





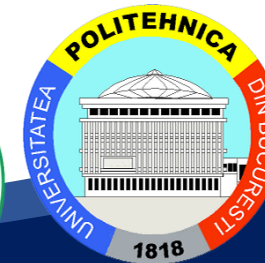
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# SCRUM Agile Project Management

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Curriculum Development  
of Master's Degree Program in  
Industrial Engineering for Thailand Sustainable Smart Industry

- Origin
- Principles
- Roles
- Methods
- Example
- Practical activity

"The best-laid plans of mice and men / Often go awry"

Robert Burns in 1785 - [https://en.wikipedia.org/wiki/To\\_a\\_Mouse](https://en.wikipedia.org/wiki/To_a_Mouse)



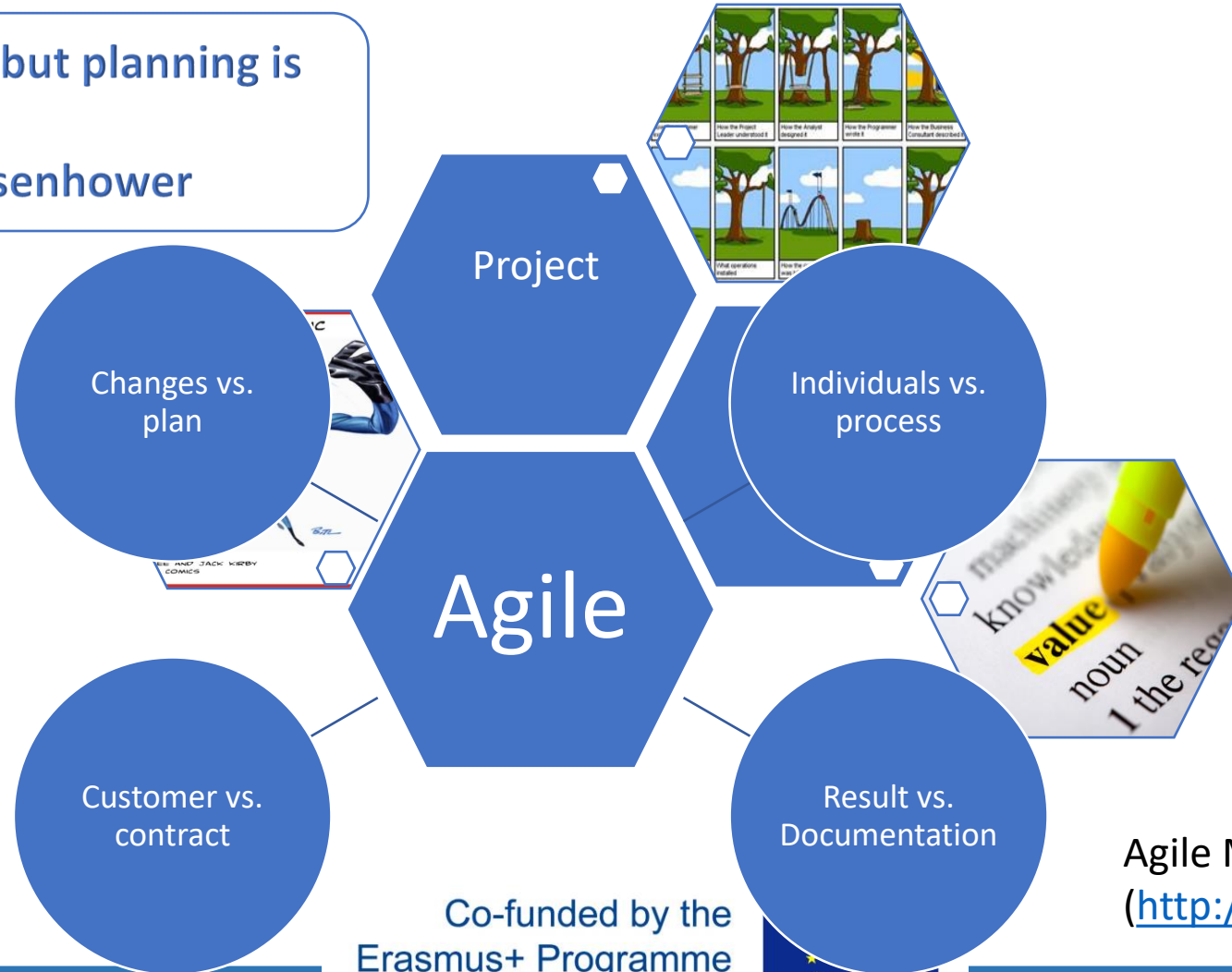
# Video: Silicon Valley S01E05 scrum scene

