Lecture 4.1
Introduction to Scrum

Course Instructor
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Introduction to Scrum

- Scrum is an Agile Software Development Process.
- Scrum is a lightweight process
  - manages and controls software and product development in rapidly changing environments.
- Scrum
  - allows us to focus on delivering the highest business value in the shortest time.

History

- 1995 : Scrum by Jeff Sutherland & Ken Schwaber.
- 1996 : Introduction of Scrum at OOPSLA conference.
- 2001 :publication “Agile Software Development with Scrum” by Ken Schwaber & Mike Beedle
- Successful appliance of Scrum in over 50 companies
- Founders are members in the Agile Alliance.

Scrum has been used by (at least):

- Microsoft
- IBM
- Yahoo
- Google
- Electronic Arts
- High Moon Studios
- Lockheed Martin
- Philips
- Siemens
- Nokia
- Capital One
- BBC
- Intuit
- Amazon
- Intuit
- Nielsen Media
- First American Real Estate
- BMC Software
- Ipswitch
- John Deere
- Lexis Nexis
- Sabre
- Salesforce.com
- Time Warner
- Turner Broadcasting
- Oce

Scrum has been used for

- Commercial software
- In-house development
- Contract development
- Fixed-price projects
- Financial applications
- ISO 9001-certified applications
- Embedded systems
- 24x7 systems with 99.999% uptime requirements
- the Joint Strike Fighter
- Video game development
- FDA-approved, life-critical systems
- Satellite-control software
- Websites
- Handheld software
- Mobile phones
- Network switching applications
- ISV applications
- Some of the largest applications in use

Scrum Principles

- Quality work: empowers everyone involved.
- Assume Simplicity: Scrum is a way to detect and cause removal of anything that gets in the way of development.
- Embracing Change: Team based approach to development where requirements are rapidly changing.
- Incremental changes: Scrum makes this possible using sprints where a team is able to deliver a product (iteration) deliverable within 30 days.

Scrum Characteristics

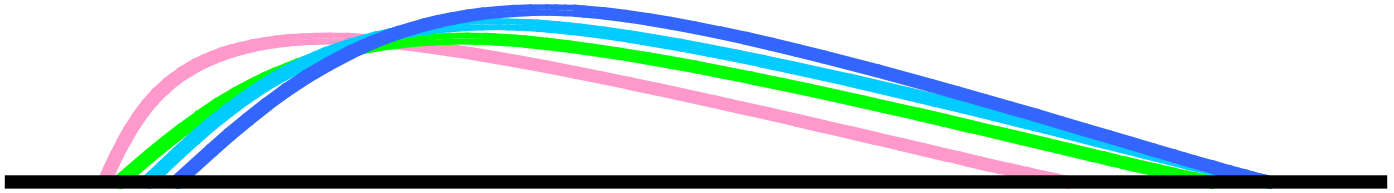
- Requirements are captured as items in a list of “product backlog.”
- Self-organizing teams
- Product progresses in a series of “sprints/iterations.”
- Product is designed, coded, and tested during each sprint.
- Uses generative rules to create an agile environment for delivering projects.
- One of the “agile processes.”

