Introduction to SCRUM

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What is SCRUM?

- It is best not to read what is in the recommended text on SRUM ☺
- Instead read the SCRUM handbook:
  - https://www.scrumguides.org/docs/scrumguide/v2017/2017-Scrum-Guide-US.pdf
- SCRUM is an open development framework with a simple set of rules that
  1. improves productively
  2. take change into account
  3. enables creativity
- It provides a project management framework
  - It advocates much of XP so could be seen as a superset of XP
- Invented in 1993
  - By Jeff Sutherland (and others) at Easel corporation
 - With roots in Toyota business culture and Aikido

SCRUM today

- SCRUM is used extensively in the software industry
- It is slowly beginning to become the preferred way of becoming agile
  - Adopted by many well-known companies including Citrix Online, Google, IBM, Microsoft, Oracle, Siemens, Yahoo….
- SCRUM is very easy to understand
  - So companies do not have a large learning burden to understand the basics
- SCRUM is not always easy to execute
  - So companies realise that though simple, finding the best way to extract the value of Scrum is not easy
- For example, it is not hard to see the value of pair programming, but working in pairs is not always easy
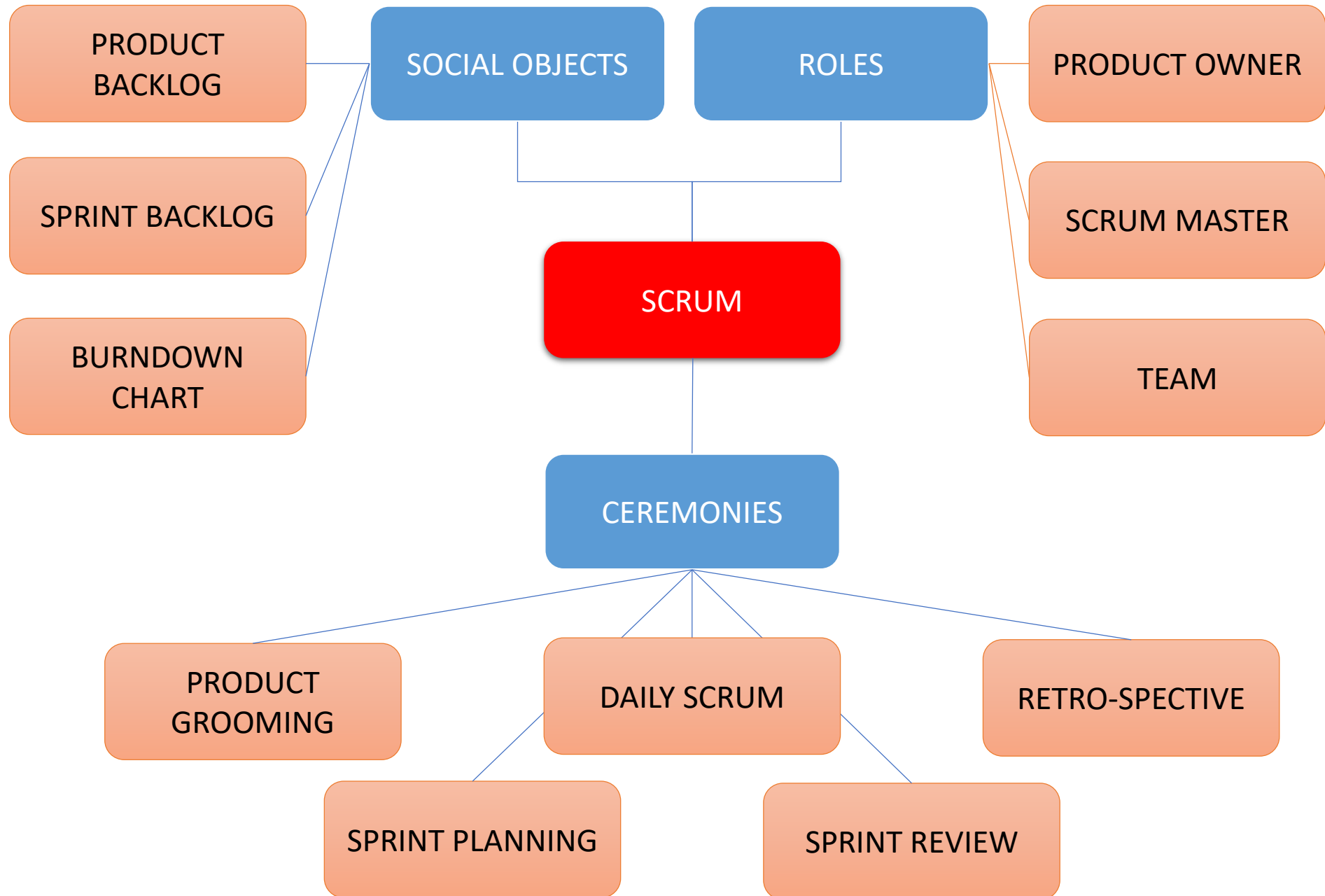
The SCRUM approach (summary)

