

# CSIT214/CSIT883

## IT Project Management



Agile project management using Scrum

# Scrum has been used by:

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- Microsoft
- Yahoo
- Google
- Electronic Arts
- High Moon Studios
- Lockheed Martin
- Philips
- Siemens
- Nokia
- Capital One
- BBC
- Intuit
- 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:

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- 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

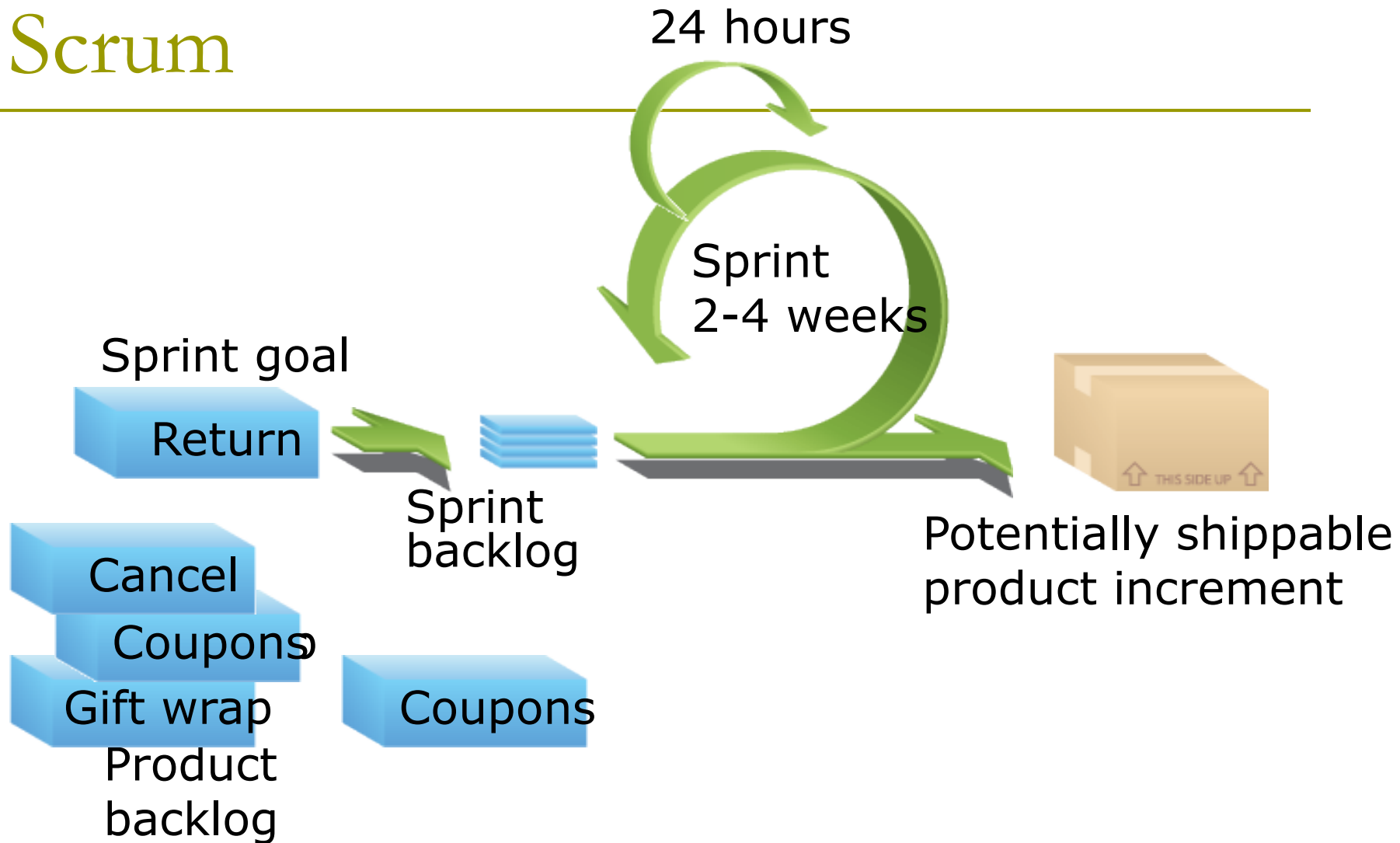
# Characteristics

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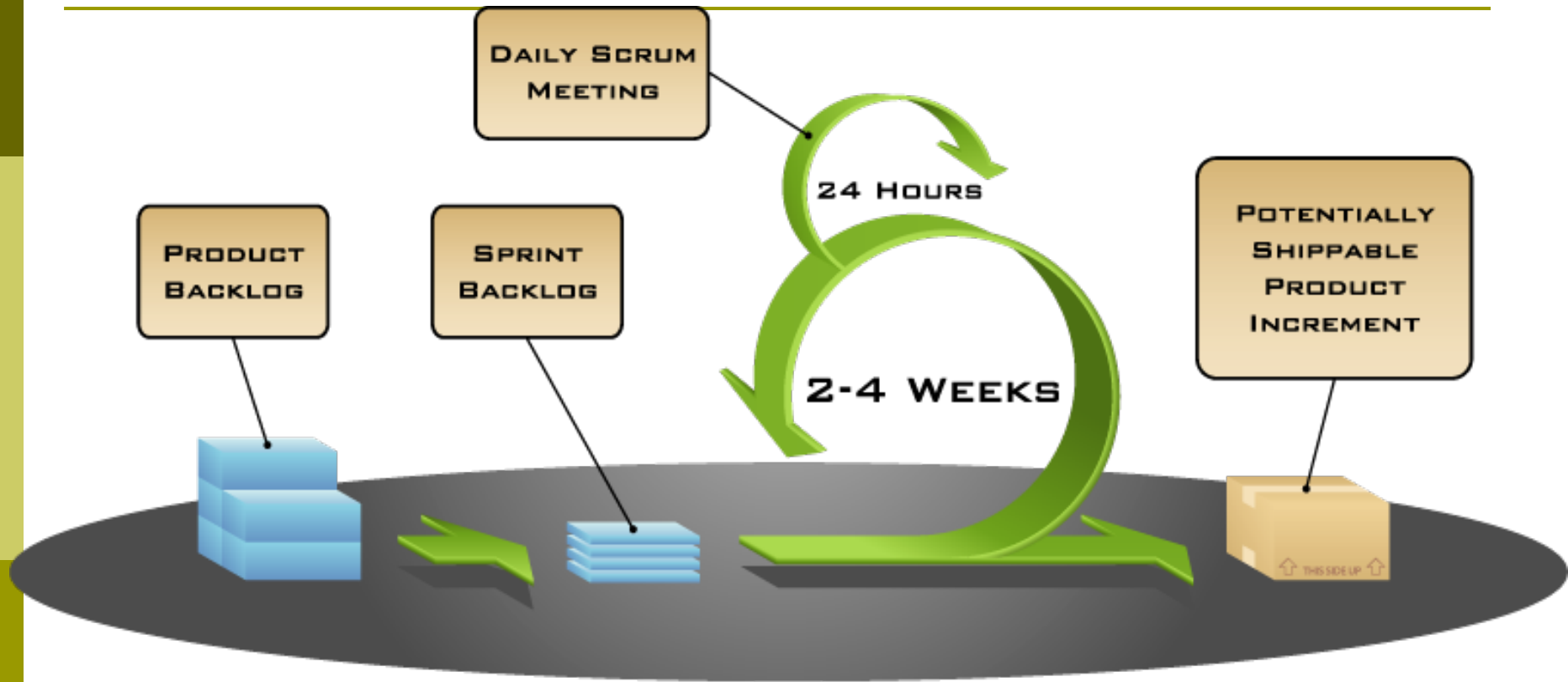
- ❑ Self-organizing teams
