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AGILE METHODOLOGIES
MODULE 1

An Introduction to Scrum

The project is co-financed by the
European Union

Good neighbours
creating
common future

Scrum summary

- 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.

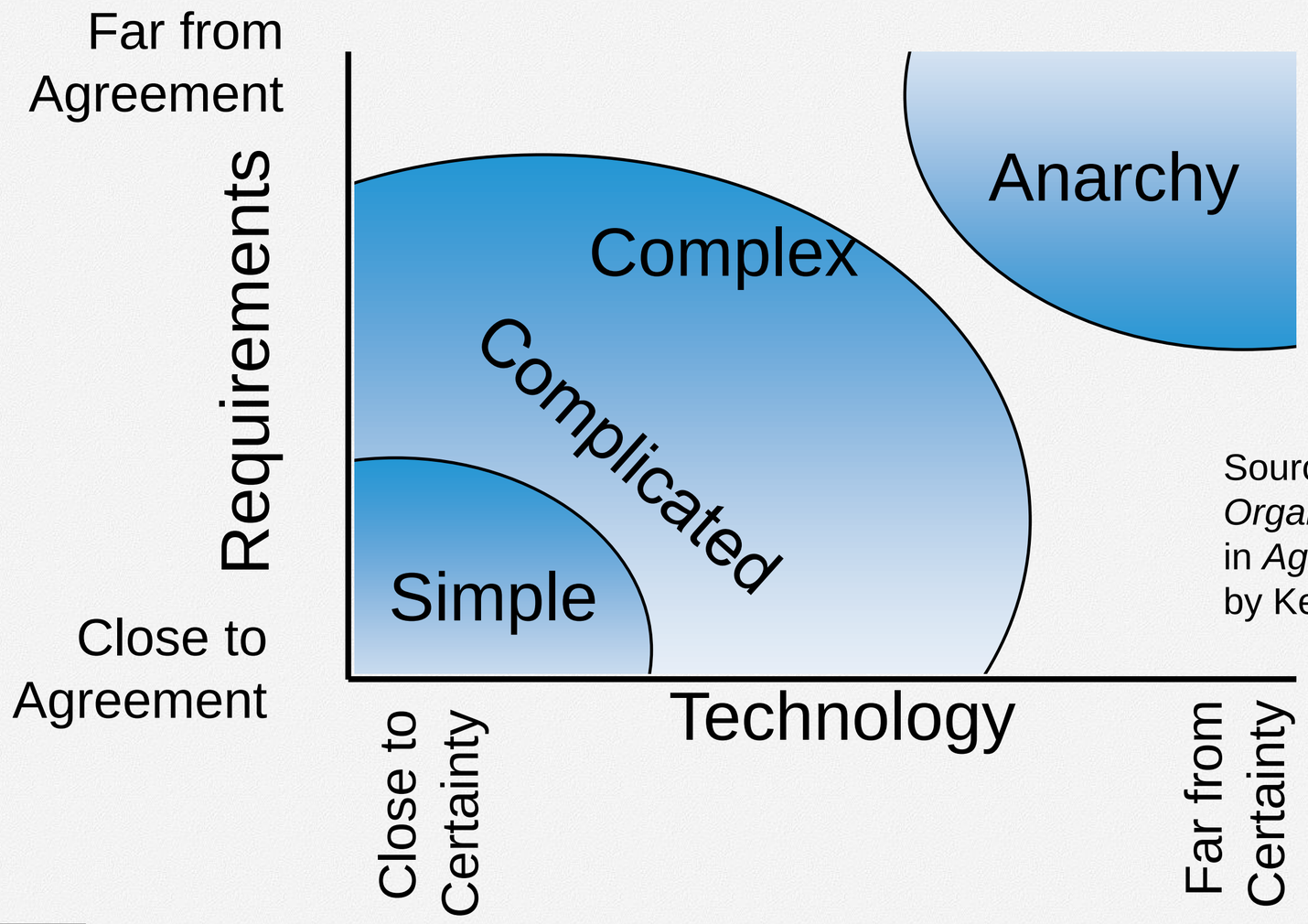
The Agile Manifesto–a statement of values

The Agile Manifesto

Individuals and interactions	over	Processes and Tools
Working Product	over	Comprehensive Documentation
Customer Collaboration	over	Contract Negotiation
Responding to change	over	Following a plan