Source: Adapted from *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle.
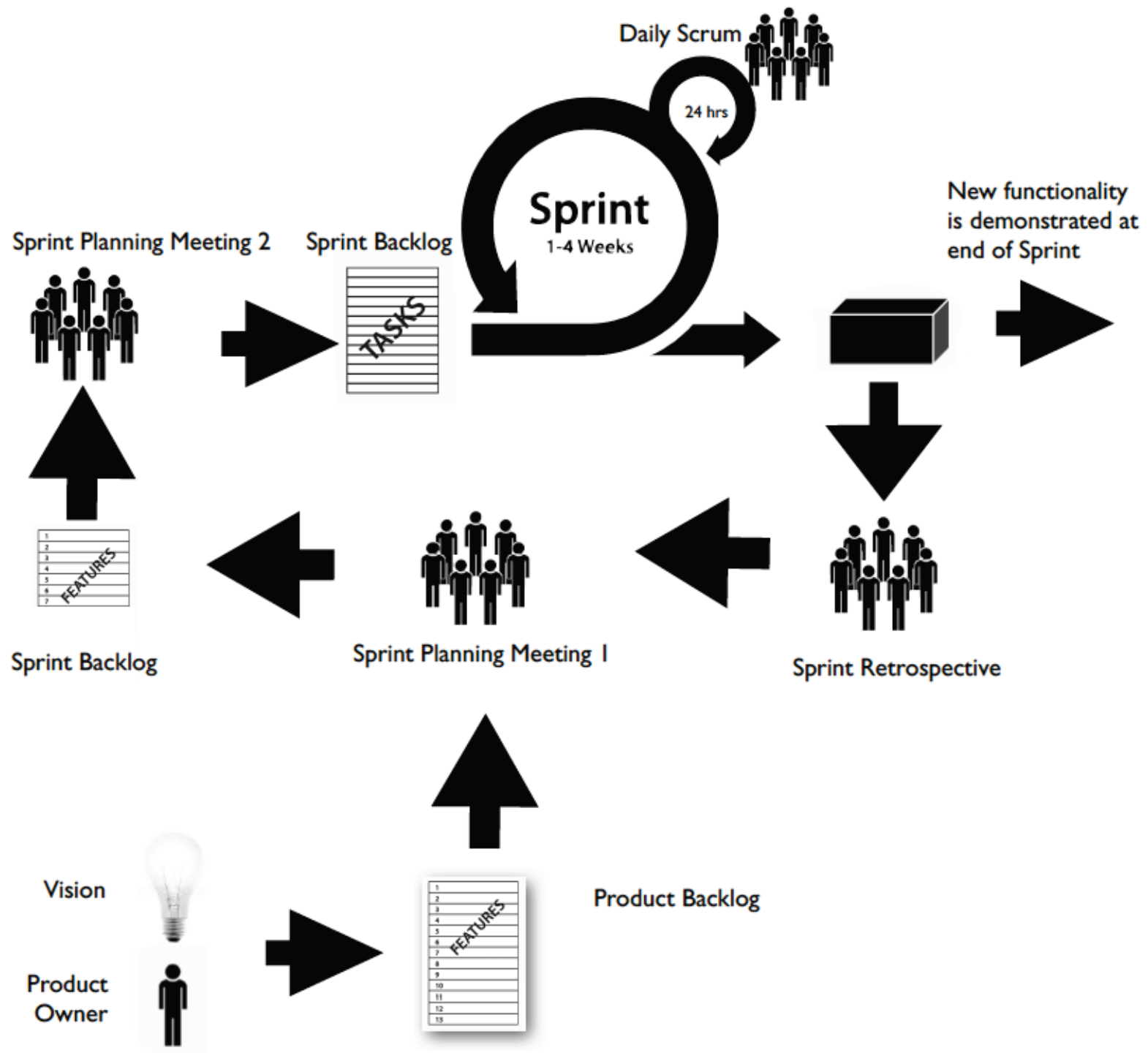
The SCRUM approach (detail)

