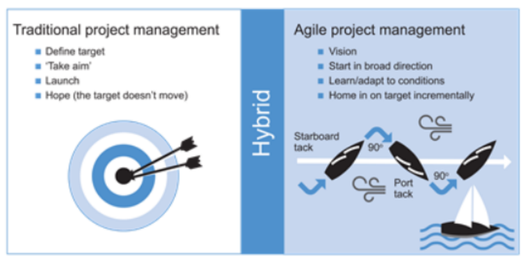


Diagram Source: Directing Agile Change

- The project breaks a requirement into smaller pieces, which are then prioritised by the team in terms of importance.
- The agile project promotes collaborative working, especially with the customer.
- The agile project reflects, learns and adjusts at regular intervals to ensure that the customer is always satisfied and is provided with outcomes that result in benefits.
- Agile methods integrate planning with execution, allowing an organisation to create a working mindset that helps a team respond effectively to changing requirements.

What are the differences between an agile and waterfall approach?

These four aspects highlight the difference between agile and waterfall (or more traditional) approaches to project management:

- Customer collaboration over contract negotiation;
- Individuals and interaction over process and tools;
- Responding to change over following a structured plan;
- Prototyping/working solutions over comprehensive documentation.

What are the benefits of agile working?

- Agile approaches empower those involved; build accountability; encourage diversity of ideas; allowing the early release of benefits; and promotion of continuous improvement.
- Agile helps build client and user engagement because changes are incremental and evolutionary rather than revolutionary: it can therefore be effective in supporting cultural change that is critical to the success of most transformation projects.
- Agile allows decision 'gremlins' to be tested and rejected early: the tight feedback loops provide benefits in agile that are not as evident in waterfall.

Scrum Project Development

Product owner

As the face of the team to the stakeholders, the following are some of the communication tasks of the product owner to the stakeholders:

- organise further meetings to demonstrate the solution to key stakeholders who were not present at a sprint review;
- defines and announces releases;
- communicates delivery and team status;
- share progress during governance meetings
- share RAID (Risks, Assumptions, Issues and Dependencies) with stakeholders
- negotiates priorities, scope, funding, and schedule;
- ensures that the product backlog is visible, transparent and clear.

Scrum master

The core responsibilities of a scrum master include (but are not limited to):[26]

- Helping the product owner maintain the product backlog in a way that ensures the needed work is well understood so the team can continually make forward progress
- Helping the team to determine the definition of done for the product, with input from key stakeholders
- Coaching the team, within the Scrum principles, in order to deliver high-quality features for its product
- Promoting self-organization within the team
- Helping the scrum team to avoid or remove impediments to its progress, whether internal or external to the team
- Facilitating team events to ensure regular progress
- Educating key stakeholders on Agile and Scrum principles
- Coaching the development team in self-organization and cross-functionality

Workflow [edit]

Sprint [edit]

Not to be confused with Hackathon § Code sprints.

A sprint (or iteration) is the basic unit of development in Scrum. The sprint is a timeboxed effort; that is, it is restricted to a specific duration.[28][*irrelevant citation*] The duration is fixed in advance for each sprint and is normally between one week and one month, with two weeks being the most common.[1]

Each sprint starts with a sprint planning event that aims to define a sprint backlog, identify the work for the sprint, and make an estimated forecast for the sprint goal. Each sprint ends with a sprint review and sprint retrospective,[12] that reviews progress to show to stakeholders and identify lessons and improvements for the next sprints.

Scrum emphasizes working product at the end of the sprint that is really done. In the case of software, this likely includes that the software has been fully integrated, tested and documented, and is potentially shippable.[27]

Scrum framework

Sprint planning [edit]

At the beginning of a sprint, the scrum team holds a sprint planning event[28] to:

- Mutually discuss and agree on the scope of work that is intended to be done during that sprint
- Select product backlog items that can be completed in one sprint
- Prepare a sprint backlog that includes the work needed to complete the selected product backlog items
- The recommended duration is four hours for a two-week sprint (pro-rata for other sprint durations) [14]
  - During the first half, the whole scrum team (development team, scrum master, and product owner) selects the product backlog items they believe could be completed in that sprint
  - During the second half, the development team identifies the detailed work (tasks) required to complete those product backlog items; resulting in a confirmed sprint backlog
    - As the detailed work is elaborated, some product backlog items may be split or put back into the product backlog if the team no longer believes they can complete the required work in a single sprint
- Once the development team has prepared their sprint backlog, they forecast (usually by voting) which tasks will be delivered within the sprint.

The Scrum process

Daily Scrum [edit]

Each day during a sprint, the team holds a daily scrum (or stand-up) with specific guidelines:

- All members of the development team come prepared. The daily scrum:
  - starts precisely on time even if some development team members are missing
  - should happen at the same time and place every day
  - is limited (timeboxed) to fifteen minutes
- Anyone is welcome, though only development team members should contribute.
- During the daily scrum, each team member typically answers three questions:
  - What did I complete yesterday that contributed to the team meeting our sprint goal?
  - What do I plan to complete today to contribute to the team meeting our sprint goal?
  - Do I see any impediment that could prevent me or the team from meeting our sprint goal?

A daily scrum in the computing room. This centralized location helps the team start on time.

Any impediment (e.g., stumbling block, risk, issue, delayed dependency, assumption proved unfounded)[29] identified in the daily scrum should be captured by the scrum master and displayed on the team's scrum board or on a shared risk board, with an agreed person designated to working toward a resolution (outside of the daily scrum). No detailed discussions should happen during the daily scrum.

Sprint review [edit]

At the end of a sprint, the team holds two events: the sprint review and the sprint retrospective.

At the sprint review, the team:

- reviews the work that was completed and the planned work that was not completed
- presents the completed work to the stakeholders (a.k.a. the demo)
- collaborates with the stakeholders on what to work on next

Guidelines for sprint reviews:

- Incomplete work cannot be demonstrated.
- The recommended duration is two hours for a two-week sprint (proportional for other sprint-durations).[14]

Sprint retrospective [edit]

At the sprint retrospective, the team:

- Reflects on the past sprint
- Identifies and agrees on continuous process improvement actions

Guidelines for sprint retrospectives:

- Three main questions are asked in the sprint retrospective: What went well during the sprint? What did not go well? What could be improved for better productivity in the next sprint?
- The recommended duration is one-and-a-half hours for a two-week sprint (proportional for other sprint duration(s))
- This event is facilitated by the scrum master