<https://youtu.be/oyVksFviJVE>





“Plans are worthless but planning is everything.”  
General Dwight D. Eisenhower



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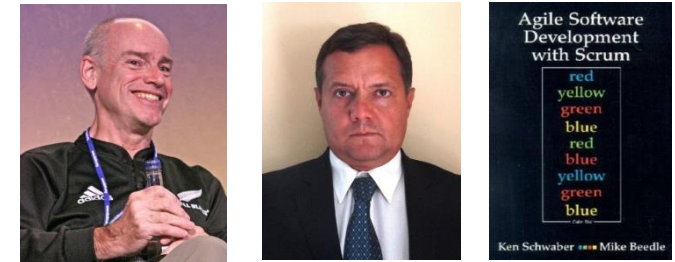
Agile Manifesto (2001)  
(<http://agilemanifesto.org/>)

- Jeff Sutherland created the scrum process in 1993 from a 1986 study by Takeuchi and Nonaka, published in the Harvard Business Review.
- In this study, Takeuchi and Nonaka describe a new approach designed to increase speed and flexibility in the commercial development of new products:
  - overlapping development phases
  - repetition of complete development processes
  - multifunctional interdisciplinary team



Compare these high-performance teams with Scrum training in rugby teams.

- In 2001, Ken Schwaber and Mike Beedle describe the method in the famous book Agile Software Development with Scrum.



- And in 2004, at Microsoft Press, Schwaber published a new work called Agile Project Management with Scrum.



- Scrum is used in thousands of companies around the world and there are certifications awarded by the Scrum Alliance – [www.scrumalliance.org](http://www.scrumalliance.org)
  - agile methodologies : XP, DSDM, Adaptive Software Development, Crystal, Feature-Driven Development, ...



- Scrum is based on the concept of work iteration or sprint, which consists of a predetermined period during which part of the product that is operational must be produced.
- Scrum is a set of interrelated practices and rules that:
  - Optimize the development environment
  - Reduce organization structure costs
  - Synchronize market requirements with iterative prototypes
- Looking to build the best possible product with the available resources, defined quality levels and required delivery dates.

- **Focus on what the Client wants**
  - Define all the features that make this a spectacular product
- **Consider customer feedback**
  - Rapid development and getting customer feedback
- **React fast**
  - Making new developments
- **Transparent communication**
  - Visual and updated communication
  - Missing workload graph

