

## What is Scrum?



- ❖ Scrum is a simple framework for project management on complex projects
- ❖ Extremely simple, but exceptionally hard

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## Scrum -- Introduction

- ❖ SCRUM is a loose set of guidelines that govern the development process of a product, from its design stages to its completion.
- ❖ SCRUM has been successfully employed by hundreds of different companies in many different fields, with outstanding results.
- ❖ There are many similarities between SCRUM and XP, but one of the major differences is that SCRUM is a fairly general set of guidelines that govern the development process of a product
  - ~ SCRUM is often used as a "wrapper" for other methodologies, such as XP or CMM, to guide the overall process of development when using these other methodologies.

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## SCRUM Values

- ❖ The SCRUM values are derived from the Agile values of software development:
  - ~ Individuals and interactions over processes and tools
  - ~ Working software over comprehensive documentation
  - ~ Customer collaboration over contract negotiation
  - ~ Responding to change over following a plan

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## The Origins of Scrum

- ❖ "The new new development game", Takeuchi & Nonaka, Harvard Business Review, 1986.
- ❖ "SCRUM Development Process", Ken Schwaber.

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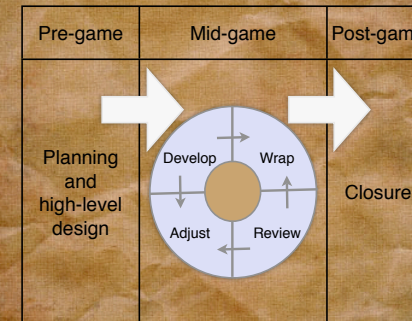
## Companies Using Scrum (among others)

- ❖ Microsoft
- ❖ Google
- ❖ Yahoo
- ❖ SAP
- ❖ Motorola
- ❖ Cisco
- ❖ Oracle
- ❖ IBM
- ❖ Nokia
- ❖ Qualcomm
- ❖ Philips
- ❖ Siemens
- ❖ Toyota
- ❖ Xerox
- ❖ Adobe
- ❖ Sun

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## The SCRUM Process

- ❖ The scrum process has 3 main phases:



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## Sprint Cycle



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## 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, Product Backlog

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## Daily SCRUM Meeting

- ❖ A 15-minute SCRUM meeting is held every day
- ❖ The SCRUM Master asks the three questions, and all members of the team and interested parties take part and give feedback
- ❖ The meeting should be held at the same time and place every time, so that people know where to go

1. What have you accomplished since the last meeting?
2. Are there any obstacles in the way of meeting your goal?
3. What will you accomplish before the next meeting?

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## 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

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## Sprint



- ❖ In the sprint the features selected at the Sprint Planning Meeting will be implemented
  - ~ Develop the product further - implement, test, and document.
  - ~ Wrap up the work - get it ready to be evaluated and integrated.
  - ~ Review the work done in this sprint.
  - ~ Adjust for any changes in requirements or plans.

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## Creating A Backlog

- ❖ The product owner compiles all the requests and specifications that are the basis of the changes of the product, e.g. new functions and bug fixes. After the goals have been defined, the entirety is broken down into segments
- ❖ Each segment should in part create business value and in part be sub-deliverable
- ❖ A prioritised list is made at the same time – the product owner personally makes the decisions at this point
- ❖ When it is time to start a new Sprint, the product owner “freezes” the foremost items on the to-do list and summons the SCRUM team to a meeting

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## Backlog

1. Product Backlog -- a repository for requirements targeted for release at some point. High level requirements with high level estimates provided by the product stake-holders
2. Release Backlog - Requirements pulled from the product backlog and identified and prioritised for an upcoming release. Contains more details about the requirement and low level estimate which are usually estimated by the team
3. Sprint Backlog - A result from each sprint planning is a backlog of requirements/sub-requirements estimated to be completed at the end of the sprint where the requirements from the release backlog are broken down into manageable chunks that can be accomplished typically in 8 - 16 hours.