Roles – Product Owner and Scrum Master

- Product Owner
  - Maintains the product backlog, constantly reordering and refining
  - Single representative of all product stake-holders

Management of Backlog · · · Analysis of Product Vision

PRODUCT OWNER

Co-ordination with Scrum Master · · · Modulating Development Team

- Scrum Master
  - Guides and protects the team from interruptions
  - Facilitates the daily Scrum
  - Removes impediments which block the team
  - Checks everyone understands and follows Scrum
  - Not at all a Project Manager – does not assign tasks

Here are all the things a *Scrum Master Does*

Change · Mirror · Other Tasks · Meetings · Team Dynamics · Learning · Product · Big Picture

- assert (Product Owner != Scrum Master)

Roles – Development team

- Scrum teams work towards achieving the sprint's goal
- Work on backlog item (discussed later) take part in scrum ceremonies (discussed later)
- Development Teams have the following characteristics:
  - Self-organizing
  - Cross-functional
  - Minimizes titles
  - Size: small enough to remain nimble and large enough to complete significant work (> 3 & < 5)

dev team

Product Owner

- The Product Owner is responsible for maximizing the value of the product resulting from 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 Backlog management includes:

  - Clearly expressing Product Backlog items;

  - Ordering the items in the Product Backlog to best achieve goals and missions;

  - Optimizing the value of the work the Development Team performs;

  - Ensuring that the Product Backlog is visible, transparent, and clear to all, and shows what the Scrum Team will work on next; and,

  - Ensuring the Development Team understands items in the Product Backlog to the level needed.

- The Product Owner may do the above work, or have the Development Team do it. However, the Product Owner remains accountable.

- The Product Owner is one person, not a committee. The Product Owner may represent the desires of a committee in the Product Backlog, but those wanting to change a Product Backlog item's priority must address the Product Owner.

- For the Product Owner to succeed, the entire organization must respect his or her decisions. The Product Owner's decisions are visible in the content and ordering of the Product Backlog. No one can force the Development Team to work from a different set of requirements.

Scrum Master

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- The Scrum Master is responsible for promoting and supporting Scrum as defined in the Scrum Guide. Scrum Masters do this by helping everyone understand Scrum theory, practices, rules, and values.

- 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.

Scrum Master Service to the Product Owner

- The Scrum Master serves the Product Owner in several ways, including:
    - Ensuring that goals, scope, and product domain are understood by everyone on the Scrum Team as well as possible;
    - Finding techniques for effective Product Backlog management;
    - Helping the Scrum Team understand the need for clear and concise Product Backlog items;
    - Understanding product planning in an empirical environment;
    - Ensuring the Product Owner knows how to arrange the Product Backlog to maximize value;
    - Understanding and practicing agility; and,
    - Facilitating Scrum events as requested or needed.

Scrum Master Service to the Development Team

- The Scrum Master serves the Development Team in several ways, including:
  - Coaching the Development Team in self-organization and cross-functionality;
  - Helping the Development Team to create high-value products;
  - Removing impediments to the Development Team's progress;
  - Facilitating Scrum events as requested or needed; and,
  - Coaching the Development Team in organizational environments in which Scrum is not yet fully adopted and understood.

Scrum Master Service to the Organization

- The Scrum Master serves the organization in several ways, including:
  - Leading and coaching the organization in its Scrum adoption;
  - Planning Scrum implementations within the organization;
  - Helping employees and stakeholders understand and enact Scrum and empirical product development;
  - Causing change that increases the productivity of the Scrum Team; and,
  - Working with other Scrum Masters to increase the effectiveness of the application of Scrum in the organization.

Roles – The Team

- The Team
  - Breaks down product backlog items into tasks
  - Estimate effort required for tasks
  - Choose top-priority items from the product backlog for each sprint
    - Note: only the team decide this
  - Do the actual design, development, testing, documentation
  - Become self-organizing (the team decides who does what)
  - Ideal team size is 7+/- 2 people, but fewer is feasible

Social Objects– Product/Sprint backlogs

- Product Backlog
  - List of requirements for a product in priority order
  - Expressed as user stories:
    - "As an amazon.com user, I want to view my past purchases sorted by price of the products I bought"
  - High priority requirements are more detailed
  - May contain features, engineering goals, bugs to fix, etc.
  - Continuously evolving!

