

Scrum – agile development methodology

Zlatko Stapić, PhD.

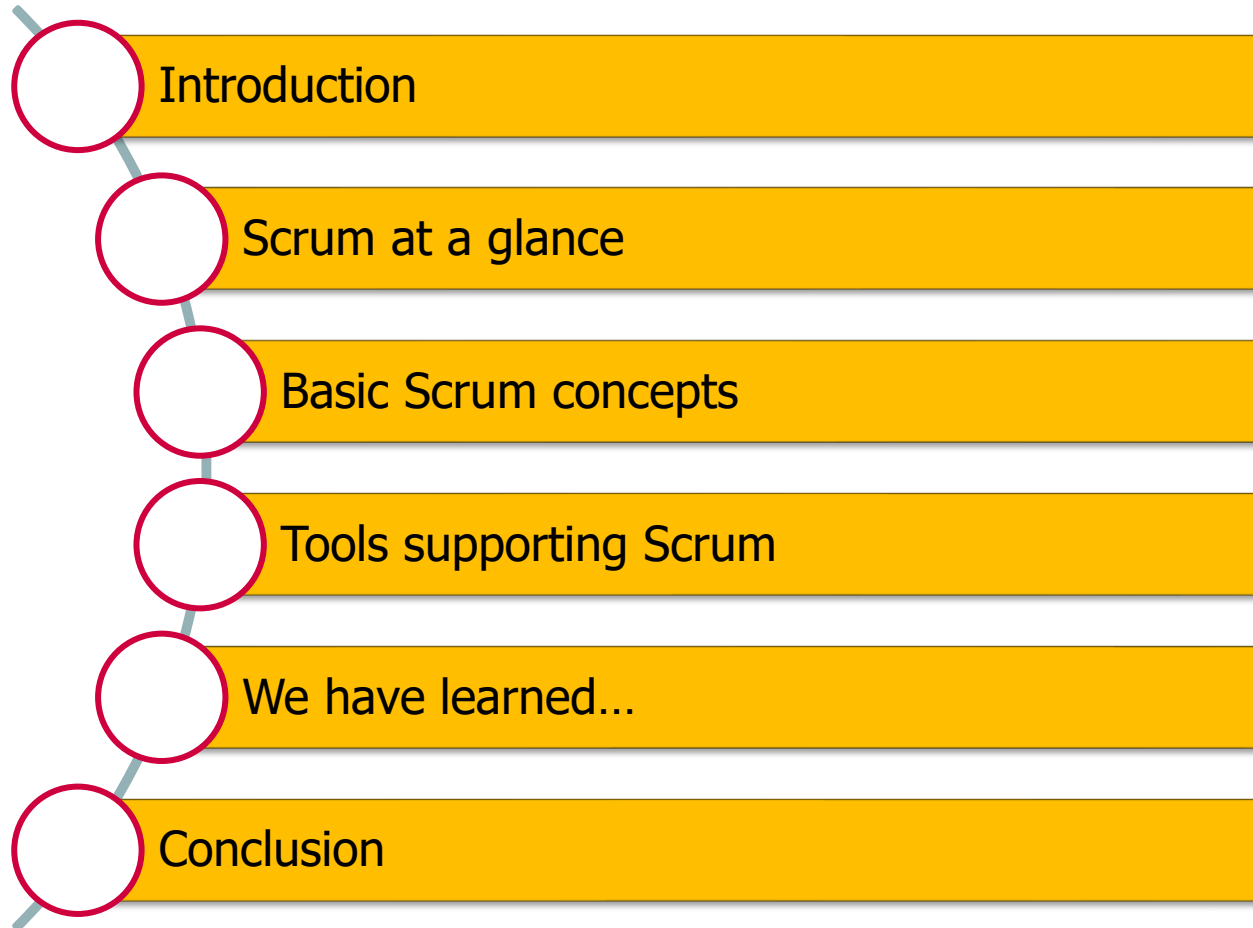
University of Zagreb

Faculty of Organization and Informatics

Course on Software Analysis and Development

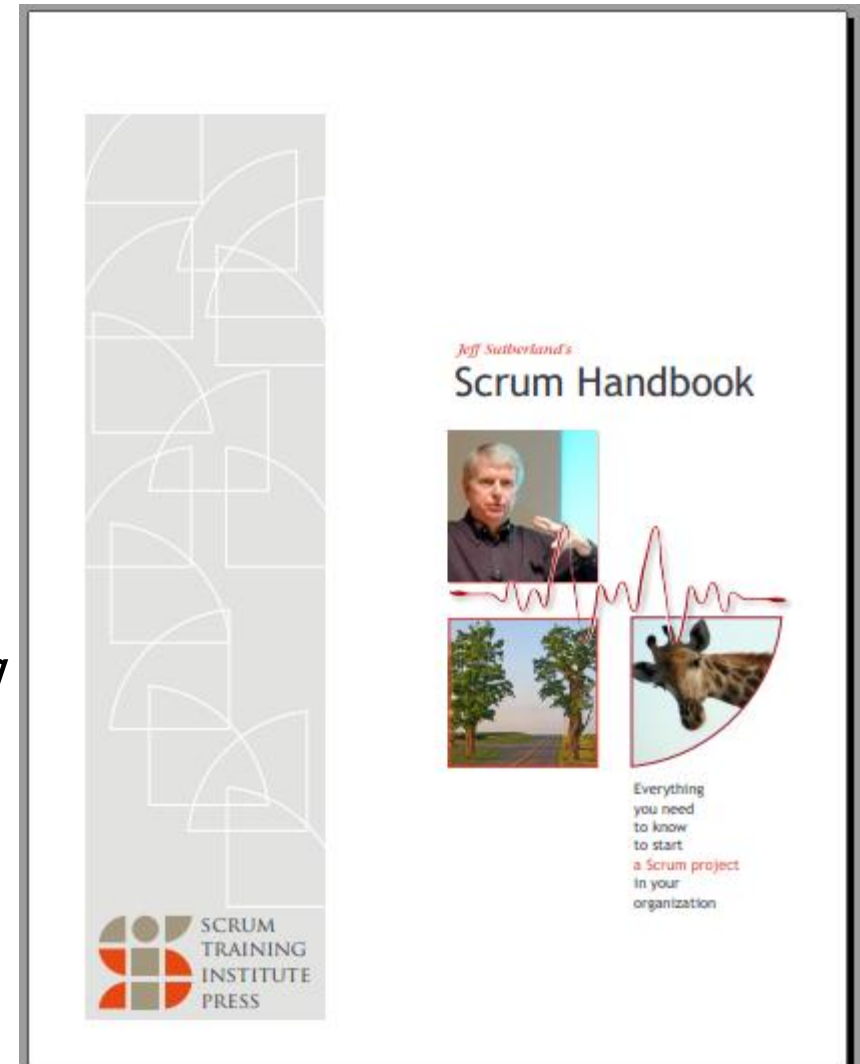
Varaždin, 11.10.2023.

- *Along with XP and some other agile methodologies, Scrum became one of the most widely used methodologies for development of mobile applications. This part of the lectures will introduce the students with the SCRUM process and with the artifacts that are created and maintained during that process. During the short assignments, students will have a chance to conduct first phases of the SCRUM on example (or their own) projects.*



- What to read?
 - “The Scrum Guide” [2]
 - updated several times each year, published in several languages (including Spanish 😊) and it could be used as a starting point of learning Scrum.
 - Jeff Sutherland’s Scrum Handbook [3]
 - provides “everything you need to know to start a Scrum project in your organization”
 - Many other books, articles, guides, presentations and handbooks.

- This presentation, except chapter on Scrum tools, is completely based on and has taken materials from:
- *J. Sutherland, "Jeff Sutherland's Scrum Handbook." Scrum Training Institute Press, 2010.*



- Scrum
 - Is an iterative, incremental framework for projects and product or application development.
 - Structures development in cycles of work called **Sprints**.
 - less than one month in length, and usually measured in weeks. Sprints take place one after the other.
 - fixed duration –end on a specific date whether the work has been completed or not, and are never extended. Hence, they are said to be time-boxed.

- At the beginning of each Sprint
 - A cross-functional team selects items (customer requirements) from a prioritized list.
 - Commit to complete the items by the end of the Sprint.
- During the Sprint
 - The chosen items do not change.
 - Every day the Team gathers briefly to replan its work to optimize the likelihood of meeting commitments.