Sequential vs. overlapping development

Requirements | Design | Code | Test

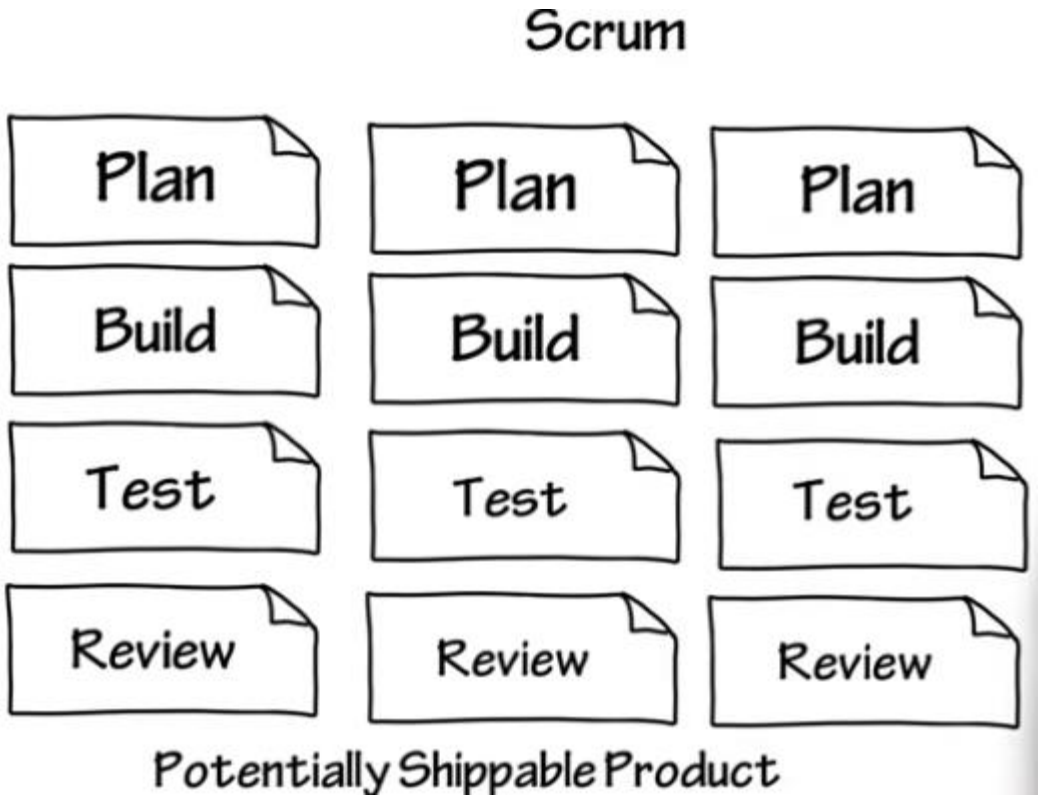
Rather than doing all of one thing at a time...

