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AND COMPUTER SCIENCE

Advanced Software Process

The Agile Process

Scrum

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Scrum Overview

Scrum has practices that capture key adaptive and agile qualities.

Scrum's distinctive emphasis among the methods is its strong promotion of

- self-directed teams
- daily team measurement
- avoidance of prescriptive process.

Scrum Overview

Scrum's practices include:

- self-directed and self-organizing team
- no external addition of work to an iteration, once chosen
- daily stand-up meeting with special questions
- usually 30-calendar day iterations
- demo to external stakeholders at end of each iteration
- each iteration, client-driven adaptive planning

Method Overview - Classification

Scrum on the cycles and ceremony scale (Figure 7.1)

Scrum is uniquely precise on the length of iterations: usually 30 calendar days, a more-or-less common length compared to other IID methods.

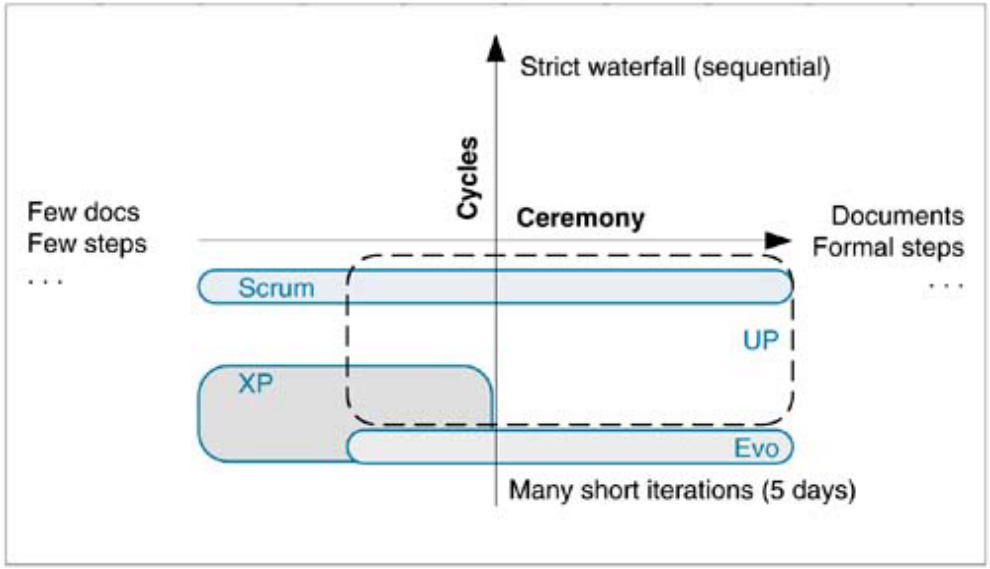
- Shorter is legal, but 30-day iterations are encouraged.

Scrum: 30 days (4w)

XP: 1 – 3 weeks

UP: 2 – 6 weeks

Evo: 1 – 2 weeks



Method Overview - Classification

Scrum is flexible on the ceremony scale; discussion of what and how many work products is outside its scope, as is how much rigor is required.