- At the end of the Sprint
 - the team reviews the Sprint with stakeholders, and demonstrates what they have built.
 - People obtain feedback that can be incorporated in the next Sprint.
- Scrum emphasizes a working product at the end of the Sprint that is really “done”; in the case of software, this means code that is:
 - integrated
 - fully tested
 - potentially shippable

- The Product Owner
- The Team
- The ScrumMaster
- The Product Backlog
- The Sprint
- Sprint Planning
- Daily Scrum Meeting
- Updating Sprint Backlog & Sprint Burndown Chart
- Sprint Review and Retrospective

- Takes the inputs of what the product should be and translates them into a product vision or a Product Backlog.
- Responsible for maximizing return on investment (ROI) by identifying product features, translating these into a prioritized feature list, deciding which should be at the top of the list for the next Sprint, and continually re-prioritizing and refining the list.
- The Product Owner has profit and loss responsibility for the product, assuming it is a commercial product.

The Product Owner

- Sometimes, the Product Owner is the Customer
- Othertimes, the customers are the milions of people
- Product owner is NOT the Project manager
 - Active interaction with the team
 - Reviewing results on a 2 or 4 weekly basis
 - Creating and changing priorities
- Product owner is only ONE person always!

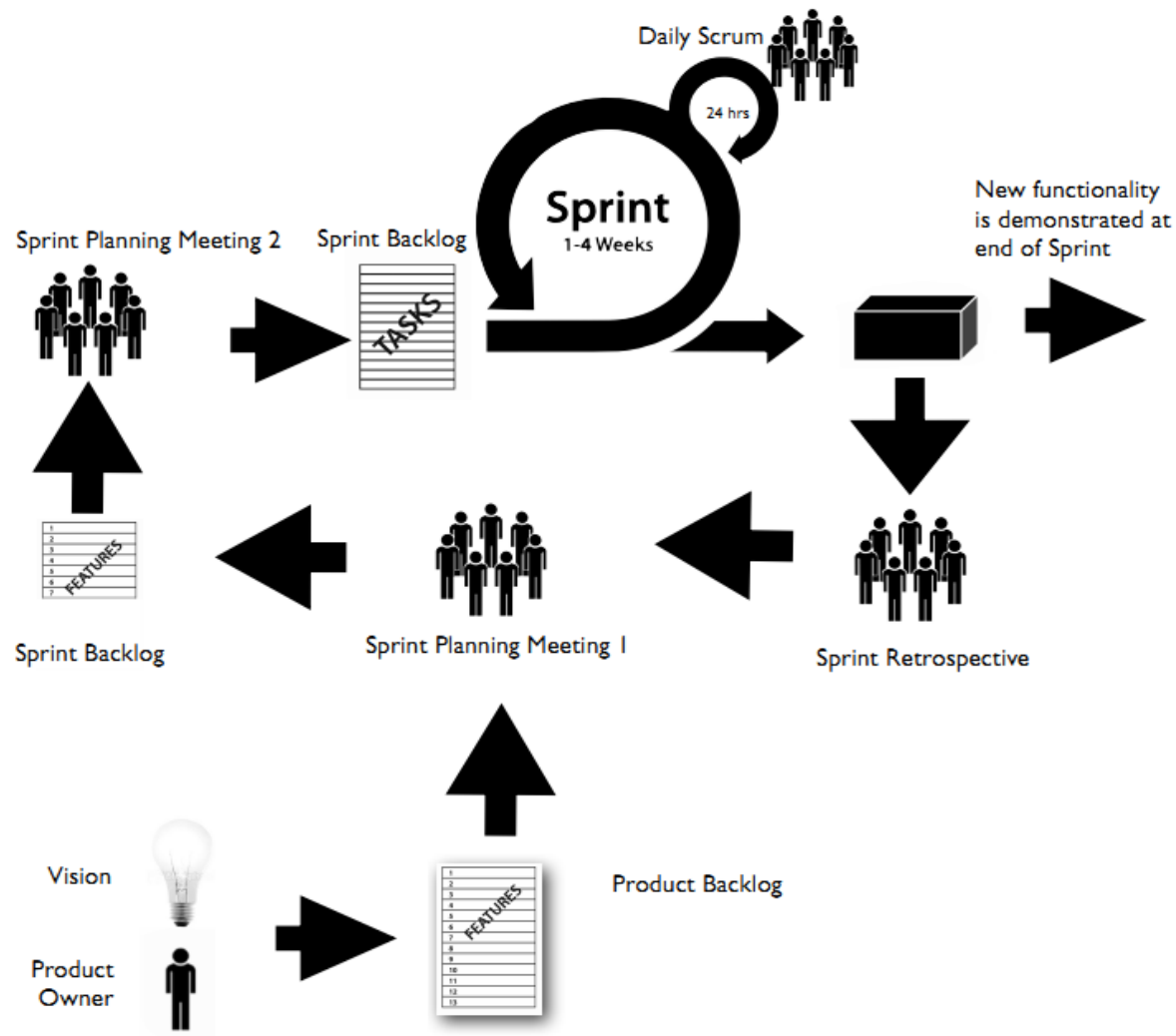
- The Team
 - develops the product envisioned by the Product Owner.
 - cross-functional and includes all the expertise necessary to deliver the potentially shippable product each Sprint.
 - Self-organizing (self-managing), with a very high degree of autonomy and accountability.

- **there is no team manager or project manager in Scrum**

- The Team
 - seven plus or minus two people
 - might include programmers, interface designers, and testers
- The Team develops
 - develop the product
 - provides ideas to the Product Owner about how to make the product great.
- Multitasking across multiple products or projects will severely limit performance.
- Application groups with many people are organized into multiple Scrum teams, each focused on different features for the product, with close coordination of their efforts. They are also known as **feature teams**.

- The ScrumMaster
 - does whatever it takes to make the Scrum Team successful, such as removing organizational impediments, facilitating meetings, acting as a gatekeeper so no one unnecessary interrupts the team's work.
 - helps the product group learn and apply Scrum to achieve business value. The ScrumMaster does whatever is in their power to help the team be successful.
 - is **not the manager of the team or a project manager**
 - serves the team, protects them from outside interference, and educates and guides the Product Owner and the team in the skillful use of Scrum.
 - makes sure everyone on the team (including the Product Owner, and those in management) understands and follows the practices of Scrum.

- The ScrumMaster
 - makes visible many impediments and threats to the team's and Product Owner's effectiveness and works hard to resolve those issues
- Scrum teams
 - should have a dedicated full-time ScrumMaster, although a smaller team might have a team member play this role (carrying a lighter load of regular work when they do so).
- The ScrumMaster and the Product Owner **cannot be the same individual**



- A Scrum project is driven by a product vision compiled by the Product Owner, and expressed in the Product Backlog.
- The Product Backlog
 - is a prioritized list of what's required, ranked in order of value to the customer or business, with the highest value items at the top of the list.
 - evolves over the lifetime of the project, and items are continuously added, removed or reprioritized.

The Product backlog

Item	Details (wiki URL)	Priority	Estimate of Value	Initial Estimate of Effort	New Estimates of Effort Remaining as of Sprint...					
					1	2	3	4	5	6
As a buyer, I want to place a book in a shopping cart (see UI sketches on wiki page)	...	1	7	5						
As a buyer, I want to remove a book in a shopping cart	...	2	6	2						
Improve transaction processing performance (see target performance metrics on wiki)	...	3	6	13						
Investigate solutions for speeding up credit card validation (see target performance metrics on wiki)	...	4	6	20						
Upgrade all servers to Apache 2.2.3	...	5	5	13						
Diagnose and fix the order processing script errors (bugzilla ID 14823)	...	6	2	3						
As a shopper, I want to create and save a wish list	...	7	7	40						
As a shopper, I want to add or delete items on my wish list	...	8	4	20						

- Scrum structures product development in cycles of work called Sprints, iterations of work which are typically 1–4 weeks in length.
- The Sprints
 - are of fixed duration and end on a specific date whether the work has been completed or not; they are never extended.

- At the beginning of each Sprint, the Sprint Planning Meeting takes place. The Product Owner and Scrum Team (with facilitation from the ScrumMaster) review the Product Backlog, discuss the goals and context for the items, and the Scrum Team selects the items from the Product Backlog to commit to complete by the end of the Sprint, starting at the top of the Product Backlog. Each item selected from the Product Backlog is designed and then broken down to a set of individual tasks. The list of tasks is recorded in a document called the **Sprint Backlog**.

- Part One:
 - the Product Owner and Team (with facilitation from the ScrumMaster) review the high-priority items in the Product Backlog that the Product Owner is interested in implementing this Sprint.
- Part Two:
 - focuses on detailed task planning for how to implement the items that the team decides to take on. The Team selects the items from the Product Backlog they commit to complete by the end of the Sprint, starting at the top of the Product Backlog (in others words, starting with the items that are the highest priority for the Product Owner) and working down the list in order.

- The Sprint Planning Meeting should be timeboxed to four hours for a four-week Sprint and two hours for a two-week Sprint.