...Scrum teams do a little of everything all the time

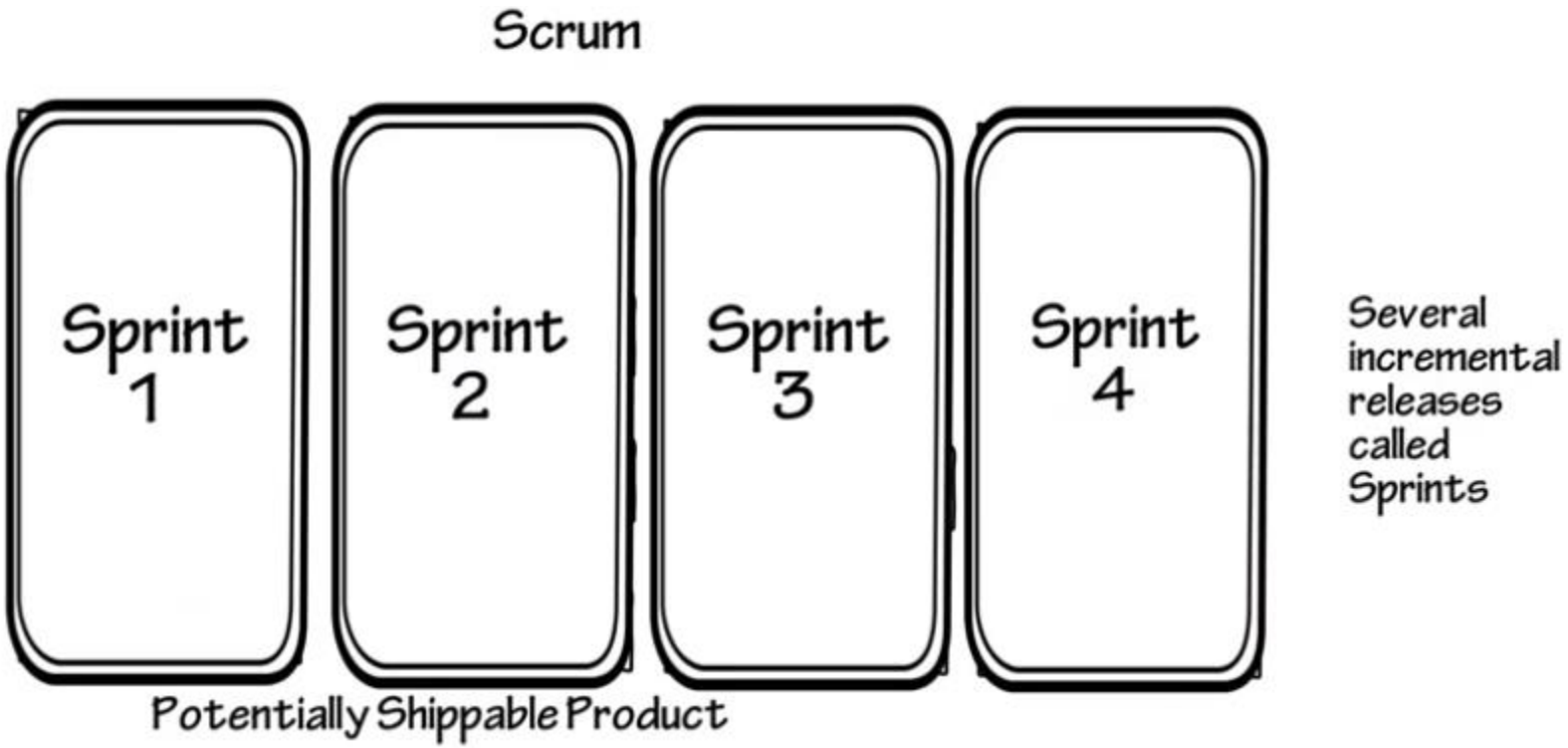


Source: "The New New Product Development Game" by Takeuchi and Nonaka. *Harvard Business Review,* January 1986.

Scrum Process



Scrum Process



Scrum Framework

Roles

- Product owner
- ScrumMaster
- Team

Meetings

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

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Components

- Product backlog
- Sprint backlog
- Burndown charts

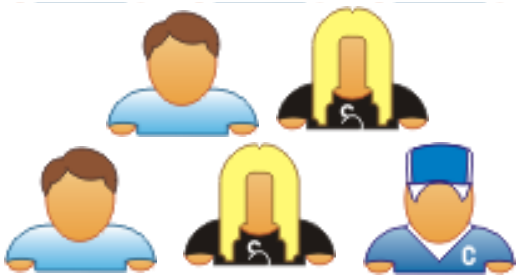
Product Owner

- Define the features of the product
- Decide on release date and content.
- 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.

The ScrumMaster

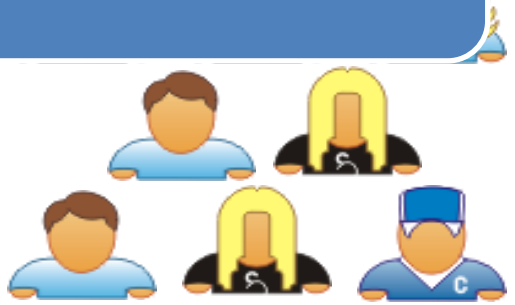
- Represents management *of* the project
- Responsible for enacting Scrum values and practices
- Removes impediments: respond if things are getting in the way
- Ensure that the team is fully functional and productive
- Enable close cooperation across all roles and functions.
- Shield the team from external interferences

The Team



- Typically 5-9 people.
- Cross-functional:
  - Programmers, testers, user experience designers, etc.

The Team



- Teams are self-organizing.
  - Ideally, no titles but rarely a possibility
- Membership should change only between sprints.

Scrum Framework

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- Team

Meetings

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Components

- Product backlog
- Sprint backlog
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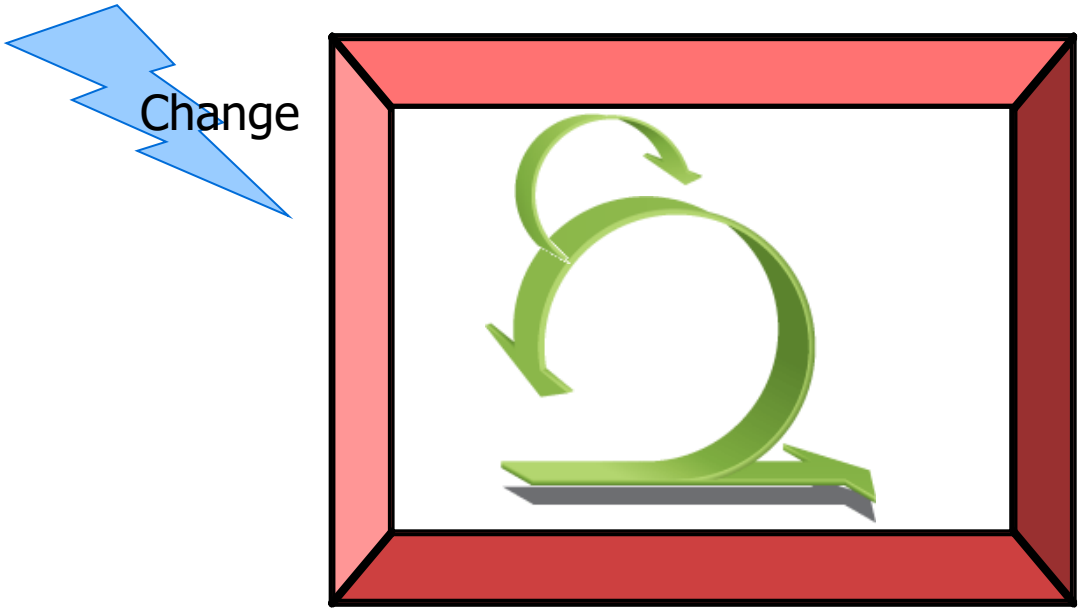
Sprint Planning Meeting