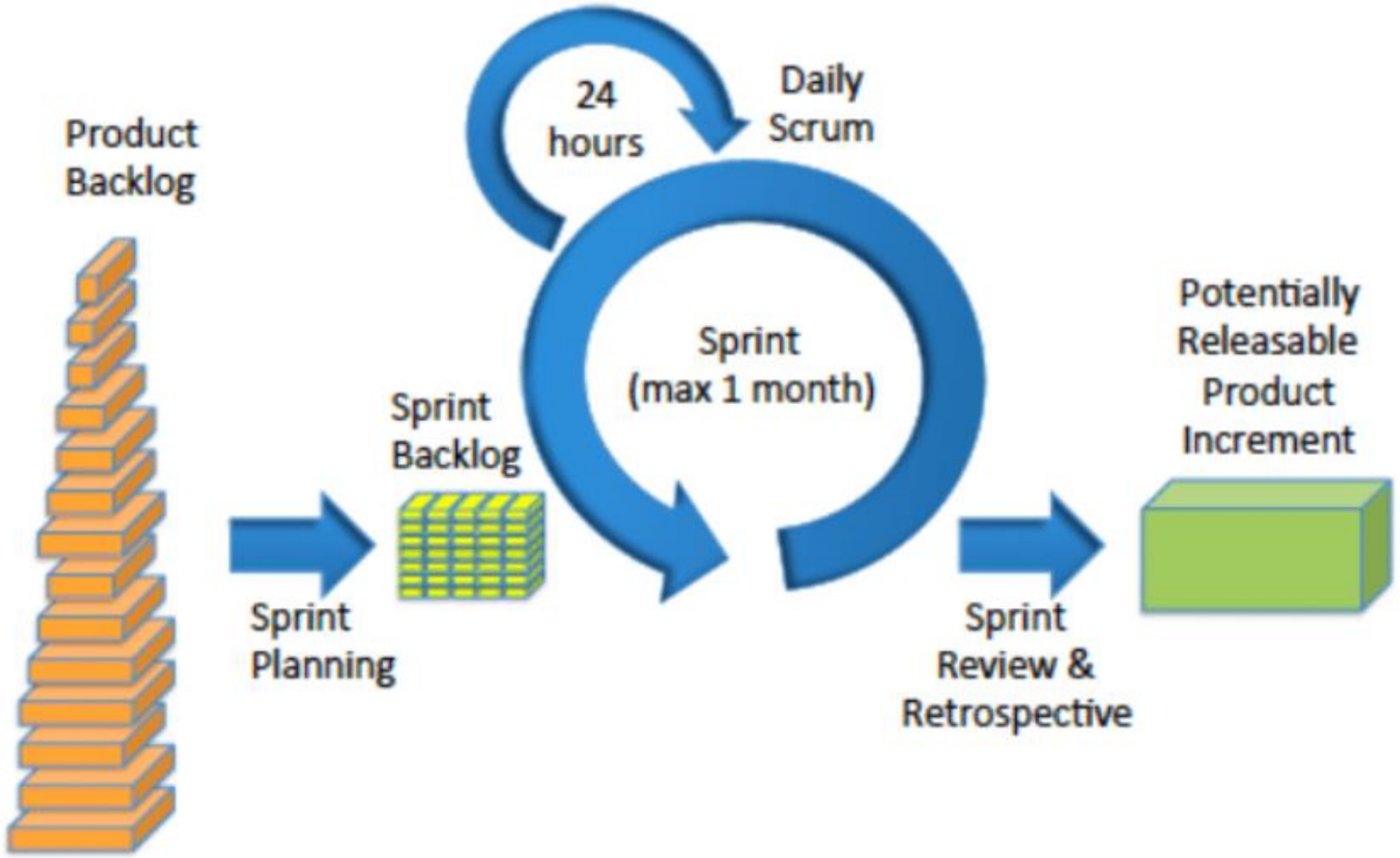
That is, while there is value in the items on the right, we value the items on the left more.

www.agilemanifesto.org



Source: *Strategic Management and Organizational Dynamics* by Ralph Stacey in *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle.

SCRUM


Product Backlog
24 hours
Daily Scrum
Sprint (max 1 month)
Sprint Backlog
Sprint Planning
Sprint Review & Retrospective
Potentially Releasable Product Increment

SPRINTS

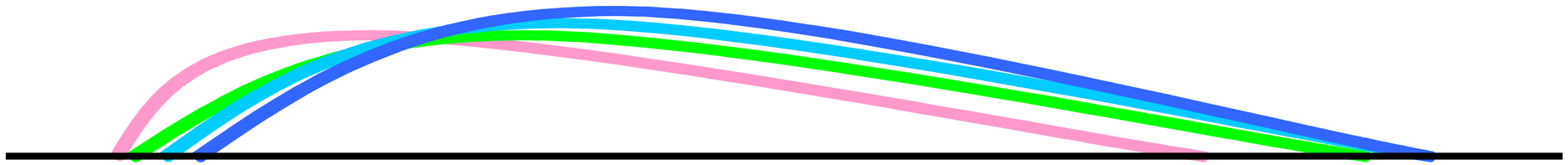
- Scrum projects make progress in a series of “sprints”
- Analogous to Extreme Programming iterations
- Typical duration is 2–4 weeks or a calendar month at most
- A constant duration leads to a better rhythm
- Product is designed, coded, and tested during the sprint

SEQUENTIAL vs. OVERLAPPING DEVELOPMENT

Requirements | Design | Code | Test

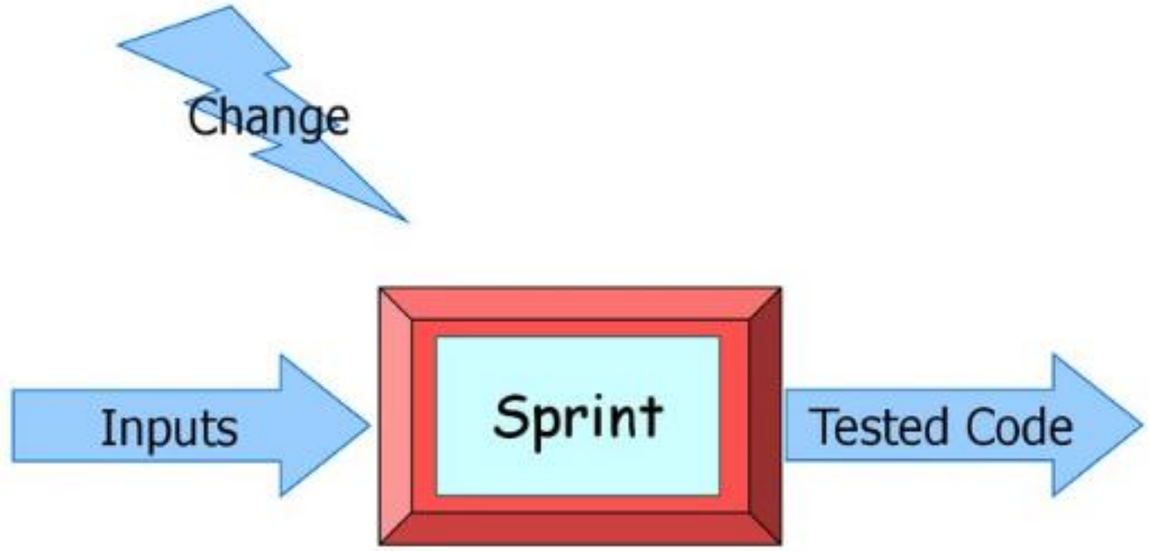
Rather than doing all of one thing at a time...