Sprint Length	2 weeks
Workdays during Sprint	8 days

Team Member	Available Days During Sprint*	Available Hours per Day	Total Available Hours
Tracy	8	4	32
Sanjay	7	5	35
Phillip	8	4	32
Jing	6	5	30

* Net of vacation and other days out of office

- Once the Team capacity available is determined, the Team starts with the first item on the Product Backlog – in other words, the Product Owner's highest priority item – and working together, breaks it down into individual tasks, which are recorded in a document called the **Sprint Backlog**

Sprint planning

			New Estimates of Effort Remaining as of Day...						
Product Backlog Item	Sprint Task	Volunteer	Initial Estimate of Effort	1	2	3	4	5	6
As a buyer, I want to place a book in a shopping cart	modify database		5						
	create webpage (UI)		8						
	create webpage (Javascript logic)		13						
	write automated acceptance tests		13						
	update buyer help webpage		3						
	...								
Improve transaction processing performance	merge DCP code and complete layer-level tests		5						
	complete machine order for pRank		8						
	change DCP and reader to use pRank http API		13						

- Daily Scrum Meeting
 - Short (15 minutes) meeting that happens every workday at an appointed time.
 - Everyone on the team attends.
 - The information needed to inspect progress is presented. This information may result in replanning and further discussions immediately after the Daily Scrum.
- To keep it brief
 - (1) What they were able to get done since the last meeting;
 - (2) what they are planning to finish by the next meeting; and
 - (3) any blocks or impediments that are in their way.

Daily Scrum Meeting

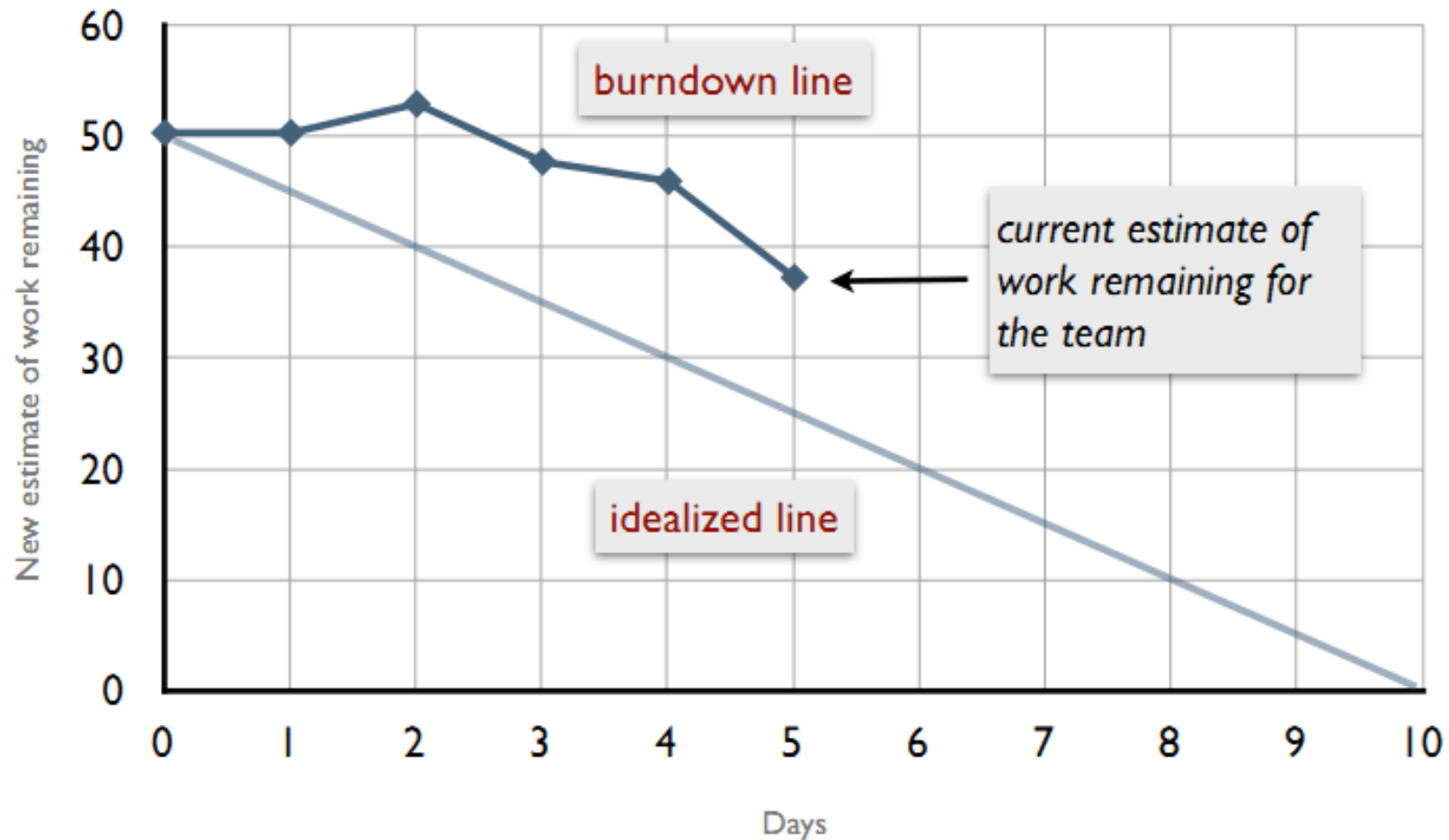
Product Backlog Item	Sprint Task	Volunteer	Initial Estimate of Effort	New Estimates of Effort Remaining at end of Day...					
				1	2	3	4	5	6
As a buyer, I want to place a book in a shopping cart	modify database	Sanjay	5	4	3	0	0	0	
	create webpage (UI)	Jing	3	3	3	2	0	0	
	create webpage (Javascript logic)	Tracy & Sam	2	2	2	2	1	0	
	write automated acceptance tests	Sarah	5	5	5	5	5	0	
	update buyer help webpage	Sanjay & Jing	3	3	3	3	3	0	
Improve transaction processing performance	...								
	merge DCP code and complete layer-level tests		5	5	5	5	5	5	
	complete machine order for pRank		3	3	8	8	8	8	
	change DCP and reader to use pRank http API		5	5	5	5	5	5	
						
		Total (person hours)	50	49	48	44	43	34	

Updating Sprint Backlog & Sprint Burndown Chart



- Every day, the Team members update their estimate of the amount of time remaining to complete their current task in the Sprint Backlog. Following this update, someone adds up the hours remaining for the Team as a whole, and plots it on the Sprint Burndown Chart.
- This graph shows, each day, a new estimate of how much work (measured in person hours or relative points) remains until the Team's tasks are finished.
- Ideally, this is a downward sloping graph that is on a trajectory to reach "zero effort remaining" by the last day of the Sprint.

Updating Sprint Backlog & Sprint Burndown Chart



Sprint Review and Retrospective

- After the Sprint ends, there is the Sprint Review, where the Scrum Team and stakeholder inspect what was done during the Sprint, discuss it, and figure out what to do next. Present at this meeting are the Product Owner, Team Members, and ScrumMaster, plus customers, stakeholders, experts, executives, and anyone else interested.
- Following the Sprint Review, the team gets together for the Sprint Retrospective which is an opportunity for the team to discuss what's working and what's not working, and agree on changes to try.

Sprint Review and Retrospective

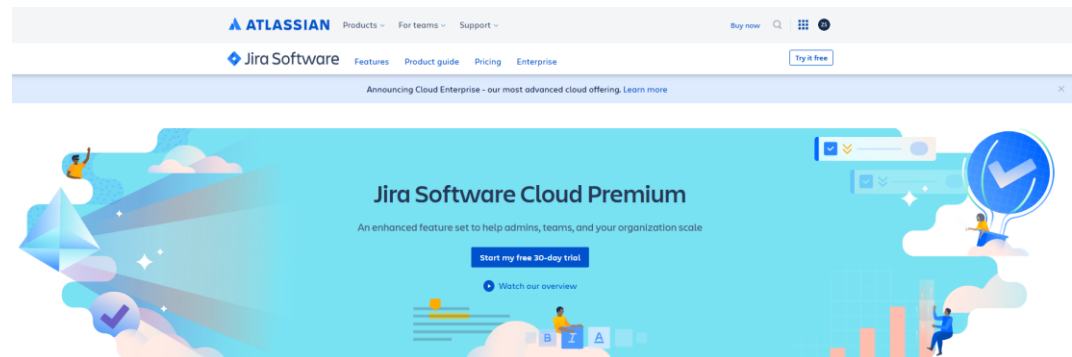
New Estimates of Effort Remaining at end of Sprint...										
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As a buyer, I want to place a book in a shopping cart (see UI sketches on wiki page)	...	1	7	5	0	0	0			
As a buyer, I want to remove a book in a shopping cart	...	2	6	2	0	0	0			
Improve transaction processing performance (see target performance metrics on wiki)	...	3	6	13	13	0	0			
Investigate solutions for speeding up credit card validation (see target performance metrics on wiki)	...	4	6	20	20	20	0			
Upgrade all servers to Apache 2.2.3	...	5	5	13	13	13	13			
Diagnose and fix the order processing script errors (bugzilla ID 14823)	...	6	2	3	3	3	3			
As a shopper, I want to create and save a wish list	...	7	7	40	40	40	40			
As a shopper, I want to to add or delete items on my wish list	...	8	4	20	20	20	20			
...								
Total				537	580	570	500			