- ❑ Product progresses in a series of month-long “sprints”
- ❑ Requirements are captured as items (user stories) in a list of “product backlog”
- ❑ No specific engineering practices prescribed
- ❑ One of the “agile processes”

# Scrum

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# Putting it all together



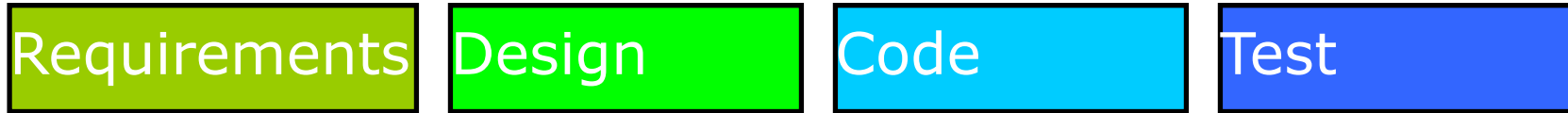
# Sprints

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- ❑ Scrum projects make progress in a series of “sprints” (i.e. iterations)
- ❑ Typical duration is 2–4 weeks or a calendar month at most
- ❑ Product is designed, coded, and tested during the sprint

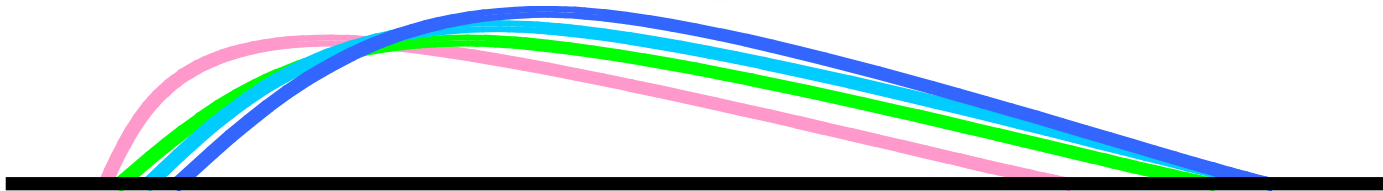
# Sequential vs. overlapping development