...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.

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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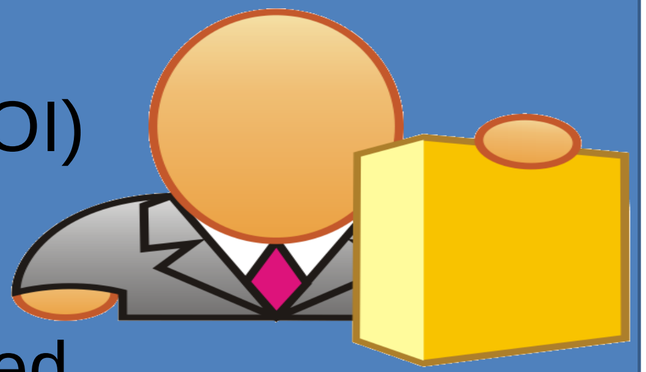
PRODUCT OWNER RESPONSIBILITIES

- 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 RESPONSIBILITIES

- 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

WHO ARE THE TEAM MEMBERS - RULES

- Typically 5-9 people
- Cross-functional team :
  - Programmers, testers, user experience designers, etc.
- Members should be full-time
  - May be exceptions of SME-s like (e.g., database administrator)
- Teams are self-organizing
  - Ideally, no titles but rarely a possibility
- Membership should change only between sprints