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## The Scrum Team

- ♦ The SCRUM team consists of 2 groups:
  - ~ the interested team, which consists of people who are interested, but who will not be doing the work
  - ~ the working team -- people who are interested, and will be doing the work on the project

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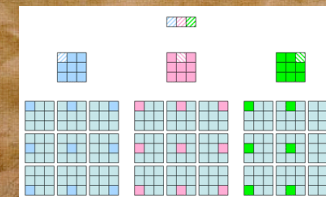
## The Scrum Team, cont'd

- ♦ A SCRUM is a self-empowered team where everyone had the global view of the product on a daily basis
- ♦ The development team should perform as a sport team, every team member working independently but towards the same goal
- ♦ A team typically 6-9 working members, although SCRUM has been successfully used with more members
- ♦ The team members decide how the work is arranged and how assignments are distributed
- ♦ There are no set project roles -- everyone should be able to swap tasks with another member

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## The Scrum Team, cont'd

- ♦ If a project is run in more than one SCRUM team, there should be people to act as bridges between the teams
  - ~ attending meetings of more than one SCRUM team
  - ~ act as a communication bridge between the teams



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## The team leader (SCRUM Master)

- ❖ The team's leader is called the SCRUM Master
- ❖ The SCRUM Master should be one of the members of the working team -- that is, he should be one of the people who is actually doing the work on the project
- ❖ The SCRUM Master measures progress, removes impediments, and leads the team meetings



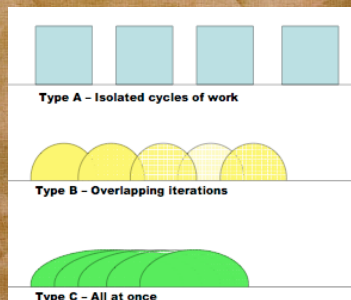
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## The Product Owner

- ❖ The product owner represents the voice of the customer and ensures that the Scrum team works with the right things from a business perspective
- ❖ The product owner administers a product Back-log
- ❖ The product owner is often a customer, but can also be part of the internal organisation

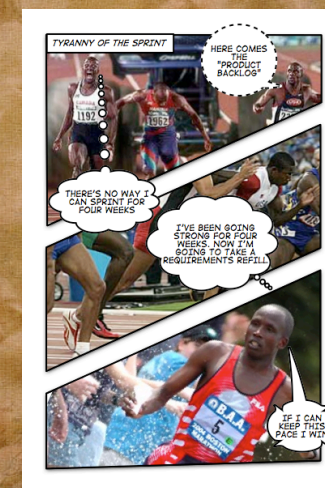
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## SCRUM divided into 3 types by Jeff Sutherland



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## Tyranny of the Sprint



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# *eXtreme Programming*

## XP Roles

### ♦ **Customer**

- ~ Writes User Stories and specifies Functional Tests
- ~ Sets priorities, explains stories
- ~ May or may not be an end-user
- ~ Has authority to decide questions about the stories

### ♦ **Programmer**

- ~ Estimates stories
- ~ Defines Tasks from stories, and estimates
- ~ Implements Stories and Unit Tests

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## XP Roles, cont'd

### ♦ **Coach**

- ~ Watches everything, makes sure the project stays on course
- ~ Helps with anything

### ♦ **Tracker**

- ~ Monitors Programmers' progress, takes action if things seem to be going off track.
- ~ Actions include setting up a meeting with Customer, asking Coach or another Programmer to help

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## XP Roles, cont'd

### ♦ **Tester**

- ~ Implements and runs Functional Tests (not Unit Tests!)
- ~ Graphs results, and makes sure people know when test results decline.

### ♦ **Doomsayer**

- ~ Ensures that everybody knows the risks involved
- ~ Ensures that bad news isn't hidden, glossed over, or blown out of proportion

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## XP Roles, cont'd

### ♦ **Manager**

- ~ Schedules meetings (e.g. Iteration Plan, Release Plan), makes sure the meeting process is followed, records results of meeting for future reporting, and passes to the Tracker
- ~ Possibly responsible to the Gold Owner.
- ~ Goes to meetings, brings back useful information
- ~ Pays for pizza

### ♦ **Gold Owner**

- ~ The person funding the project, which may or may not be the same as the Customer

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## XP Practices

XP is based on 12 key practices:

- ♦ The Planning Process
  - ~ Release Planning & Iteration Planning
- ♦ Frequent, Small Releases
- ♦ System Metaphor
- ♦ Simple Design
- ♦ Test Driven Development
- ♦ Refactoring
- ♦ Pair Programming
- ♦ Collective Code Ownership
- ♦ Continuous Integration
- ♦ Sustainable Pace
- ♦ On-site Customer
- ♦ Coding Standard

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## Stages of an XP project

### ♦ **Initiation**

- ~ User Stories

### ♦ **Release Planning**

### ♦ **Release (each Release is typically 1 -6 months)**

- ~ Iteration 1 (typically 1 -3 weeks)

#### ♦ **Development**

#### ♦ **Deployment**

#### ♦ **Acceptance Testing**

- ~ Iteration 2

#### ♦ **Development**

#### ♦ **Deployment**

#### ♦ **Acceptance Testing**

- ~ ...