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

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

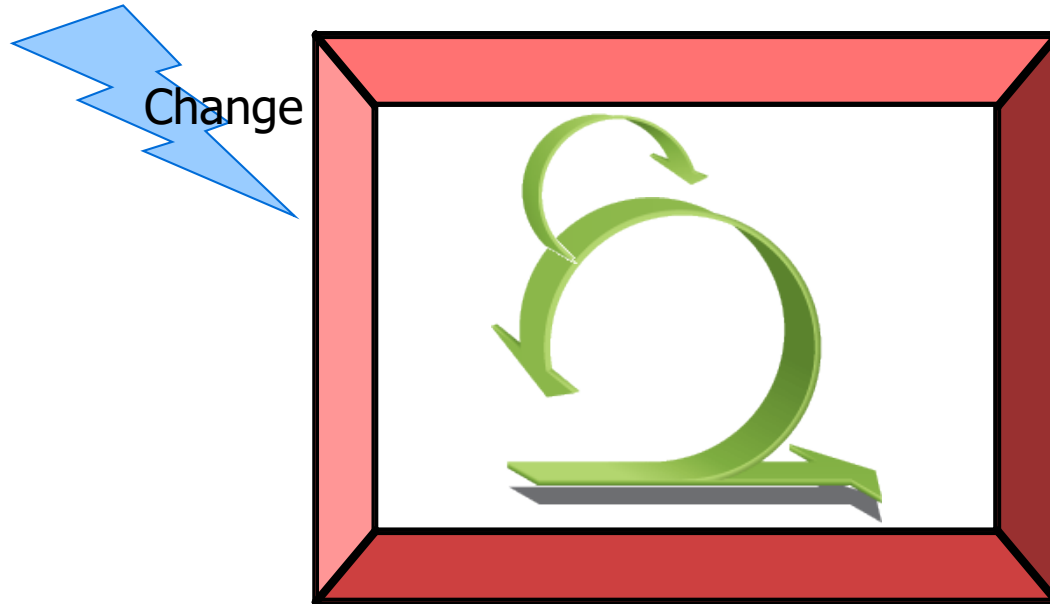


Source: “The New New Product Development Game”  
by Takeuchi and Nonaka. *Harvard Business Review*,  
January 1986.



# No changes during a sprint

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

# Scrum framework

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## Roles

- Product owner
- ScrumMaster
- Team

## Ceremonies

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

## Artifacts

- Product backlog
- Sprint backlog
- Burndown charts

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# Product backlog

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This is the  
product backlog

- ❑ A typical Scrum backlog comprises the following different types of items:
  - Features
  - Bugs
  - Technical work (e.g. "Upgrade all developers' workstations to Windows 10")
  - Knowledge acquisition (e.g. "researching various JavaScript libraries and making a selection.")
- ❑ **Prioritized** by the product owner
- ❑ Reprioritized at the start of each sprint

# User stories

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- ❑ **User stories** are short, simple descriptions of a feature told from the perspective of a user or customer of the system who desires the new capability.
- ❑ User stories typically follow a simple template:
  - *As a < type of user >, I want < some goal > so that < some reason >.*
- ❑ Examples:
  - As a site visitor, I can read current news on the home page.
  - As a trainer, I can create a new course or event. This includes the following information: name, description (HTML), trainer names (multiple selection from a list), start date, end date, venue name (HTML) and address, contact name, contact phone, contact email, a link for more information, and a link to register. For a certification course the name of the class is a dropdown list; for others, it is free text.

# 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

What are these?



# Traditional vs. agile size/effort estimation

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# Estimate user stories using ideal days

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- ❑ How long something would take if
  - it's all you worked on
  - you had no interruptions
  - and everything you need is available
- ❑ The ideal time of a soccer game is 90 minutes
  - Two 45-minute halves
- ❑ The elapsed time is much longer (e.g. 2 hours).



# Ideal time vs. elapsed time


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- ❑ It's easier to estimate in ideal time
- ❑ It's too hard to estimate directly in elapsed time
  - Need to consider all the factors that affect elapsed time at the same time you're estimating

# Estimate user stories using story points

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- ❑ Story points are commonly used to represent the effort of completing a user story. The effort is influenced by:
  - How hard a user story is
  - How much there is
- ❑ Relative values are what is important:
  - A login screen is a 2.
  - A search feature is an 8.
- ❑ Story point estimation are team-specific



As a user, I want to be able to have some but not all items in my cart gift wrapped.

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# Techniques for estimating user stories

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- ❑ Estimate by analogy
  - Comparing a user story to others
    - ❑ “This story is like that story, so its estimate is what that story’s estimate was.”
  - Don’t use a single gold standard
  - Triangulate instead
    - ❑ Compare the story being estimated to multiple other stories

# Triangulation

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- ❑ Confirm estimates by comparing the story to multiple other stories.
- ❑ Group like-sized stories on table or whiteboard

3 points	Story A		
2 points	Story C	Story D	Story F
1 point	Story B	Story E	

# Use the right units

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- Use a set of numbers that make sense.
  - Fibonacci series are commonly used in practice, e.g. 1, 2, 3, 5, 8, 13, ....

