

# Software Project Management

Week – 17

## Today's Lecture

- Agile Project Management with SCRUM

Slides from Ken Schwaber's book on Agile Project Management with SCRUM

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# INTRODUCTION TO SCRUM

## Introduction to SCRUM

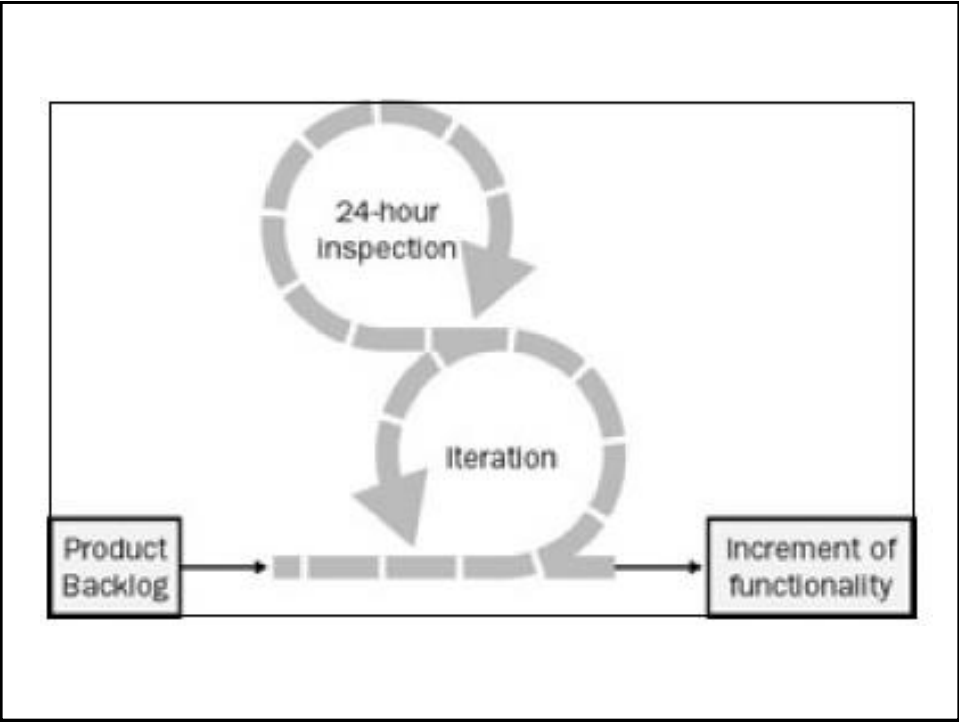
- Scrum is an agile process that allows us to focus on delivering the highest business value in the shortest time.
- It allows us to rapidly and repeatedly inspect actual working software (every two weeks to one month).
- The business sets the priorities. Our teams self-manage to determine the best way to deliver the highest priority features.
- Every two weeks to a month anyone can see real working software and decide to release it as is or continue to enhance for another iteration.

## Scrum Framework

- **Roles** : Product Owner, ScrumMaster, Team
- **Ceremonies** : Sprint Planning, Sprint Review, Sprint Retrospective & Daily Scrum Meeting
- **Artifacts** : Product Backlog, Sprint Backlog, and Burndown Chart

## Characteristics of SCRUM

- Self-organizing teams
- Product progresses in a series of month-long “sprints”
- Requirements are captured as items in a list of “product backlog”
- No specific engineering practices prescribed
- Uses generative rules to create an agile environment for delivering projects
- One of the “agile processes”



**ROLES**

## Roles

- Product Owner
- ScrumMaster
- Team

## SCRUM Roles

- Product Owner
  - Represents stakes involved
  - Responsible for
    - Requirements management
    - ROI
    - Release plans
  - Define the features of the product
  - Decides on release date and content
  - Be responsible for the profitability of the product (ROI)
  - Prioritize features according to market value
  - Adjust features and priority every iteration, as needed
  - Accept or reject work results.