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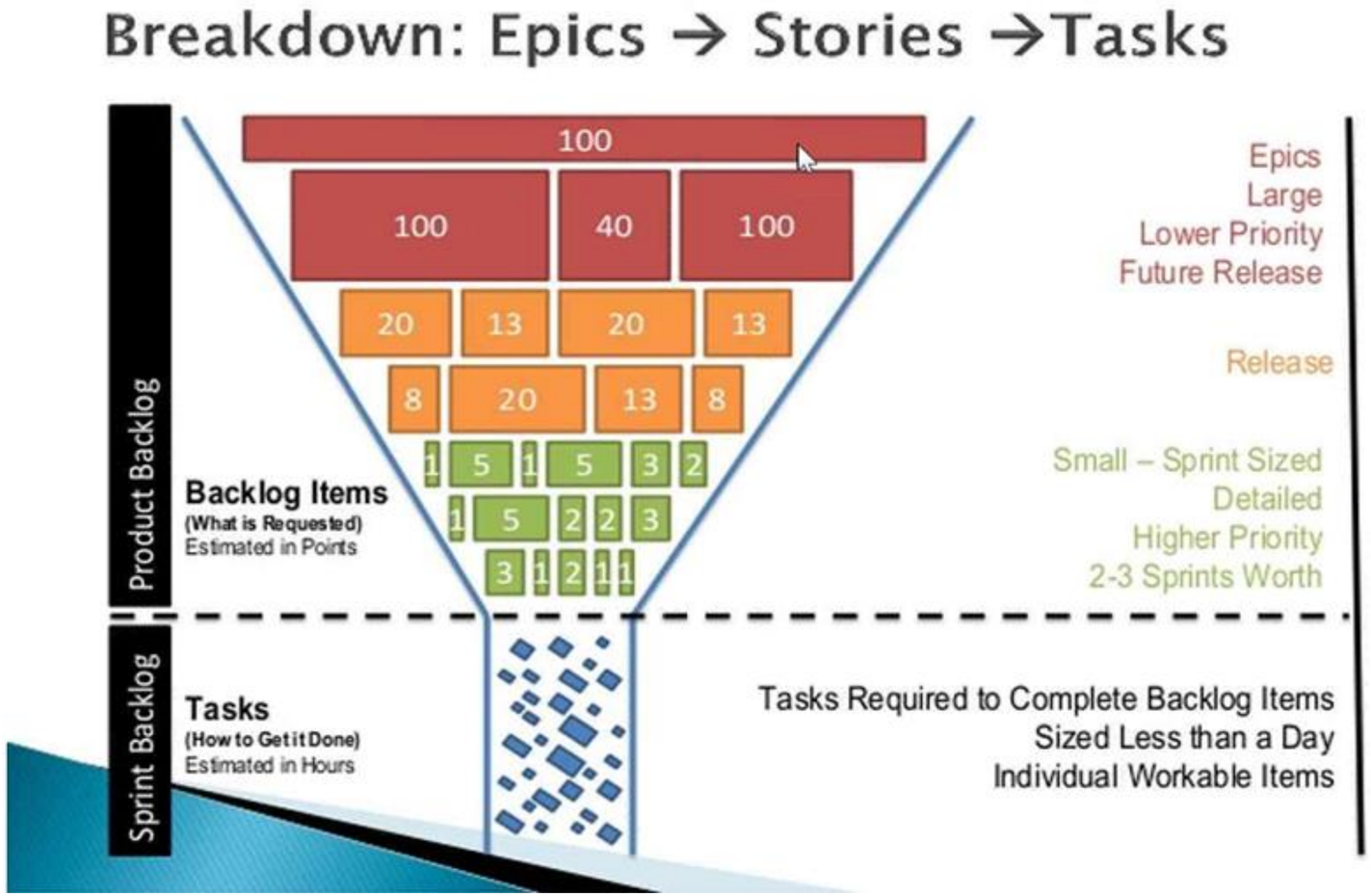
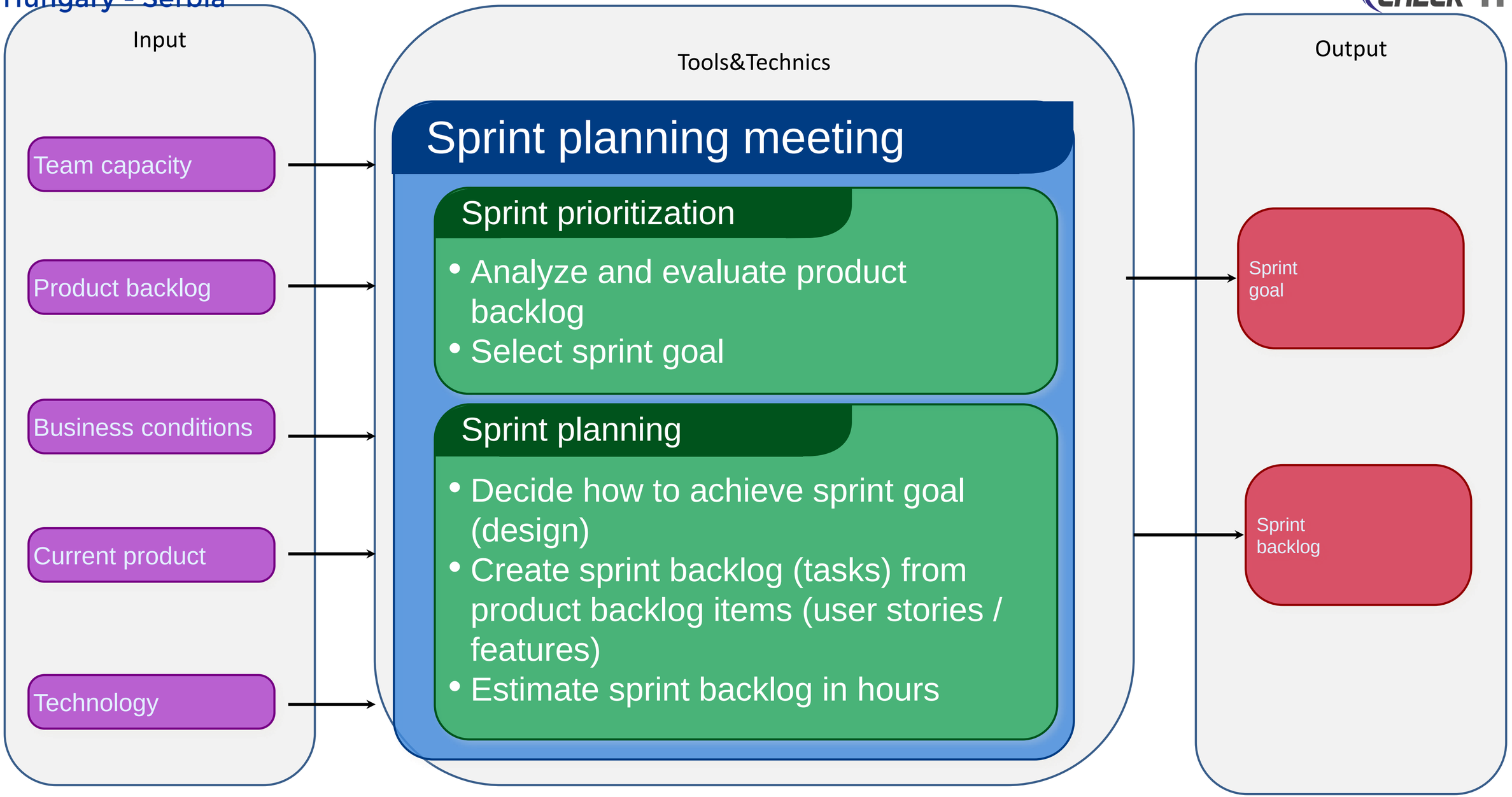

Breakdown: Epics → Stories →Tasks
Product Backlog
Sprint Backlog
100
100
40
100
20
13
20
13
8
20
13
8
1
5
1
5
3
2
1
5
2
2
3
3
1
2
1
1
Backlog Items
(What is Requested)
Estimated in Points
Tasks
(How to Get it Done)
Estimated in Hours
Epics
Large
Lower Priority
Future Release
Release
Small – Sprint Sized
Detailed
Higher Priority
2-3 Sprints Worth
Tasks Required to Complete Backlog Items
Sized Less than a Day
Individual Workable Items


Input
Team capacity
Product backlog
Business conditions
Current product
Technology
Tools&Technics
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
Output
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 SCRUM