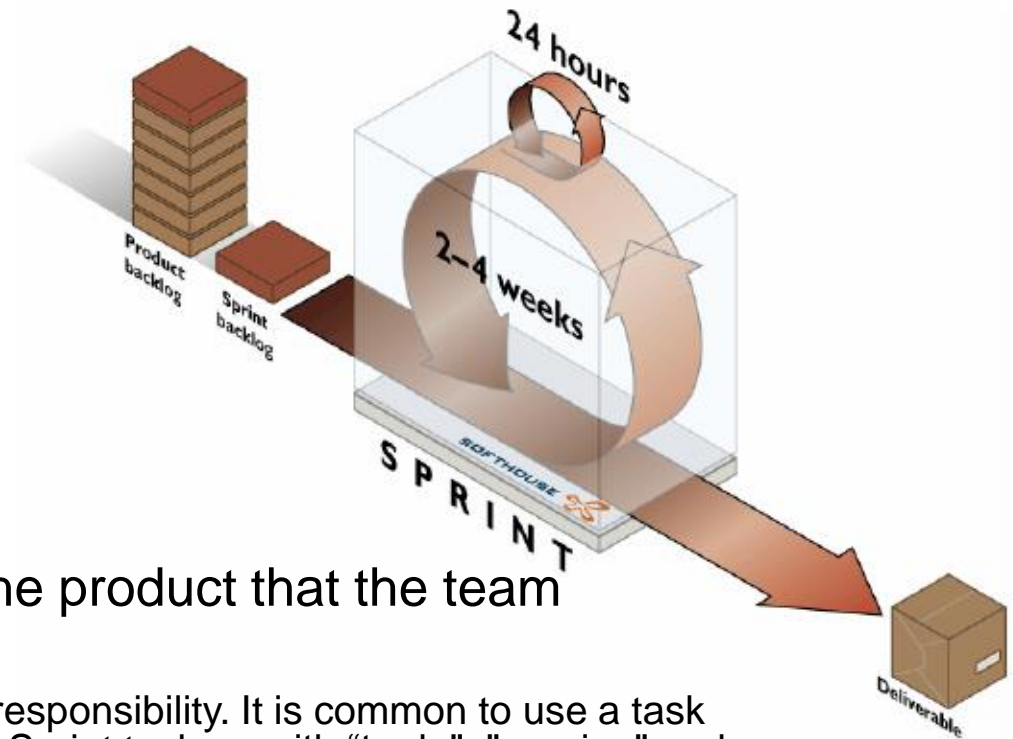
- Customers can change their ideas about what they want and need, and unforeseen challenges cannot be easily addressed with traditional management methods.
  - The problem cannot be fully understood or defined, and the focus is placed on the team's ability to quickly deliver versions of the product and respond to emerging requirements in an agile manner.
- **Product Backlog:** High-level document for the entire project, containing the items to be built, prioritized according to the respective business value.
  - The product **backlog belongs to the product owner**, who establishes the commercial value of each resource. The development effort is estimated by the project team.
- **Define all the features that make this product spectacular**
- **User story: How (role), I want / would like (feature), to get (benefit)**
- **Wishlist**



Client

- **Release Backlog:** feature set of a product version

- Priority order
- Defining the amount of work
- Must contain 4 or more sprints



- **Sprint Backlog:** set of characteristics of a version of the product that the team proposes to implement in the next Sprint cycle.

- The Sprint Backlog **is owned by the team** and estimates are their responsibility. It is common to use a task board or a Kanban board to check and change the status of current Sprint tasks. - with "to do", "running" and "done".
- Set of short-lived milestones
- How to manage a part of the product
- Results in a functional prototype



*Scrum Master* – facilitates and monitors work (manager)



*Product Owner* - represents the customer and users



*Team* – multifunctional team + self management

- Sprint starts with a planning session, including the customer (Product Owner), the facilitator (Scrum Master) and a multifunctional group (Team).
- The specific items for each Sprint are defined during the planning meeting that takes place before each Sprint.



- At this meeting, the Product Owner informs the team about the backlog items for the product they want to complete. The team then determines how many items in the backlog it agrees to complete in the next Sprint.

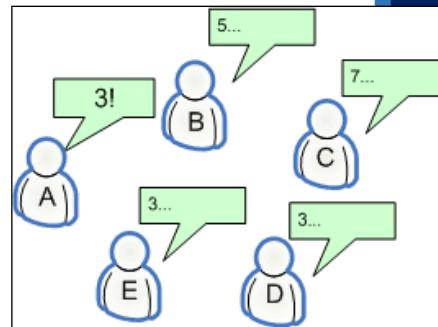
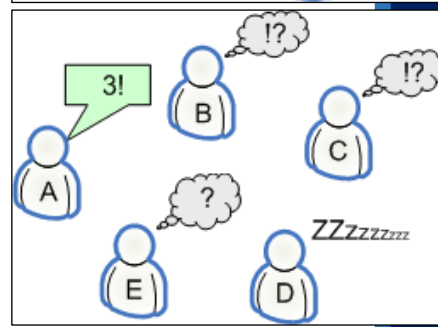
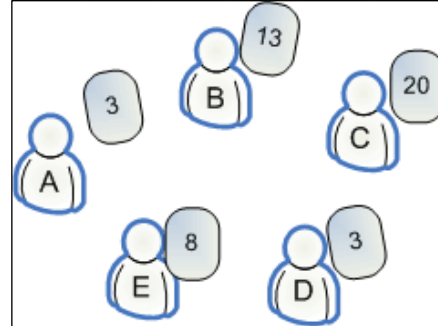