- A collaborative meeting in the beginning of each Sprint between the Product Owner, the Scrum Master and the Team.
- Takes 8 hours for a 1 month long Sprint.

Sprint

- A month-long iteration, product functionality or feature set is defined.
- NO outside influence can interference with the Scrum team during the Sprint.
- Each Sprint begins with the Daily Scrum Meeting.

No changes during a sprint



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

Product backlog, or the requirements from your specs

We did this just once, it's just 6 week project after all

Sprint planning meeting

Prioritize

- Analyze and evaluate product backlog

Selected requirements to be completed in iteration one

Sprint planning

- Decide how to do it

You created tasks needed to complete the requirements

Sprint Backlog

our iteration requirements

Sprint Planning Meeting

- Team selects items from the requirements they can commit to completing.
  - Select the most important requirements from the product backlog that you think you can complete in a Sprint *iteration*
- High-level design is considered.

As a vacation planner, I want to see photos of the hotels.

Code the middle tier (8 hours)
Code the user interface (4)
Write test fixtures (4)
Code the foo class (6)
Update performance tests (4)

What's Happening now?

- Building something/working on those tasks
- Team should be in the same room ideally
  - Doing different things
  - Communicating
  - No hiding or promising to do something that won't get done.

The Daily Scrum

- At start of day
- Time Boxed: 15 minutes
- Stand-up: to keep it short
- Not for problem solving, which comes later
  - Only team members, ScrumMaster, product owner, can talk
- Helps avoid other unnecessary meetings.

Everyone answers 3 questions

1. What did you do yesterday?
2. What will you do today?
3. Is anything in your way?

- These are *not* status updates for ScrumMasters
  - They are commitments in front of the team

Tasks

- **Tasks**: Added to story at beginning of a sprint and broken down into hours.
  - Each task should not exceed 12 hours, it's common for teams to insist that a task take no more than a day to finish.

Tasks

- Individuals sign up for work of their own choosing during the Sprint Review
  - Work is never assigned
- Track the progress of tasks with a Task Board
  - Defined ➔ In Progress ➔ Completed
- Can add, change, or remove tasks
- Update time remaining daily
- When complete, mark the task as complete
- Track progress with a burn down chart

The Sprint Review

- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture
- Informal
  - Time boxed (4 hours for a monthly sprint), for shorter sprints, it can be shorter.
  - No powerpoints
- Whole team participates

Sprint Retrospective

- At the end of sprint take a look at what is and what is not working.
- Time boxed
- Whole team participates
  - ScrumMaster
  - Product owner
  - Team
  - Possibly customers and others

Start / Stop / Continue

- Whole team gathers and discusses what they'd like to:

Start doing

Stop doing

Continue doing

This is just one of many ways to do at a sprint retrospective.

Scrum Framework

Roles

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Ceremonies

- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

3 Artifacts

- Product Backlog
  - User stories
- Sprint Backlog
- Burndown chart

Product Backlog

This is the product backlog

- The requirements
- A list of all desired work on the project
- Ideally expressed such that each item has value to the users or customers of the product
- Prioritized by the product owner
- Reprioritized at the start of each sprint.

User Stories

A sample product backlog

Backlog item	Estimate
Allow a guest to make a reservation	3
As a guest, I want to cancel a reservation.	5
As a guest, I want to change the dates of a reservation.	3
As a hotel employee, I can run RevPAR reports (revenue-per-available-room)	8
Improve exception handling	8
...	30
...	50

The Sprint goal

- A short statement of what the work will be focused on during the sprint

Life Sciences

Support features necessary for population genetics studies.

