**When to use Agile in projects?**

Complex work an intense work that involves many interrelated factors and many unknowns at the same time needs adaptive planning.

**Product characteristics**

1. Functionalities (how useful it is)
2. Capabilities (what are its limitations)
3. Features (how well it serves its purpose)

**SCRUM**

A popular agile based framework for dynamic projects embodying the agile philosophy.

* Lockheed Martin 1940 American airline “skunk works” create a jet
  + Lean teams, efficient collaboration and quick decision making
* The new new product development game 1986 Hirotaka Takeuchi and Ikujiro Nonaka
  + Cross-functional team approach.
* SCRUM framework OOPSLA conference 1995 Ken Schwaber and Jeff Sutherland
  + Project management that emphasis on collaboration and adaption

**Scrum theory and structure**

Scrum is a lightweight framework designed to help people, teams and organizations generate value by finding adaptive solutions to complex problems.

**Scrum foundation (pillars)**

1. Transparency (open communication all parties involved)
2. Inspection (frequent checks)
3. Adaptation (adjust, immediate reaction)

**Scrum elements**

1. Artifacts (what):
   1. Product backlog
   2. Sprint backlog Note: this three generates the scope
   3. Increment
2. Scrum team (who):
   1. Product owner
   2. Development team Note: cohesive cross-functional unit
   3. Scrum master
3. Events (how):
   1. Sprint planning
   2. daily scrum Note: all of this are generated in a sprint
   3. sprint review
   4. sprint retrospective meeting

**Scrum artifacts**

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

1. ***Product backlog*** older list of older tasks that need to be executed to:
   1. *Build the product*
   2. *Further develop the product*
   3. *Improve the product*

* It contains the requirements (functionalities, features and attributes) the final product should possess.
* Each element is a Product Backlog item [PBI]
* Is implemented through sprints.

1. ***Sprint backlog*** user stories and Epics
   1. How useful the product is
   2. How easy it is to work with it
   3. How fast it is
   4. What the user experience is like

**User stories in Agile and Scrum:** one sentence description of a specific desire (capability of the system, a product feature) [Users]

**“**As a user I want to be able to…**” “**in order to…**”** (gives value)

Representative users (stakeholders) brainstorm together and generate the user stories, product owner gives the user stories

**Epics in Agile and Scrum:** In Scrum an Epic is consider a big piece of work with refers into an important set of product requirements, it can be broken down into small pieces of work (1 epic = # user stories)

Note: if the feature can be created within a single sprint is a user story

**Increment and incremental delivery**

In the scrum methodology each of the completed parts of the product is referred as an increment. Each increment is a tangible, usable piece of the product that delivers value.

The goal of every sprint is to create an increment or increments that are fully functional, tested and ready to be used.

When an increment is release, it can start benefiting early before the whole development is completed.

***Time to market:*** period between having an idea and the moment of having an actual product introduced to the market. (beneficial on software development projects the most important functionalities are programmed first).

**What is MVP (Minimum Viable Product) in Agile**

The early version of the product that which include the most important functionalities and capabilities to make the product viable or usable in practice.

Posses the minimum number of features that will enable the organization to start using it.

**Key elements of scope definition and management:**

* User stories
* Epics
* Releases
* MVP

**Scrum roles: product owner**

Projects are done by people and for people (collaboration in project team and project owners)

The person who owns the product backlog including all the aspects and decisions to it.

* Are responsible for defining and validating the requirements (user stories an epics).
* Review all outputs and validate if the requirements are meet.
* Approve the final product
* Represents the organization for which the product of the project is created (project client)
* Often is a Sr. or manager (head of sales, head of marketing, head of it) [strategic view and detailed expertise]
* Work closely with the team
* Provide constructive feedback (why the output is not meeting the desire standards)
* The one who can approve the change in the priority of the backlog items.

**Scrum roles: development team**

People creating physically the product, the IT engineers.

* How much time is needed to achieve all of them?
* Are all of them achievable at all?
* Are there any other solutions to the same problem, which may be better?

Scrum demand high quality of the product and flexible adaption to changes.

* Asses the related work from technical perspective
* Determine how much effort each user story requires

The amount of ***effort*** is measured in story point.

Responsibility assigns story points to each PBI (Product backlog item).

*Note: take first the ones which have a small number of story points if the urgency and importance are identical*

Capacity of the team (how many story points can be delivered in a sprint) **[Velocity]**

*Note: you can work series or parallel.*

**Scrum roles: scrum master**

The responsibilities:

* Support product owner and development team
* Validate the work is in line with scrum goals
* Coordinate activities between them
* Main point of communication between scrum team and the stakeholders.
* Comprehensive backlog planning
* Efficient management of the backlog along with any changes
* Coordination between team members
* Removal of any roadblocks or issues in front of the team
* Coach & mentor (building knowledge in scrum practices and values)
* Ensure the correct adoption
* Train & coach sessions, and use retrospective (search for improvement)

**Scrum events**

* Sprints fixed length events of (2-4 weeks)
  + Sprint planning (Product owner -> sprint goal, development team -> allocate PBIs) [Sprint backlog]
  + Daily scrum (development team, product owner, scrum master) [progress and adjustments]
    - What did you do yesterday?
    - What will you do today?
    - Are there any obstacles that might prevent you for completing your tasks?
  + Sprint review (achievements, feedback and update product backlog) [stakeholders, customers and other interested parties]
  + Sprint retrospective (methods, adaptation, improvement)
    - Backlog refinement (grooming) [review and adjust backlog]