# Sprint realization - Activity planning

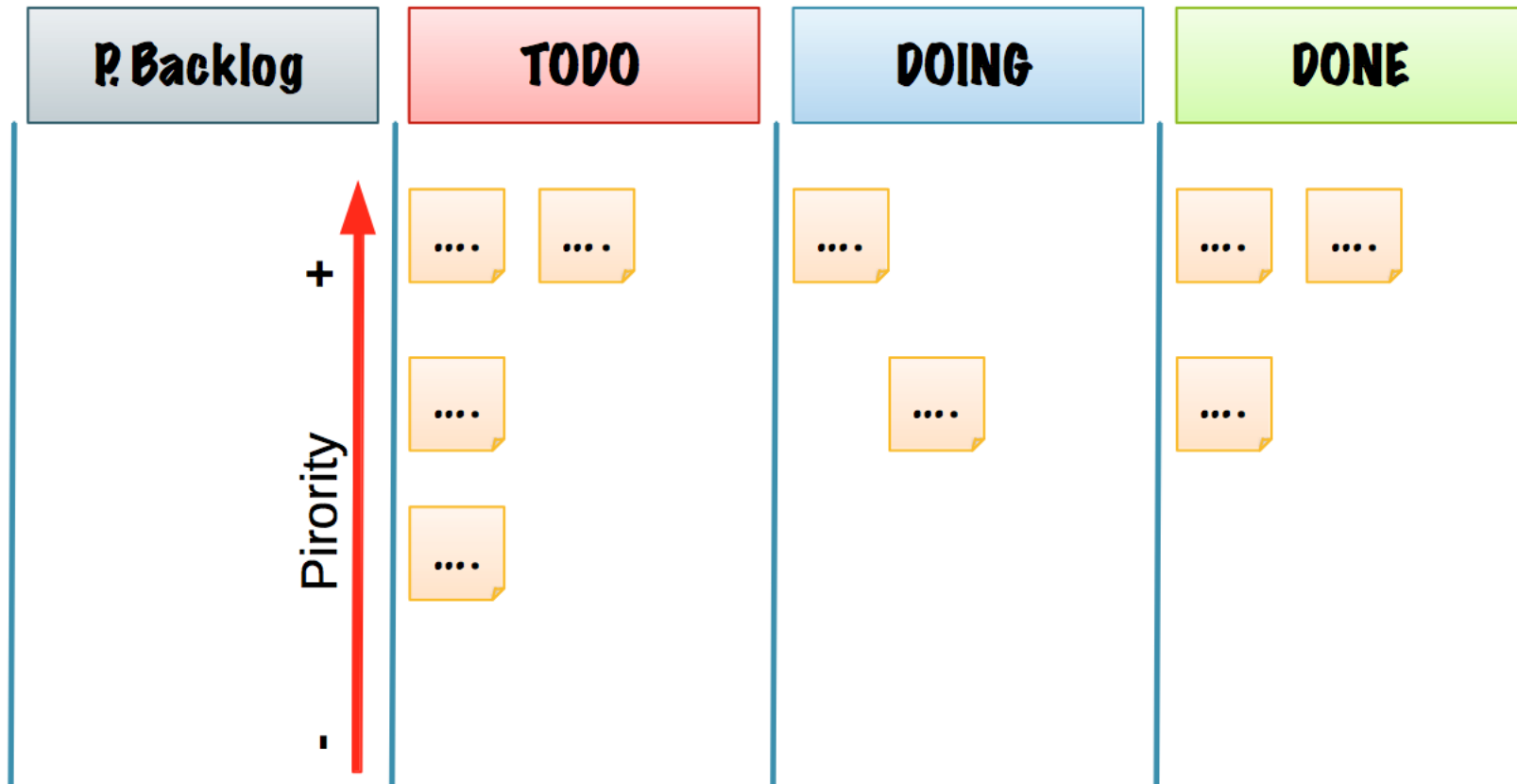
- Planning Poker - Estimativa de complexidade para características (requisitos) a serem desenvolvidas para o projeto
  - Sem falarem, cada elemento da equipa seleciona uma carta referente à sua perceção sobre a complexidade do requisito (item do backlog)
  - Todos viram a sua carta simultaneamente
  - Os extremos explicam a sua perspetiva e abre-se a discussão durante um tempo limitado
  - Voltam a jogar
  - Tentam chegar a consenso em poucas jogadas

(<http://www.planningpoker.com/>)

0	1/2	1	2	3	5
8	13	20	40	100	?



