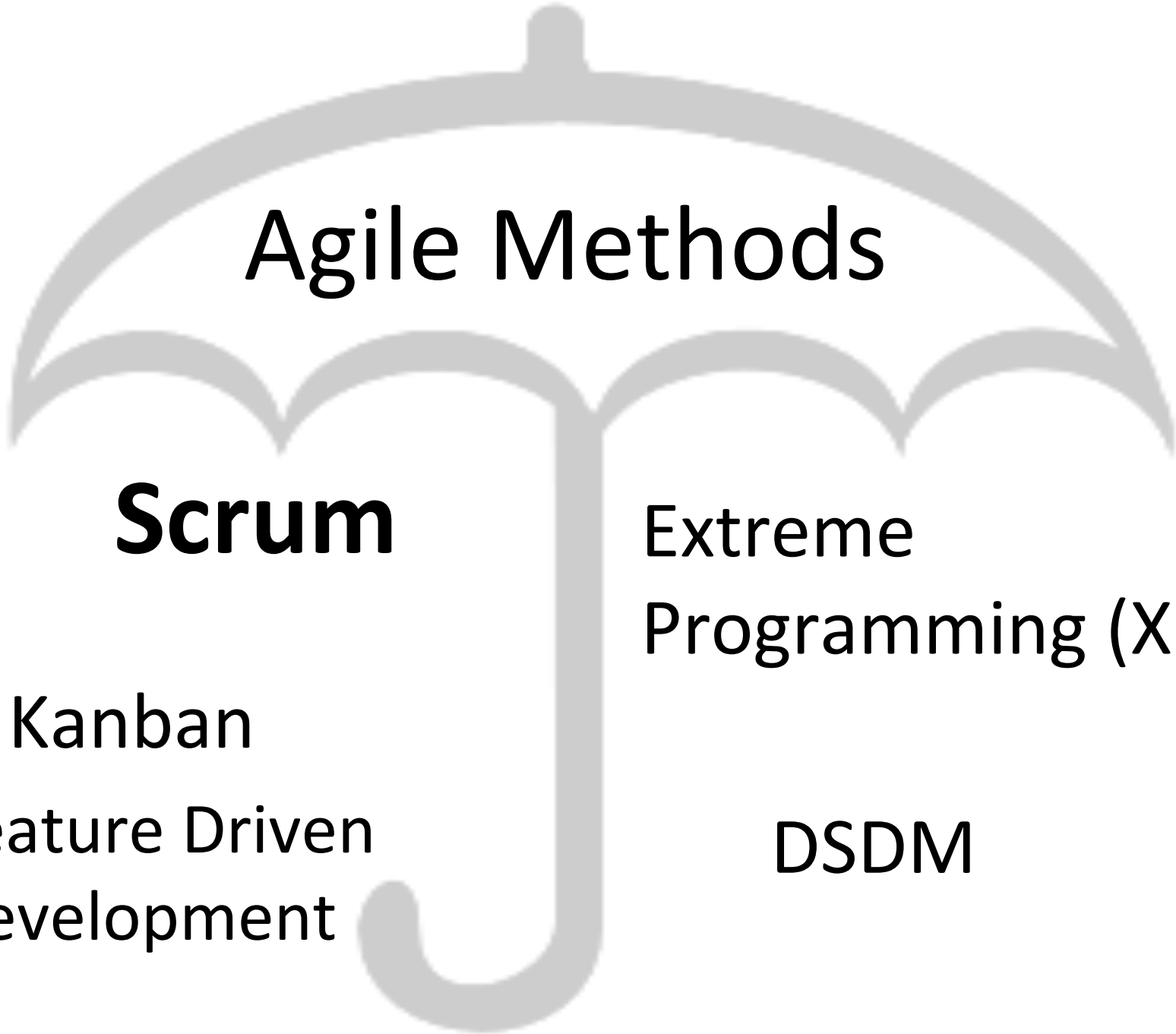
Agile development through Scrum

this presentation has been adopted from a presentation
www.mountaingoatsoftware.com

What is Scrum?

- Scrum is a lightweight, simple to understand (but difficult to master) agile process framework.
- Scrum is one of several agile software development methods.
- Scrum and Extreme Programming (XP) are probably the two best-known Agile methods. XP emphasizes technical practices such as pair programming and continuous integration. Scrum emphasizes management practice such as the role of Scrum Master.
- Many companies use the management practices of Scrum with the technical practices of XP.


Agile Methods
Scrum
Extreme Programming (XP)
Kanban
Feature Driven Development
DSDM

The Agile Manifesto–a statement of values

Individuals and interactions	over	Process and tools
Working software	over	Comprehensive documentation
Customer collaboration	over	Contract negotiation
Responding to change	over	Following a plan

Source: www.agilemanifesto.org

History of Scrum

- Ken Schwaber and Jeff Sutherland developed the Scrum method in the early 1990's. The Scrum method has evolved somewhat over the years.
- The definitive guide to the rules of Scrum, *The Scrum Guide*, is maintained by Ken Schwaber and Jeff Sutherland. [The most recent edition of The Scrum Guide was published in 2016.]

Origins of the idea

- The Scrum methodology was inspired by new approaches to commercial product development being explored in the late 1980's.

"In today's fast-paced, fiercely competitive world of commercial new product development, speed and flexibility are essential. Companies are increasingly realizing that the old, *sequential approach* to developing new products simply won't get the job done. Instead, companies in Japan and the United States are using a holistic method—as in rugby, the ball gets passed within the team as it moves as a unit up the field."

