



Software Development with Scrum

Andrea Polini

Software Project Management
MSc in Computer Science
University of Camerino

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What is Scrum?

Scrum

is an **Agile methodology** – i.e. a collection of practices combined with ideas, advice, experience (BoK) – to software system development

- certainly the **most adopted** agile methodology

Which are the most important characteristics?

Scrum embodies the following practices:

- Three main roles in Scrum: **Product Owner – PO**, **Scrum Master – SM**, **Team Member – TM**
- The **product owner** creates and maintains a **product backlog**
- The team runs timeboxed month-long **sprints**. The requirements for the current sprint are called the **sprint backlog**
- The team meets for a **daily standup meeting** in which **everyone talks** through the work they did the day before, the work they plan to do today, and any obstacles in their way
- the **Scrum master** keeps the project rolling by working with the team to get past “roadblocks”. He/she drives the **sprint review** and the **retrospective**

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Scrum basic rules – Sprint planning

- 1 **Attendance:** SM, PO, TMs
- 2 Meeting divided in **two different parts**, each one lasting 4 hours – **Exploration** and **Operative plan** – duration can be reduced according to the duration of the sprint
- 3 PO comes with an **already prioritized backlog**
- 4 1st part of the meeting: PO and TMs works together to **select items to be delivered** during the next sprint. The **sprint backlog** is formed.
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- 2 **Period:** every day
- 3 **Duration:** 15 minutes (timeboxed) – **everyone should be on time!**
- 4 **Characteristics:** stand-up meeting
- 5 **Objective:**
 - What have I done since the last daily scrum?
 - What will I do between now and the next daily scrum?
 - What obstacles and roadblocks are in my way?
- 6 **Follow-up meeting** among interested members to further elaborate on possible emerged issues

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Building the team

If you are asked to organize the team for the next project, and you would like to give a try to SCRUM, consider that:

- People **do not come on board if they are not convinced**. In teams accustomed to WF like processes people can be reluctant to accept the challenge
- **You need support by the management**
- Try hard and be persuasive

Consultants vs. Team members

- Team members are generally multitalented and have variegated interests
- Consultants are generally much more specialised and they are considered gurus in their specific competence
- Team member are full tim onth eproject
- Consultants are enrolled when needed and they can enter the project for a single sprint. When involved they are peer with respect to team members

To build the team list the competences and skills you need on the rows of a table. Add a column for each potential team candidate rating each quality with a mark within 1 and 5. Cover all the skill and competences you need with team members and consultants trying to get the maximum sum. Teams generally include within 5 and 9 people

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Scrum basic rules – Sprints

- 1 **Duration:** typically within 2 and 4 weeks, or a month.
- 2 **Characteristics:** timeboxed
- 3 **How to:** as soon as a TM recognizes he/she has overcommitted report to PO, that then will have to **inform the users/stakeholder**
- 4 Product backlog should be visible to everyone. Generally sprints cannot be stopped (in case the PO)

Scrum basic rules – Sprint closing

- 1 The software is presented to the stakeholders (only the **running part of the system, no diagrams are admitted**)
- 2 stakeholders are asked to **provide their opinions and feedbacks**. The PO possibly update the PB.

Scrum basic rules – After the sprint

- 1 Retrospective meeting is held. Each one answers to the following questions:
 - What went well?
 - What can improve in the future?
- 2 SM takes notes and possibly adds items to the PB for non functional items

Roles – Scrum Master

The SM is not the traditional PM in a **command-and-control project**. The SM does not own and maintain the plan. Guiding the team is his main responsibility. The SM:

- **drives** the team in the adoption and usage of scrum practices
- **protects** the team from “unfair” requests from the PO
- **helps** TMs to feel ownership for the project

Roles – Product Owner

- The PO is the one who made the **commitment to the company**
- The PO is generally **acquainted with the business domain** of the project
- should get the TMs able to understand the goals of the project, so that they can commit to the project itself
- s/he meets **everyday** with the TMs and takes **day-to-day decisions** to drive the project, possibly **changing the backlog**
- The **PO manages the PB** prioritizing the items in it
- brings the **view of users and stakeholders** in the project.

Commitment

Promise made by people to **gets certain things done**, usually by a certain time

Commitment vs. involvement

A Pig and a Chicken are walking down the road

The Chicken says: Hey Pig, I was thinking we should open a restaurant!

Pig replies: Hm, maybe; what would we call it?

The Chicken responds: How about 'ham-n-eggs'?

The Pig thinks for a moment and says: No, thanks. I'd be committed, but you'd only be involved!

Commitment refers to each role and should be fostered by each other

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Scrum values

Every company has a culture (e.g. separation of duties, transparency). When the **culture matches agile values and principles** the adoption of agile methodologies will be much more successful. Scrum has its own values:

- Courage
- Commitment
- Respect
- Focus
- Openness

Courage

Team members have the courage to stand up for the project . . . Scrum teams have the courage to live by values and principles that benefit the project. It takes courage to ward off the constant pushback from a company whose values clash with the Scrum and agile values.