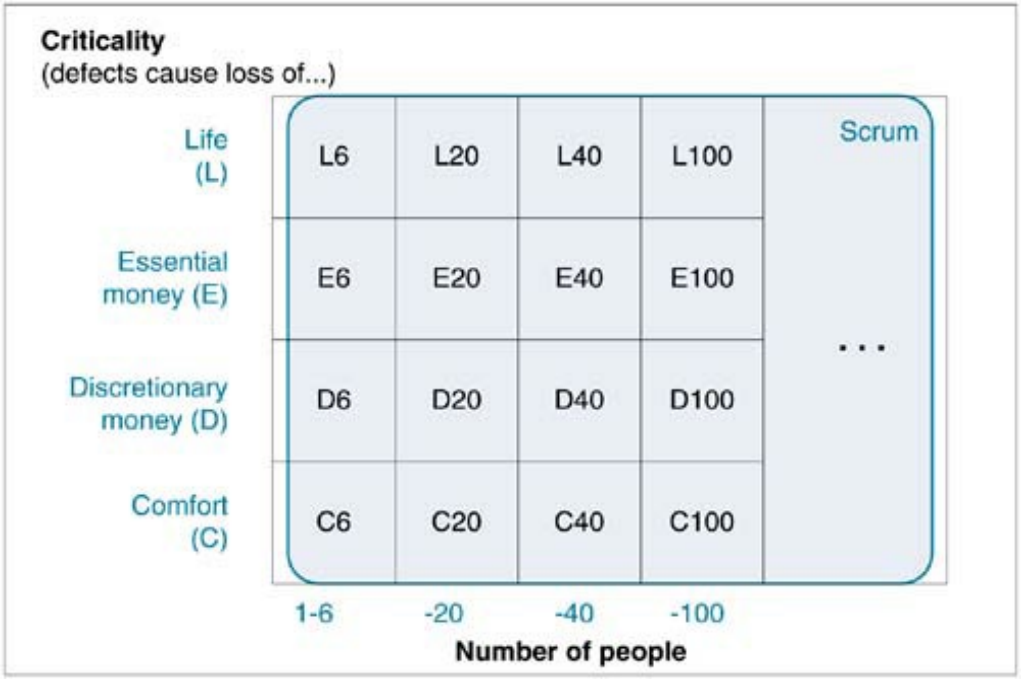
As a guiding principle, the Scrum founders would say, "as little ceremony as possible."

Also on a Scrum project, the whole team – not a manager – will decide how much is appropriate.

Method Overview - Classification

In terms of scope on the Cockburn scale, Scrum covers the cells shown in the following figure.

Scrum on the Cockburn scale (Figure 7.2)



A method selector = a function of (criticality, size, priority): how much formal process (ceremony, cycles) a software project requires: Cockburn scale (criticality, size)

- L: Loss of Life
- E: Loss of Essential Money
- D: Loss of Discretionary Money
- C: Loss of Comfort

Reference:
http://alistair.cockburn.us/Cockburn+Scale

Method Overview - Classification

Scrum is complementary enough to other practices that it may be applied across all domains of software applications, from life-critical to more casual – and it has.

Although one Scrum team should be seven or less, multiple teams may form a project.

- Since Scrum practices include working in a common project room, it scales via a "scrum of scrums"
- Where small teams work together and hold a daily stand-up meeting, and representatives from each those teams likewise meet daily.

Method Overview - Introduction

Scrum is an IID method that emphasizes a set of project management values and practices, rather than those in requirements, implementation, and so on.

As such, it is easily combined with or complementary to other methods.

A key Scrum theme is its emphasis on empirical rather than defined process.