## SCRUM Roles

- SCRUM Master
  - Represents management to the project
  - Responsible for enacting Scrum values and practices
  - Removes impediments
  - Ensure that the team is fully functional and productive
  - Enable close cooperation across all roles and functions
  - Shield the team from external interferences

## SCRUM Roles

- Team
  - Typically 5-10 people
  - Cross-functional
    - QA, Programmers, UI Designers, etc.
  - Members should be full-time
    - May be exceptions (e.g., System Admin, etc.)
  - Teams are self-organizing
    - What to do if a team self-organizes someone off the team??
    - Ideally, no titles but rarely a possibility
  - Membership can change only between sprints
  - Two types
    - Pigs: responsible for project and exercise authority
    - Chicken: not responsible for project (usually for a particular sprint)

## **CEREMONIES / FLOWS**

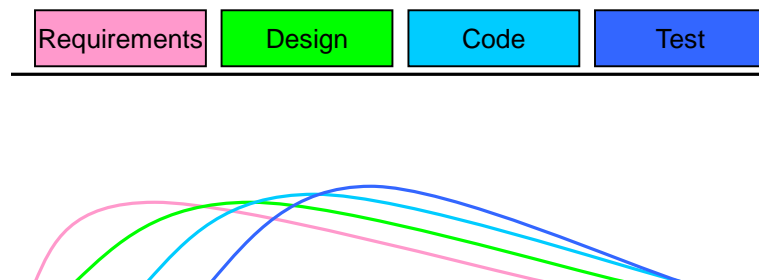
### **SCRUM Ceremonies/Flows**

- Sprint Planning
- Sprint
- Sprint Review
- Daily Scrum Meeting
- Sprint Retrospective

## Sprint Planning

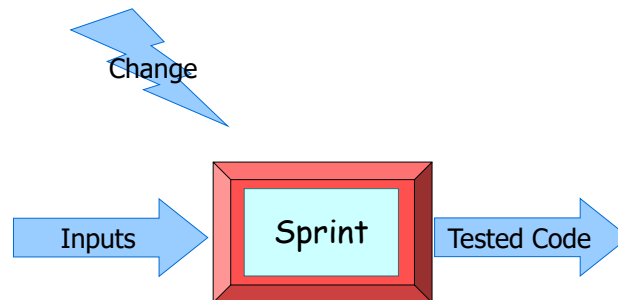
- Sprint Planning Meeting
  - Two parts
  - First hour for product owner to delineate priority
  - Next four hours for sprint planning
- Sprint
  - Scrum projects make progress in a series of “sprints”
    - Analogous to XP iterations
  - Target duration is one month
    - +/- a week or two
      - But, a constant duration leads to a better rhythm
  - Product is designed, coded, and tested during the sprint

## Sequential vs. Overlapping Dev.



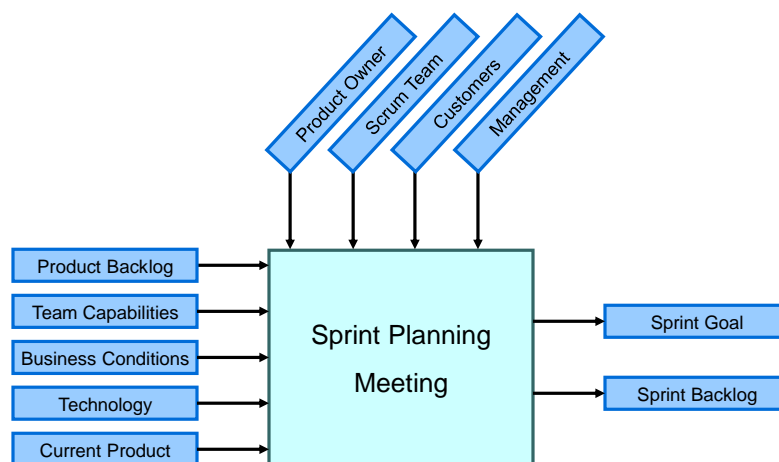


## No changes during the sprint



- Plan sprint durations around how long you can commit to keeping change out of the sprint

## Sprint Planning Meeting



## Sprint Goal

- A sprint goal summarizes the desired outcome of an iteration.
- It provides a shared objective, and it states why it's worthwhile undertaking the sprint.
- Sample sprint goals are
  - “Learn about the right user interaction for the registration feature”,
  - “Provide the missing reporting functionality”.
- Every sprint should have **one shared goal**.
- This ensures that everyone moves in the same direction.
- Once the goal has been selected, the team implements it.
- Stakeholder feedback is then used to understand if the goal has been met, as the following picture shows