# Planning poker

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- ❑ An iterative approach to estimating
- ❑ Steps
  - Each estimator is given a deck of cards, each card has a valid estimate written on it
  - Customer/Product owner reads a story and it's discussed briefly
  - Each estimator selects a card that's his or her estimate
  - Cards are turned over so all can see them
  - Discuss differences (especially outliers)
  - Re-estimate until estimates converge

See Planning Poker in action

<https://www.youtube.com/watch?v=cOJ5i4GVZYg>

# Planning poker - example

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Estimator	Round 1	Round 2
Susan	3	5
Vadim	8	5
Ann	2	5
Chris	5	8

# Why Planning Poker works

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- ❑ Those who will do the work, estimate the work
- ❑ Estimators are required to justify estimates
- ❑ Combining of individual estimates through group discussion leads to better estimates
- ❑ Emphasizes relative rather than absolute estimating
- ❑ Estimates are constrained to a set of values so we don't waste time in meaningless arguments
- ❑ Everyone's opinion is heard
- ❑ It's quick and fun



# Sprint planning

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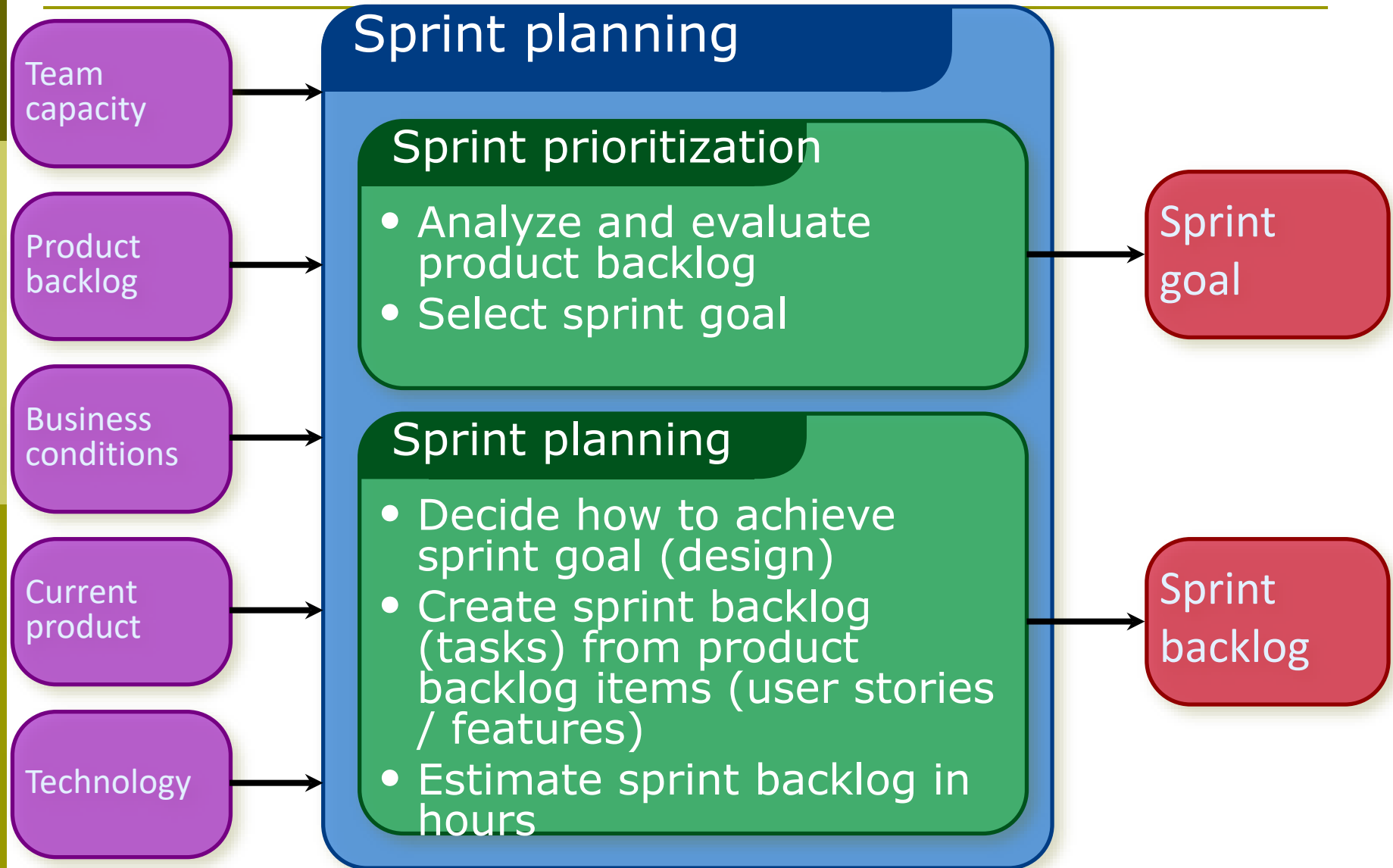
- Watch this video

<https://youtu.be/En3ifkDYgHM>

- Answer the following questions:

- What is the purpose of sprint planning?
- What are the main output of sprint planning?
- What activities are often conducted during sprint planning?