- Sprint Backlog
  - List of items selected from product backlog for a sprint
  - Stories are broken down into tasks
  - Effort / complexity is estimated in time or "story points"

Social Objects – Burndown chart

- Burndown Chart
  - Simple graph of remaining effort over time
  - Immediate visibility of whether backlog tasks are likely to be achieved
  - Updated daily
  - May be a Spreadsheet or whiteboard

20-Day Sprint Burndown Chart
Sprint 2.6
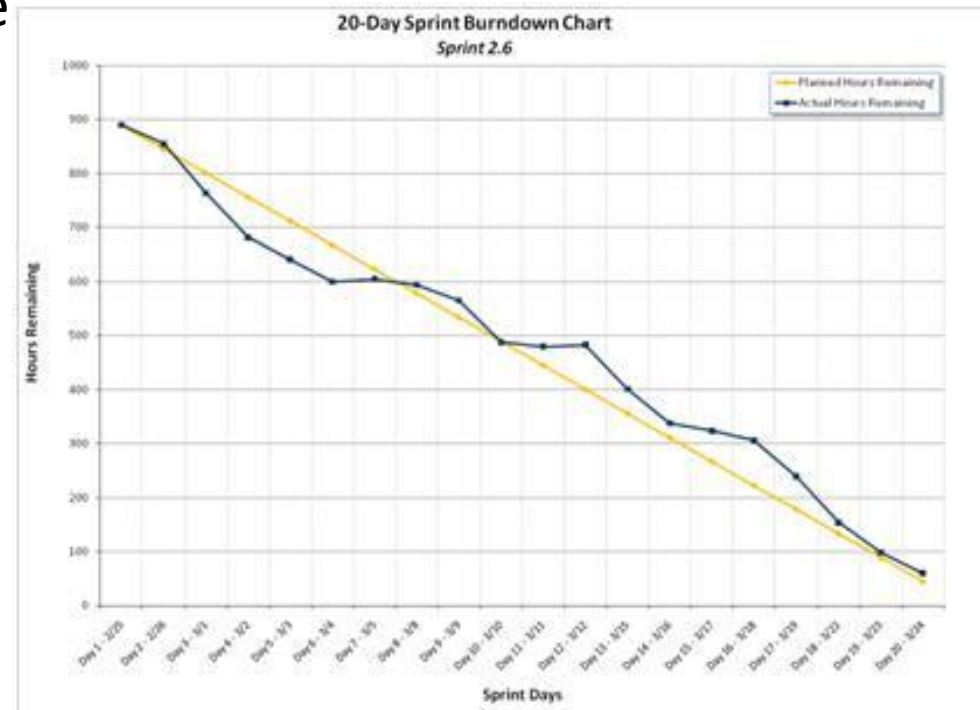
Social Objects – SCRUM Board