## Example – Sprint backlog

User Story	Tasks	Day 1	Day 2	Day 3	Day 4	Day 5	...
As a member, I can read profiles of other members so that I can find someone to date.	Code the ...	8	4	8	0		
	Design the ...	16	12	10	4		
	Meet with Mary about ...	8	16	16	11		
	Design the UI	12	6	0	0		
	Automate tests ...	4	4	1	0		
	Code the other ...	8	8	8	8		
As a member, I can update my billing information.	Update security tests	6	6	4	0		
	Design a solution to ...	12	6	0	0		
	Write test plan	8	8	4	0		
	Automate tests ...	12	12	10	6		
	Code the ...	8	8	8	4		

## Parts of Sprint Planning Meeting

- 1<sup>st</sup> Part:
  - Creating Product Backlog
  - Determining the Sprint Goal.
  - Participants: Product Owner, Scrum Master, Scrum Team
- 2<sup>nd</sup> Part:
  - Participants: Scrum Master, Scrum Team
  - Creating Sprint Backlog

## Pre-Project/Kickoff Meeting

- A special form of Sprint Planning Meeting
- Meeting before the begin of the Project

## Sprint

- A month-long iteration, during which is incremented a product functionality
- NO outside influence can interfere with the Scrum team during the Sprint
- Each Sprint begins with the Daily Scrum Meeting

## Next ceremonies

- Daily Scrum
- Sprint Review Meeting
- SCRUM Retrospective

## Daily Scrum

- Parameters
  - Daily
  - 15-minutes
  - Stand-up
  - Not for problem solving
- Three questions:
  1. What did you do yesterday
  2. What will you do today?
  3. What obstacles are in your way?
- Chickens and pigs are invited
  - Help avoid other unnecessary meetings
- Only pigs can talk

## Daily Scrum

- Is NOT a problem solving session
- Is NOT a way to collect information about WHO is behind the schedule
- Is a meeting in which team members make commitments to each other and to the Scrum Master
- Is a good way for a Scrum Master to track the progress of the Team

## Scrum FAQs

- Why daily?
  - “How does a project get to be a year late?”
    - “One day at a time.”
      - Fred Brooks, The Mythical Man-Month.
- Can Scrum meetings be replaced by emailed status reports?
  - No
    - Entire team sees the whole picture every day
    - Create peer pressure to do what you say you’ll do

## Sprint Review Meeting

- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture
- Informal
  - 2-hour prep time rule
- Participants
  - Customers
  - Management
  - Product Owner
  - Other engineers



## Sprint Retrospective Meeting

- Scrum Team only
- Feedback meeting
- Three questions
  - Start
  - Stop
  - Continue
- Don't skip for the first 5-6 sprints!!!

## ARTIFACTS

## SCRUM Artifacts

- Product Backlog
- Sprint Backlog
- Burndown Chart

## Product Backlog

- A list of all desired work on the project
  - Usually a combination of
    - story-based work (“let user search and replace”)
    - task-based work (“improve exception handling”)
- List is prioritized by the Product Owner
  - Typically a Product Manager, Marketing, Internal Customer, etc.



## Product Backlog

- Requirements for a system, expressed as a prioritized list of Backlog Items
- Is managed and owned by a Product Owner
- Spreadsheet (typically)
- Usually is created during the Sprint Planning Meeting
- Can be changed and re-prioritized before each PM