Database Application

Make the application run on SQL Server in addition to Oracle.

Financial services

Support more technical indicators than company ABC with real-time, streaming data.

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

Managing the Sprint backlog

- Individuals sign up for work of their own choosing
  - Work is never assigned
- Estimated work remaining is updated daily
- Any team member can add, delete or change the sprint backlog
- If work is unclear, define a sprint backlog item with a larger amount of time and break it down later
- Update work remaining as more becomes known

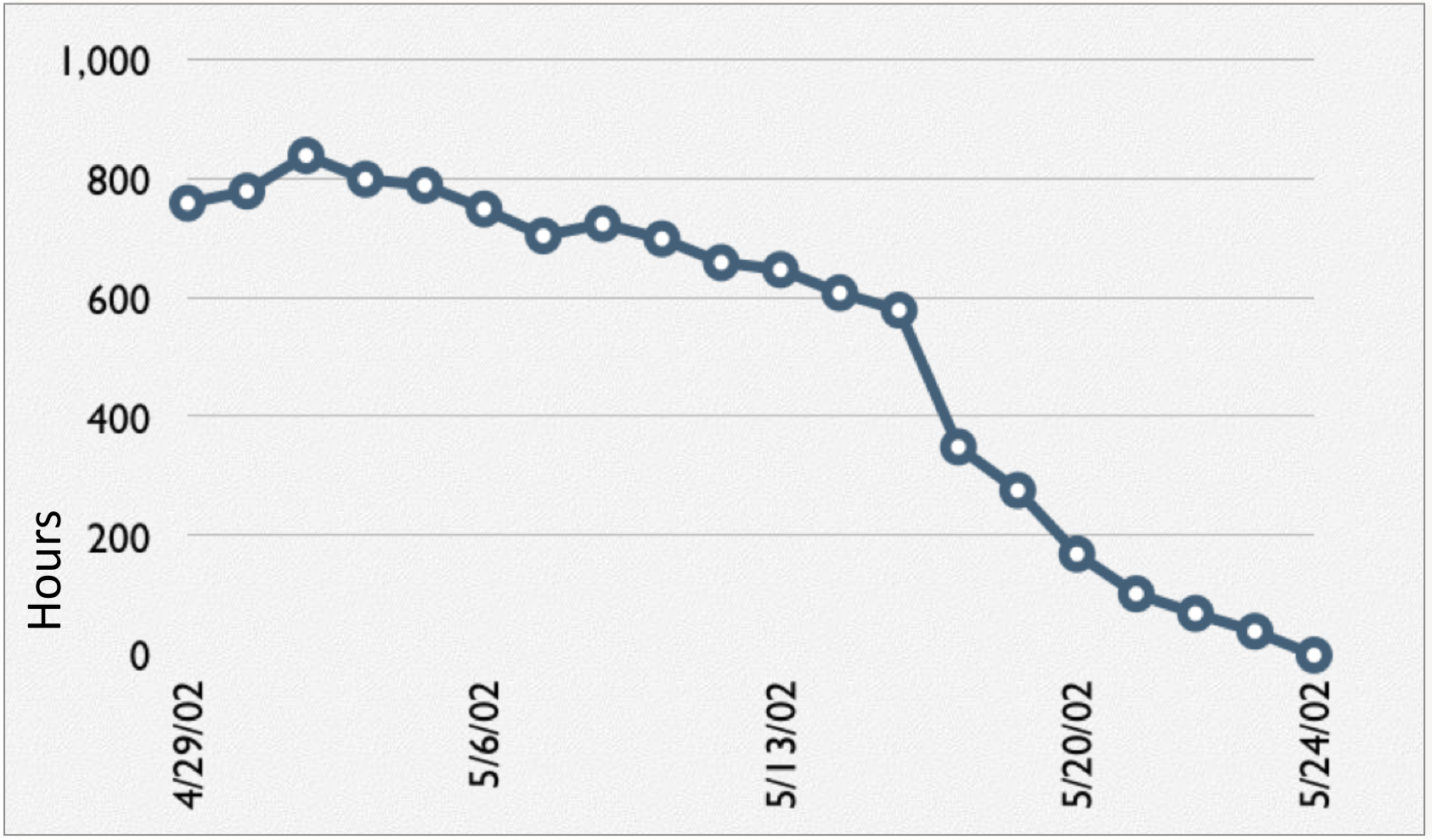
A Sprint Backlog

Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	4	
Test the middle tier	8	16	16	11	8
Write online help	12				
Write the foo class	8	8	8	8	8
Add error logging			8	4	