# Sprint planning



# Sprint planning

- Team decides on the **goal** for a particular sprint, and then selects items from the product backlog they commit to complete to achieve the **sprint's goal**.
- Sprint backlog is created
  - Tasks are identified and each is estimated (e.g. 1-16 hours)
  - Collaboratively, not done alone by the ScrumMaster
- High-level design is considered

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

**User story**

Develop UML design (4 hours)  
Code the middle tier (8 hours)  
Code the user interface (4)  
Write test fixtures (4)  
Code the foo class (6)

**Tasks (Example only)**

Note: effort estimation can be in **story points**.

# The sprint goal

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

## Life Sciences

Support features necessary for population genetics studies.

## Financial services

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

## Database Application

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

# Managing the sprint backlog

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- Any team member can add, delete or change the sprint backlog
- Work for the sprint emerges
- 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 (burndown chart)

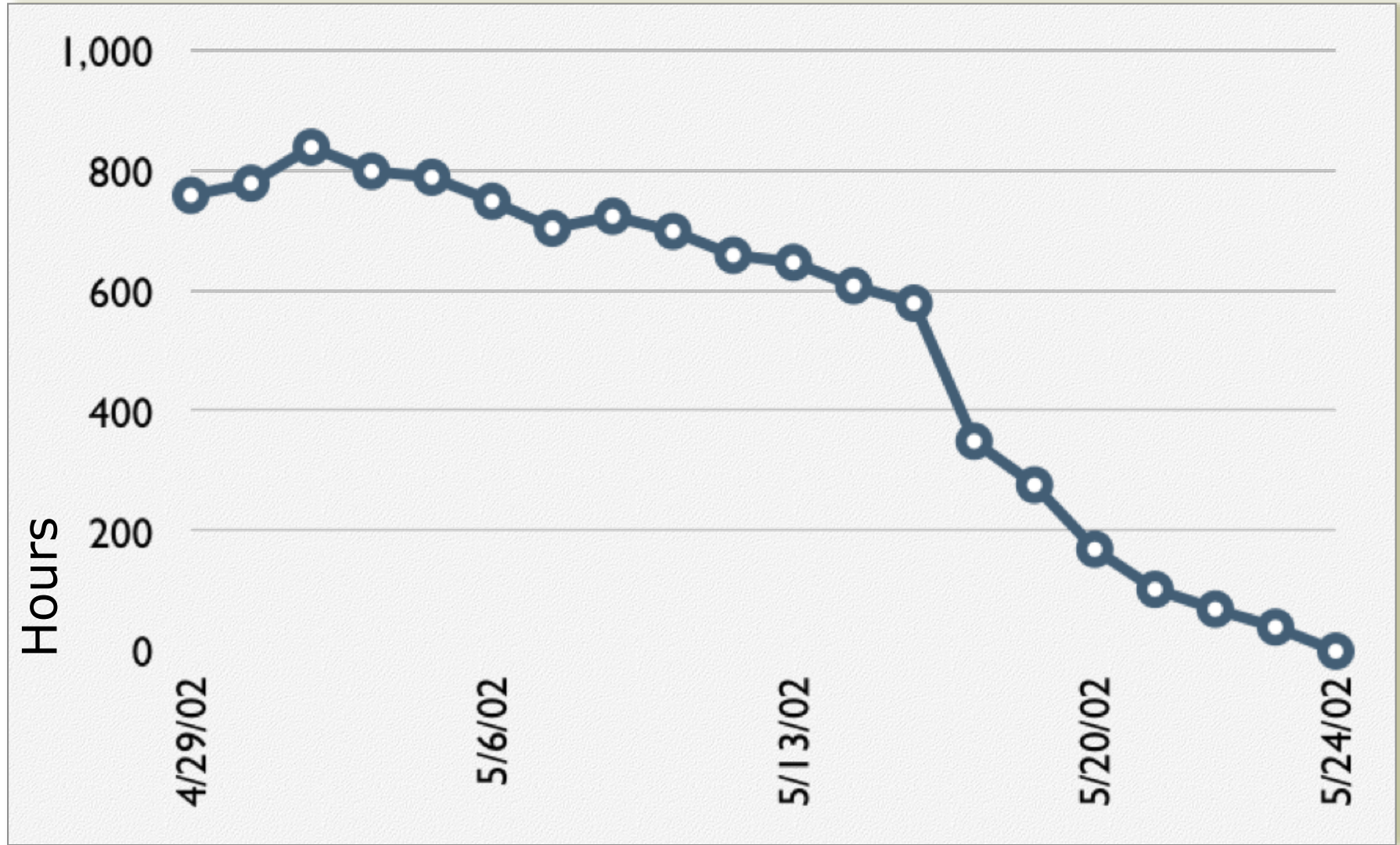