Scrum in 100 words

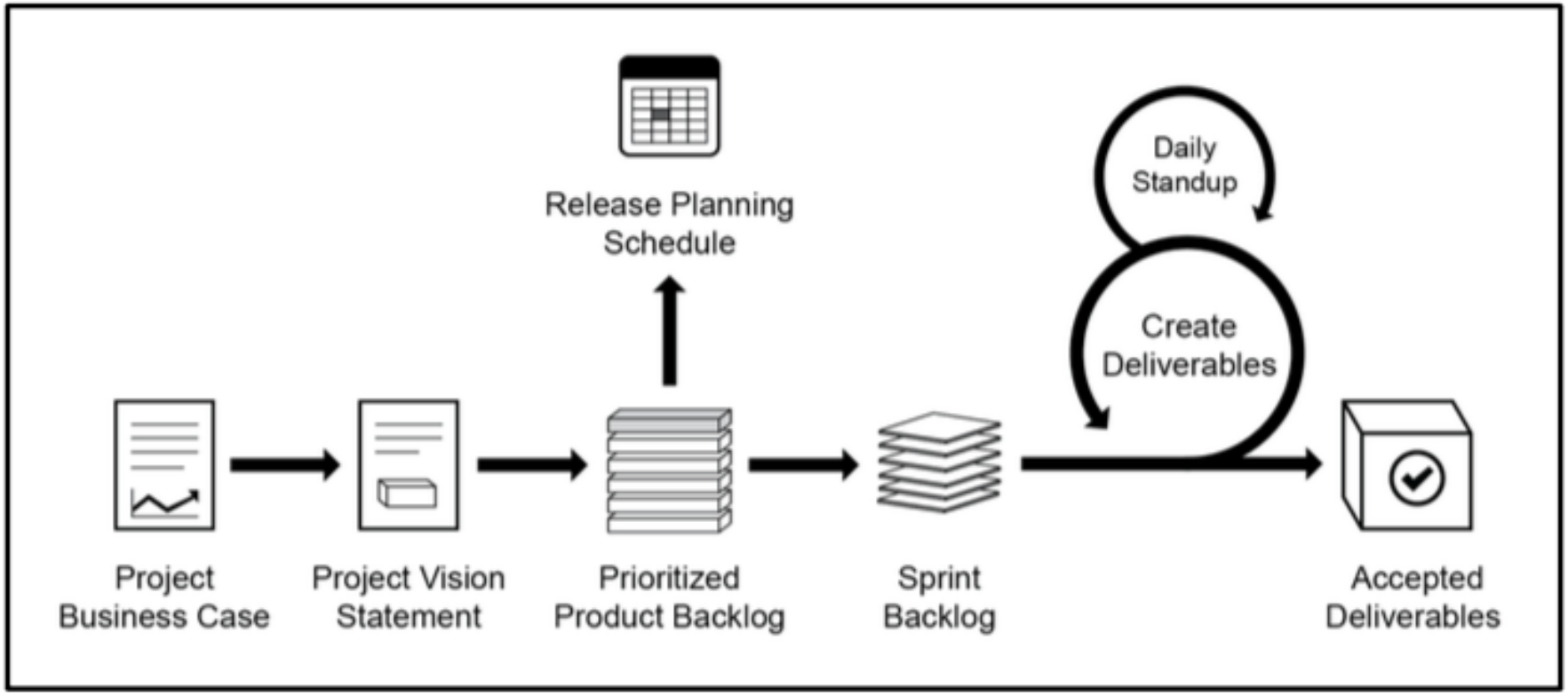
- Scrum is an agile process that allows us to focus on delivering the highest business value in the shortest time.
- It allows us to rapidly and repeatedly inspect actual working software (every two weeks to one month).
- The business sets the priorities. Teams self-organize to determine the best way 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.

Characteristics

- Self-organizing teams
- Product progresses in a series of month-long (or shorter) "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"

Generative Rules

- Most methodologies provide inclusive rules—all the things you could possibly do under all situations. Agile methods offer **generative rules**—a minimum set of things you must do under all situations to generate appropriate practices for special situations.


Release Planning
Schedule
Daily
Standup
Create
Deliverables
Project
Business Case
Project Vision
Statement
Prioritized
Product Backlog
Sprint
Backlog
Accepted
Deliverables