Sprint burndown chart

- Are used to represent “work done”.
- Are wonderful Information Radiators
- 3 Types:
  - Sprint Burn down Chart (progress of the Sprint)
  - Release Burn down Chart (progress of release)
  - Product Burn down chart (progress of the Product)

A Sprint burndown chart



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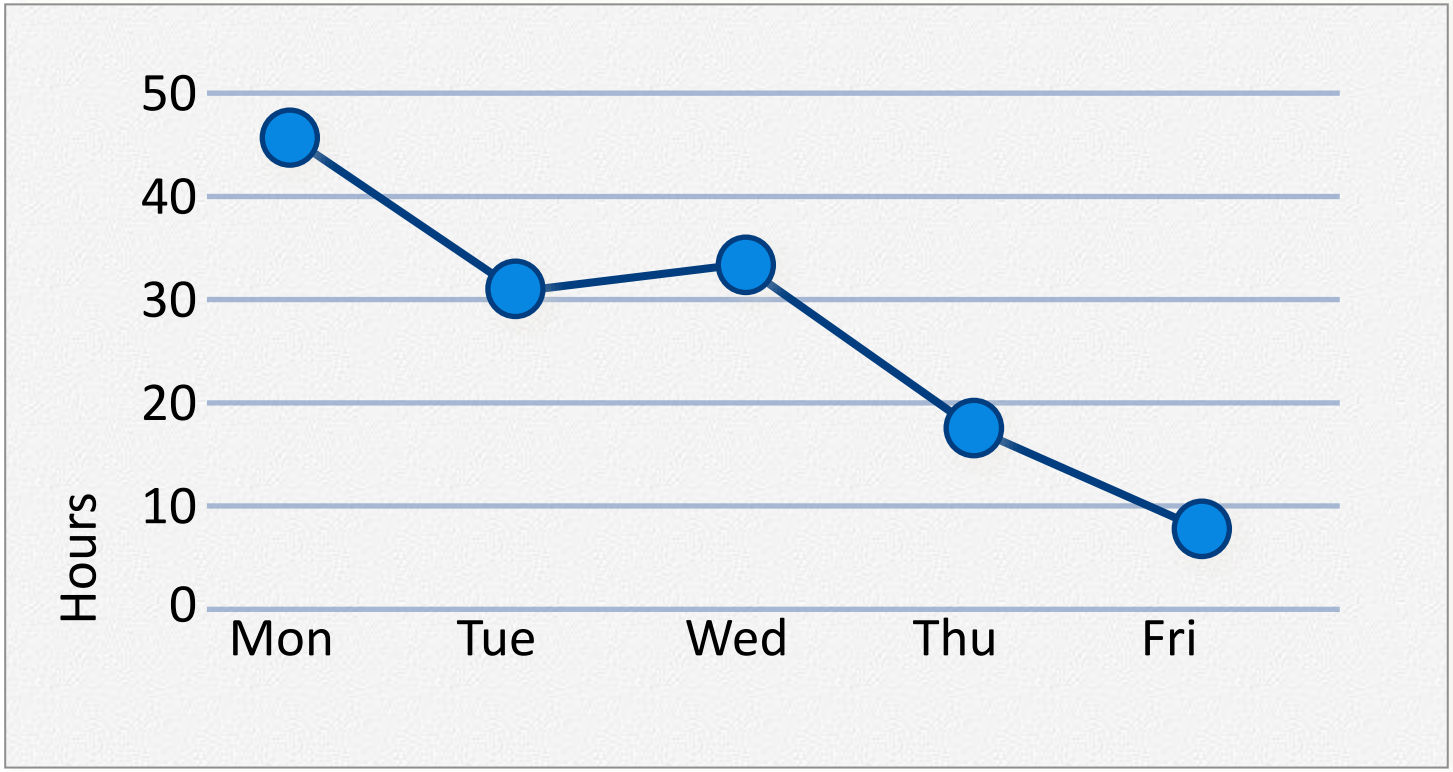


Sprint burndown chart Example

- Duration: 5 days
- Sprint Backlog: 8 tasks
- Velocity: 80 available hours
- **Step 1 – Create Estimate Effort:**
- 80 hours over 5 days= 80/5 = 16 hours a day.