- Tools supporting Scrum process are emerging monthly on the internet. The overall notice is that almost all of them are not free and generally provide many options for team using Scrum methodology.
- Tools supporting Scrum should [5]:
 - Help you run sprints
 - Track project progress and promote retrospectives
 - Encourage collaboration
 - Offer transparency
 - Not get in a way

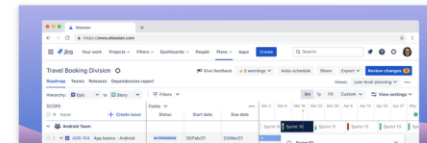
- The following list is not exhaustive but rather shows an small insight in the existing tools on Scrum [5]

- **Jira**
- VivifyScrum
- Targetprocess
- ClickUp
- Scrumwise
- QuickScrum
- Yodiz
- nTask
- Axosoft
- ScrumDo
- ActiveCollab
- Pivotal Tracker

<https://www.atlassian.com/software/jira>



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The dashboard displays a Kanban board with three columns: TO DO 3, IN PROGRESS 3, and DONE 2. Each card represents a task with a title, a status label, a progress indicator, a count, and a due date.

Column	Task Title	Status Label	Progress Indicator	Count	Due Date
TO DO 3	Engage Jupiter Express for outer solar system travel	SPACE TRAVEL PARTNERS	✓ ↑	5	TIS-25
	Create 90 day plans for all departments in the Mars Office	LOCAL MARS OFFICE	✓ ↓	9	TIS-12
IN PROGRESS 3	Requesting available flights is now taking > 5 seconds	SEESPACEEZ PLUS	✓ ↑	3	TIS-8
	Engage Saturn Shuttle Lines for group tours	SPACE TRAVEL PARTNERS	✓ ↑	4	TIS-15
	Engage Saturn's Rings Resort as a preferred provider	SPACE TRAVEL PARTNERS	✓ ↑	3	TIS-17
DONE 2	Homepage footer uses an inline style- should use a class	LARGE TEAM SUPPORT	✓ ↑	68	TIS-68
	Engage JetShuttle SpaceWays for travel	SPACE TRAVEL PARTNERS	✓ ↑	5	TIS-23

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[Features](#)
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Plans and pricing

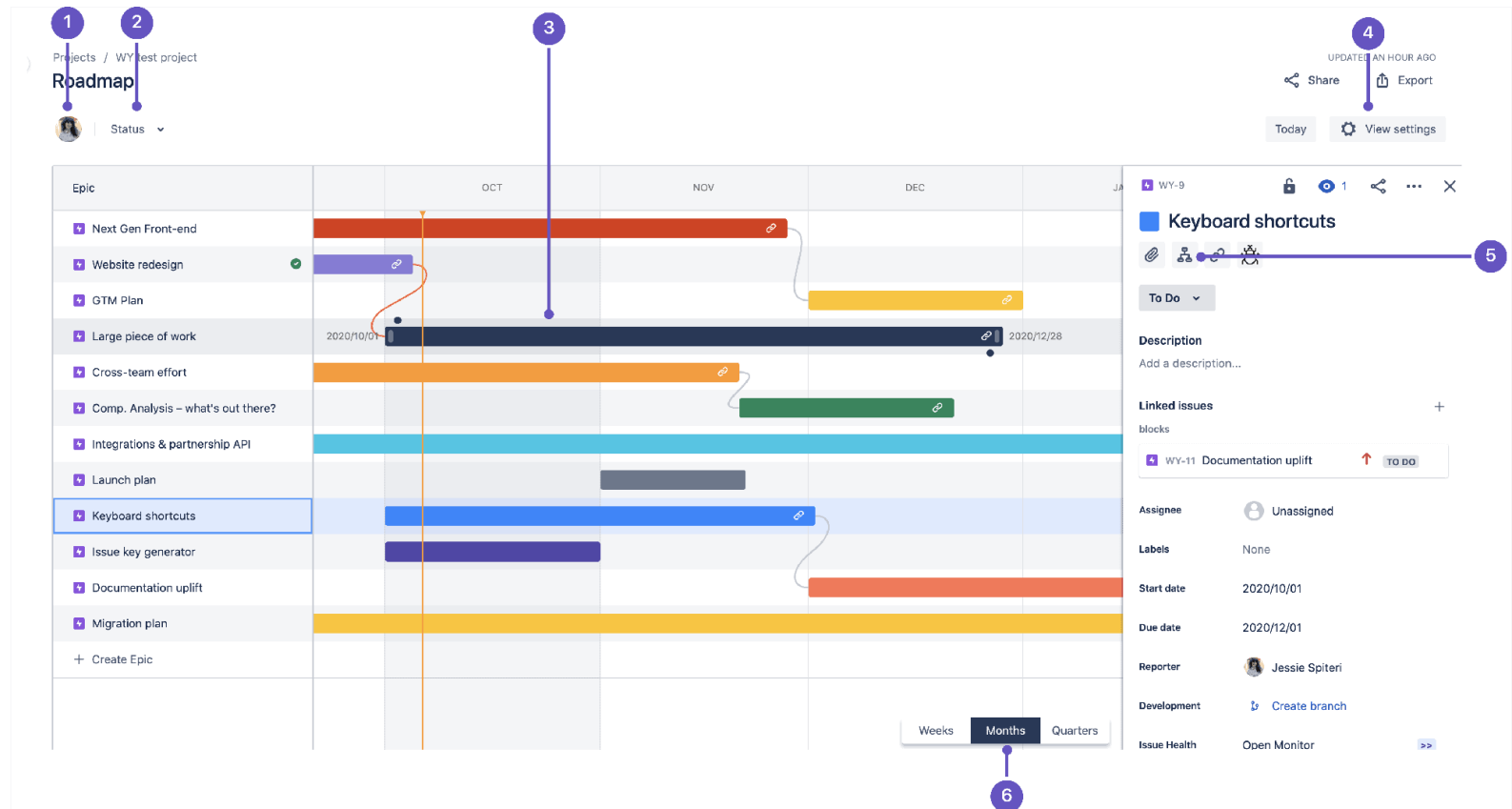
How many users do you have?

Billing cycle: ☒ Monthly ☐ Annual

	Free	Standard	Premium	Enterprise
	\$0 Always free for 10 users Get started	\$7 per user (average) \$70 a month Start trial	\$14 per user (average) \$140 a month Start trial	Billed annually. Switch the Billing cycle to Annual to view Enterprise pricing. Contact us
	For small teams to plan and track work more efficiently	For growing teams focused on building more together	For organizations that need to scale how they collaborate and track work	For enterprises with global scale, security, and governance needs
Features				
User limit (per site)	10 users	20,000 users	20,000 users	20,000 users
Site limit	One	One	One	Unlimited
Scrum and Kanban boards	✓	✓	✓	✓
Backlog	✓	✓	✓	✓
Agile reporting	✓	✓	✓	✓
Customizable workflows	✓	✓	✓	✓

