Agile S/W Process Model

SCRUM

Scrum

- Not an acronym – derived from observing a rugby scrum
- Iterative software development process
  - Empirically controlled (rather than rigid, plan-based)
  - Focuses on maximizing business value
  - Constant improvement and priority/risk driven

Scrum is an empirical process

- Empirical processes do not specify software development activities in advance….
  - Treat the development process as a black box.
  - Development starts with a *best estimate at what will work*. Then the process is regularly inspected at defined intervals (i.e., every day), assessed, and adjusted, if necessary.
  - Process is not well-defined, but based around techniques that focus on *learning from past experience*.
  - Knowledge is used for *guidance going forward*, not for repeatability of past actions.
  - Requires a high level of trust from the client

Roles in Scrum

- Product Owner
  - Manages the vision, ROI and decides on when to release the product into a production environment,
  - Understands business level risks as well as consequences of actions/ decisions from a business perspective,
  - Develops and maintains the product backlog – team assists.
- *Scrum Master*
  - Owns the process, motivates/coaches/guides team,
  - Ensures that the team does not go off target -- makes all project level decisions and ensures that the team has the necessary environment, information to deliver on the vision within the constraints set.
- Scrum team member
  - Plan tasks, manages their commitments and works as a team to achieve the vision set for them. Responsible for delivery of functionality.

Product Backlog

- Product backlog
  - Features, architecture, defects, quality attributes, constraints, etc.
  - Everything currently assessed to be necessary to bring project to completion (could be features not yet implemented, bugs not yet resolved, documents not yet written, etc.)
  - Owned by the 'product manager or product owner' – single role ownership
  - Non-binding (effort) estimates for each item in the backlog are put forward by the product owner/manager – the team assists in this effort.

Scrum Team and Sprinting

- Once the product backlog is ready and estimates put forward - the team starts the sprint (i.e. the iteration), during which they will address chosen backlog items (the sprint backlog)
  - Sports metaphor – once the game starts, the rules cannot be changed, i.e. the sprint (product) backlog cannot be revised (until end of the sprint).
  - Each sprint is *30 calendar working days* (approx. 1½ months in business working days).
  - The team is *self-organising* (as is a footy team) – under the guidance of the *scrum master* (this is a role – does not mean a separate person is needed 100% for this).
  - Team expands backlog into tasks and gets to work on them.
  - Team should be 7 members (+/- 2) [less than 5 discouraged]
    - Hypothesis – *odd member teams work better*

Sprint – Before and After

- Before each sprint session – the team takes time to plan for the sprint
  - Product owner, Scrum master and team meet to prioritise the functional requirements and organise the work,
  - The team identifies the set of functionality they can deliver – the choice is made by assessing business value of the functionality; this is the **sprint backlog**
  - Ends in a short (but formal) presentation outlining the commitment from the team – any stakeholder may attend this session.
- After the sprint – the team reviews the previous iteration (sprint) and identifies what they can learn from it all
  - Similar to an iteration retrospective but includes a presentation of the work done in the previous iteration (i.e. a product functionality demonstration)

Sprint Planning

- The following activities are undertaken in a sprint planning session
  - ☐ Sprint planning meeting time/date set (Scrum master)
  - ☐ Product backlog is presented, with any information helpful to the team from the business (Product owner)
  - ☐ Select product backlog items for the sprint (Entire Team)
  - ☐ Define the goal (vision) for the sprint (Product Owner)
  - ☐ Construct sprint backlog (Scrum team + Scrum Master)
  - ☐ Formal presentation to stakeholders (Scrum master)

Daily Scrum

- In short it is nothing more than a *stand-up meeting*
- Every team member answers the following questions:
  1. What did you do since the last Scrum?
  2. What are you doing until the next Scrum?
  3. What prevented you from doing work?
- No detailed discussions in this forum – the aim here is to *increase transparency*, not debate!
- Must be held at the ‘same time, same location’ every day
- Scrum master responsible for correcting information gained from Question 3
- Some quick decisions may be taken, left to the discretion of the scrum master (works best just for information gathering)