Putting it all together

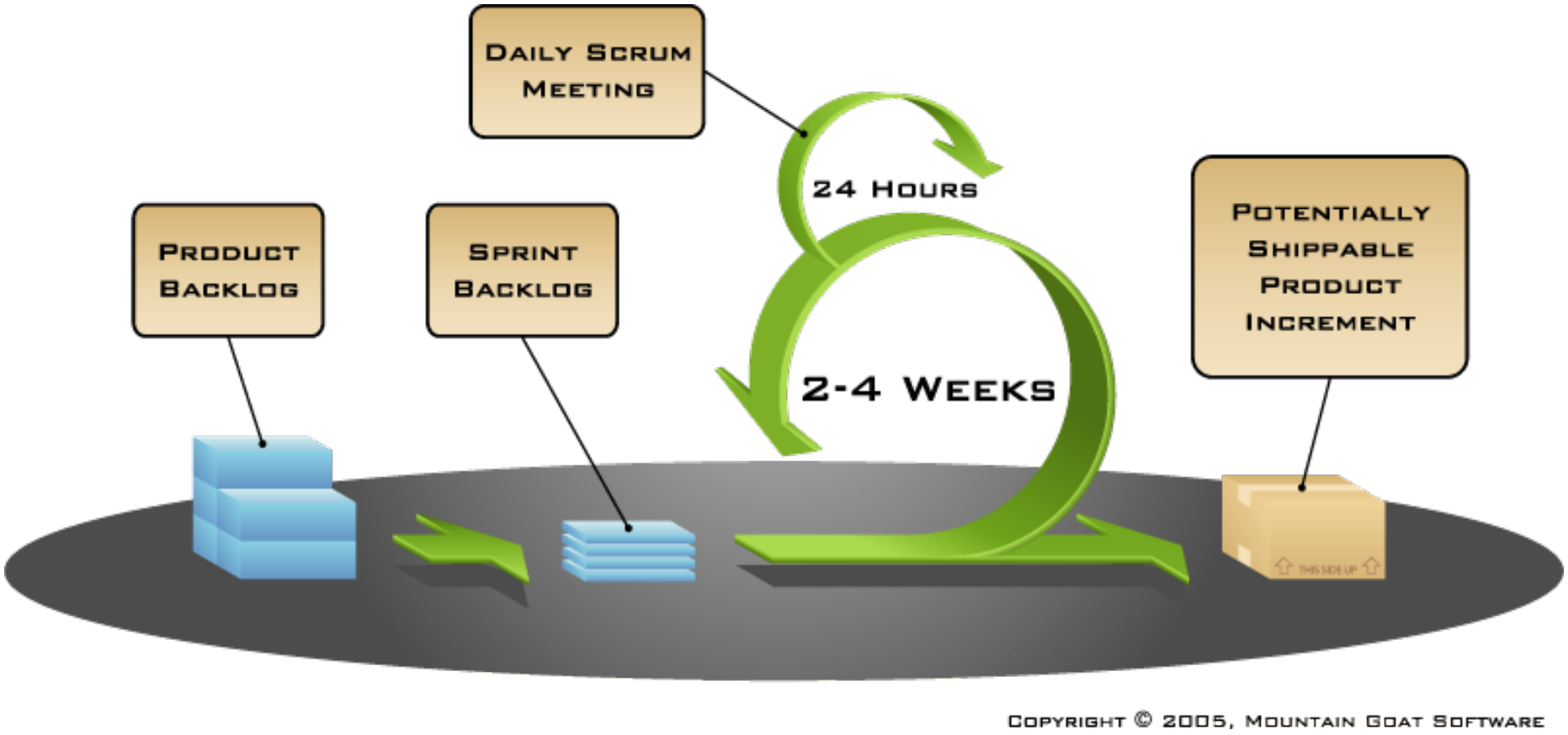
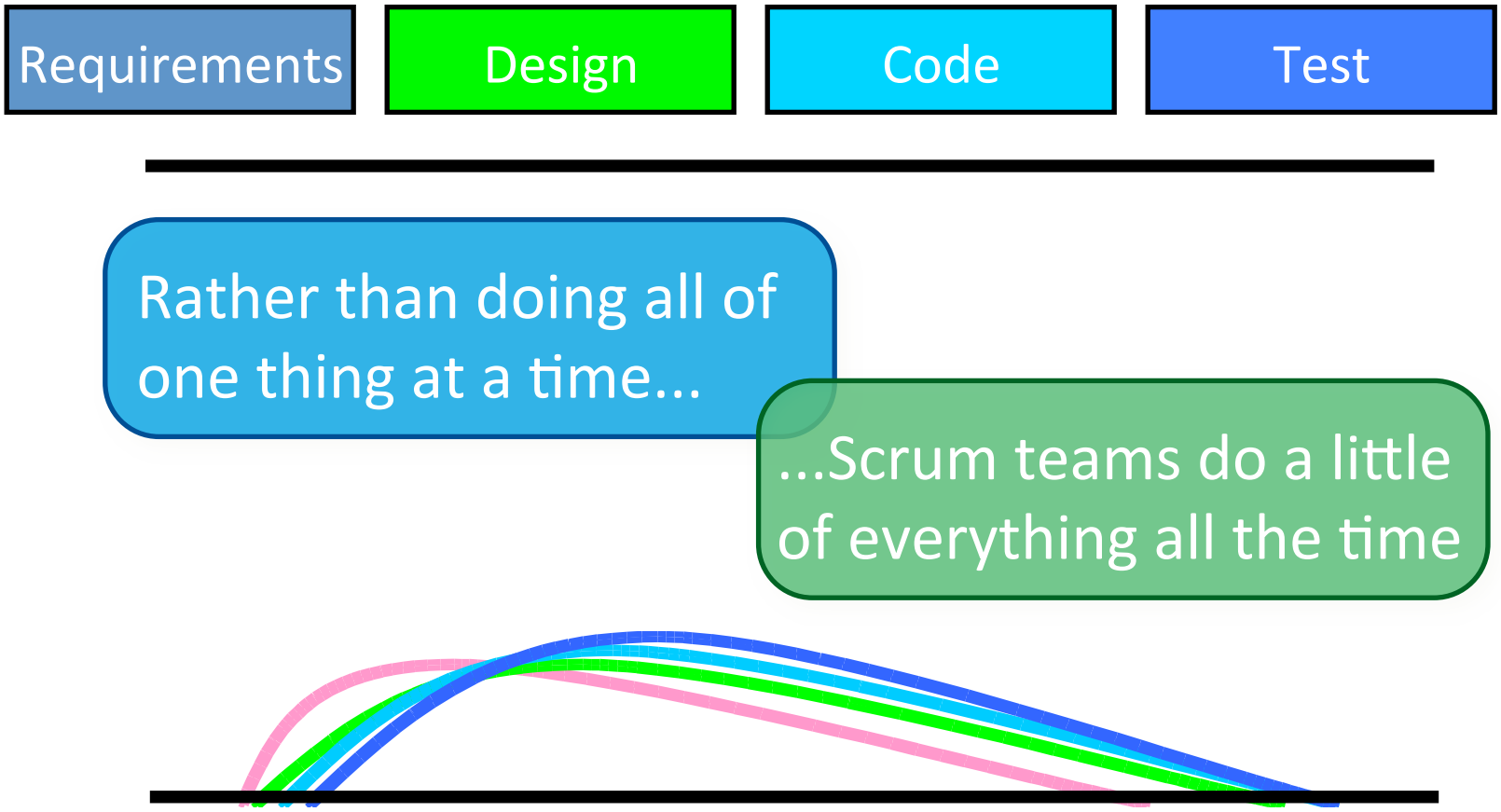


Image available at
www.mountaingoatsoftware.com/scrum

Sprints

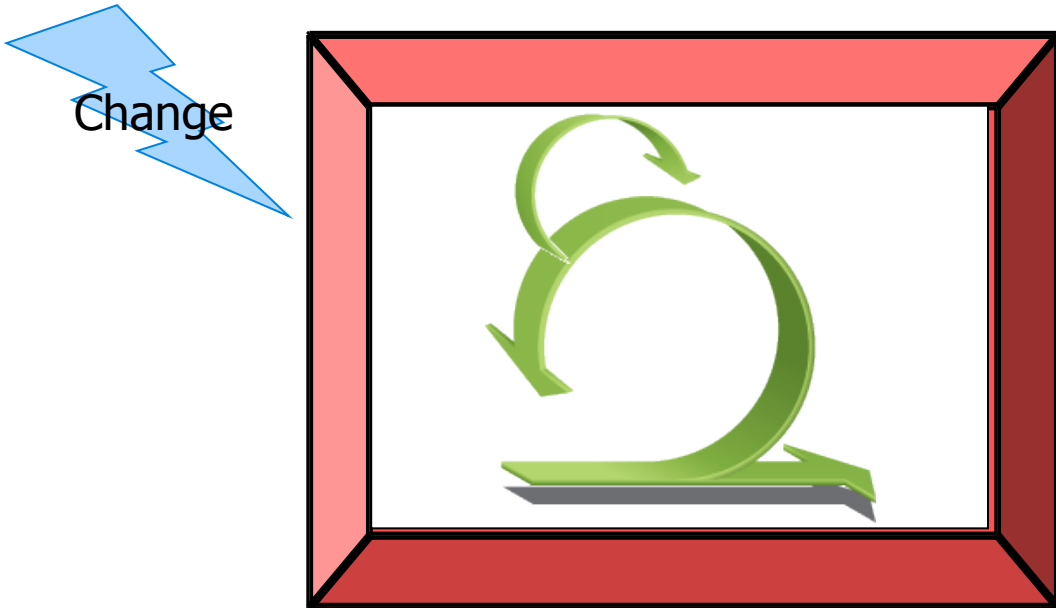
- Scrum projects make progress in a series of "sprints"
  - Analogous to Extreme Programming iterations
- Typical duration is 2–4 weeks or a calendar month at most
- A constant duration leads to a better rhythm
- Product is designed, coded, and tested during the sprint