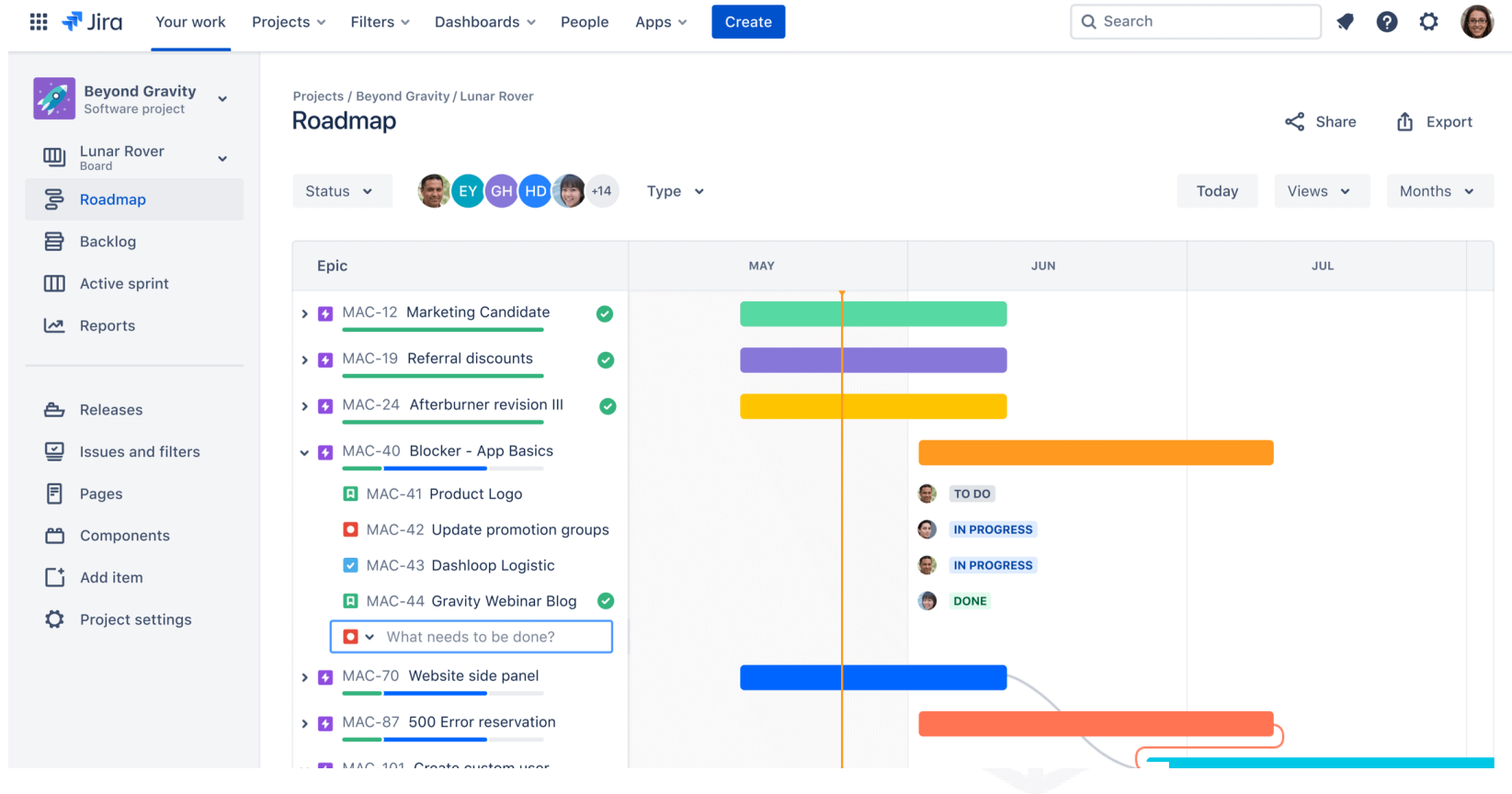
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Monitoring plan implementation



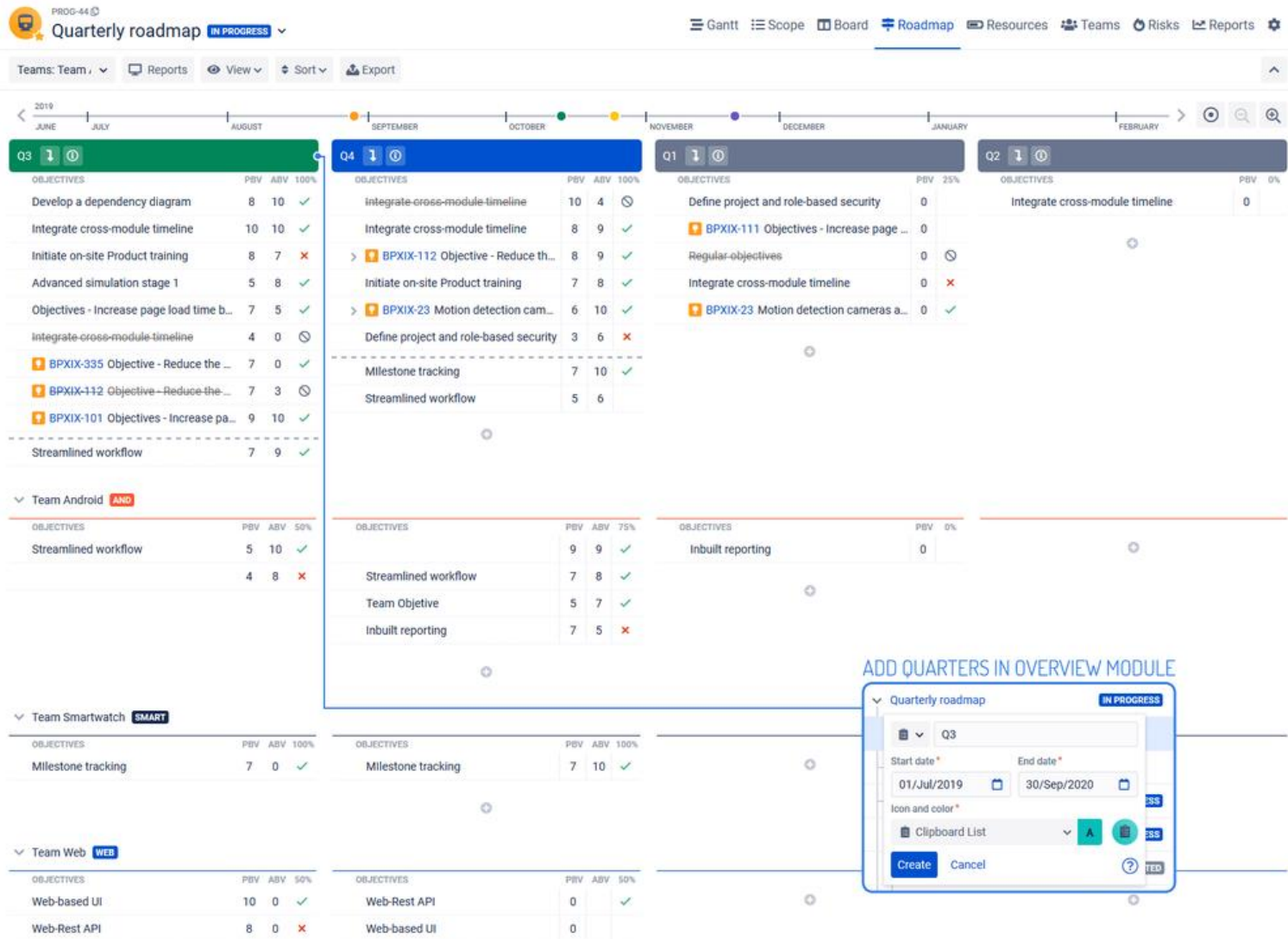
How to Set up Roadmaps in Jira: The Complete 2021 Guide, <https://www.idalko.com/jira-roadmaps/>

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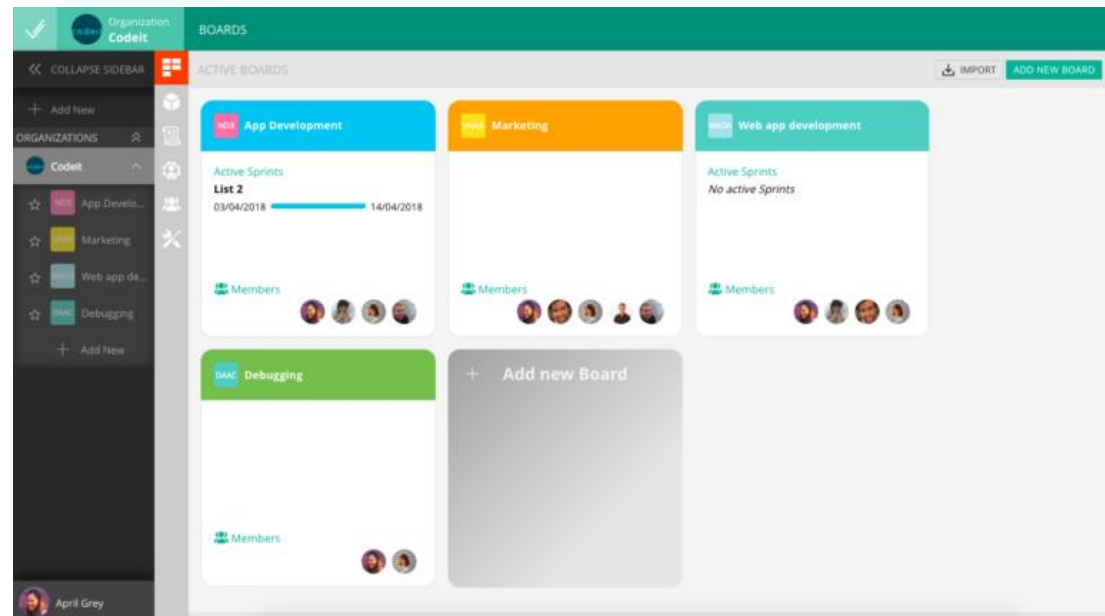