# Tools - Kanban Board



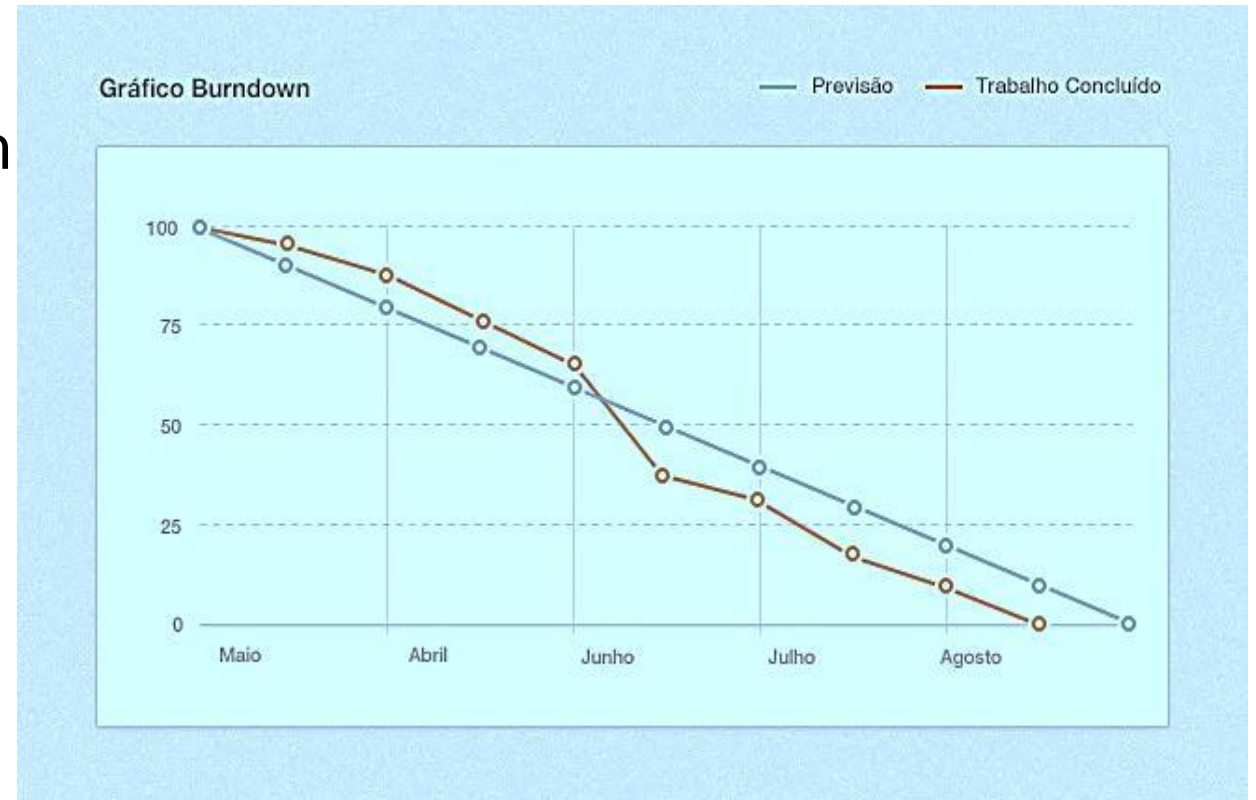


- During each Sprint, which typically occurs between every 2 and 4 weeks, the team creates an increment of the potentially complete product.
- The set of requirements that is analyzed in each Sprint comes from the product backlog, which is a prioritized set of work requirements that must be performed.
- During the performance of the Sprint, it is not allowed to change the project backlog, which means that the requirements are frozen during the Sprint.
- After the conclusion of the Sprint, the team presents the functional part of the developed product.