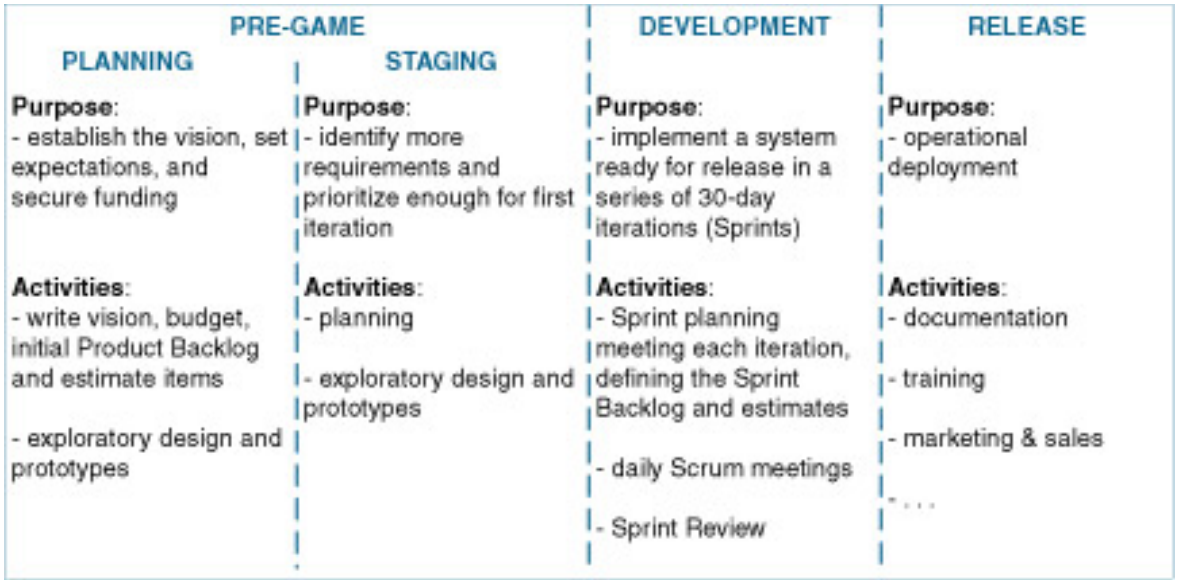
Lifecycle

The Scrum lifecycle is composed of four phases:

Pre-game
- Planning
- Staging

Development

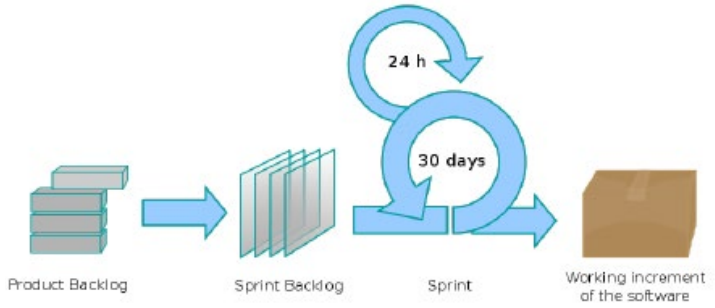
Release



PRE-GAME		DEVELOPMENT	RELEASE
PLANNING	STAGING		
Purpose: - establish the vision, set expectations, and secure funding	**Purpose**: - identify more requirements and prioritize enough for first iteration	**Purpose**: - implement a system ready for release in a series of 30-day iterations (Sprints)	**Purpose**: - operational deployment
Activities: - write vision, budget, initial Product Backlog and estimate items - exploratory design and prototypes	**Activities**: - planning - exploratory design and prototypes	**Activities**: - Sprint planning meeting each iteration, defining the Sprint Backlog and estimates - daily Scrum meetings - Sprint Review	**Activities**: - documentation - training - marketing & sales - . . .

Workproducts, Roles, and Practices

Workproducts:



WORKPRODUCTS (non-software)	Requirements	Design
	Product & Release Backlog: All items for the product. The Release Backlog is a subset. Includes features, use cases, enhancements, defects, technologies.	
	Implementation	**Test & Verification**
	Project Management	**Configuration & Change Management Environment**
	Backlog Graph: Estimate of work remaining versus days. Sprint Backlog: Tasks for the iteration. Granularity 4-16 hours. Product & Release Backlog	

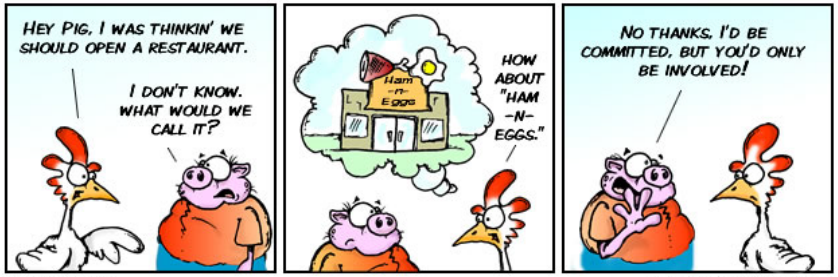
Workproducts, Roles, and Practices

Roles:

Chickens vs. Pigs

- Chickens: involve, consult on the project and are informed of its progress.
- Pigs: committed to the project and accountable for its outcome

Source:
http://www.implementingscrum.com/2006/09/11/the-classic-story-of-the-pig-and-chicken/



ROLES

Customer

Product Owner

- *one* person who is responsible for creating and prioritizing the Product Backlog
- chooses the goals (from the Product Backlog) for the next Sprint
- along with other stakeholders, reviews the system at the end of each Sprint

Development

Scrum Team

- work on the Sprint (iteration) Backlog
- there is explicitly no other title than "team member"

Management

Scrum Master

-50% developer, not just management

-knows and reinforces the project and iteration vision and goals

- ensures Scrum values and practices followed
- mediates between Management and Scrum Team
- listens to progress and removes impediments
- conducts the Daily Scrum
- conducts the Sprint Review (demo)

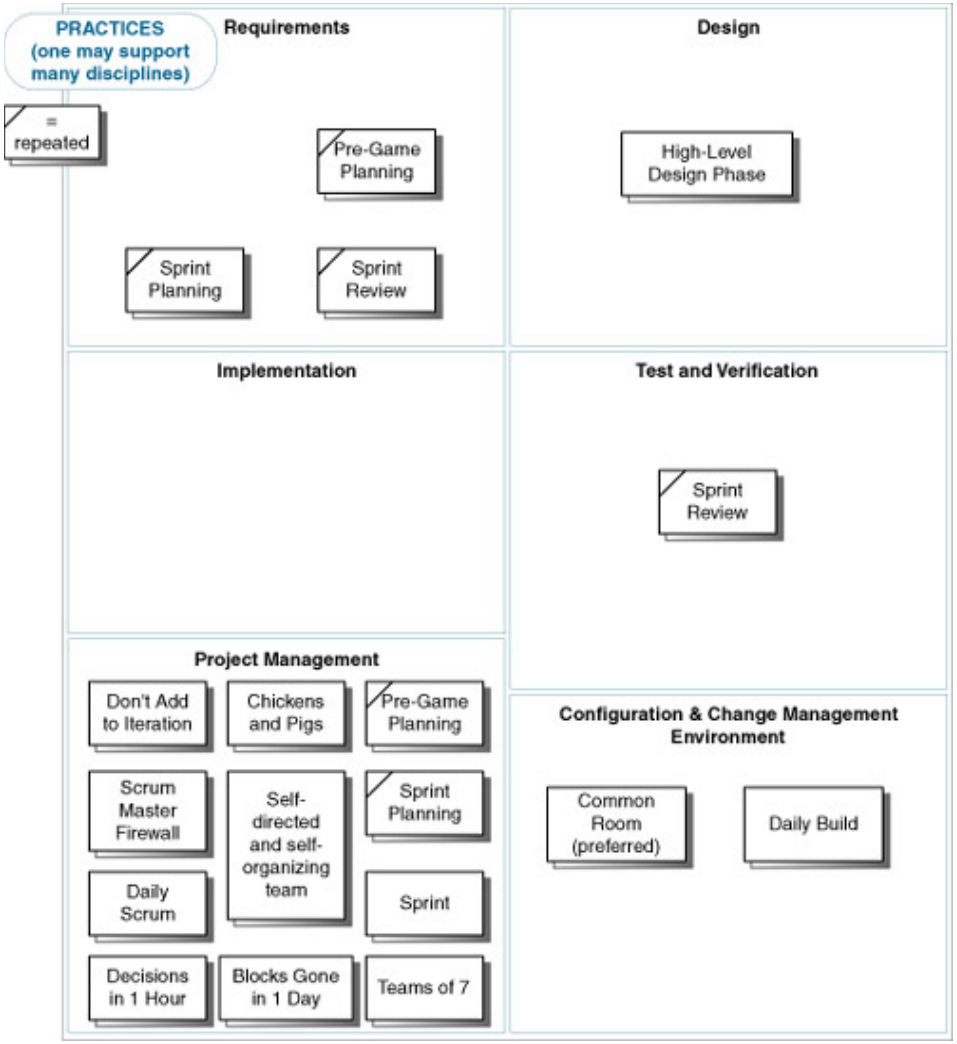
Other

Chickens

- everyone else can observe, but not interfere or speak during an iteration

Workproducts, Roles, and Practices

Practices:



Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Pre-game planning and staging	During Pre-game Planning, all stakeholders can contribute to creating a list of features, use cases, enhancements, defects, and so forth, recorded in the Product Backlog. One Product Owner is designated its owner, and requests are mediated through her. During this session, at least enough work for the first iteration is generated, and likely much more. Starting at these meeting and evolving over time, is identification of the Release Backlog, the subset of the Product Backlog that will make the next operational or product release. .

Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Sprint planning	Before the start of each iteration – or Sprint – two consecutive meetings are held. In the first, stakeholders meet to refine and re-prioritize the Product Backlog and Release Backlog, and to choose goals for the next iteration, usually driven by highest business value and risk. In the second meeting, the Scrum Team and Product Owner meet to consider how to achieve the requests, and to create a Sprint Backlog of tasks (in the 4–16 hour range) to meet the goals. If estimated effort exceeds resources, another planning cycle occurs. As the iteration proceeds, the Sprint Backlog is updated, often daily during the early part of the iteration, as new tasks are discovered. As a history of many Sprint Backlogs grows, the team improves their creation of new ones.

Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Sprint	Work is usually organized in 30-calendar-day iterations; each is called a Sprint.
Self-directed and self-organizing teams	During an iteration, management and the Scrum Master do not guide the team in how to fulfill the iteration goals, solve its problems (other than to make decisions when requested, and remove reported blocks), nor plan the order of work. The team is empowered with the authority and resources to find their own way, and solve their own problems. This hands-off approach for 30 days, except to provide resources and remove blocks, is perhaps the most personally challenging aspect for management adopting Scrum.

Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Scrum meeting	Each workday at the same time and place, hold a meeting with the team members in a circle, at which the same special Scrum questions are answered by each team member.
Don't add to iteration	During an iteration, management does not add work to the team or individuals. Uninterrupted focus is maintained. In the rare case something has to be added, something else should ideally be removed. But, before each new iteration, the Product Owner and Management have the right and responsibility to re-prioritize the Product Backlog, and indicate what to do in the next iteration, as long as the work request estimates don't exceed the resources.

Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Scrum master firewall	The Scrum Master looks out to ensure the team is not interrupted by work requests from other external parties, and if they occur, removes them and deals with all political and external management issues. The Scrum Master also works to ensure Scrum is applied, removes reported blocks, provides resources, and makes decisions when requested. She also has to take initiative when she sees during the meeting that someone isn't completing work, if the team doesn't speak up.
Decision in one hour	Blocks reported at the Scrum Meeting that require decisions by the Scrum Master are ideally decided immediately, or within one hour. The value of “bad decisions are better than no decisions, and they can be reversed” is promoted.

Workproducts, Roles, and Practices

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Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Blocks gone in one day	Blocks reported at the Scrum Meeting are ideally removed before the next meeting.
Chickens and pigs	During the Scrum Meeting, only the Scrum Team can talk (the pigs). Anyone else can attend, but should remain silent (the chickens), even the CEO. An exception is management (e.g., CEO) feedback on survival points or explanation of the business relevance of the team's work. The Scrum needs to be a vehicle for communicating the product vision and organization goals. From this story: A pig and chicken discussed the name of their new restaurant. The chicken suggested Ham n' Eggs. “No thanks,” said the pig, “I'd be committed, but you'd only be involved!”

Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Teams of seven	Scrum can scale to large projects, but recommends one team have a maximum of seven members. Larger projects are multi-team. Scrum of scrums if large.
Common room (preferred)	Ideally, the team work together in a common project room, rather than separate offices or cubes. Separate, private space is still available for other activities. However, teams composed of geographically spread members, participating by speakerphone in the Daily Scrum, have reported success.
Daily build	At least one daily integration and regression test across all checked-in code for the project. The XP practice of Continuous Integration is even better.