Tools supporting Scrum

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

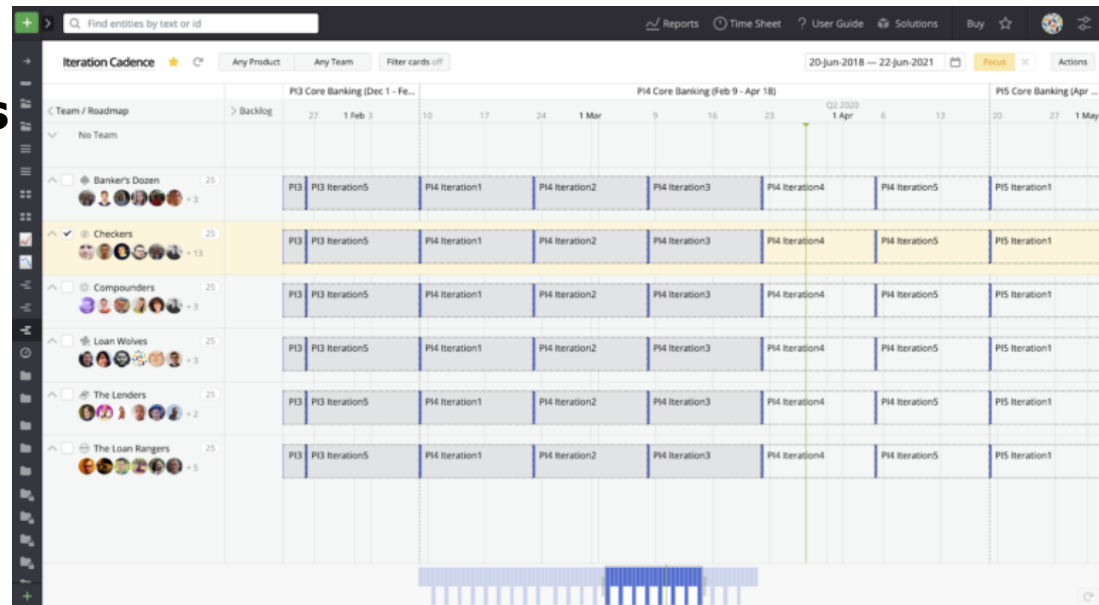


Izvor: <https://geekbot.com/blog/scrum-tools/>

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

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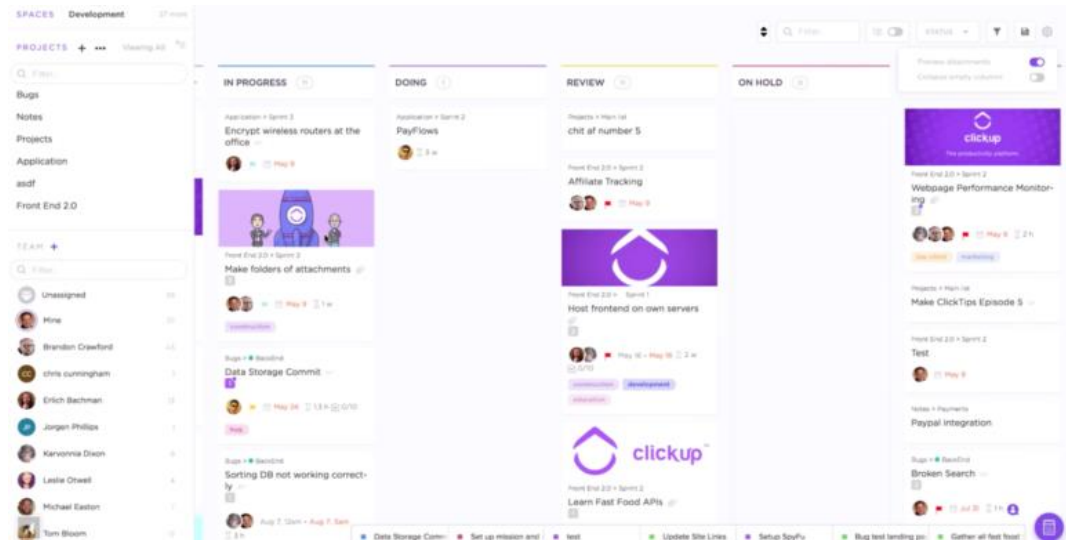
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<https://clickup.com/>



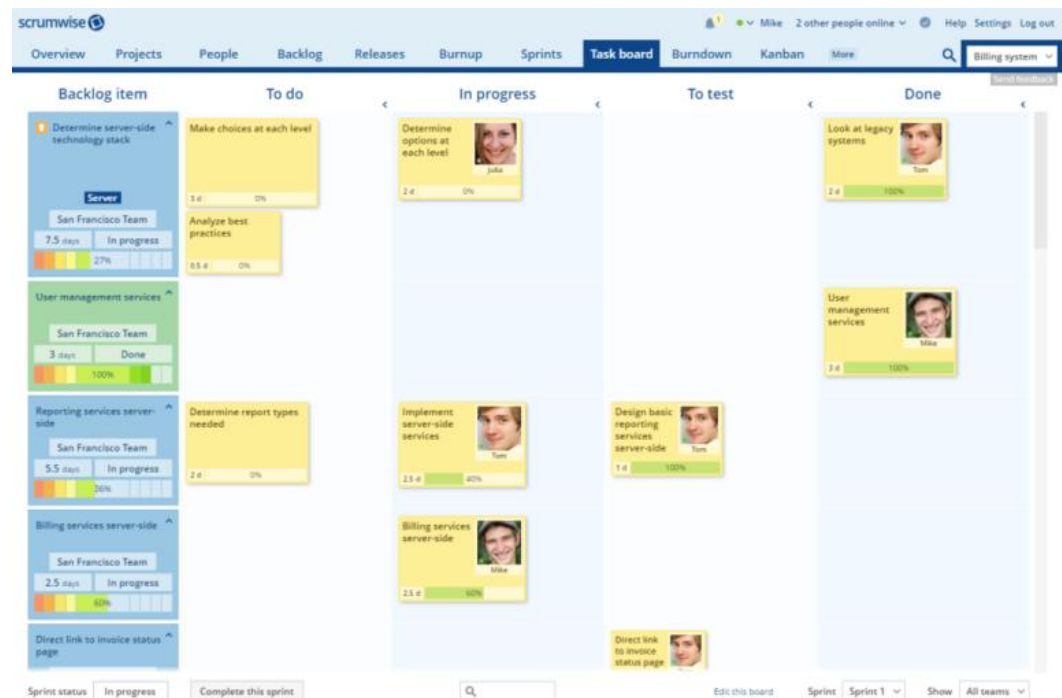
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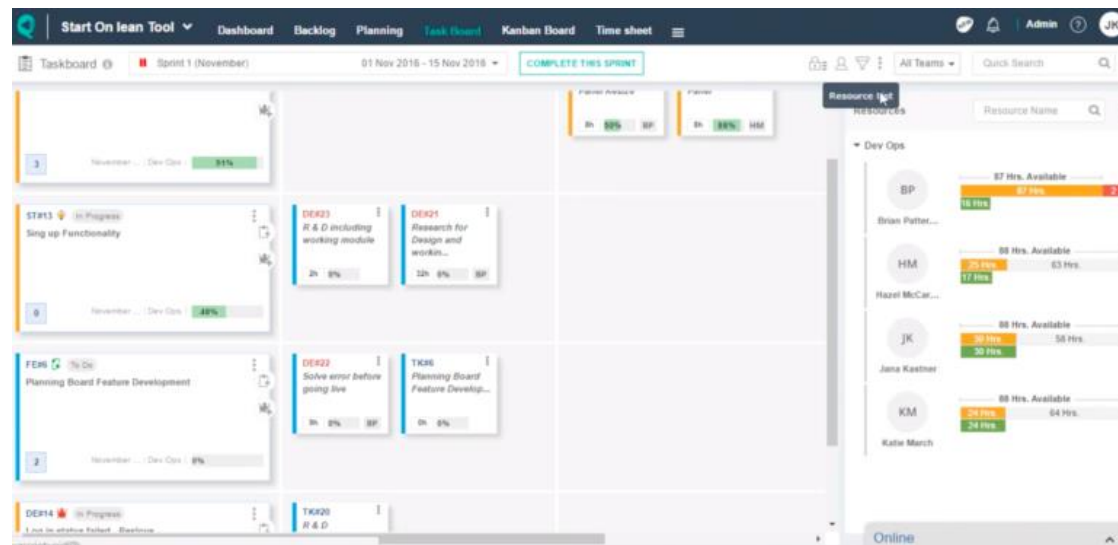
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<https://www.quickscrum.com/>