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Effort remaining	80	64	48	32	16	0

Sprint Burndown chart Example

- **Step 2 – Track Daily Process:**
- The daily progress is then captured in the table against each task. Burndown – Daily progress:

Task	Hours	Day 1	Day 2	Day 3	Day 4	Day 5	Total
Task 1	10	3	2	0	1	4	10
Task 2	10	3	2	0	1	4	10
Task 3	10	3	2	0	1	4	10
Task 4	10	3	2	0	1	4	10
Task 5	10	3	2	0	1	4	10
Task 6	10	3	2	0	1	4	10
Task 7	10	3	2	0	1	4	10
Task 8	10	3	2	0	1	4	10

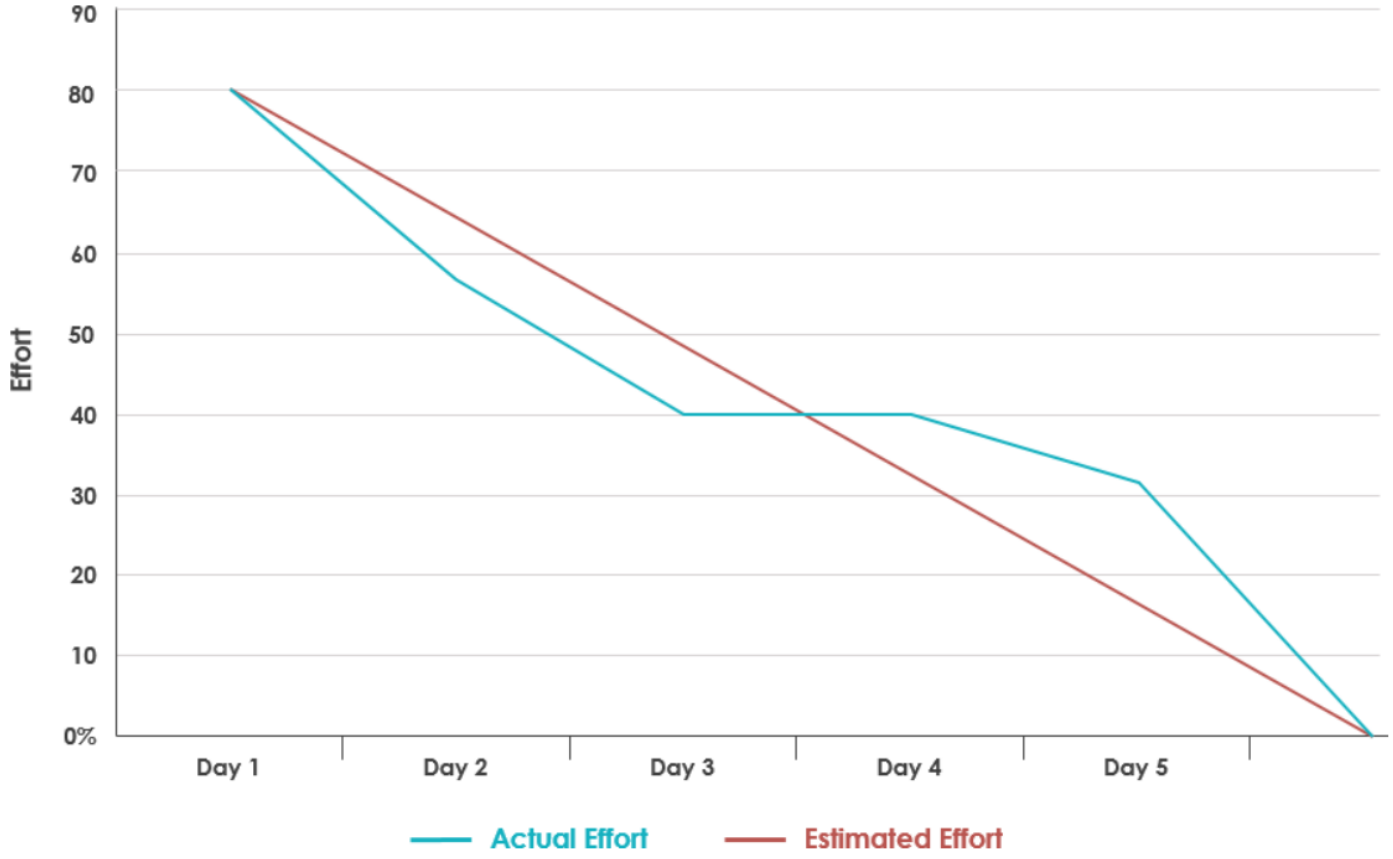
Sprint burndown chart

- **Step 3 – Compute the Actual Effort:**
- Burndown – Actual effort:

		Day 1	Day 2	Day 3	Day 4	Day 5
Actual effort	80	56	40	40	32	0
Effort remaining	80	64	48	32	16	0

Sprint burndown chart

- **Step 4 – Plot the Burndown using the Dataset:**
- Burndown – Final dataset:



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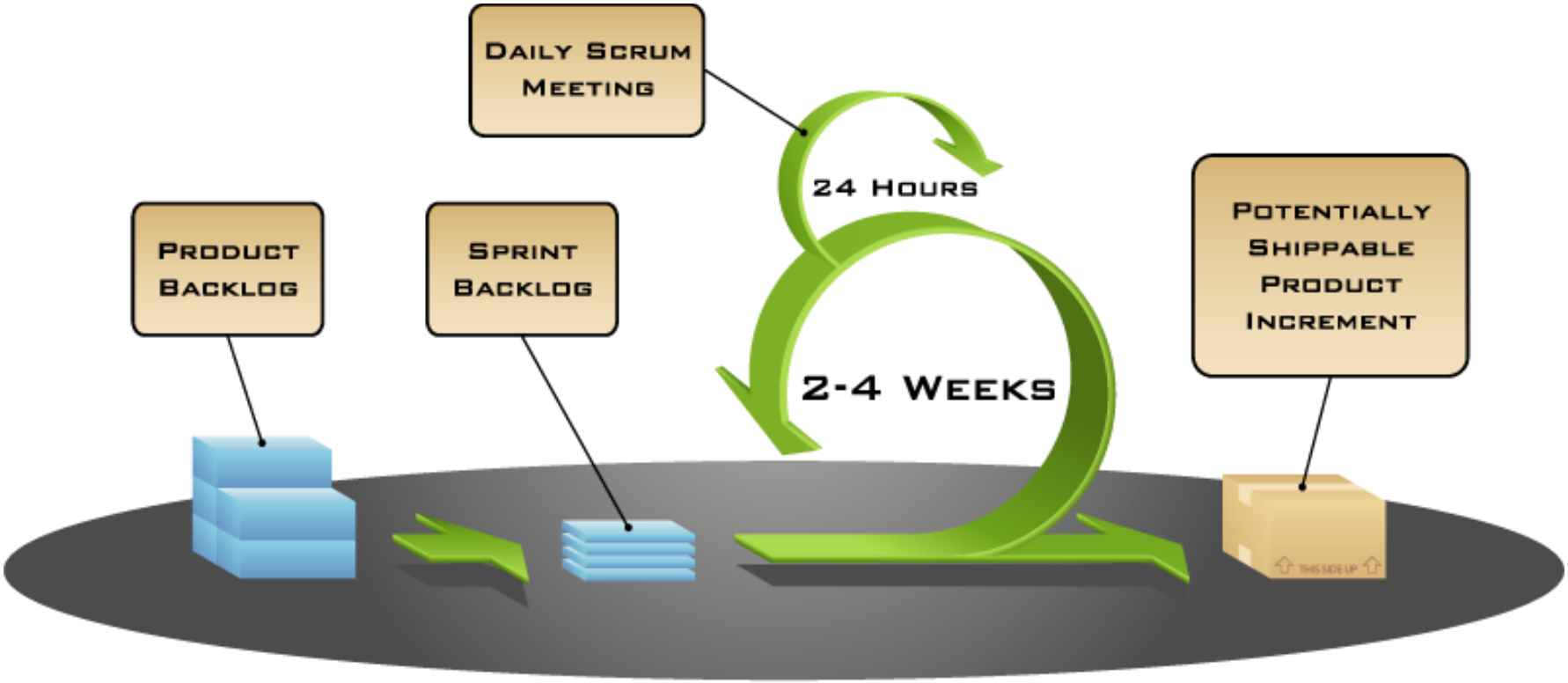

Scalability

- Typical individual team is 7 ± 2 people
  - Scalability comes from teams of teams
- Factors in scaling
  - Type of application
  - Team size
  - Team dispersion
  - Project duration
- Scrum has been used on multiple 500+ person projects

References

- Miscellaneous Journals and Internet Resources.