Sequential vs. overlapping development



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

No changes during a sprint



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

Scrum framework

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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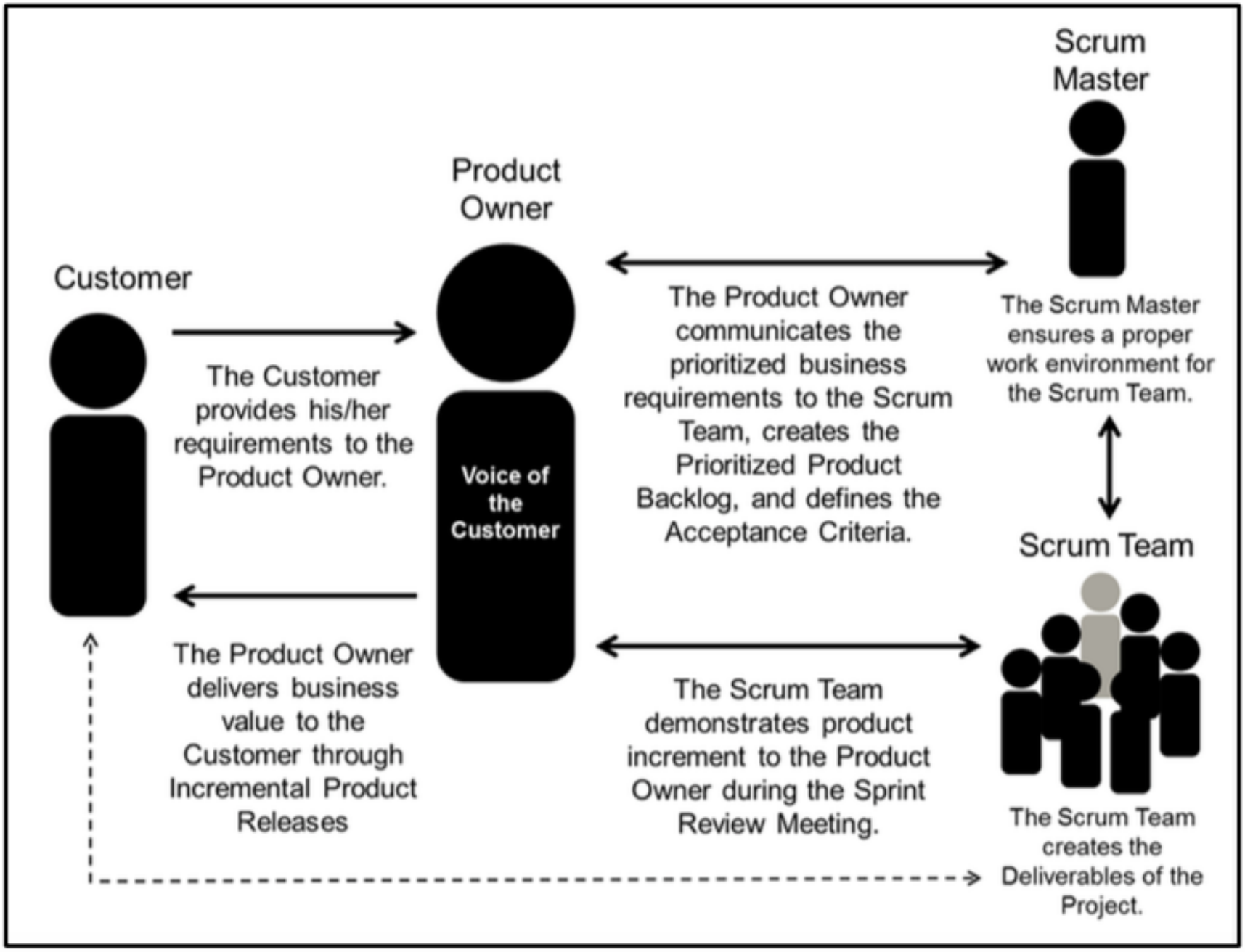
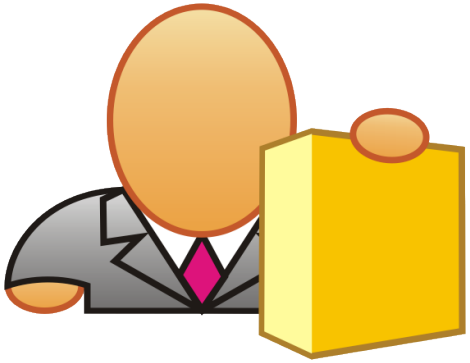

Scrum Master
Product Owner
Customer
The Product Owner communicates the prioritized business requirements to the Scrum Team, creates the Prioritized Product Backlog, and defines the Acceptance Criteria.
The Scrum Master ensures a proper work environment for the Scrum Team.
The Customer provides his/her requirements to the Product Owner.
Voice of the Customer
Scrum Team
The Product Owner delivers business value to the Customer through Incremental Product Releases
The Scrum Team demonstrates product increment to the Product Owner during the Sprint Review Meeting.
The Scrum Team creates the Deliverables of the Project.