# An example of sprint backlog

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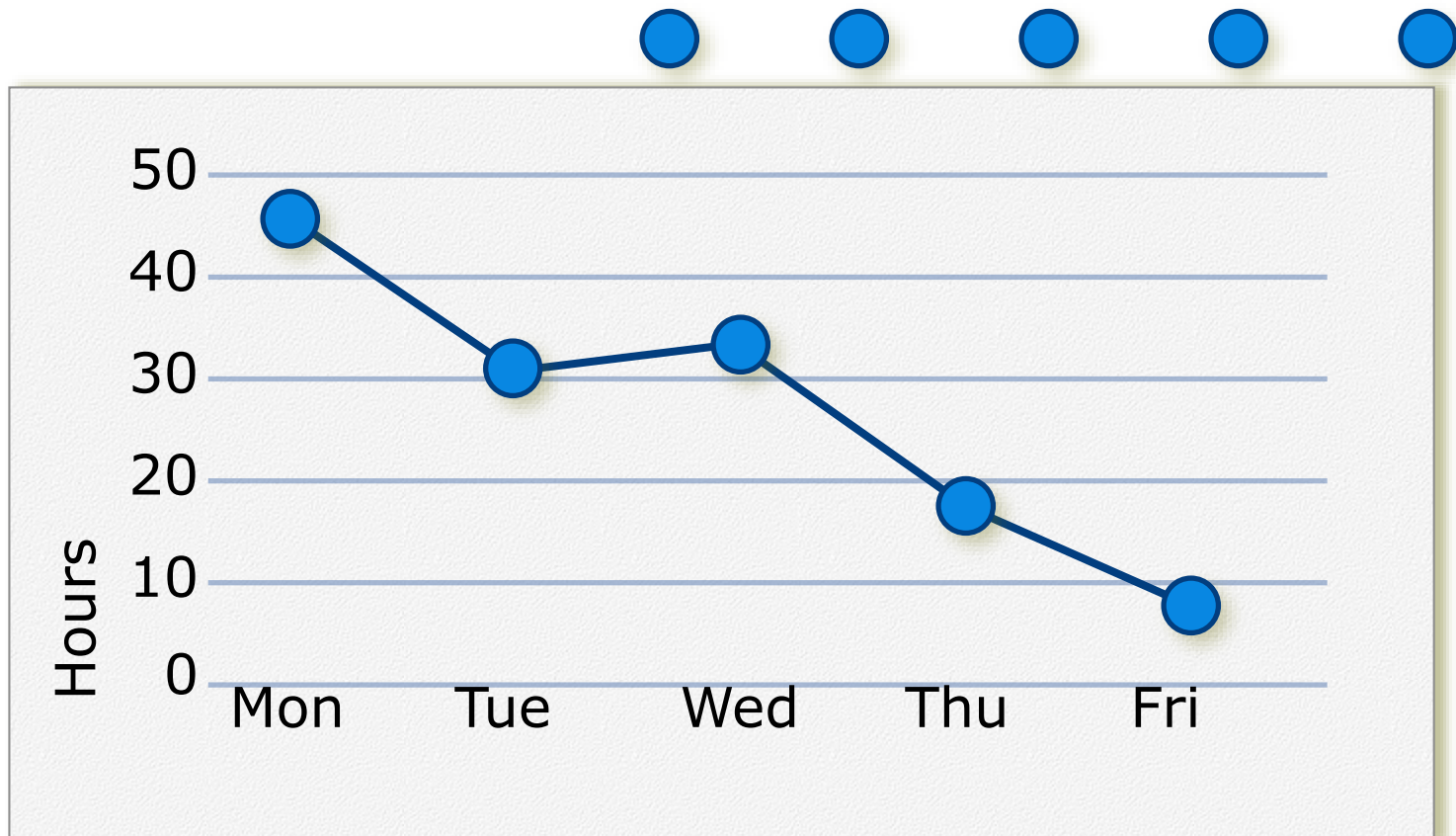
Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	4	
Test the middle tier	8	16	16	11	8
Write online help	12				
Write the foo class	8	8	8	8	8
Add error logging			8	4	

# A sprint burndown chart

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Tasks	Mon	Tues	Wed	Thur	Fri
Code the user interface	8	4	8		
Code the middle tier	16	12	10	7	
Test the middle tier	8	16	16	11	8
Write online help	12				





# Scrum framework

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## Roles

- Product owner
- ScrumMaster
- Team

## Ceremonies

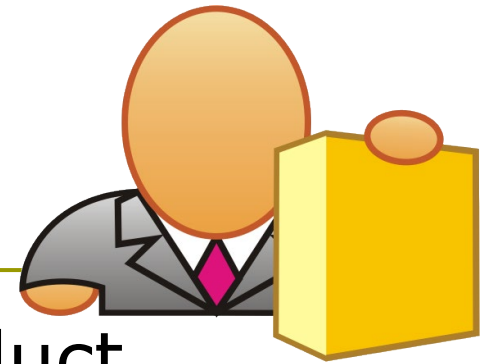
- Sprint planning
- Sprint review
- Sprint retrospective
- Daily scrum meeting

## Artifacts

- Product backlog
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# Product owner

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- ❑ Define the **features** of the product
- ❑ Decide 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

# The ScrumMaster

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- 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

# The team

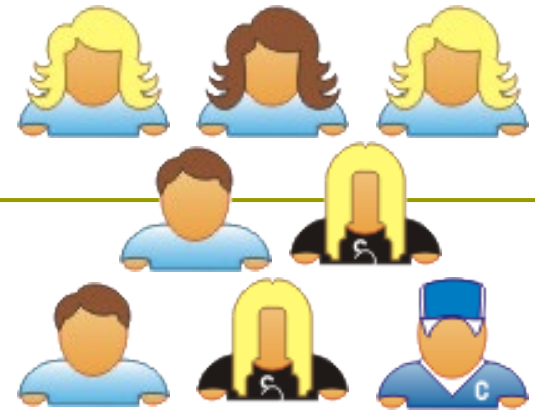
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- Typically 5-9 people
- Cross-functional:
  - Programmers, testers, user experience designers, etc.