## Sample Product Backlog

	Item #	Description	Est	By
<b>Very High</b>				
	1	Finish database versioning	16	KH
	2	Get rid of unneeded shared Java in database	8	KH
	-	Add licensing	-	-
	3	Concurrent user licensing	16	TG
	4	Demo / Eval licensing	16	TG
	-	Analysis Manager	-	-
	5	File formats we support are out of date	160	TG
	6	Round-trip Analyses	250	MC
<b>High</b>				
	-	Enforce unique names	-	-
	7	In main application	24	KH
	8	In import	24	AM
	-	Admin Program	-	-
	9	Delete users	4	JM
	-	Analysis Manager	-	-
	10	When items are removed from an analysis, they should show up again in the pick list in lower 1/2 of the analysis tab	8	TG
	-	Query	-	-
	11	Support for wildcards when searching	16	T&A
	12	Sorting of number attributes to handle negative numbers	16	T&A
	13	Horizontal scrolling	12	T&A
	-	Population Genetics	-	-
	14	Frequency Manager	400	T&M
	15	Query Tool	400	T&M
	16	Additional Editors (which ones)	240	T&M
	17	Study Variable Manager	240	T&M
	18	Haplotypes	320	T&M
	19	Add icons for v1.1 or 2.0	-	-
	-	Pedigree Manager	-	-
	20	Validate Derived kindred	4	KH
<b>Medium</b>				
	-	Explorer	-	-
	21	Launch tab synchronization (only show queries/analyses for logged in users)	8	T&A
	22	Delete settings (?)	4	T&A

## From Sprint Goal to Sprint Backlog

- Scrum team takes the Sprint Goal and decides what tasks are necessary
- Team self-organizes around how they'll meet the Sprint Goal
  - Manager doesn't assign tasks to individuals
- Managers don't make decisions for the team
- Sprint Backlog is created

## Sprint Backlog during the Sprint

- Changes
  - Team adds new tasks whenever they need to in order to meet the Sprint Goal
  - Team can remove unnecessary tasks
  - But: Sprint Backlog can only be updated by the team
- Estimates are updated whenever there's new information

## Sprint Backlog

- A subset of Product Backlog Items, which define the work for a Sprint
- Is created ONLY by Team members
- Each Item has it's own status
- Should be updated every day

## Sprint Backlog

- No more than 300 tasks in the list
- If a task requires more than 16 hours, it should be broken down
- Team can add or subtract items from the list. Product Owner is not allowed to do it

## Sample Sprint Backlog

Days Left in Sprint		15	13	10	8	
Who	Description	1/22/2002	1/24/2002	1/26/2002	1/31/2002	
<b>Total Estimated Hours:</b>		554	458	362	270	0
-	<b>User's Guide</b>	-	-	-	-	-
SM	Start on Study Variable chapter first draft	16	16	16	16	
SM	Import chapter first draft	40	24	6	6	
SM	Export chapter first draft	24	24	24	6	
<b>Misc. Small Bugs</b>						
JM	Fix connection leak	40				
JM	Delete queries	8	8			
JM	Delete analysis	8	8			
TG	Fix tear-off messaging bug	8	8			
JM	View pedigree for kindred column in a result set	2	2	2	2	
AM	Derived kindred validation	8				
<b>Environment</b>						
TG	Install CVS	16	16			
TBD	Move code into CVS	40	40	40	40	
TBD	Move to JDK 1.4	8	8	8	8	
<b>Database</b>						
KH	Killing Oracle sessions	8	8	8	8	
KH	Finish 2.206 database patch	8	2			
KH	Make a 2.207 database patch	8	8	8	8	
KH	Figure out why 461 indexes are created	4				

## Sprint Burn down Chart

- Depicts the total Sprint Backlog hours remaining per day
- Shows the estimated amount of time to release
- Ideally should burn down to zero to the end of the Sprint
- Actually is not a straight line
- Can bump UP

## Information Radiator

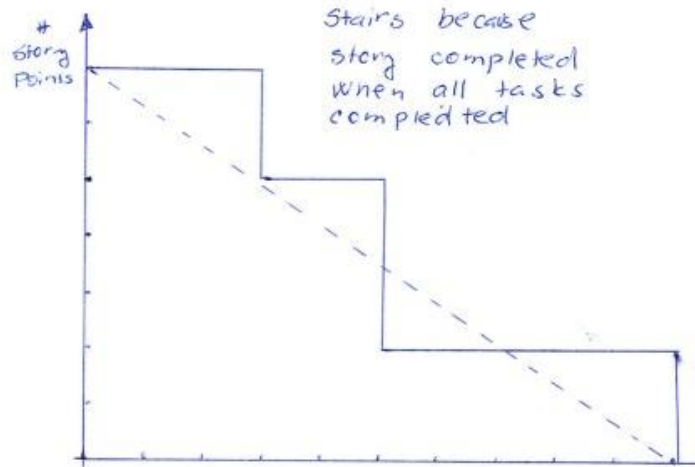
- Two characteristics are key to a good information radiator.
  - The first is that the information changes over time.
  - This makes it worth a person's while to look at the display...
  - The other characteristic is that it takes very little energy to view the display."