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Each person is committed to the project's goals. . . team has the authority to make decisions in order to meet project' goals, and everyone can influence how the project is planned and executed

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Respect

Team members respect each other ... then they trust each other to do a good job with the work they've taken on.

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Focused

Everyone is focused on the work . . . a TM working on a sprint should not be distracted by other activities for the duration of the sprint (full time assignment). Switching people among activities lead to waste of time and money

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Openness

The teams value openness. . . when you're working on a Scrum team, everyone else on the team should always be aware of what you're working on and how it moves the project toward its current goals.

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Daily Scrum

The Daily Scrum

It functions as an **inspection of the work that the team is doing**, so TMs can **adapt that work to deliver the most value**. And it gives the team the opportunity to **make decisions at the last responsible moment**, giving the flexibility to have the **right person do the right work at the right time**

Team mood

- interested - listen to colleagues statements
- collaborative - if you can help do it
- humble - people generally make mistakes

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Daily Scrum – How to

How to hold an effective Daily Scrum

- Act like a “pig” – do not ignore the “to do” column
- Take detailed conversation off-line
- Take turns going first
- Don't treat like a ritual
- Everyone participates
- Don't treat it like a status meeting
- Inspect every task
- Change the plan if it needs to be changed

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Sprints and Planning

Scrum is based on:

- **Iterative and Incremental** approach to software development
- **Effective project planning**
- **Frequent delivery of running software (value to customer)**
- **User needs defined in User stories**

User Stories

What is it?

A simple and quick description of a **specific way that the user will use the software**. Generally between **one and four sentences** long stays in a 3×5 index card

- They permit to **deliver value to the customer**
- **Reduce the risk of gold-plating**

Can generally follow a template:

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User stories and satisfaction conditions

Nominate a video for an achievement

As a returning user with a large friends list,
I want to nominate one friend's video
for an achievement
so that all of our mutual friends can vote
to give him a star.

User stories and satisfaction conditions

Nominate a video for an achievement

Conditions of satisfaction

- * A user can nominate a video for an achievement
- * A user's friend is notified when his video gets an achievement
- * A user can see all of the videos his friends have nominated
- * A video with an achievement is displayed with a star next to it

Story points

Useful tool to assess the **effort needed** to elaborate a user story. The objective is to assign a value to each user story using a comparative analysis

- 1 value each story between 1 and 5 (or 10)
- 2 Or use Fibonacci numbers ($f_0 = 1, f_1 = 1, f_n = f_{n-1} + f_{n-2}$)

How?

- discussion among team members
- Planning poker

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Story points qualities

- They are simple
- They are not magic
- The team is in control of them
- They get your team talking about estimates
- Developers are not scared of them
- They help the team discover exactly what a story means
- They help everyone on the team become genuinely committed

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Team velocity and sprint planning

Velocity

Measure of the **ability of the team to satisfy story points** within a single sprint.

Sprint planning:

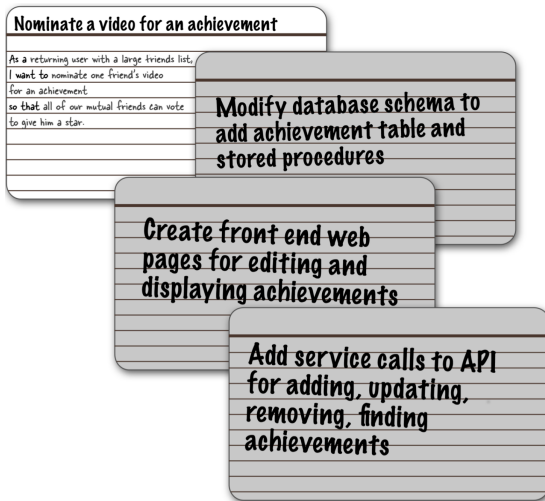
- Select the most valuable stories for which the sum is smaller than the velocity (**stay below**)

Running sprint

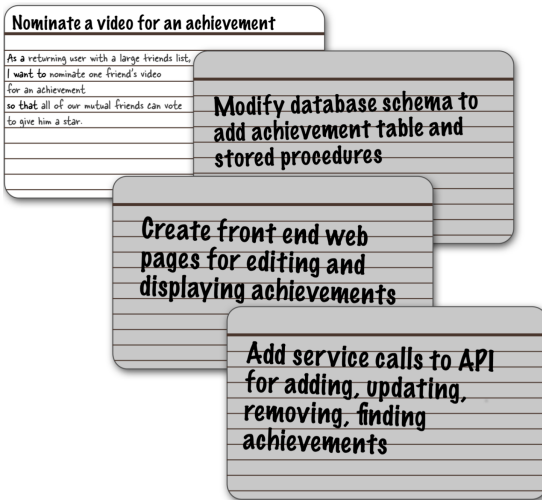
Let's consider a general sprint backlog, how do we plan the sprint?