Product owner



- 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

- 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

The team

- Typically 5-9 people
- Cross-functional:
  - Programmers, testers, user experience designers, etc.
- Members should be full-time
  - May be exceptions (e.g., database administrator)

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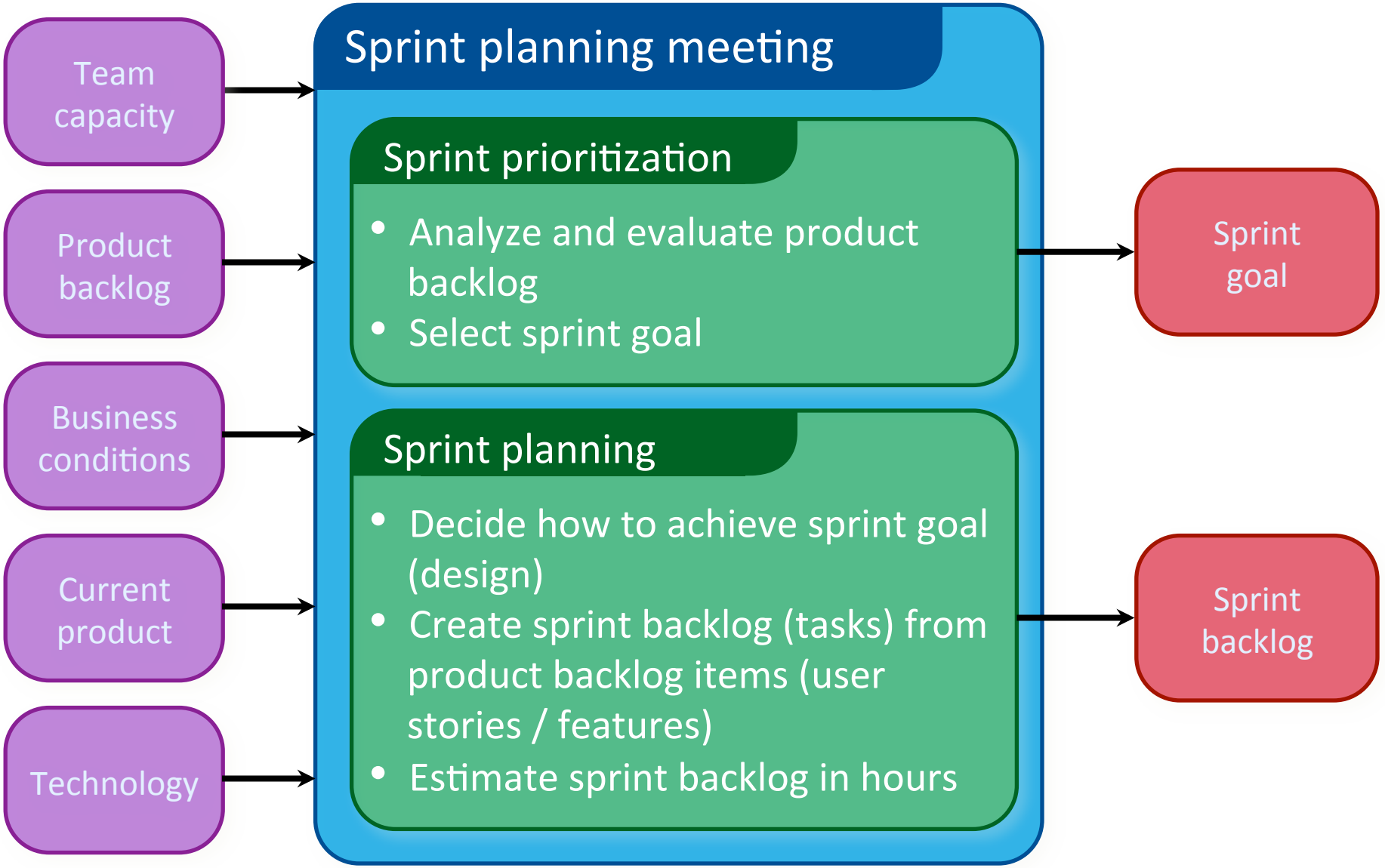
Processes

Phase	Processes
Initiate	1. Create Project Vision 2. Identify Scrum Master and Stakeholder(s) 3. Form Scrum Team 4. Develop Epic(s) 5. Create Prioritized Product Backlog 6. Conduct Release Planning
Plan and Estimate	7. Create User Stories 8. Approve, Estimate, and Commit User Stories 9. Create Tasks 10. Estimate Tasks 11. Create Sprint Backlog
Implement	12. Create Deliverables 13. Conduct Daily Standup 14. Groom Prioritized Product Backlog
Review and Retrospect	15. Convene Scrum of Scrums 16. Demonstrate and Validate Sprint 17. Retrospect Sprint
Release	18. Ship Deliverables 19. Retrospect Project


Team capacity
Product backlog
Business conditions
Current product
Technology
Sprint planning meeting
Sprint prioritization
Analyze and evaluate product backlog
Select sprint goal
Sprint planning
Decide how to achieve sprint goal (design)
Create sprint backlog (tasks) from product backlog items (user stories / features)
Estimate sprint backlog in hours
Sprint goal
Sprint backlog

Sprint planning

- Team selects items from the product backlog they can commit to completing
- Sprint backlog is created
  - Tasks are identified and each is estimated (1-16 hours)
  - Collaboratively, not done alone by the ScrumMaster
- High-level design is considered