## Burndown Charts

- As a definition of this chart we can say that the Burndown chart displays the *remaining effort for a given period of time*.
- When they track product development using the Burndown chart, teams can use a sprint Burndown chart and a release Burndown chart.
- **Sprint Burndown Chart**
  - Teams use the sprint Burndown chart to track the product development *effort remaining in a sprint*.
  - General speaking the Burndown chart should consist of:
    - X axis to display working days
    - Y axis to display remaining effort
    - Ideal effort as a guideline
    - Real progress of effort

## Sprint Burndown Chart

The chart displays the remaining *size of all stories in a sprint* backlog that needs to be done, using story points.



## Release Burndown Chart

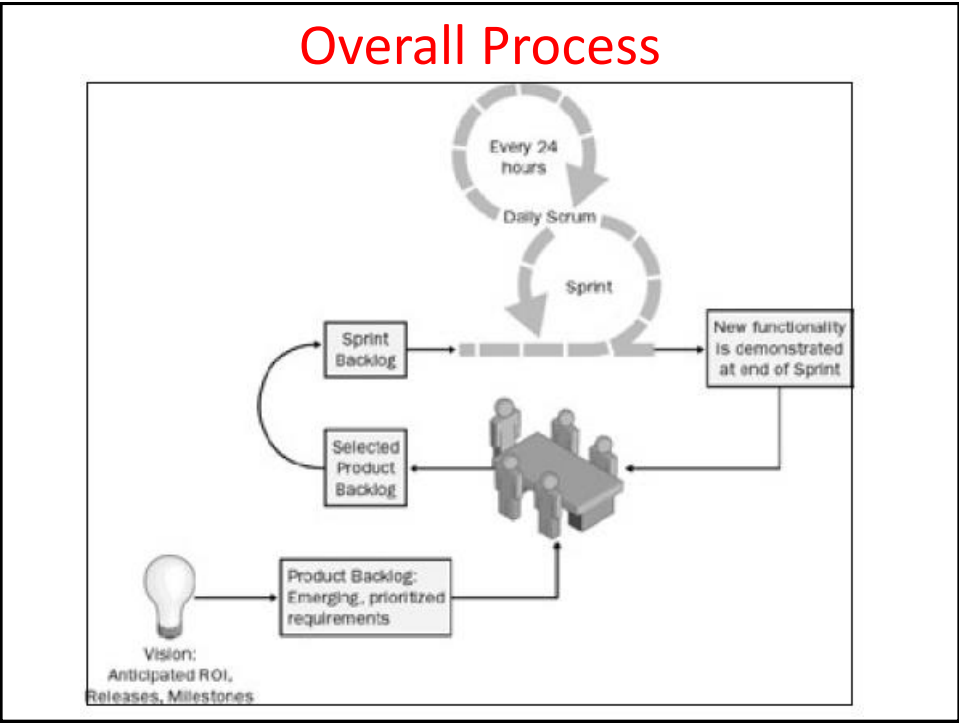
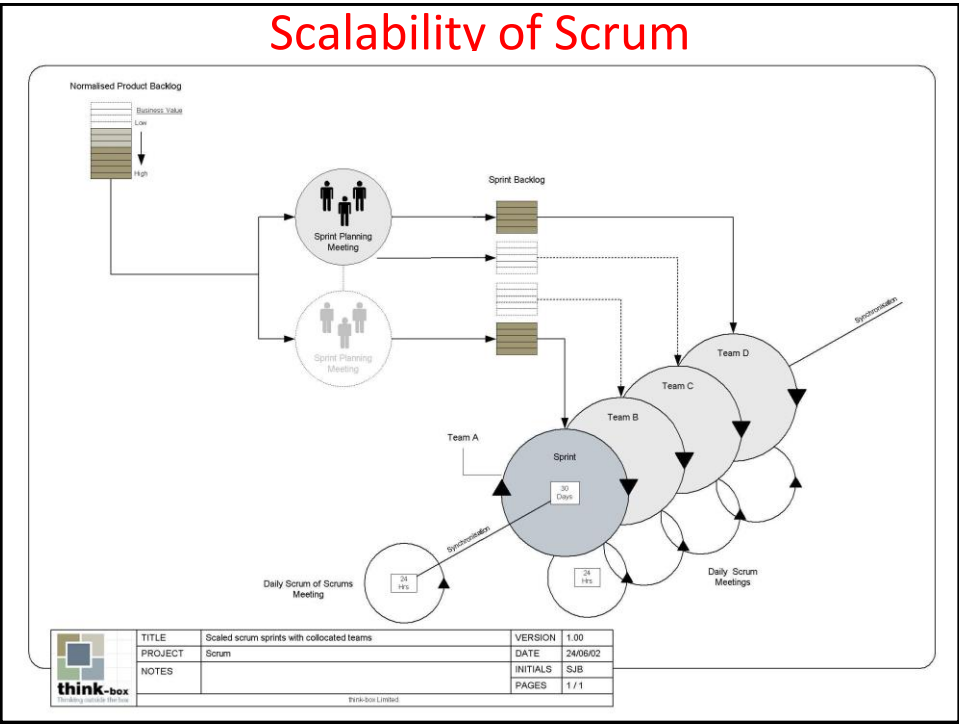
- Will the release be done on right time?
- X-axis: sprints
- Y-axis: amount of hours remaining
- The estimated work remaining can also burn up