# The team

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

# Scrum framework

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## Ceremonies

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- ## Artifacts
- Product backlog
  - Sprint backlog
  - Burndown charts

# Sprint planning meeting

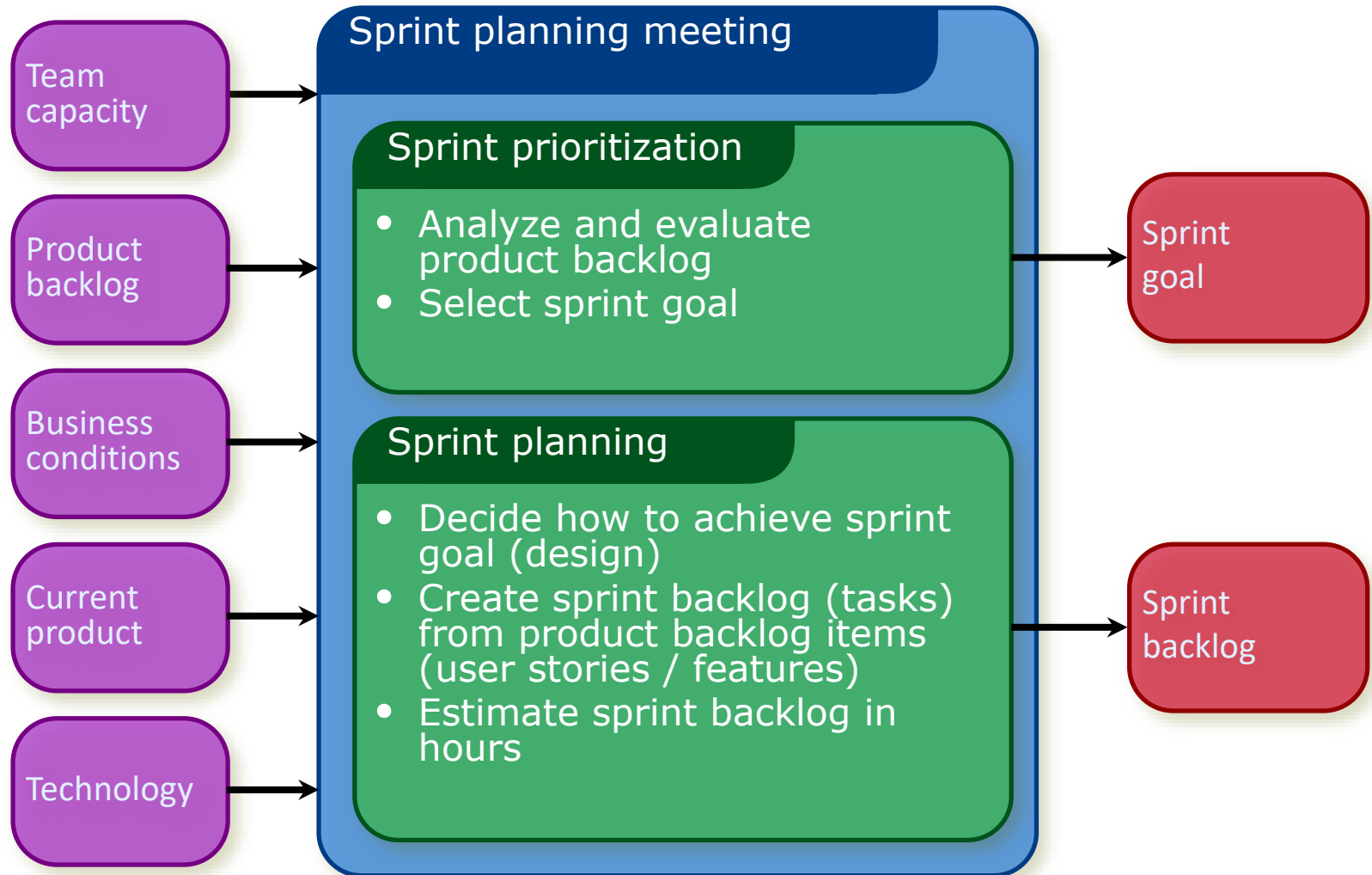
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- Watch this video

<https://youtu.be/2A9rkiIcnVI>

- Answer the following questions:
  - What is the purpose of sprint planning meeting?
  - Who should participate?
  - What should be the outcomes?