- Consider the user stories in the sprint backlog and **detail them on needed activities**, where each activity does not require **more than one day to complete** (2nd planning meeting lead by the SM)
- group cards **together with the user story**
- proceed iteratively selecting one card per time and **move them among the columns of the backlog**
- if the the sprint ends and there are still cards non fully implemented, **move them back to the product backlog**

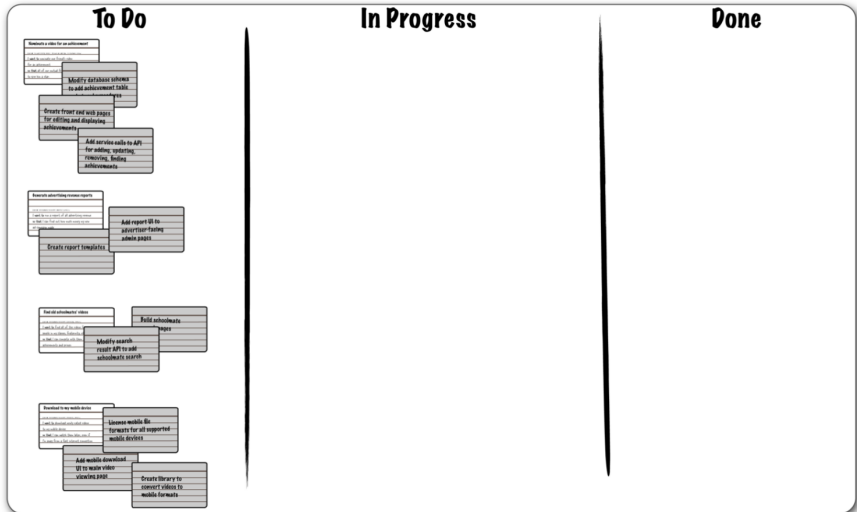
User stories and activities



Story decomposition



Sprint Backlog - example



still on velocity

How can you define your velocity for a new team at the first sprint?

Alternatives

- Take data from similar teams, working in similar contexts
- Make a “random” guess
- Do not define velocity and postpone the decision

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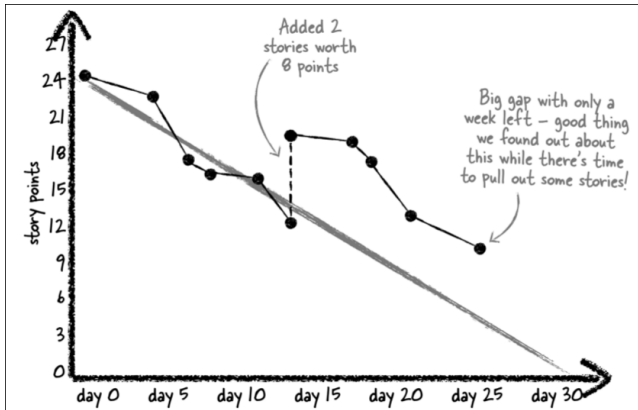
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Sprint execution and burndown charts

When the sprint starts:

- Draw a **burndown chart**
- report points acquisition for “**done done**” stories
- in case you **add stories** to the sprint report it in the chart

Burndown chart sample



Determining Sprint Length

General Guidelines and Relevant Factors

- ▶ No one-fits-all solutions (from 1 to 4 weeks)
- ▶ Consider customer availability and location
- ▶ Consider need for feedbacks and requirements clarity
- ▶ Consider team ability to decompose work
- ▶ Consider project duration
- ▶ Consider established engineering practice within the team

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General Guidelines and Relevant Factors

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How do you know you are done?

“Done” dimensions

- ▶ ... with a story
- ▶ ... with a sprint
- ▶ ... release to integration
- ▶ ... release to production

How to

- ▶ Brainstorming session
- ▶ Categorization session (Development, Testing, Project Management, Other)
- ▶ Sorting and Consolidation
- ▶ Creation and publishing

Release Planning

Does SCRUM suggest to not derive release plans?

- ▶ Sketch a preliminary release plan
 - ▶ Estimated, ordered, and prioritized product backlog
 - ▶ Team velocity
 - ▶ End-of-sprint dates
- ▶ Establish degree of confidence
- ▶ Revise the plan every sprint

Key to success

- ▶ Communicate up front and often
- ▶ Update the release plan after every sprint
- ▶ Try to do the highest-priority items first
- ▶ Refine estimates on bigger items
- ▶ Deliver working software

Decomposing stories and tasks

Writing stories and tasks of the right size can mean the difference between succeeding with Scrum and failing miserably

Setting the stage

Three flavors stories – epics, themes, stories

- ▶ Redesign the user interface for the document editor
- ▶ Redesign the menu bar for the document editor
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Tasks should not need more than two days to complete

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Rule of thumbs for good decompositions

- Can the team estimate the product backlog in story points?
- Is there clarity on the stories in the backlog?
- How precise are your stories, and what is the right precision? Is it testable?
- Do I understand this story well enough to do it myself?

FAQs

- How does a scrum team deal with **dependencies between tasks**?
- This all sound good in theory, but **can it really work** on a real project?
- The “**last responsible moment**” seems to be a bit risky. Isn't it a better idea to plan up front, even if that plan has to change?
- Don't **programmers suck at planning** – especially for projects, which are inherently unpredictable?
- Isn't unrealistic to promise that you will have **working software to demonstrate at the end of each sprint**? What if the team is working on something that cannot really be demonstrated?

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