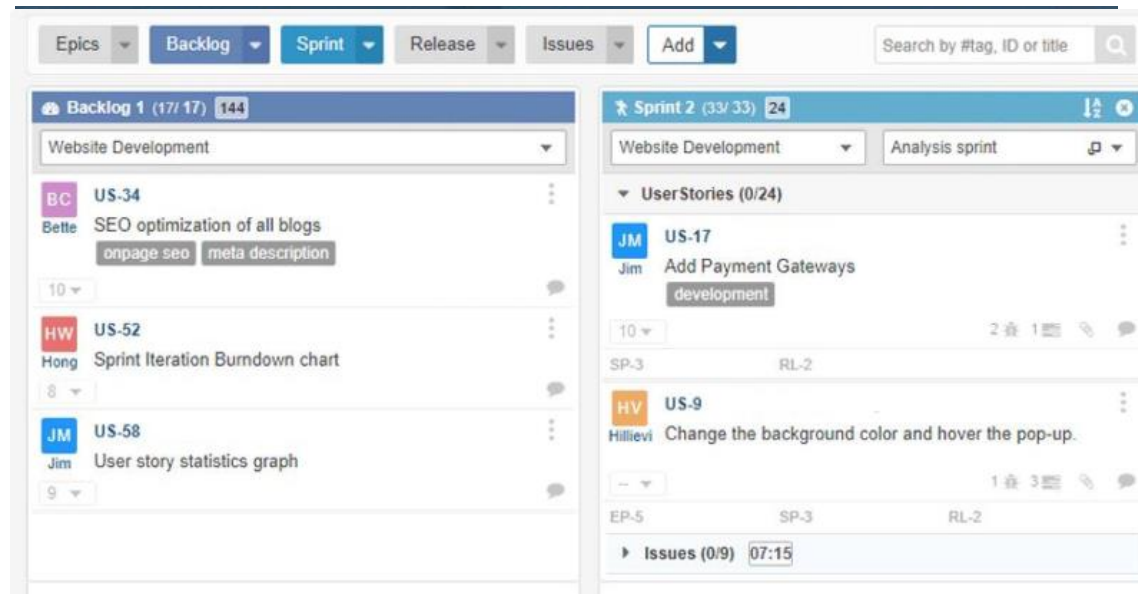


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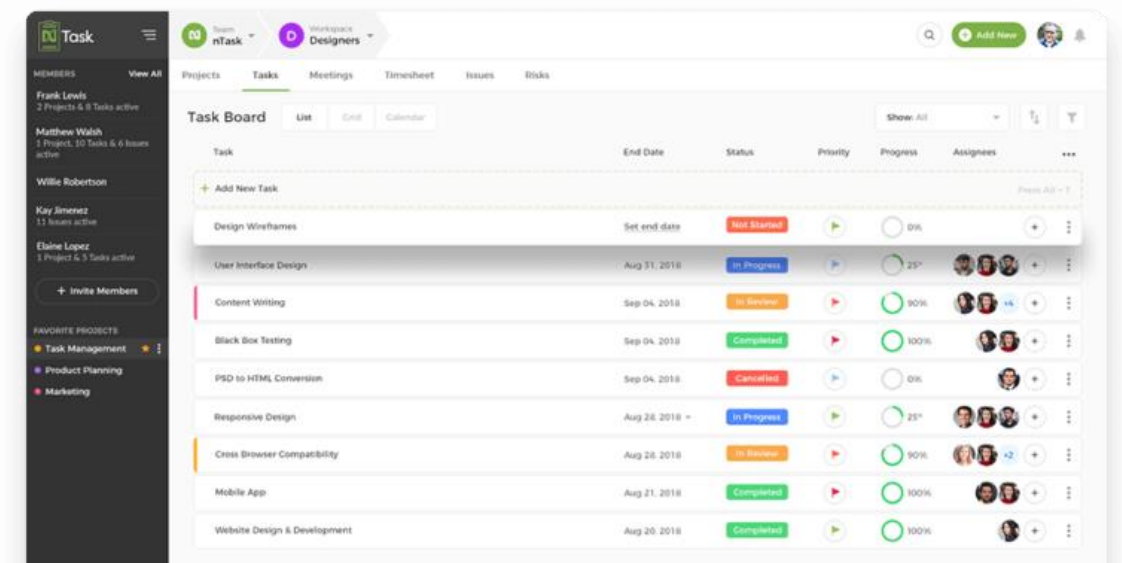
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<https://www.ntaskmanager.com/>



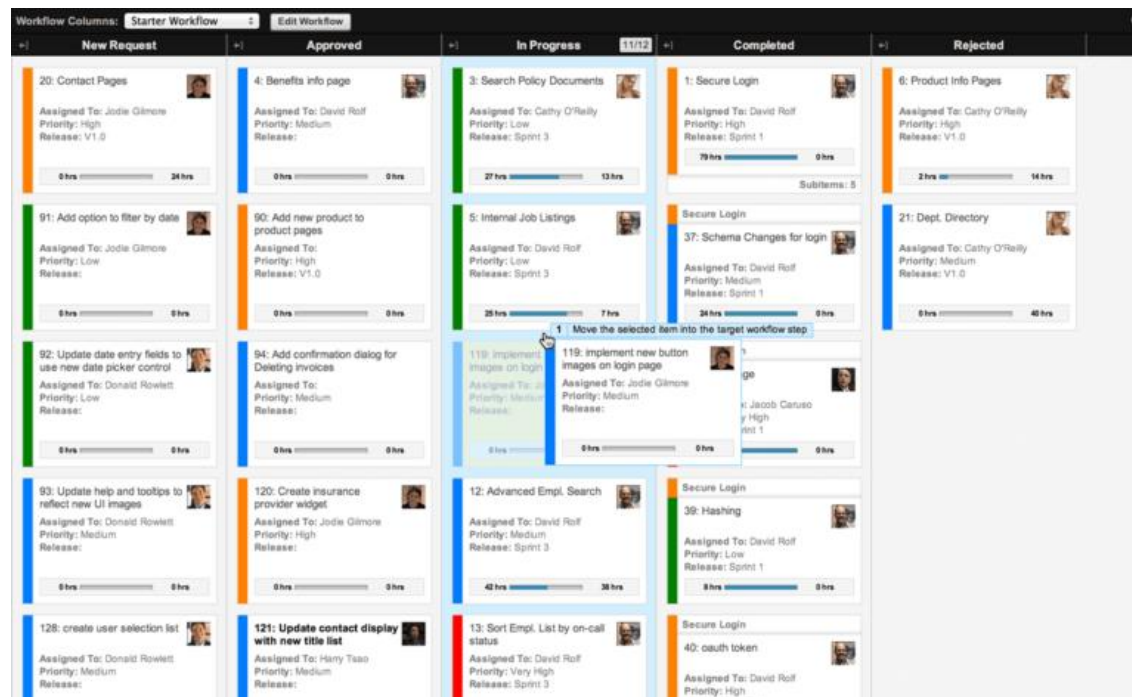
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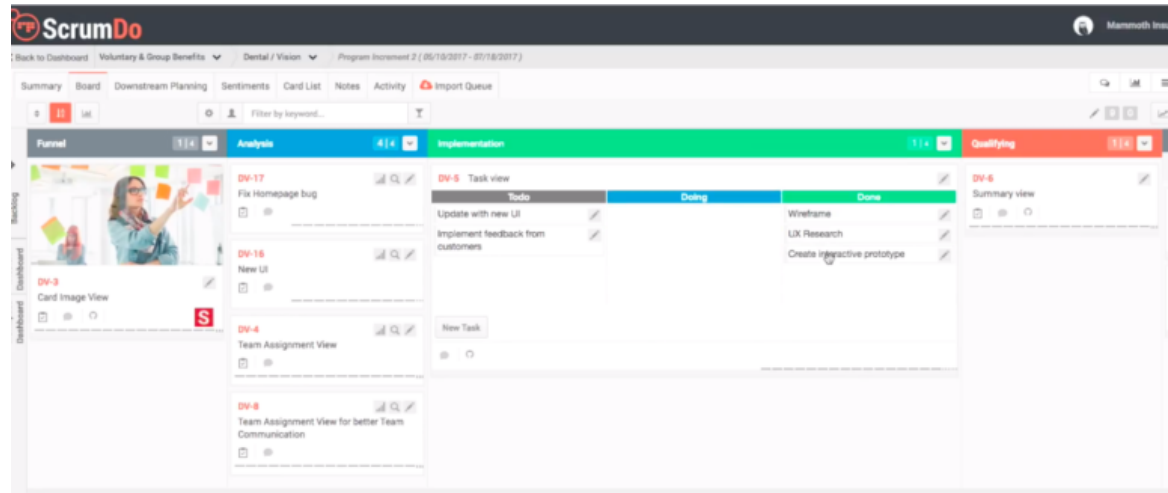