Workproducts, Roles, and Practices

Core Practices:

Practice	Description
Sprint review	At the end of each iteration, there is a review meeting (maximum of four hours) hosted by the Scrum Master. The team, Product Owner, and other stakeholders attend. There is a demo of the product. Goals include informing stakeholders of the system functions, design, strengths, weaknesses, effort of the team, and future trouble spots. Feedback and brainstorming on future directions is encouraged, but no commitments are made during the meeting. Later at the next Sprint Planning meeting, stakeholders and the team make commitments. “Power Point” presentations are forbidden. Preparation emphasis is on showing the product.

Workproducts, Roles, and Practices

The Scrum Meeting: Details

The Scrum Meeting – or scrum – is the heartbeat of Scrum and the project.

Each workday at the same time and place, hold a meeting with the team members standing in a circle, at which time the same special questions are answered by each member:

1. What have you done since the last Scrum?
2. What will you do between now and the next Scrum?
3. What is getting in the way (blocks) of meeting the iteration goals?

Workproducts, Roles, and Practices

The Scrum Meeting: Details

Larman (2004-2009) added two more questions that have been useful:

4. Any tasks to add to the Sprint Backlog? (missed tasks, not new requirements)
5. Have you learned or decided anything new, of relevance to some of the team members? (technical, requirements, …)

   Continuously improving and learning – vital to agile development

No other discussion is allowed beyond the three (or five) questions.

- If other issues need discussion, secondary meetings immediately after the Scrum Meeting occur, usually with subsets of the team.

  "We need to talk about that. Let's meet after the Scrum."

Workproducts, Roles, and Practices

The Scrum Meeting: Details

- The Scrum Meeting provides a daily forum to update tasks, and surface and remove impediments.
- The meeting is ideally held in a stand-up circle to encourage brevity.
- On average, 15 or 20 minutes for 7–10 people.
  - Longer meetings are common near the start of an iteration.
- Non-team members (chickens) are outside the circle.
- It is held next to a whiteboard at which all the tasks and blocks are written when reported.
  - The Scrum Master erases blocks only once they've been removed.

Workproducts, Roles, and Practices

Workproducts

In addition to the workproducts (illustrated before), Scrum allows any other workproducts of value to the project.

For example, it can be combined with some UP practices, and one can create a Vision or Risk List, using UP terminology.

Workproducts, Roles, and Practices

Workproducts

Sample Product Backlog (Figure 7.3)

	A	B	C	D	E	F
1	**Product Backlog**					
2						
3	**Requirement**	**Num**	**Category**	**Status**	**Pri**	**Estimate**
4	log credit payments to AR	17	feature	underway	5	2
5	process sale-simple cash scenario	232	use case	underway	5	60
6	slow credit payment approval	12	issue	not started	4	10
7	sales commission calculation	43	defect	complete	4	2
8	lay-away plan payments	321	enhance	not started	3	20
9	PDA sale capture	53	technology	not started	1	100
10	process sale-credit pmt scenario	235	use case	underway	5	30

Note that all conceivable items go in the **backlog** and are prioritized by the Product Owner. The **estimates** (in person-hours of effort) start as rough guidelines, refined once the team commits to an item.

Workproducts, Roles, and Practices

Workproducts

Sample Sprint Backlog (Figure 7.4)

	A	B	C	D	E	F	G	H	I
1	**Sprint Backlog**								
2	**Task Description**	**Originator**	**Responsible**	**Status**	**Hours of work remaining**				
3					**6**	**7**	**8**	**9**	**10**
4					**362**	**322**	**317**	**317**	**306**
5	Meet to discuss the goals and	JM	JM/SR	Completed	20	10	0	0	0
6	Move Calculations out of	TL	AW	Not Started	8	8	8	8	8
7	Get GEK Data		TN	Completed	12	0	0	0	0
8	Analyse GEK Data - Title		GP	In Progress	24	20	30	25	20
9	Analyse GEK Data - Parcel		TK	Completed	12	12	12	12	12
10	Define & build Database		BR/DS	In Progress	80	80	75	60	52

Note the daily estimate of work remaining for each task; these columns also show the date (e.g., 6 of Jan) and total hours remaining on each day (e.g., Jan 6, 362 hours).