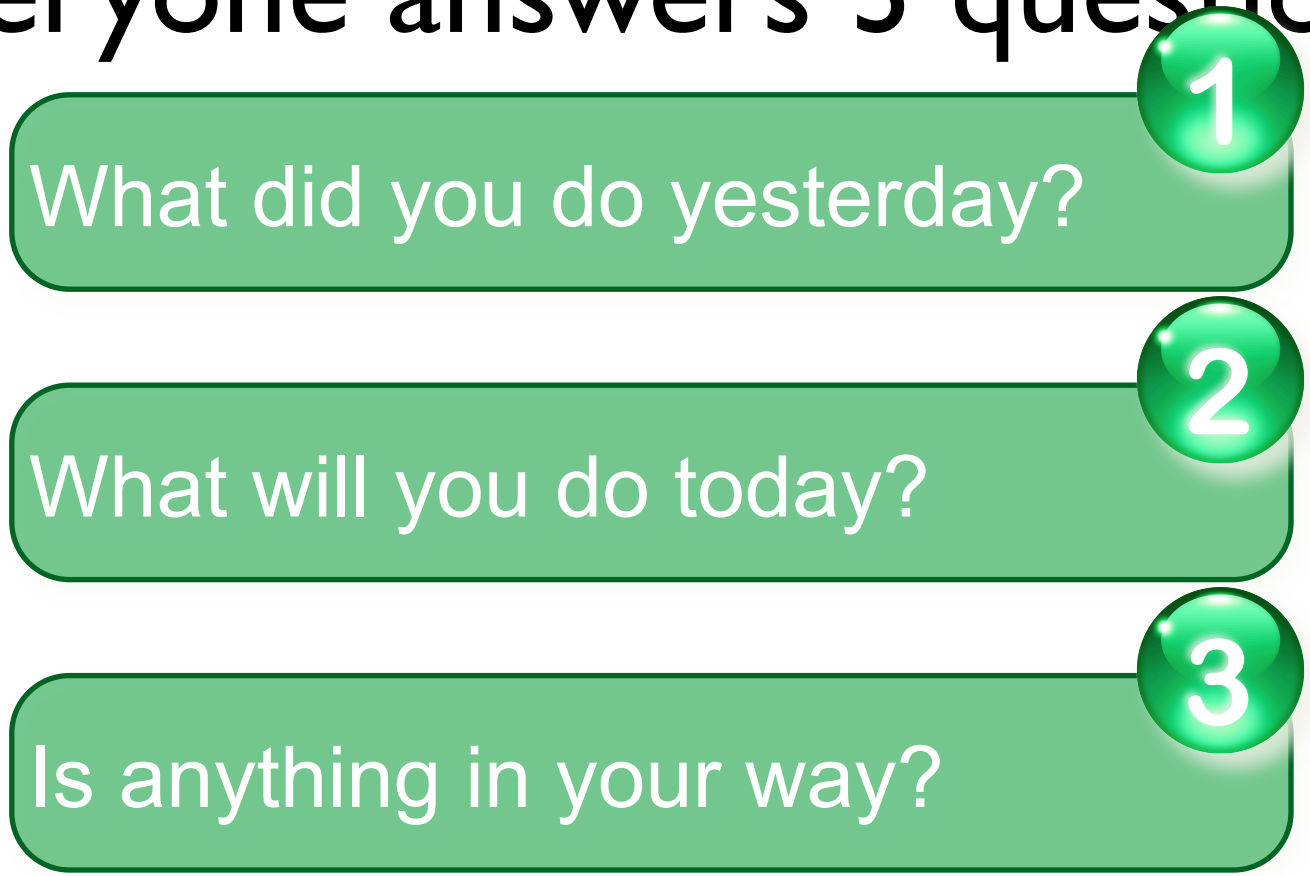
As a vacation planner, I want to see photos of the hotels.

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

The daily s

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

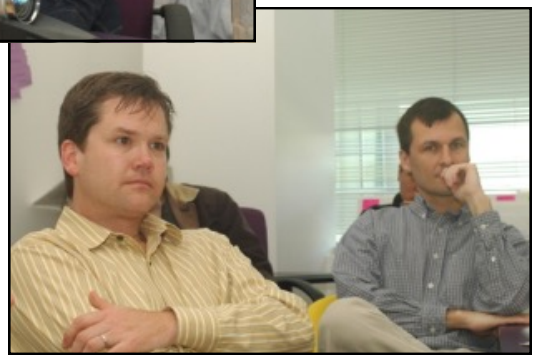
Everyone answers 3 questions



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

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
  - 2-hour prep time rule
  - No slides
- Whole team participates
- Invite the world

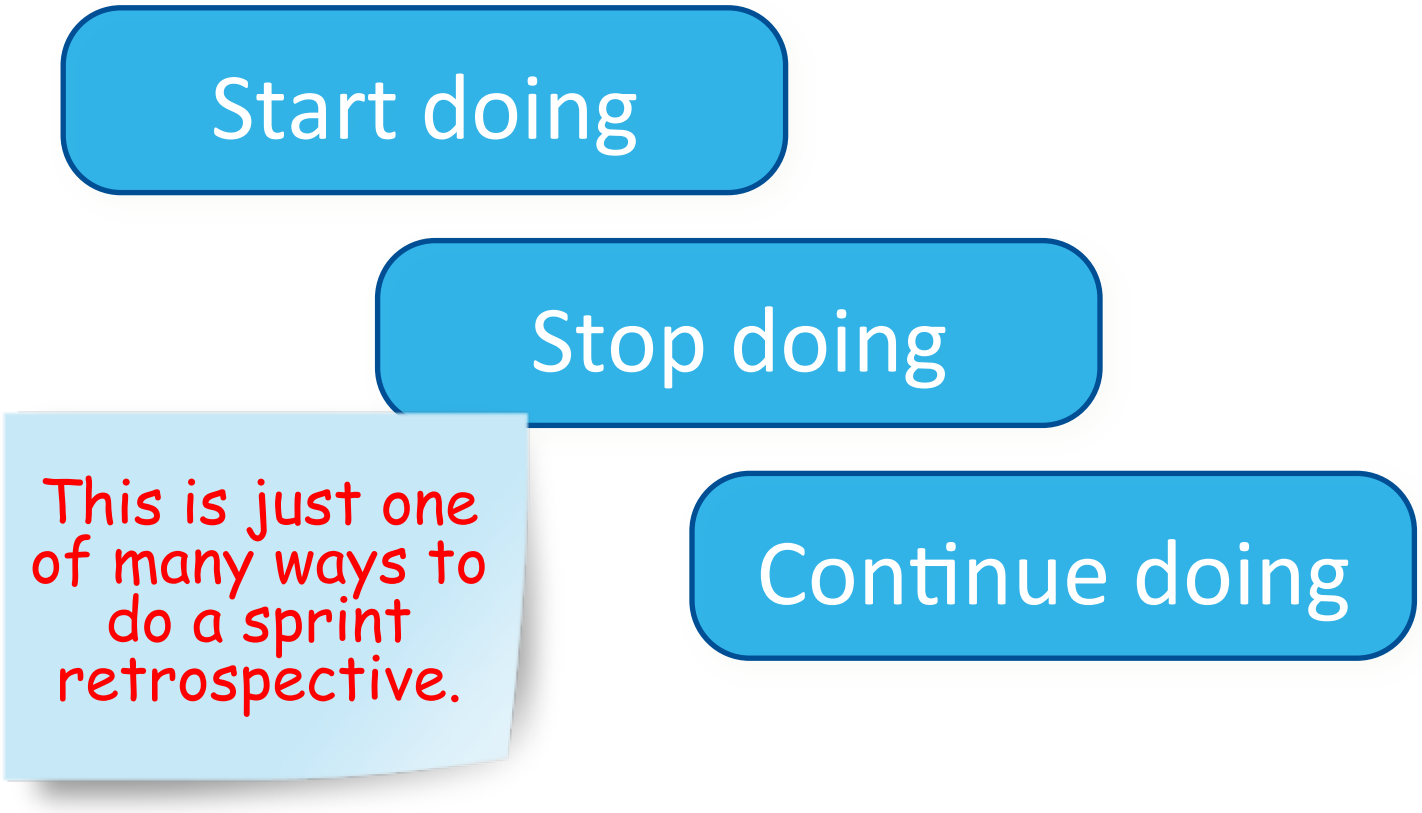


Sprint retrospective

- 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

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



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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

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.

