Agile Software Development with the Scrum Framework

Frank Burkholder (credit R. Henning)

Objectives

- Be able to explain the difference between Waterfall and Agile project management methodologies

- Give a few reasons why Agile is a better approach than Waterfall for software development

- Describe the Scrum Framework

- How we (and you) use Agile Scrum to manage your projects.

Project Management (PM)

.. is the practice of initiating, planning, and executing the work of a team to achieve specific goals and success criteria at the specified time.

The primary challenge of project management is to achieve all of the project goals within the given constraints. – Wikipedia

"Those who plan do better than those who do not plan, even though they rarely stick to their plan." – Winston Churchill.

Funny (and jaded) PM quotes from LinkedIn

"Any project can be estimated accurately (once it's completed)."

"Nothing is impossible for the person who doesn't have to do it."

"The person who says it will take the longest and cost the most is the only one with a clue on how to do the project."
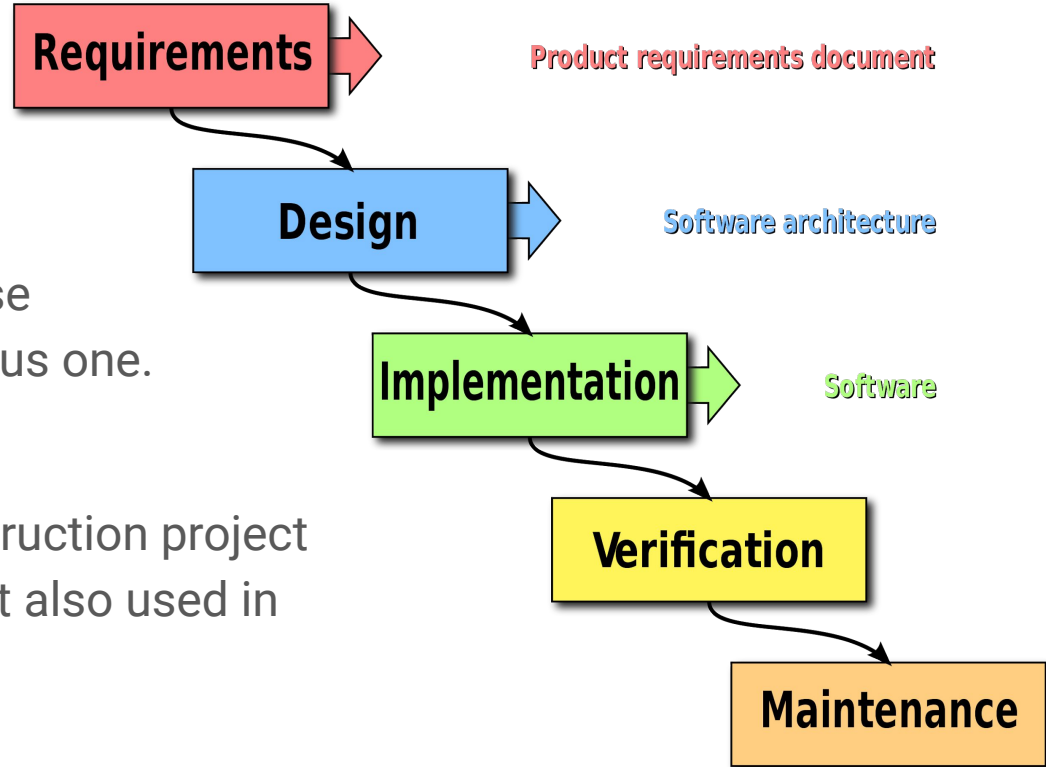
"The first 90% of a project takes 90% of the time, the last 10% takes the other 90%."

"All project managers face problems on Monday mornings - good project managers are working on next Monday's problems."

PM - Waterfall methodology

The waterfall model is a breakdown of project activities into sequential phases, where each phase depends on the results of the previous one.

More common in engineering/construction project that have component lead times, but also used in software development.

Requirements → Product requirements document

Design → Software architecture

Implementation → Software

Verification

Maintenance

PM - Waterfall methodology

Waterfall advantages

- Forced to think about entire project from beginning to end

- Start and end point of each phase is set, so it's easy to measure progress

- Can identify long lead-term items and ensure they are started/ordered early

- Tasks remain stable throughout the project

- Straightforward to sell to a client

- All the work that went into designing the project keeps it on track (resisting outside forces that want to change it).

PM - Waterfall methodology

Waterfall disadvantages

- It takes a long time to get started - writing and documenting requirements, as well as looking forward to evaluate project risks, takes time.

- Need strict monitoring of schedule otherwise project likely falls behind.

- Client will not see project in-development, only final project.

- What if, mid-project, something has to change?

  - Proposed approach won't work, or
  - Client's requirements have changed!

Enter another PM paradigm, the Agile Manifesto

http://agilemanifesto.org/

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

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

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

Agile software development

In Agile software development:

- Requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and their client.
    - A group of people, with complementary skill sets, are given the responsibility of getting the job done. They frequently check-in with the client to make sure it's what the client wants.