It is updated daily by the responsible members or by a daily tracker who visits each member.

New estimates are allowed to increase above the original estimate.

The simplest (and thus preferred) tool is a spreadsheet; Sutherland uses a customized version of the open-source GNU GNATS tracking tool, with a Web interface.

Workers daily update the Sprint Backlog - Individuals are responsible for daily updates estimating the time remaining for their tasks.

Workproducts, Roles, and Practices

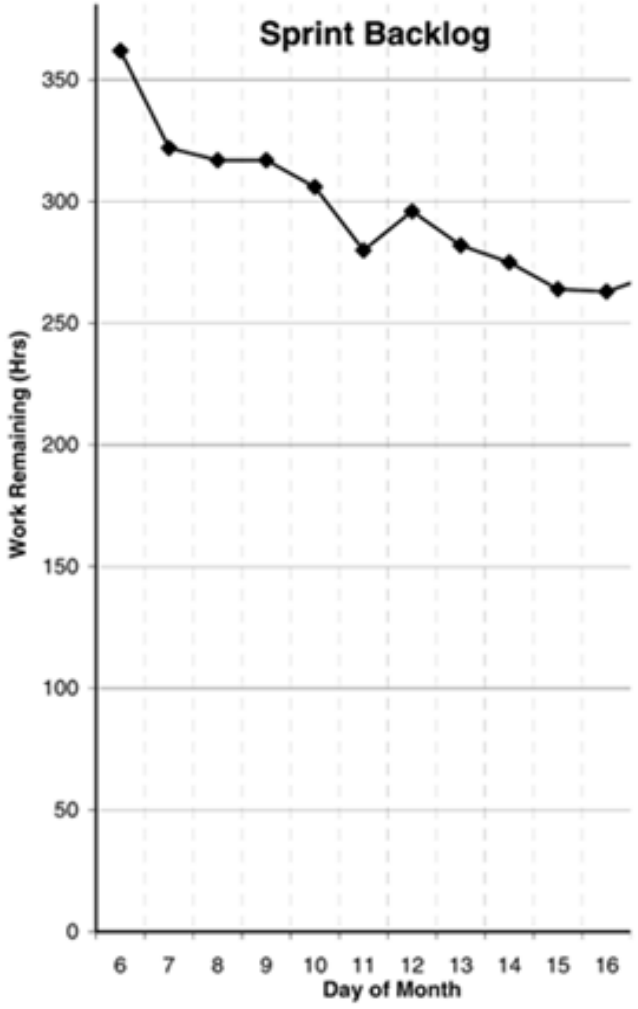
Workproducts

Figure 7.5. sample Backlog Graph

It is a visual summary of estimated task hours remaining in the Sprint Backlog.

In Scrum, this is considered the most critical project data to track.

Recommended: Post an updated version of this each day on the wall by the Scrum meeting.



Workproducts, Roles, and Practices

Other Practices and Values

- Scrum Master reinforces vision
  - She needs to daily share and clarify the overall project vision, and goals of the Sprint, perhaps at the start of the Scrum meeting.
- Replace ineffective Scrum Master
  - The manager/Scrum Master is the servant of the developers, not vice versa.
  - If Scrum Master is not removing blocks promptly, acting as a firewall, and providing resources, the Scrum founders encourage replacing the Scrum Master.

Values

Openness

- The openly accessible Product Backlog makes visible the work and priorities.
- The Daily Scrums make visible the overall and individual status and commitments.
- Work trend and velocity are made visible with the Backlog Graph.