Managing the sprint backlog

- Individuals sign up for work of their own choosing
  - Work is never assigned
- Estimated work remaining is updated daily
- Sprint Task
  - Specifies how to achieve the implementation of the story (what)
  - Requires one day or less of work
  - Stories are deliverable stuff that the product owner cares about.
  - Tasks are non-deliverable stuff, or stuff that the product owner doesn't care about.

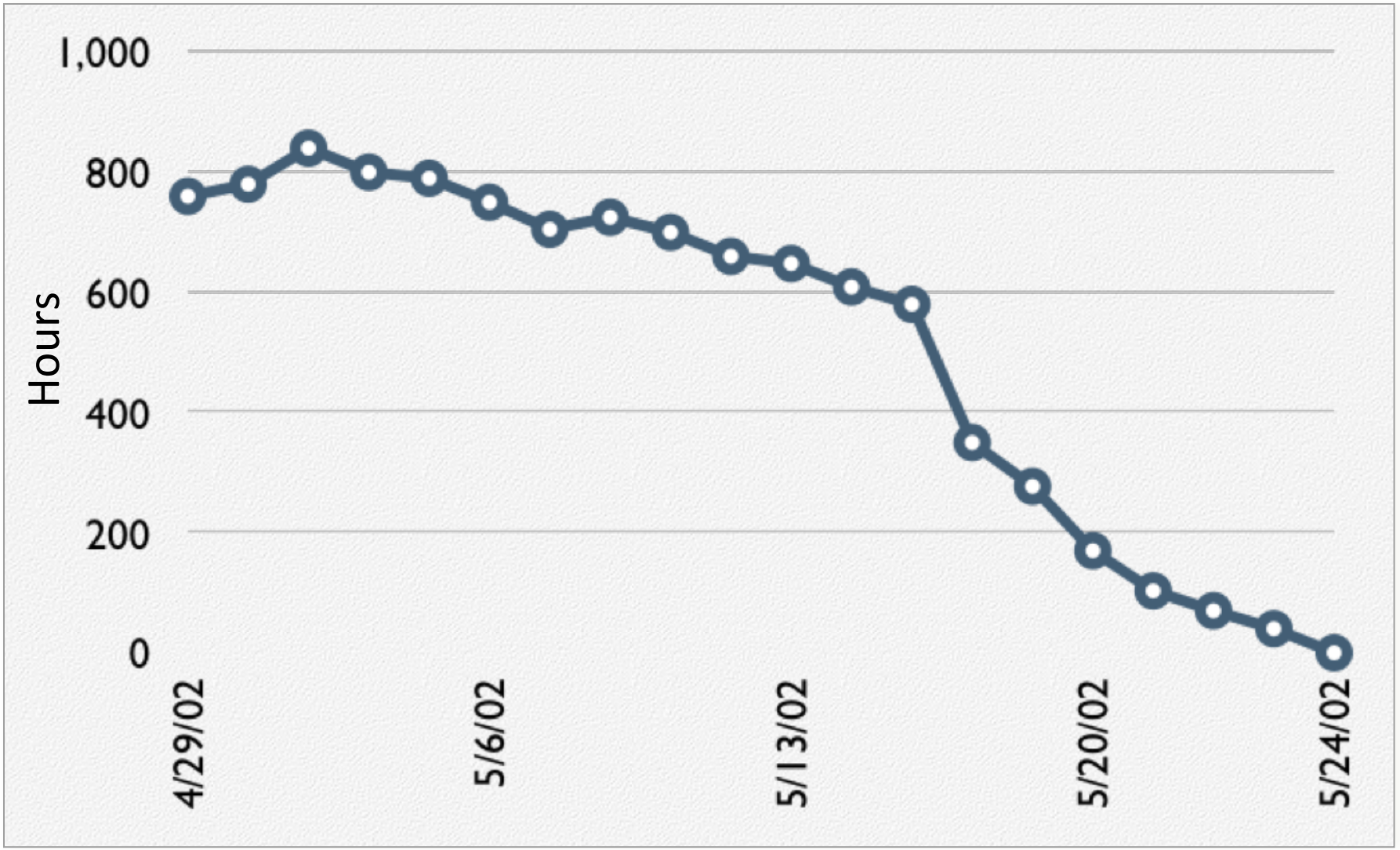
Managing the sprint backlog