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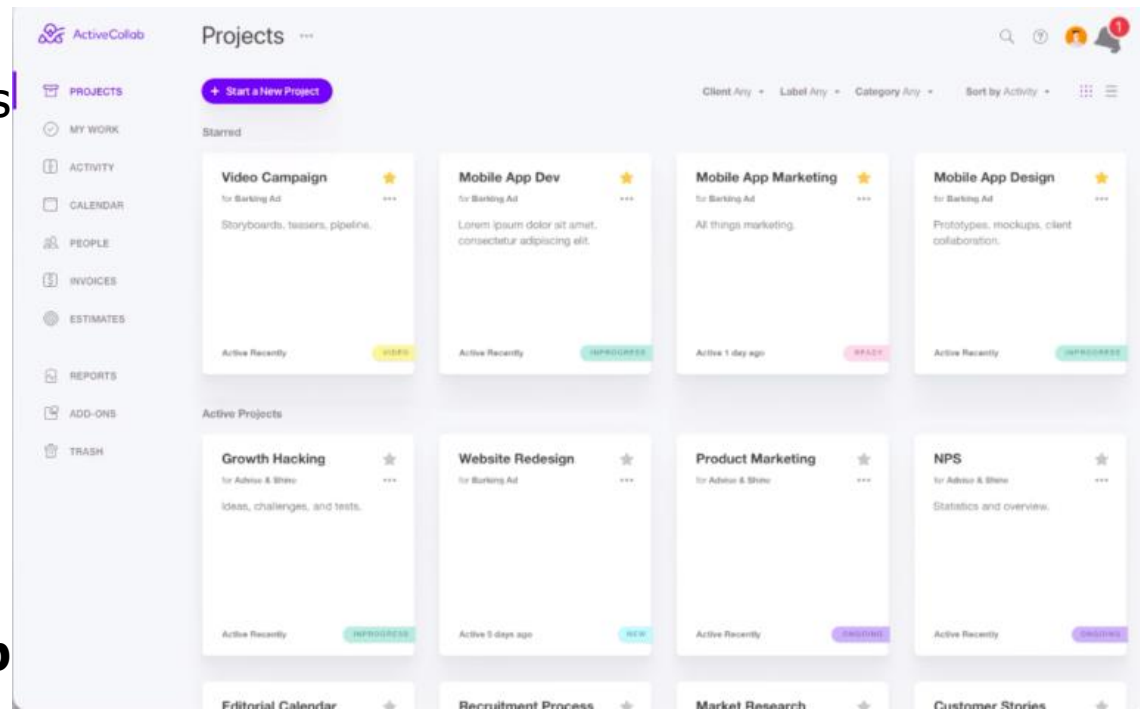
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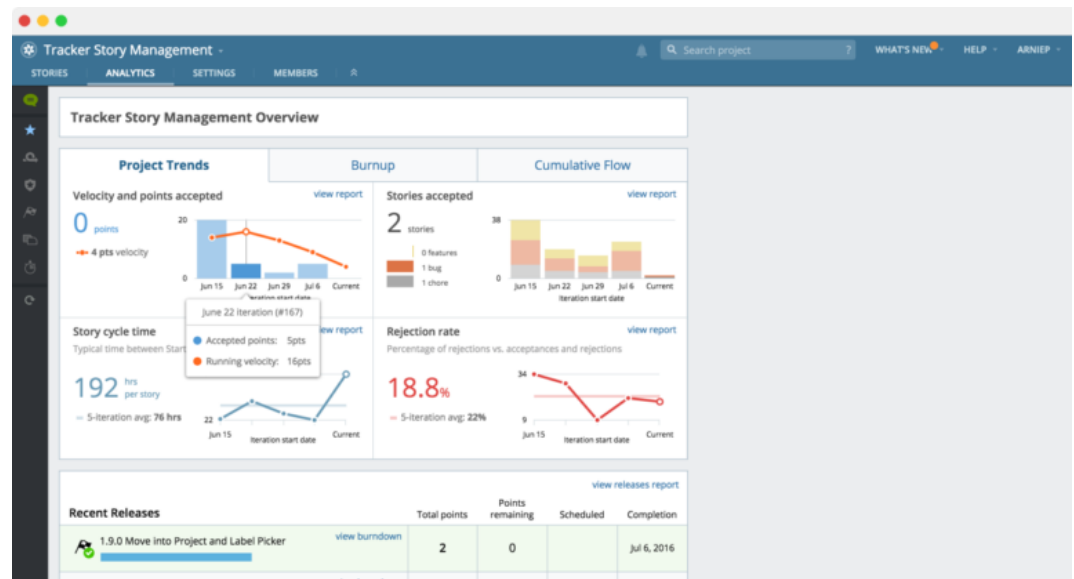


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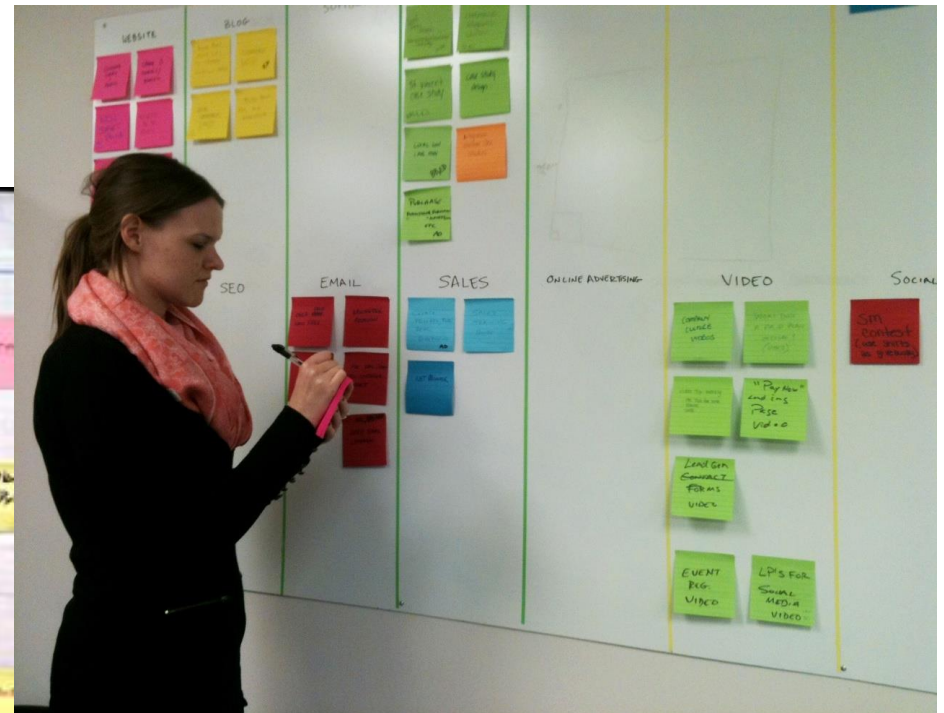
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<https://www.pivotaltracker.com/>



Izvor: <https://geekbot.com/blog/scrum-tools/>

- Still commonly used option 😊



- Scrum:
 - Agile project management methodology.
 - Created by Ken Schwaber and Jeff Sutherland .
 - Skeleton that includes a small set of practices and predefined roles.
 - De facto standard for managing agile software development projects.
 - Consists of only a few common sense practices that can be applied in many situations.
 - By itself is never enough, and development teams have to shop in other methods (usually XP) for additional practices.

SCRUM PROCESS



- Most projects have a list of requirements (type of system, planning items, type of application, development environment, user considerations, etc.) Scrum records requirements in a Product Backlog. Requirements need not be precise nor do they need to be described fully. As with most projects, the requirements are sourced from the expected users or "the business". The Product Owner prioritizes the Product Backlog: items of importance to the project/business, i.e. those items that add immediate and significant business value, are bubbled up to the top. [1]

- One of Scrum's primary practices is the 24 hour cycle shown in figure 1: the Daily Scrum meeting. The purpose of the Daily Scrum meeting is to answer Scrum's three questions [1]:
 - What did you do yesterday?
 - What will you do today?
 - What obstacles are in your way?

- Scrum roles [1] :
 - **Product Owner** - possibly a Product Manager or Project Sponsor, a member of Marketing or an Internal Customer
 - **Scrum Master** - key, he or she "represents management to the project". Such a role usually filled by a Project Manager or Team Leader. They are responsible for enacting Scrum values and practices. Their main job is to remove impediments, i.e. project issues that might slow down or stop activity that moves the project forward.
 - **Project Team** - should consist of between 5-10 members. The team itself should be cross-functional, involving individuals from a multitude of disciplines: QA, Programmers, UI Designers, etc.

- Conclusion in picture [4]



Scrum Team are known as pigs because they're committed to delivering Sprint Goal

People who are involved but not dedicated to the project are known as chickens

- Attend Daily Scrums as observers

Looking forward to your questions 😊

foi



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