Meeting	Characteristics	Procedure
Daily Scrum	<p>Every day during each Sprint, a project status meeting is held with specific guidelines.</p> <p>The meeting takes place at the same place and at the same time every day, lasting 15 minutes</p> <p>Active team participation, scrum master (and eventually product owner).</p>	<p>Each member must answer the following questions:</p> <p>What have you done since yesterday?</p> <p>What do you intend to do today?</p> <p>Are there any obstacles to achieving the goal?</p>
Scrum of scrum	<p>This meeting is held every day after the Daily Scrum, in order to allow groups of teams to discuss their work, focusing on the areas of overlap and integration. One member of each team designated by the same participates.</p>	<ul style="list-style-type: none"> <li>• What has the team done since the last meeting?</li> <li>• What will the team do until the next meeting?</li> <li>• Is there anything that prevents the activities from being carried out?</li> <li>• Will it cause any overlap with the work of other teams?</li> </ul>

Reunião	Characteristics	Procedure
Sprint Planning Meetings	This meeting is held at the beginning of each Sprint (every 15-30 days). This meeting has a limit of 8 hours.	<ul style="list-style-type: none"><li>• Select the job to be performed in the cycle.</li><li>• Prepare the Sprint backlog detailing the duration of Sprint activities with the team.</li></ul>
Sprint review meeting	This meeting to end the cycle that takes place at the end of a Sprint cycle with a time limit of 4 hours.	<ul style="list-style-type: none"><li>• Review completed work and incomplete work.</li><li>• Present the completed work to the interested party demonstrating the functionality in operation.</li></ul>
Sprint retrospective	Meeting of lessons learned from the cycle with a limit of 3 hours.	<ul style="list-style-type: none"><li>• All members reflect on the past Sprint cycle.</li><li>• Performs continuous improvements in the process.</li><li>• Reflect on what will improve in the next cycle.</li></ul>

- The sprint burndown graph is a graph that shows the remaining work in the sprint backlog.
- Updated daily by ScrumMaster, this chart provides a simple overview of Sprint's progress, as well as a quick overview for reference.





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# Lego 4 Scrum

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<https://www.lego4scrum.com/>

[Alexey Krivitsky](#)



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# PRE-GAME: Organizing Teams

*Will take 5 minutes*



- Self organizing in groups of 4-6 people and allocate working space





## PRE-GAME: Project Chartering

*Will take 10 minutes.*



1. All teams will be building a single product - not competing.
2. The product is a CITY with certain features.
3. The main building elements are LEGOs, though any other material can be used in addition.
4. I am the main decision maker of the product – it is *my* city.
5. I will be involved in the development process by being available to answer questions and provide feedback.





# PRE-GAME: Building the Backlog

*Will take 15 minutes*



- One storey building (several of these, one per sticky note)
- Two storey building (several)
- Shop
- School
- Church
- Hospital
- Kindergarten
- Bus stop
- Intersection (can be drawn)
- Park (can be drawn)
- River (can be drawn)
- Bridge