- It advocates adaptive planning, evolutionary development, early delivery, and continual improvement, and it encourages rapid and flexible response to change. -- Wikipedia

Agile advantages

Agile advantages:
- You can deploy software quicker, so your customer can get value sooner rather than later
- You waste fewer resources because you always work on up-to-date tasks
- You can better adapt to change
- You can detect and fix issues faster
- You spend less time on bureaucracy and busywork
- You can get immediate feedback (which also improves team morale)
- You don't have to worry about premature optimization
- You can experiment and test ideas as you go

source

Agile disadvantages

Agile disadvantages:
- Documentation tends to get sidetracked, which makes it harder for new members to get up to speed
- It's more difficult to measure progress than it is in Waterfall because progress happens across several cycles
- Agile demands more time and energy from everyone because developers and customers must constantly interact with each other
- Projects can become ever-lasting because there's no clear end (and no final budget)
- Teams can get sidetracked into delivering new functionalities at the expense of technical debt, which increases the amount of unplanned work
- Features that are too big to fit into one or even several cycles are avoided because they don't fit in nicely into the philosophy

source

The Scrum Framework: how to implement Agile

The Agile: Scrum Framework at a glance
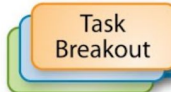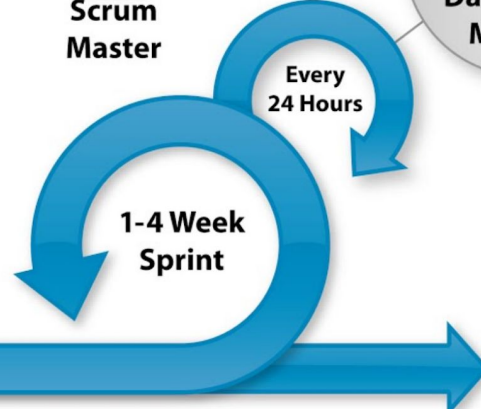
Sprint Story points/Tasks/Status/Burndown chart
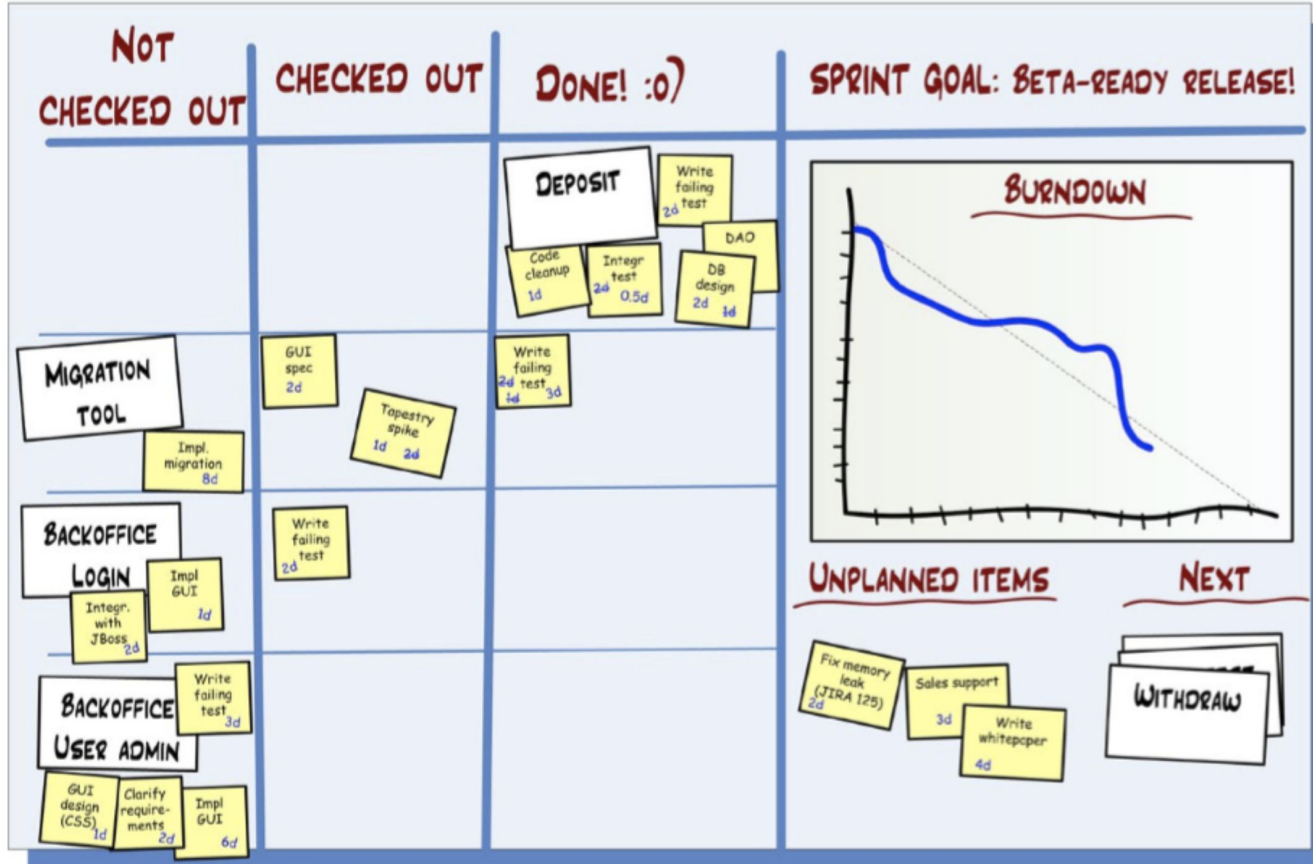
Wikipedia Burn-down chart

Using Agile Scrum to manage your capstones

- As the product owner, you create the Product Backlog (what do you want to deliver, and what high-level steps are required to get there?)

- Meet with an instructor to create a one-week sprint backlog with more detailed tasks (we'll do it during your sprint meeting).

- Encourage you to create a scrum board to track your progress (and learn!)
  - Demo [Trello](#)

- Daily scrum meetings in the morning. The focus of these meetings will be:
  - What you accomplished yesterday
  - What you're working on today
  - What issues you're having

- The Sprint Review will be the presentation of your project.

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Reference

- Scrum and XP from the Trenches
  - Free pdf online. Currently here.