- 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

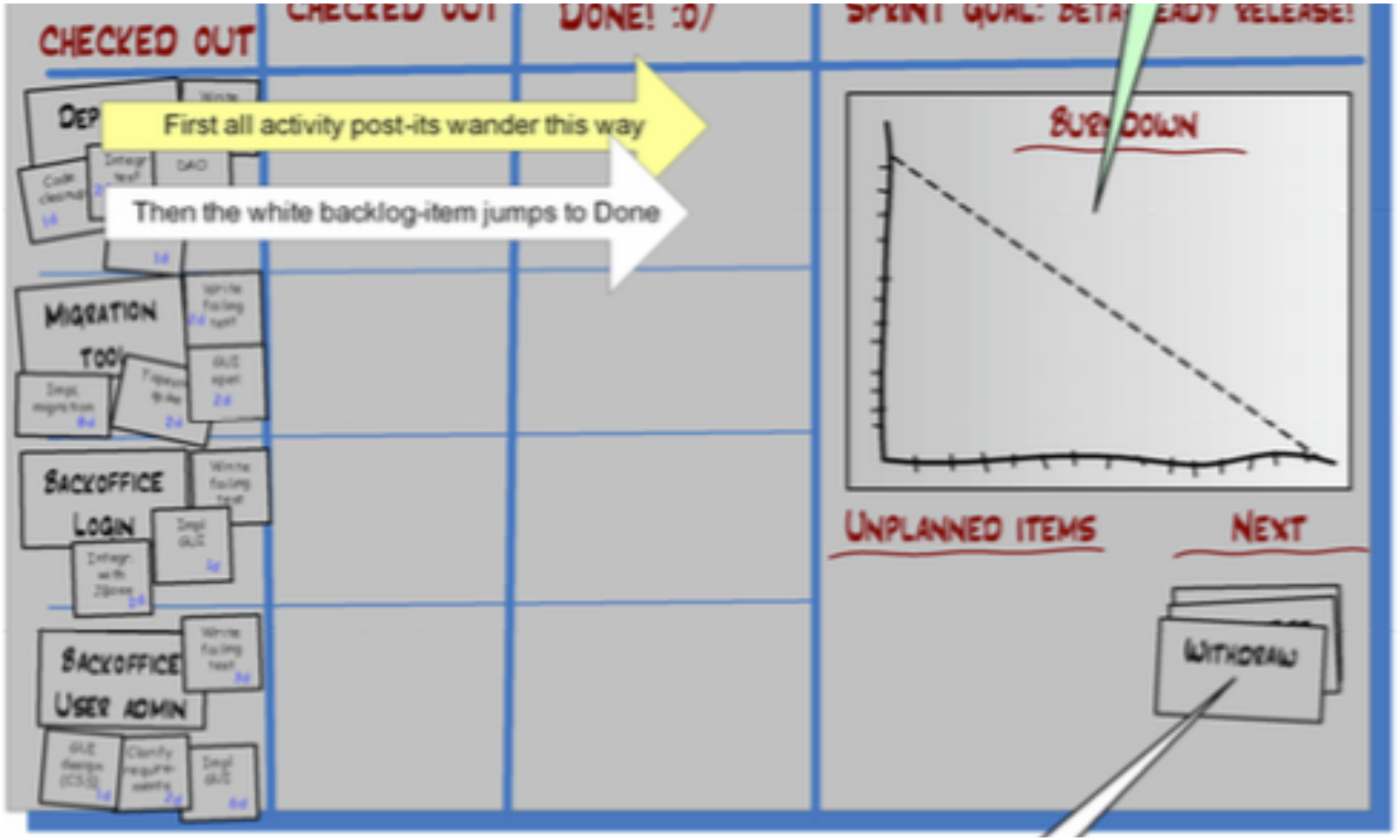
A sprint backlog

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	

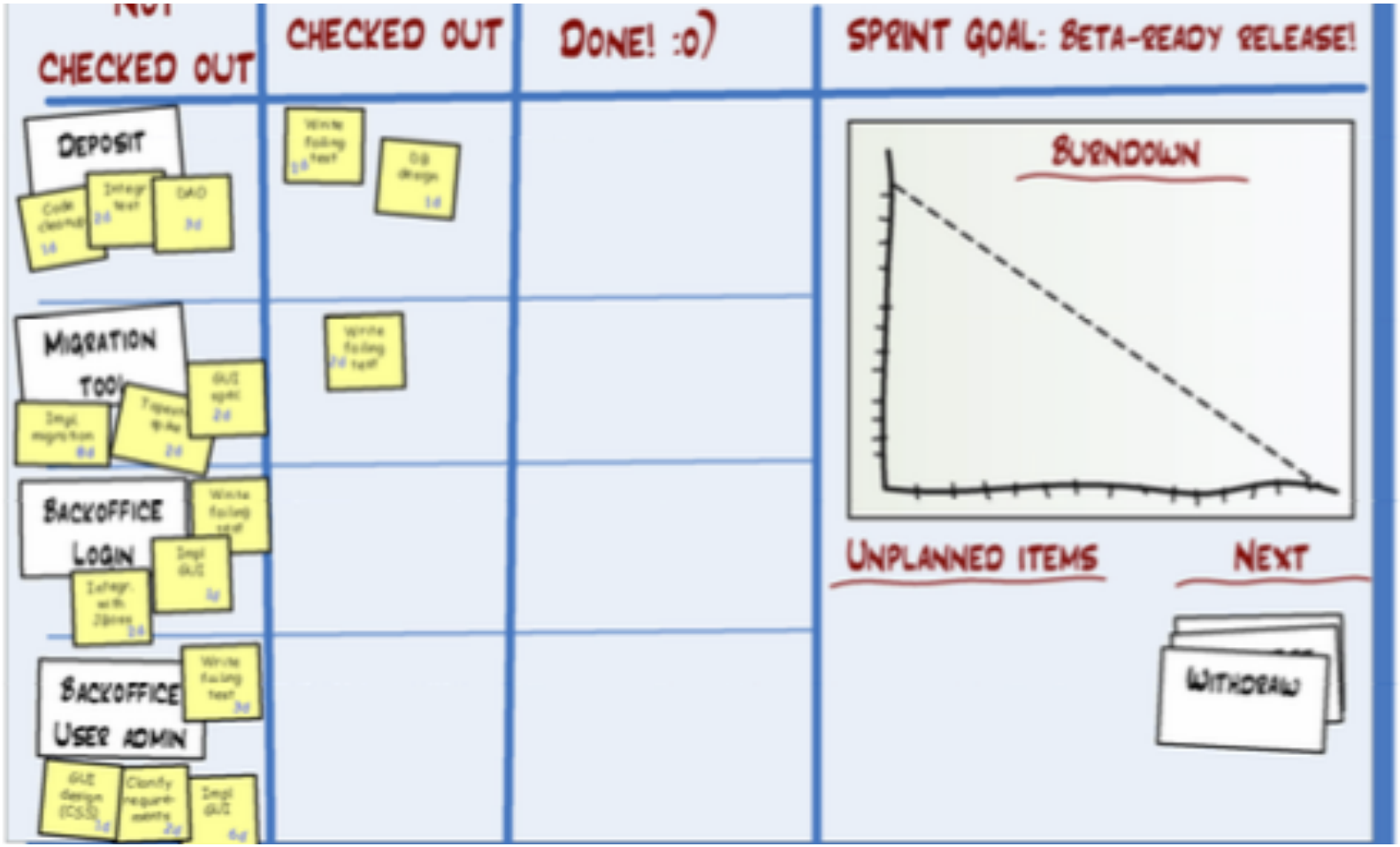
A sprint burndown chart



Task board


CHECKED OUT
DONE! :0/
First all activity post-its wander this way
Then the white backlog-item jumps to Done
MIGRATION TOOL
BACKOFFICE LOGIN
BACKOFFICE USER ADMIN
BURNDOWN
UNPLANNED ITEMS
NEXT
WITHDRAW

After the first daily scrum



After a few more days