# PRE-GAME: Estimating

*Will take up to 20 minutes*

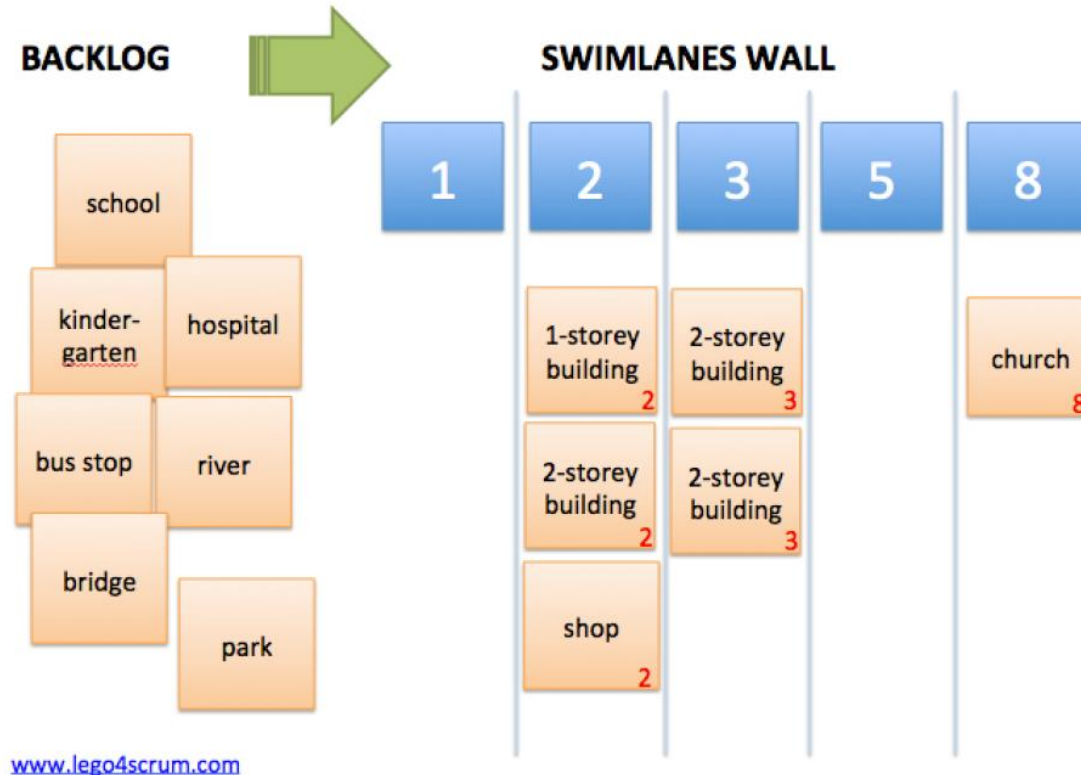


Figure 1: Swimlanes for group estimations

# GAME: Sprint Planning

*You are 50 minutes into the game now.*

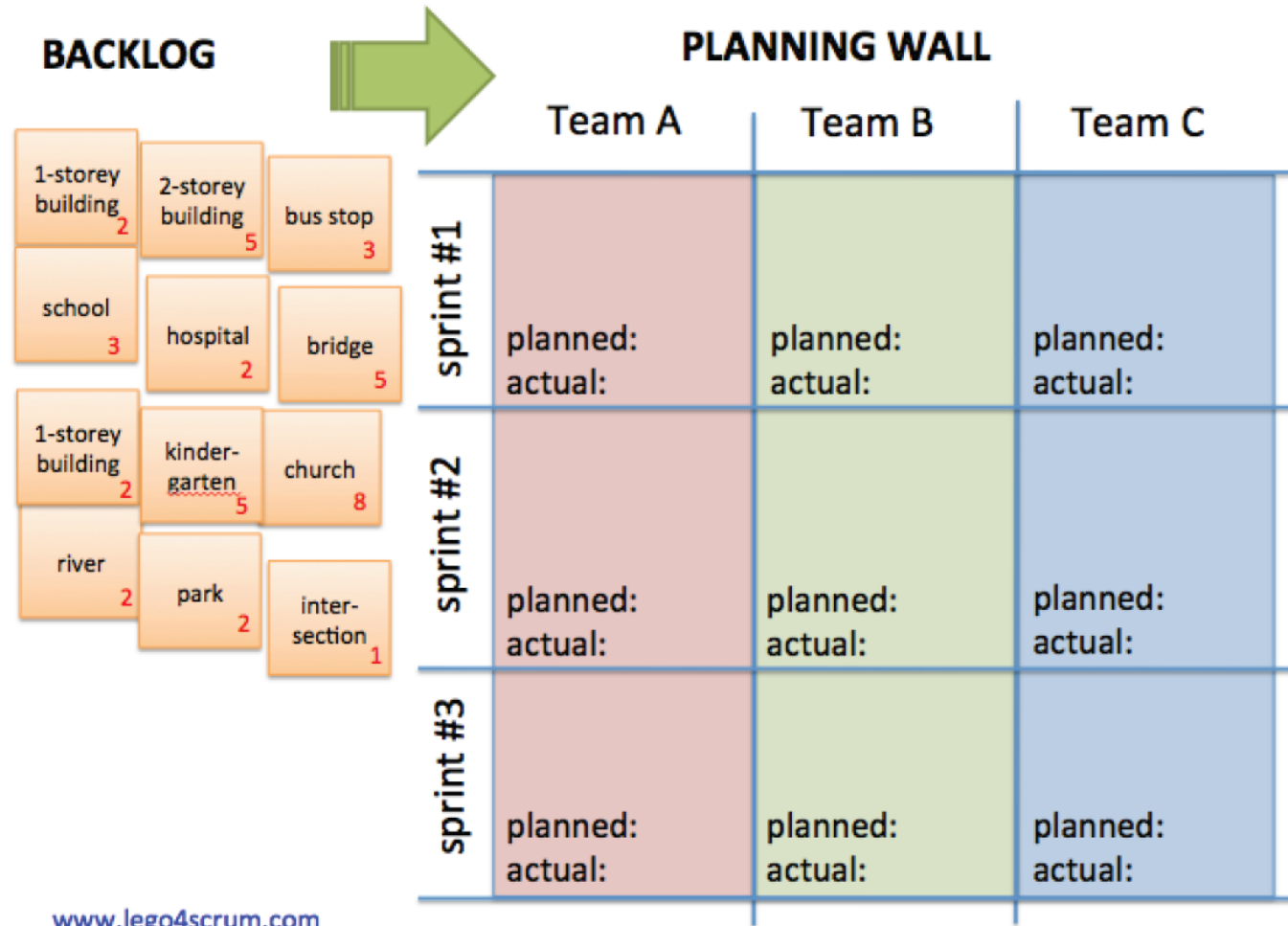


Figure 2: Multi-team Planning Wall, before planning sprint #1

# GAME: Sprinting

*Will take 7 minutes.*

[www.online-stopwatch.com](http://www.online-stopwatch.com)

00:02:39  
402

Pause

Clear

← Back

Figure 4: A stopwatch from [www.online-stopwatch.com](http://www.online-stopwatch.com) - timers of different forms, can be used offline.



# GAME: Reviewing

*Will take 5 minutes*



*Where is my city?*



# GAME: Release Cycle

1. Sprint #1
    - a. Planning – 3 minutes
    - b. Sprinting – 7 minutes
    - c. Review – 5 minutes
  2. Sprint #2
    - a. Planning – 3 minutes
    - b. Sprinting – 7 minutes
    - c. Review – 5 minutes
  3. Sprint #3
    - a. Planning – 3 minutes
    - b. Sprinting – 7 minutes
    - c. Review – 5 minutes
- Subtotal: 45 minutes

What did students observe?

- How did it feel being on a Scrum team?
- How did the short iterations go?
- How accurate were the estimations (provided the Release Burndown is there)
- What would we have done differently from the beginning, if we had another chance to play the game?
- What was the job of the Product Owner?
- How did it feel after the first sprint when almost all items required re-work?
- What did the Scrum Masters do?
- How will your strategy change, if you know the Product Owner is unavailable during sprints?
- How did inter-team communication go? Were there any dependencies? How were they resolved?
- What did students learn?



## Agile

- It is an agile process to manage and control development work;

## Team

- It is a team-based approach to develop, iteratively and incrementally, systems and products whose requirements are subject to rapid change;

## Articulation

- It is a process that aims to control the chaos caused by interests and needs in conflicts;

## Communication

- It is a way to improve communications and maximize cooperation;

## Scalable

- It is a scalable method, from isolated projects to an entire organization;

## Involved

- It is a way for everyone to feel good about their work and contributions and to have guarantees that they have done the best they can;



# Jeff Sutherland



<https://www.youtube.com/watch?v=s4thQcgLCqk>

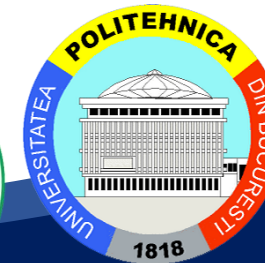
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- <http://www.westspacejournal.org.au/article/the-agile-union/>

MSE 4.0

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# Thank You



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