Scrum master solve this obstacles

Main Strength of Agile

Managing Sprints

- Burn-down charts are used to get an idea of progress – quantitative data is essential for this
  - Burn-down charts use estimated hours remaining on the project (in terms of work/effort)
  - The slope of the line is used to derive *team velocity*
- Information gained in daily meeting used to cross-verify data being shown on burn-down chart
- A number of sprints is generally undertaken before a product is released

Challenges when using Scrum

- Need a good, effective manager
  - Must be willing to make positive changes (quickly)
  - Must constantly monitor both quantitatively and qualitatively
- Team makes most decisions normally made by managers in traditional approaches – challenging to implement in practice
  - Managers are not generally encouraged to lead this way
- Not every person is happy to accept responsibility for their own actions, the amount of transparency makes it hard to be average
  - Some people work better in a structured environment where work is delegated – not everyone is comfortable making decisions

Benefits of Scrum

- A *transparent development process*
- Productivity increases – once transition is made
- Improvements are slow, but continuous
  - The transparency forces the team to take corrective actions – a sports team would not intentionally take actions to lose
- Accepts software development is not always a predictable, stable and repeatable process
  - Progress is made even when requirements are evolving
  - Constant feedback, empirical evidence to guide team
  - Team communicates better

User Story

- In Scrum projects, the Product Backlog is a list of user stories.
- These User Stories are prioritized and taken into the Sprint Backlog in the Sprint Planning Meeting.
- User Story is narrated from user perspective regarding what he wants to have rather that what system can do for him.

The User Story Structure

As a *<Type of User>*,

I want *<To Perform Some Task>*,

So that *<I can achieve some goal/benefit/value.>*

User Story: Import Gmail Contacts

As a registered user,

I want to automatically follow all of my Gmail contacts that have twitter accounts,

So that I can easily be able to follow my friends' tweets.

From User Story to Tasks

Feature extraction

- ❑ Add a new **Import Contacts** page
- ❑ Add a new **Gmail authentication** screen
- ❑ Add a service to **get contacts from Gmail**
- ❑ Add a **Twitter authentication** screen
- ❑ Modify the **contact** class to accommodate Gmail specific data
- ❑ Modify the **contacts data schema**
- ❑ **Save contacts** to the database

Roles

Product Owner: Set priorities

ScrumMaster: Manage process, remove blocks

Team: Develop product

Stakeholders: observe & advise

Key Artifacts

Product Backlog
- List of requirements & issues
- Owned by Product Owner
- Anybody can add to it
- Only Product Owner prioritizes

Sprint Backlog
- List of tasks
- Owned by team
- Only team modifies it

Burn Down Chart
- Shows estimated vs actual effort of the scrum tasks
- Shows the work remaining

Sprint Goal
- One-sentence summary
- Declared by Product Owner
- Accepted by team

Blocks List
- List of blocks & unmade decisions
- Owned by ScrumMaster
- Updated daily

Increment
- Version of the product
- Shippable functionality (tested, documented, etc.)

Key Meetings

Sprint Planning Meeting
- Hosted by ScrumMaster; ½-1 day
- **In:** Product Backlog, existing product, business & technology conditions

1. Select highest priority items in Product Backlog; declare Sprint Goal
2. Team turns selected items into Sprint Backlog

- **Out:** Sprint Goal, Sprint Backlog

Daily Scrum
- Hosted by ScrumMaster
- Attended by all
- Same time every day
- **Answer:** 1) What did you do yesterday? 2) What will you do today? 3) What's in your way?
- Team updates Sprint Backlog; ScrumMaster updates Blocks List

Sprint Review Meeting
- Hosted by ScrumMaster
- Attended by all
- Informal, 4-hour, informational
- Team demos **Increment**
- All discuss
- Hold **retrospective**
- Announce next Sprint Planning Meeting

Development Process