## Product Burndown Chart

- Is a “big picture” view of project’s progress (all the releases)

## Scalability of Scrum

- A typical Scrum team is 6-10 people
- Jeff Sutherland - up to over 800 people
- "Scrum of Scrums" or what called "Meta-Scrum"
- Frequency of meetings is based on the degree of coupling between packets





## Difference between PMP, PRINCE2 and SCRUM

- PMP is a standard, PRINCE2 is a methodology and Scrum / Agile is a framework
- Standard means best practices.
- They are neither legally binding nor you are forced to adopt them.
- It simply means that based on experiences from all over the world,
- Standard has been made which if you apply in your situation, will bring favorable results.
- But it doesn't mean there is 100% guarantee that they will always bring favorable results to you
- The first page of PMBOK 6<sup>th</sup> edition, after trademarks and logos, has title "Notice", stating exactly that.
- Here are some excerpts from that page.

Slides from here onwards from a web resource: [Difference between PMP, PRINCE2 and Scrum/Agile](#)

## PMP

- The Project Management Institute, Inc. (PMI) standards and guidelines publications, of which the document contained herein is one, are developed through a voluntary consensus standards development process.
- PMI does not undertake to guarantee the performance of any individual manufacturer or seller's products or services by virtue of this standard or guide.
- PMI has no power, nor does it undertake to police or enforce compliance with the contents of this document.

## PRINCE2

- PRINCE2 is a methodology.
- Methodology means doing something step by step.
- This is what PRINCE2 essentially about
  - It lists down steps to perform to do project management unlike PMP.
  - It tells you what to do first, then second and so on.
  - Although you may see that PMP has also got steps but essentially they are not and neither they are performed in particular order in strict sense.

## SCRUM

- Scrum/Agile is a framework.
- Framework means a base on which you can build something.
- That's why you will see that based on Scrum framework there are numerous certifications being offered.
- One of them is offered by PMI which is called PMI-ACP (Agile Certified Practitioner).
- And then there are some others too such as Scrum Alliance and Scrum Council.  
Framework provides you with boundary or blue print of what is included in it and then you can extend on it.
- PRINCE2 is a process-driven project management method which contrasts with reactive/adaptive methods such as Scrum

## Summary

- SCRUM
  - Roles
  - Ceremonies
  - Artifacts
- Comparison
  - PMP
  - PRINCE2
  - SCRUM