- Scrum Board
  - Task-based progress indicator
  - E.g. whiteboard with a Post-it note for every task
  - Columns indicate tasks states:
    - Not started | in progress | development complete | done
  - Post-it notes move from left to right over a sprint
  - Should be visible and accessible to all
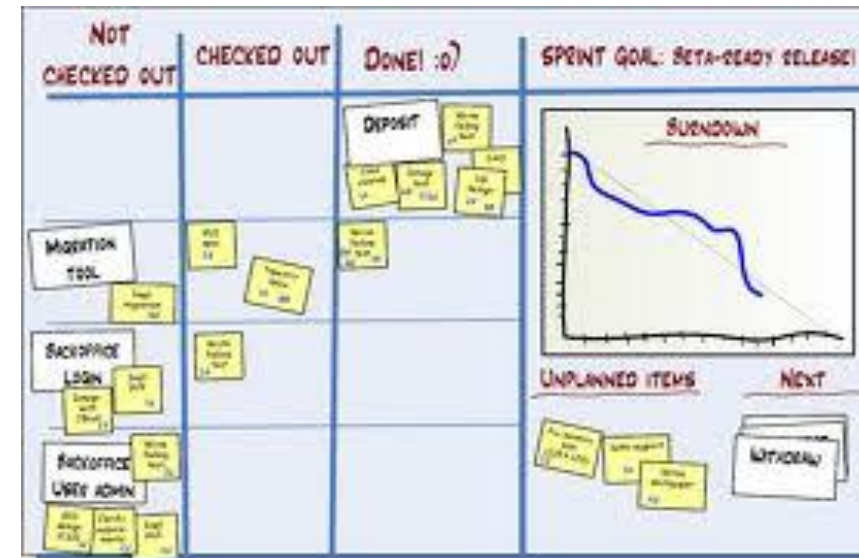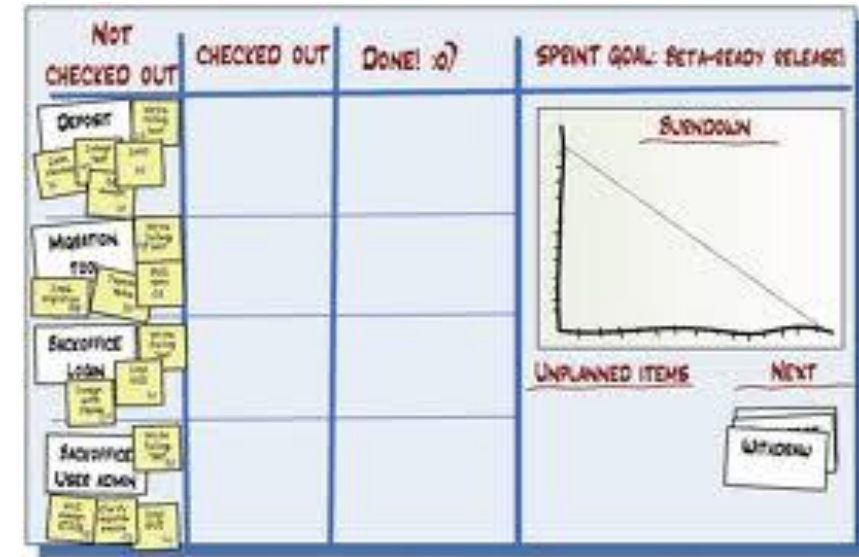
Ceremonies

- Sprint Planning
  - Creating the sprint backlog
  - Breakdown of user stories into tasks
- Daily Scrum – Unique to SCRUM. Every day you say:
  - What did I do yesterday
  - What will I do today
  - What impediments stopped me from being more productive
- Sprint review
  - What did we achieve in this sprint
  - Demo
- Sprint retrospective
  - What can we do better in the next sprint

Scrum Artifacts

Scrum's artifacts represent work or value to provide transparency and opportunities for inspection and adaptation.

Artifacts defined by Scrum are specifically designed to maximize transparency of key information so that everybody has the same understanding of the artifact.

Product Backlog

- The Product Backlog is an ordered list of everything that is known to be needed in the product.
    - It 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.
- The Product Backlog lists all features, functions, requirements, enhancements, and fixes that constitute the changes to be made to the product in future releases.
- Product Backlog items have the attributes: description, order, estimate, and value.
- Product Backlog items often include test descriptions that will prove its completeness when "Done".

Product Backlog

- Higher ordered Product Backlog items are usually clearer and more detailed than lower ordered ones. More precise estimates are made based on the greater clarity and increased detail; the lower the order, the less detail. Product Backlog items that will occupy the Development Team for the upcoming Sprint are refined so that any one item can reasonably be "Done" within the Sprint time-box. Product Backlog items that can be "Done" by the Development Team within one Sprint are deemed "Ready" for selection in a Sprint Planning. Product Backlog items usually acquire this degree of transparency through the above described refining activities.

Sprint Backlog

- The Sprint Backlog is the set of Product Backlog items selected for the Sprint, plus a plan for delivering the product Increment and realizing the Sprint Goal. The Sprint Backlog is a forecast by the Development Team about what functionality will be in the next Increment and the work needed to deliver that functionality into a "Done" Increment.

SCRUM for COMP3613

- You are not expected to know all the ins and outs of SCRUM (e.g. enterprise SCRUM, distributed SCRUM, etc.)
  - You should know a little bit about each of the roles, social objects and ceremonies of SCRUM
- However, you should read the SCRUM handbook
  - it will help you in your project
- For your project, you will use a few of the SCRUM ideas
  - Incremental development lets me see where you are
  - You can experience the SCRUM roles as you develop SW
  - You need to have some SWE theory and practice not in SCRUM

Further Reading

- The Scrum Handbook:
  - https://www.scrumguides.org/docs/scrumguide/v2017/2017-Scrum-Guide-US.pdf
- Scrum and XP
  - Henrik Kniberg: Scrum and XP from the trenches