- 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

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

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

Whole team gathers and discusses what they’ d like to: Start / Stop / Continue

Start doing

Stop doing

Continue doing

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

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PRODUCT BACKLOG

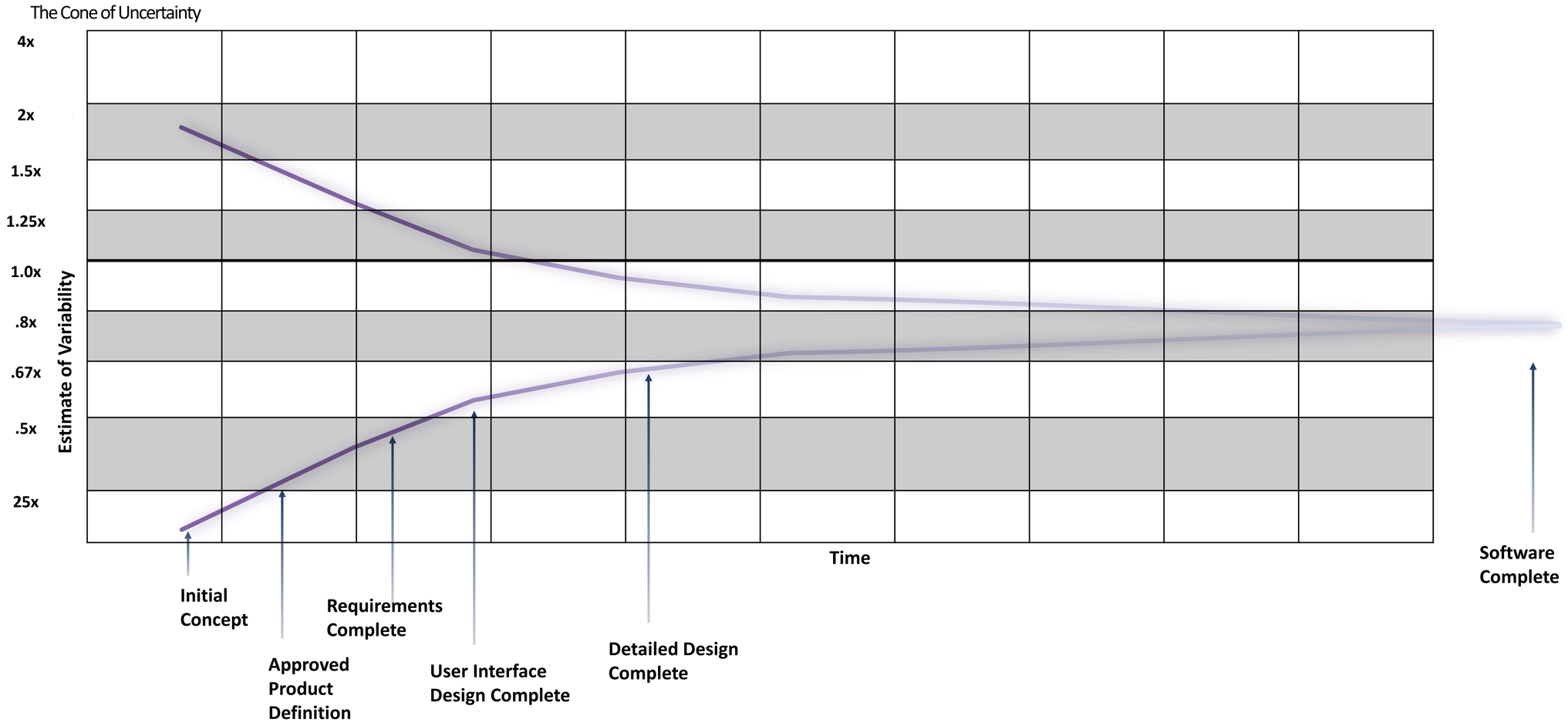
- The requirements
- A list of all desired work on the project
- Ideally expressed such that each item has value to the users or customers of the product
- Prioritized by the product owner
- Reprioritized at the start of each sprint

This is the product backlog

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

PLANNING HIGHLEVEL TARGET



AGILE ESTIMATION

Wikipedia: Estimation is the calculated approximation
of a result which is usable even if input data may be incomplete or uncertain
- Problem is that estimates become an unbreakable schedule, where any deviation is considered bad

Agile Estimation throws this logic away and always
re-estimates a project after each iteration
- Different value system, deviations are not deviations, they are more accurate estimations
- Uses the cone of uncertainty to your advantage

HOW TO ESTIMATION

- User stories
- Planning poker
- Story points
- Product backlog
- Velocity
- Re-estimation

USER STORY

- Users break down the functionality into “user stories”
- User stories are kept small
- User stories include acceptance criteria

PLANNING POKER

- After all the user stories are written, get a list of stories and do a high level estimate
  Estimate is for setting priorities, not schedule
- NOT a time based estimation
  Super hard, hard, medium, easy, and super easy
- Done by consensus
  To get there, you play “planning poker”
  Why? No pressure

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

THE SPRINT GOAL

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.