Values

Respect

- Or, team responsibility rather than scapegoating.
- The individual members on a team are respected for their different strengths and weaknesses, and not singled out for iteration failures.
- The whole team rather than a manager, through self-organization and direction, adopts the attitude of solving "individual" problems through group exploration of solutions, and is given the authority and resources to react to challenges, such as hiring a specialist consultant to compensate for missing expertise.

Values

Courage

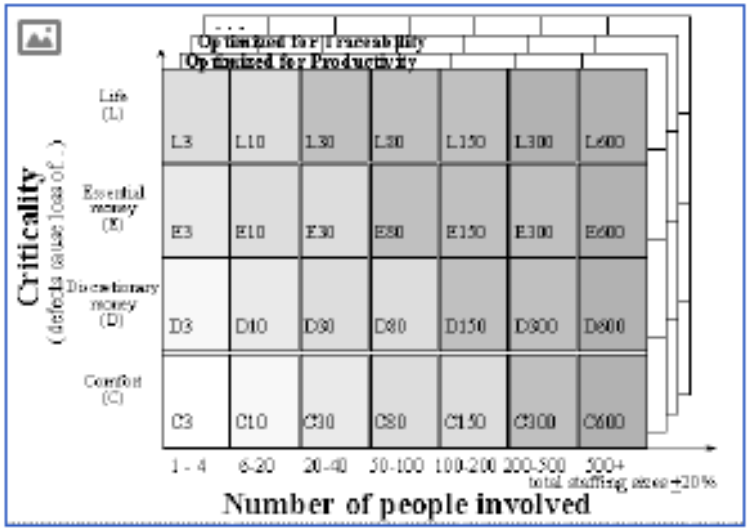
- Management has the courage to plan and guide adaptively and to trust individuals and the team by avoiding telling them how to get the iteration done.
- The team has the courage to take responsibility for self-direction and self-management.

Sample Projects

The following projects had significant Scrum influence:

- Large— IDX Web-enabled benefits suite
  - One year, 330 people across multiple related projects, an E300 project on the Cockburn scale, [SB02]
- Medium— Caremark
  - Four months, 20 people, an E20 project, [SB02]
- Small— Individual Personal NewsPage
  - One month, eight people, a C20 project [SB02]

"Criticality" is defined by the sentence "A defect could cause loss of ":



Process Mixtures

Scrum + XP

The Scrum practice of a demo to external stakeholders at the end of each iteration enhances XP's feedback and communication goals.

- The Scrum Backlog and progress tracking approaches are minor variations of XP practices, and so simple that they are well within the XP spirit of "do the simplest thing that could possibly work."

Process Mixtures

Scrum + XP

Scrum's 30-day timeboxed iteration length is not completely consistent with XP, which prefers shorter – even one-week – iterations.

History

The roots of Scrum are found in a well-known article summarizing common best practices in 10 innovative Japanese companies, "The New New Product Development Game," Harvard Business Review, Jan 1986, by Takeuchi and Nonaka.

It introduced the terms Sashimi (slices) for IID, and Scrum for the adaptive and self-directed team practices. The name was taken from the game of rugby, for the adaptive team behavior moving a ball up the field.

History

Jeff Sutherland is one of the Scrum creators and was VP at Easel Corporation in 1994 when he introduced some of its practices.

- He was influenced by a report on a hyper-productive project at Borland Corporation that effectively used structured daily meetings [Coplien94].
- In 1995 Ken Schwaber worked with Sutherland at Easel on the formalization of Scrum.
- Their results were described in a workshop paper [Schwaber95].
- In 1996 Sutherland joined Individual Inc., and asked Ken Schwaber to assist in the adoption of Scrum ideas.
- Schwaber refined and extended Scrum, in collaboration with Sutherland, into the versions ultimately described in [BDSSS98] and [SB02].

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- Agile, XP Method – Robert Martin: http://www.objectmentor.com/
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