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## Gathering Requirements

### ♦ **Responsibilities**

- ~ Key Point: The Customer is responsible for the requirements.
- ~ Programmers help to gather and clarify requirements. Customers especially need help with non-functional requirements and with working out the details of acceptance tests.

### ♦ **Documentation**

- ~ User Stories
- ~ Acceptance Test Cases

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## User Stories

- ❖ A short description of the behaviour of the system from the point of view of the Customer
- ❖ Use the Customer's terminology without technical jargon
- ❖ One for each major feature in the system
- ❖ Must be written by the users
- ❖ Are used to create time estimates for release planning
- ❖ Replace a large Requirements Document

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## User Stories cont'd

- ❖ Drive the creation of the acceptance tests:
  - ~ Must be one or more tests to verify that a story has been properly implemented
- ❖ Different than Requirements:
  - ~ Should only provide enough detail to make a reasonably low risk estimate of how long the story will take to implement.
- ❖ Different than Use Cases:
  - ~ Written by the Customer, not the Programmers, using the Customer's terminology
  - ~ More "friendly" than formal Use Cases

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## User Stories cont'd

- ❖ User stories have three crucial aspects:
- ❖ Card
  - ~ Enough information to identify the story
- ❖ Conversation
  - ~ Customer and Programmers discuss the story to elaborate on the details
  - ~ Verbal when possible, but documented when required
- ❖ Confirmation
  - ~ Acceptance tests to confirm that the story has been properly implemented

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## Acceptance Tests

- ❖ Formal test to determine if a system satisfies its acceptance criteria, i.e. the User Stories!
- ❖ Should be automated, but may simply be a series of repeatable steps
- ❖ At least one Acceptance Test for each Story

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## Release Planning

- ❖ Customer defines the business value of desired features (User Stories)
- ❖ Programmers provide estimates of 1, 2 or 3 "points"
- ❖ Stories larger than 3 points must be split into smaller stories
- ❖ Customer decides which Stories are to be included in a Release
- ❖ Focus on completing the Stories with the highest business value and highest risk first

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## Release Planning cont'd

- ❖ Stories for a Release are arranged into 1-3 week Iterations
- ❖ Higher risk, and higher priority stories in earlier Iterations
- ❖ For new system, the 0:th Iteration defines the basic skeleton of the application and infrastructure required
- ❖ The Release and Iterations have fixed dates for completion – dates are fixed, scope is variable
- ❖ This is the Release Plan

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## Iteration Planning

- ❖ Stories for Iteration are broken down into Tasks by Programmers
- ❖ Tasks are estimated by all Programmers as a group
- ❖ Programmers "sign up" for Tasks, and estimate the time to complete
- ❖ Can only sign up for as many points as were completed in the last Iteration
- ❖ Once development begins, Project Velocity measures progress

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## Programmer Tests

- ❖ Automated tests written to test the behaviour of individual classes
- ❖ Fundamental to XP, and maintaining a flat cost curve
- ❖ XP uses a Test First mentality; write the test, then write to code to make the test pass.
  - ~ "Never write a line of code without a failing test." (Kent Beck)
- ❖ No code goes into production unless it has associated tests
- ❖ Tests are written first
- ❖ Tests determine what code you need to write

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## Programmer Tests cont'd

- ♦ Programmer Tests must run at 100% before code is integrated
- ♦ At most one test failing at any time
- ♦ "Grey-box" testing
- ♦ Assist with Refactoring (promote Courage)
- ♦ Testing frameworks exist for many languages:
  - ~ JUnit for Java
  - ~ CPPUNIT for C++
  - ~ NUnit for all .Net languages

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## *One-Hour-Scrum*

## 59-Minute Exercise

Complete Sprint Planning Meeting	10 min
Conduct a Sprint "Day 1"	10 min
Conduct a Daily Scrum Meeting	05 min
Conduct a Sprint "Day 2"	10 min
Conduct a Sprint Review/Demo	06 min
(per team x4)	
Debrief the exercise	15 min
Questions	15 min

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## Sprint Planning 10 min

- ♦ Review the Product Backlog
- ♦ Select an achievable Sprint Goal together with Product Owner
- ♦ Determine what the number of features might be that your team can complete
- ♦ Think about initial assignments
- ♦ Produce a Sprint Backlog on team worksheet