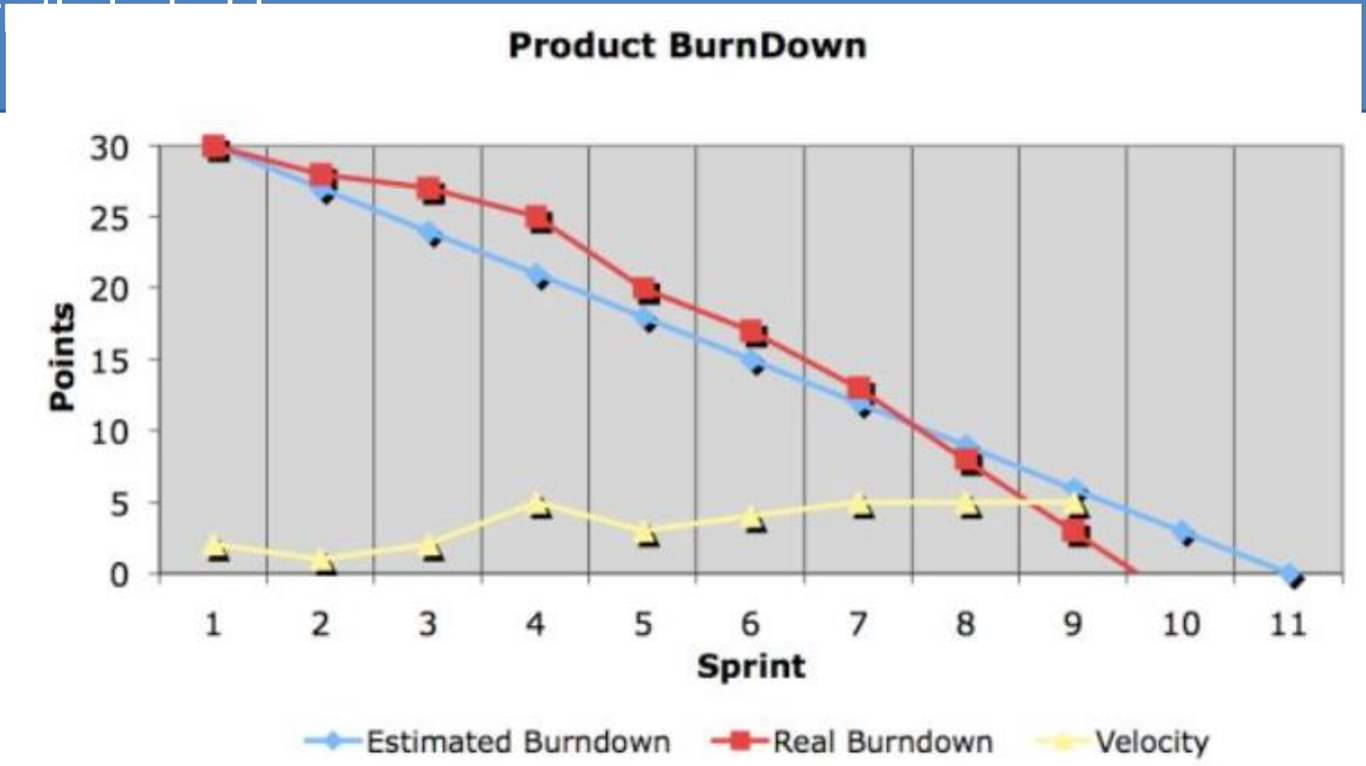
MANAGING THE SPRINT BACKLOG

- Individuals sign up for work of their own choosing
  - Work is never assigned
- Estimated work remaining is updated daily
- 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