# Sprint planning meeting



An example of sprint planning in real life <https://youtu.be/GivcWpDRID4>



# Daily Scrum meeting

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- Watch this video to see how Daily Scrum Meeting in action

<https://www.youtube.com/watch?v=xcC0LmkzG9g>

- Answer the following questions:
  - What are daily scrum meetings for?
  - Who should participate in daily scrum meetings?
  - What are the questions each team member should address in a daily scrum meeting?

# Daily scrum meeting

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- Parameters
  - Daily
  - 15-minutes
  - Stand-up
- Not for problem solving
  - Only team members, ScrumMaster, product owner, can talk
- Helps avoid other unnecessary meetings



# Everyone answers 3 questions

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1

What did you do yesterday?

2

What will you do today?

3

Is anything in your way?

- These are *not* status for the ScrumMaster
  - They are commitments in front of peers

# Sprint review meeting

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- 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
  - **No slides**
- Whole team participates

Check out this video for some typical scenarios in sprint review meeting

<https://youtu.be/cbJinz6TieI>



# Sprint retrospective meeting

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- Watch this video

- <https://www.youtube.com/watch?v=MiaZhJyYUj0>

- Answer the following questions:

- What is the purpose of sprint retrospective meeting?
  - Who should participate?
  - What should be discussed?

# Sprint retrospective meeting

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- ❑ Periodically take a look at what is and is not working
- ❑ Typically 15–30 minutes
- ❑ Done after every sprint
- ❑ Whole team participates
  - ScrumMaster
  - Product owner
  - Team
  - Possibly customers and others

# Start / Stop / Continue

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- 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 a sprint  
retrospective.

# Scrum in 100 words

- 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. Teams **self-organize** 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 it for another sprint.

**Acknowledgement:** The following slides on Scrum were adapted from [mountaingoatsoftware.com](http://mountaingoatsoftware.com)



# Exit Quiz

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## QUESTION 1

What kind of software development projects can be executed by Scrum Project Management Framework?

Choice-1: Complete software packages

Choice-2: Customer projects

Choice-3: Sub-systems, components or parts of bigger systems

Choice-4: All kinds of software development projects

Choice-5: None of the given answers

## QUESTION 2

What does NOT belong to cornerstones of the agile manifesto?

Choice-1: Individuals and interactions over processes and tools

Choice-2: Working software over comprehensive documentation

Choice-3: Processes over people

Choice-4: Customer collaboration over contract negotiation

Choice-5: Responding to change over following a plan

### QUESTION 3

What is defined by the Scrum Framework?

- A) Rules & Roles
- B) Document guidelines
- C) Artifacts and events

Choice-2: B

Choice-3: C

Choice-4: A, B, C

Choice-5: A, C

### QUESTION 4

Where are the customer requirements stored?

Choice-1: In the Product Backlog

Choice-2: In the Sprint Backlog

Choice-3: In a database

Choice-4: In a Scrum Product Requirement Specification

Choice-5: Nowhere. The Scrum Product Owner knows them

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## QUESTION 5

Which ones of the following main roles are defined by Scrum Framework?

- A) Scrum Tester
- B) The Scrum Team
- C) Scrum Manager
- D) Scrum Master
- E) Scrum Product Owner

Choice-1: A, B, C, D, E

Choice-2: B, C, D, E

Choice-3: B, D, E

Choice-4: A, B, D, E

Choice-5: A, B, C, D

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## QUESTION 6

Which ones of the following main events are defined by Scrum Framework?

- A) Sprint Planning Meeting
- B) Sprint Retrospective Meeting
- C) Sprint Review Meeting
- D) Mid-Sprint Status Review Meeting
- E) Daily Scrum Meeting

Choice-1: A, B, C, D, E

Choice-2: A, B, C, D

Choice-3: A, C, D, E

Choice-4: A, B, C, E

Choice-5: A, C, E

## QUESTION 7

Which concept is NOT defined in the Scrum Framework?

Choice-1: Scrum Master

Choice-2: Project Manager

Choice-3: Scrum Product Owner

Choice-4: Daily Scrum

Choice-5: Scrum Product Burndown

## QUESTION 8

What is important in all Scrum projects?

A) Self-organization

B) Clear hierarchies in the company

C) Communication

D) Continuous improvement

Choice-1: A, B, C, D

Choice-2: A, C, D

Choice-3: A, D

Choice-4: A

Choice-5: A, B

## QUESTION 9

In software engineering what are the disadvantages of the classical waterfall model?

- A) End-Product has to be fully anticipated beforehand.
- B) Some requirements are implemented as defined in the beginning of the project, and yet they are not really needed by the customer.
- C) Each phase is strictly separated.

Choice-1: A

Choice-2: B

Choice-3: C

Choice-4: A, B

Choice-5: A, B, C

## QUESTION 10

What are the advantages of the Scrum Framework?

Choice-1: Fine-grained requirements are only defined when they are really needed.

Choice-2: All activities to design, build and test a certain functionality are kept together in one phase.

Choice-3: Changes are expected and welcomed by Scrum team.

Choice-4: All of the given answers

Choice-5: None of the given answers