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## Example Sprint Backlog

- ❖ **Sprint Goal:** Explain Entertainment
- ❖ **Potential effort:** 6 members \* 20 min = 120 minutes
- ❖ Describe entertainment in the park
  - ~ Music 20 min
  - ~ Comedy/Improv 20 min
- ❖ Describe special events
  - ~ Fireworks Festival 15 min
  - ~ Celebrating "Kanelbullens dag" 10 min
- ❖ Suggest related nearby activities and events
  - ~ Lego Museum 25 min
  - ~ Giant ball of twine 17 min
  - ~ = 107 min

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## YOUR Sprint Backlog

Sprint Goal:

1. \_\_\_\_\_
    - \_\_\_\_\_ min
    - \_\_\_\_\_ min
  2. \_\_\_\_\_
    - \_\_\_\_\_ min
    - \_\_\_\_\_ min
  3. \_\_\_\_\_
    - \_\_\_\_\_ min
    - \_\_\_\_\_ min
  4. \_\_\_\_\_
    - \_\_\_\_\_ min
    - \_\_\_\_\_ min
- = \_\_\_\_\_ TOTAL

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## Exercise - Daily Scrum

Scrum Meeting 5 mins

- ❖ Team **stands** in a circle facing each other
- ❖ Each team member answers 3 questions:
  - ~ What have I completed since our last meeting ?
  - ~ What do I intend to complete before our next meeting ?
  - ~ What is getting in my way ?

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## Exercise - Sprint Review

Sprint Review 6 mins

- ❖ Elect a spokesperson to facilitate the Sprint Review and Demo Meeting
- ❖ Conduct a Sprint Review and Demo of your brochure at the end of the sprint:
  - ~ What is the potentially shippable increment (Demo)?
  - ~ What did we complete of our Sprint Backlog?
  - ~ What is the feedback from our Product Owner?

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## A Few Rules

- ❖ Each team MUST work together
- ❖ Everyone MUST have work in the Sprint
- ❖ Each team MUST demo something at the end of the Sprint
- ❖ Each team MUST complete their Sprint Planning with a Sprint Backlog on the worksheet
- ❖ Each team MUST conduct their Daily Scrum meeting
- ❖ No Scrum Master is used in this exercise
- ❖ No predefined roles on Team; self-organization rules!

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## Doggy Daycare Brochure

- ❖ Create cover art, brand, and/or logo
- ❖ Define major care sections
- ❖ Outline minimum requirements (shots, temper, breeding, etc.)
- ❖ Define all service offerings
- ❖ Set pricing structure for services
- ❖ Outline boarding options
- ❖ Complete a guarantee policy
- ❖ Define "Ultra Doggy Spa" service
- ❖ Write testimonials
- ❖ Suggest daypack contents to accompany clients
- ❖ Provide satisfied customer testimonials
- ❖ Complete a certification structure
- ❖ Complete bios on staff members (backgrounds, training, interests)
- ❖ Define discounted partner pet services
- ❖ Outline full week lunch menu

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## Martian Visiting Earth – Tourist Brochure

- ❖ Create cover art, brand, and/or logo
- ❖ Define major topics for Martian tourism
- ❖ Describe "Art Interests in Europe" tour
- ❖ Describe a tour based on photosynthesis
- ❖ Outline a "7 wonders of the world" expedition
- ❖ Set prices for the tours
- ❖ Outline warning messages (gravity, oxygen, fungi, etc.)
- ❖ Suggest clothing options
- ❖ Explain travel options to/from Mars
- ❖ Describe a "Human Sports" tour
- ❖ Outline refund policy
- ❖ Suggest related services
- ❖ Define advertisers
- ❖ Define a 12-month campaign
- ❖ Set-up how to get more information

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## Spam Brand Theme Park Marketing

- ❖ Create cover art, brand, and/or logo
- ❖ Define major topics about Spam
- ❖ Design 3 key rides that involve Spam
- ❖ Describe a general museum associated with the park
- ❖ Set prices for the rides
- ❖ Outline concession stand choices
- ❖ Set-up how to get more information
- ❖ Suggest clothing options
- ❖ Explain travel options to/from the Park
- ❖ Describe interactive contest opportunities
- ❖ Outline refund policy
- ❖ Define advertisers
- ❖ Set-up a musical act line-up for a concert series at the park
- ❖ Suggest related services
- ❖ Define a 12-month campaign

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