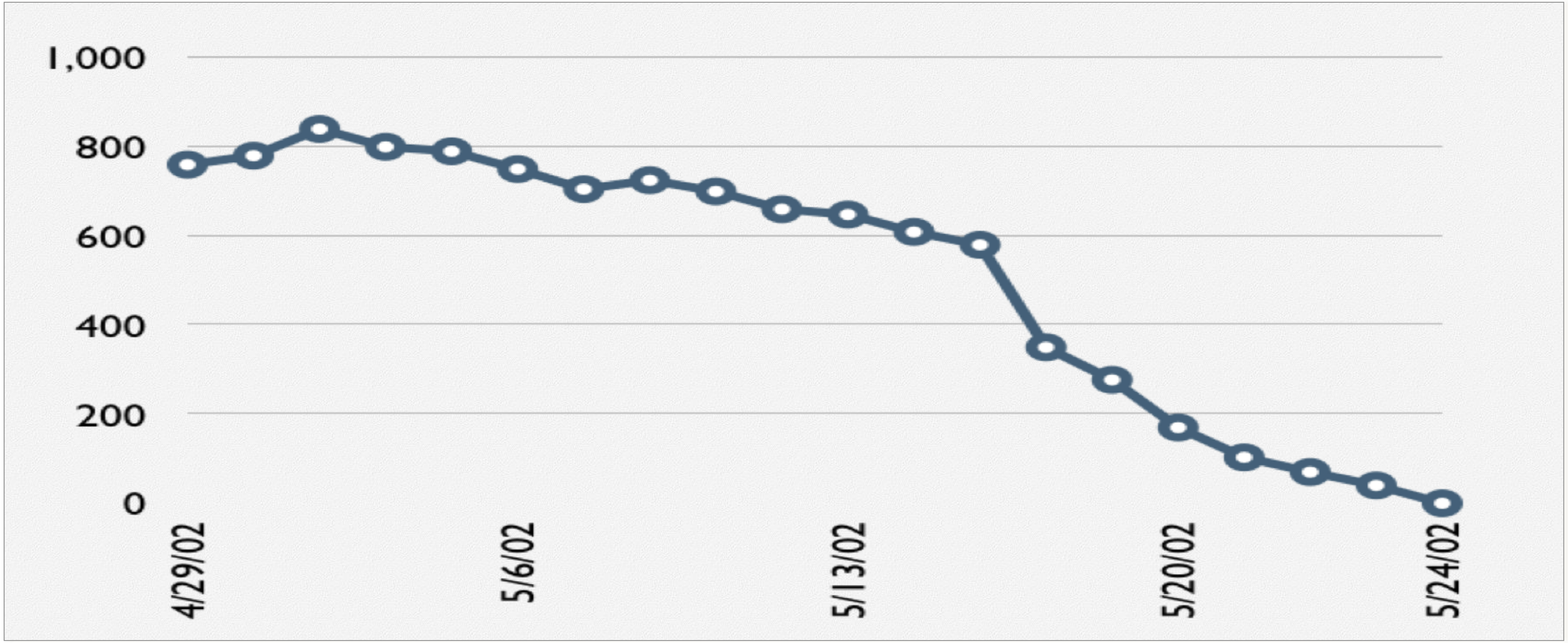
A SPRINT BACKLOG

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	

The Scrum Burndown Chart is a visual measurement tool that shows the completed work per day against the projected rate of completion for the current project release. Its purpose is to enable that the project is on the track to deliver the expected solution within the desired schedule.
The rate of progress of a Scrum Team is called "velocity". It expresses the amount of e.g. story points completed per iteration. An import rule for calculating the velocity is that only stories that are completed at the end of the iteration are counted. Counting partially finished work (e.g. coding only - test missing) is str



A SPRINT BURNDOWN CHART



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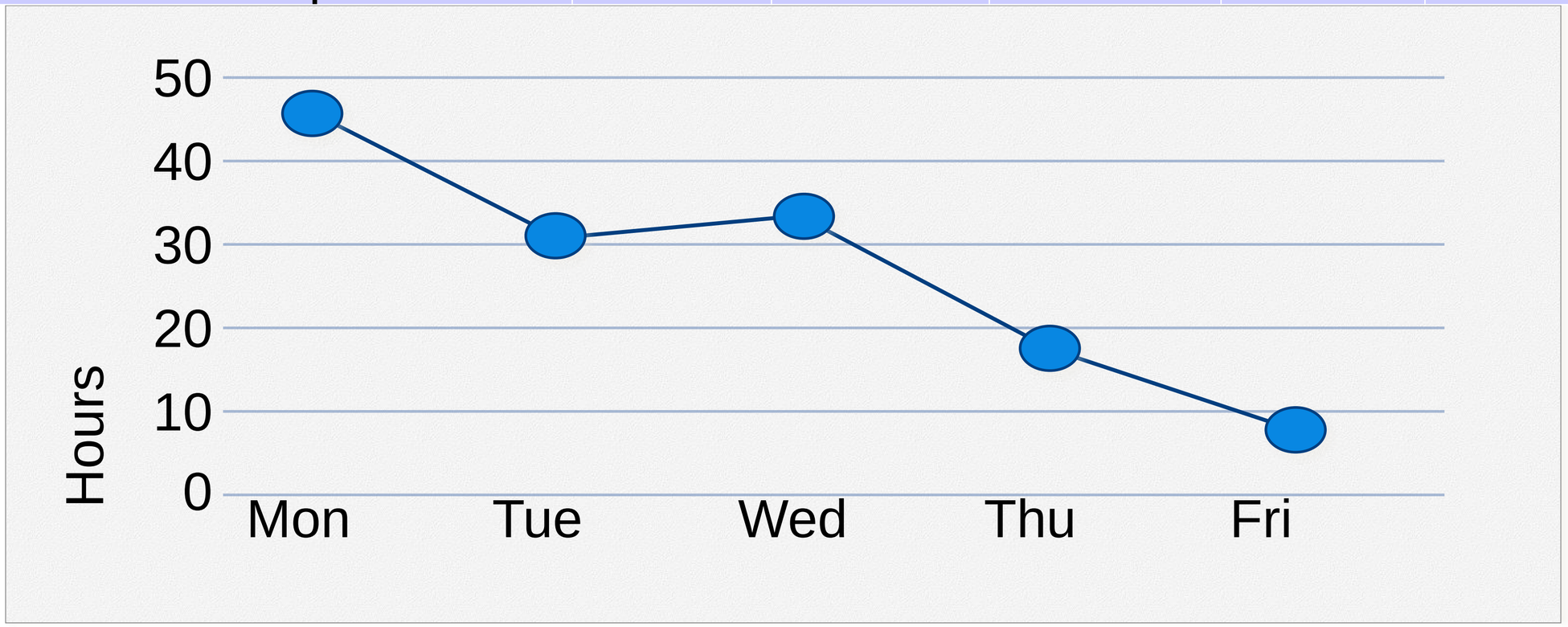


SCALABILITY

- 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

看板 – KANBAN CARDS LIMIT EXCESS WORK IN PROGRESS

- 看板 – kanban literally means “visual card,” “signboard,” or “billboard.”
- Toyota originally used Kanban cards to limit the amount of inventory tied up in “work in progress” on a manufacturing floor
- kanban cards act as a form of “currency” representing how WIP is allowed in a system.
- Kanban is an emerging process framework that is growing in popularity since it was first discussed at Agile 2007 in Washington D.C.

看板 – KANBAN BASIC RULES

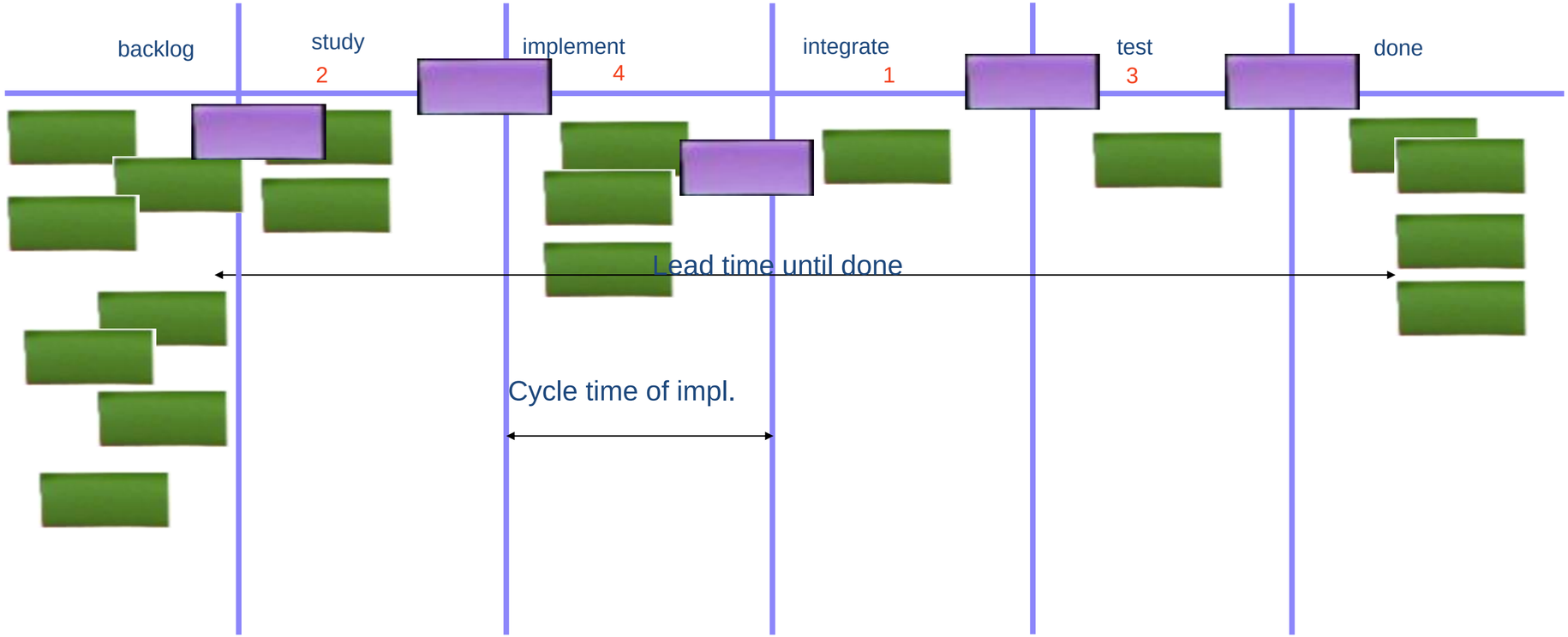
Visualize the workflow

Limit Work In Progress (WIP)

Measure and manage flow

Make process policies explicit

Improve Collaboratively (using models/scientific method)



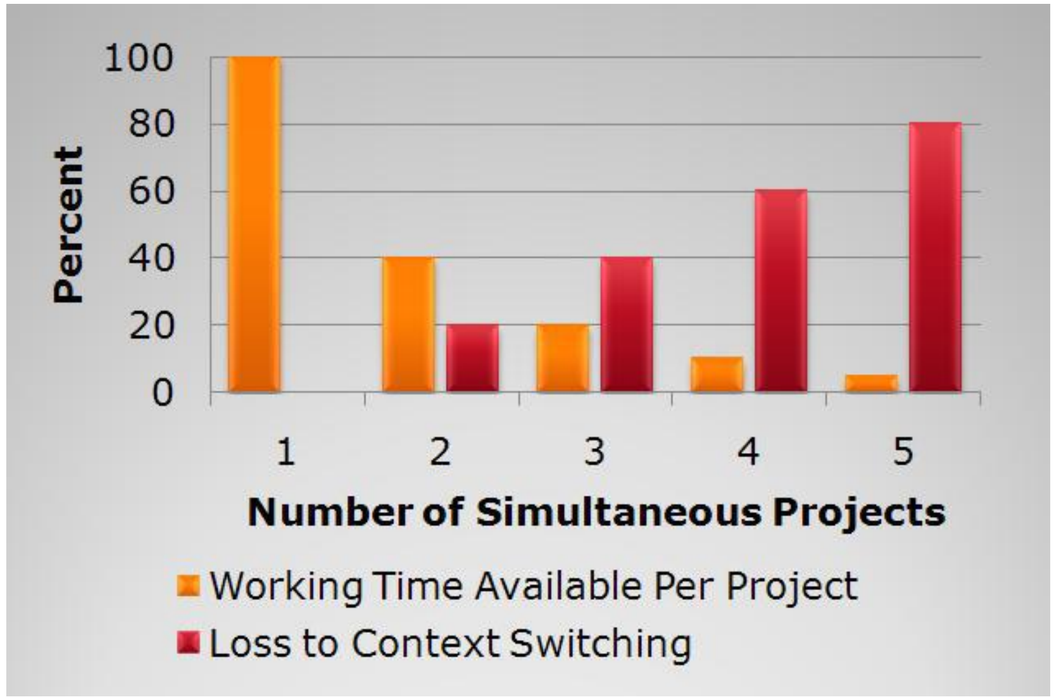
LITTLE'S LAW FOR QUEUING THEORY

- Total Cycle Time = Number of Things in Progress / Average Completion Rate

- The only way to reduce cycle time is by either reducing the WIP, or improving the average completion rate.
  - Achieving both is desirable.
  - Limiting WIP is easier to implement by comparison.

LITTLE'S LAW FOR QUEUING THEORY

20% time is lost to context switching per task, so fewer tasks means less time lost *(from Gerald Weinberg, Quality Software Management: Systems Thinking)*



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