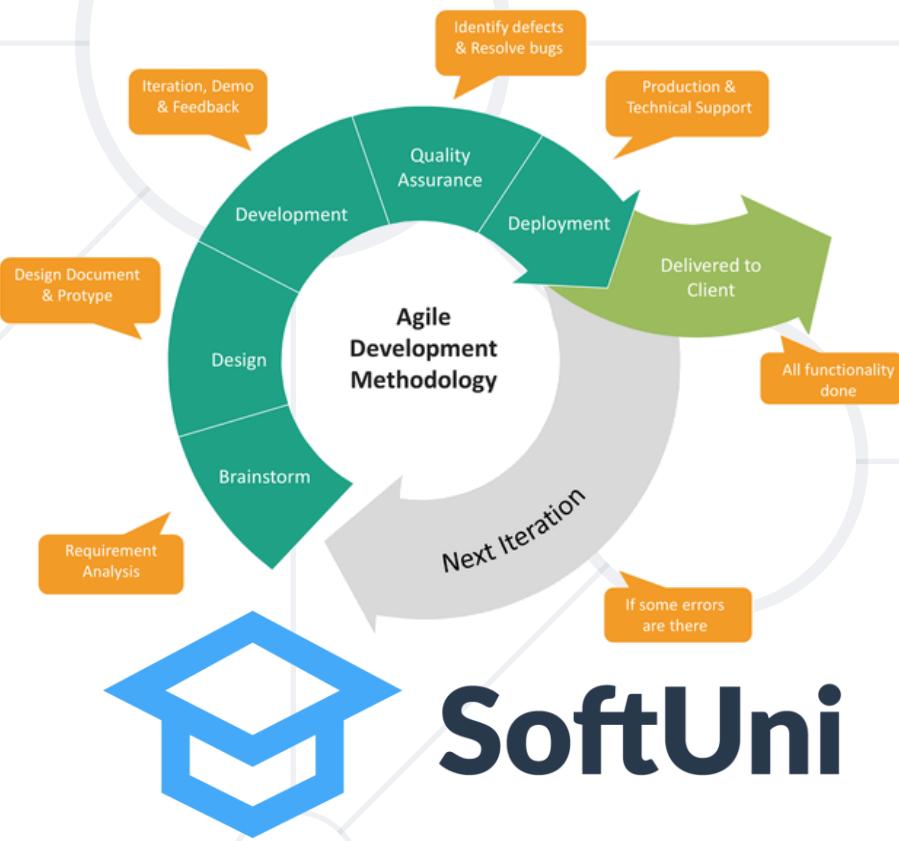


# Software Development Methodologies

Software Project Management, Development Methodologies, Agile Development, Kanban, Scrum

SoftUni Team  
Technical Trainers



SoftUni



Software University  
<https://softuni.bg>

Have a Question?



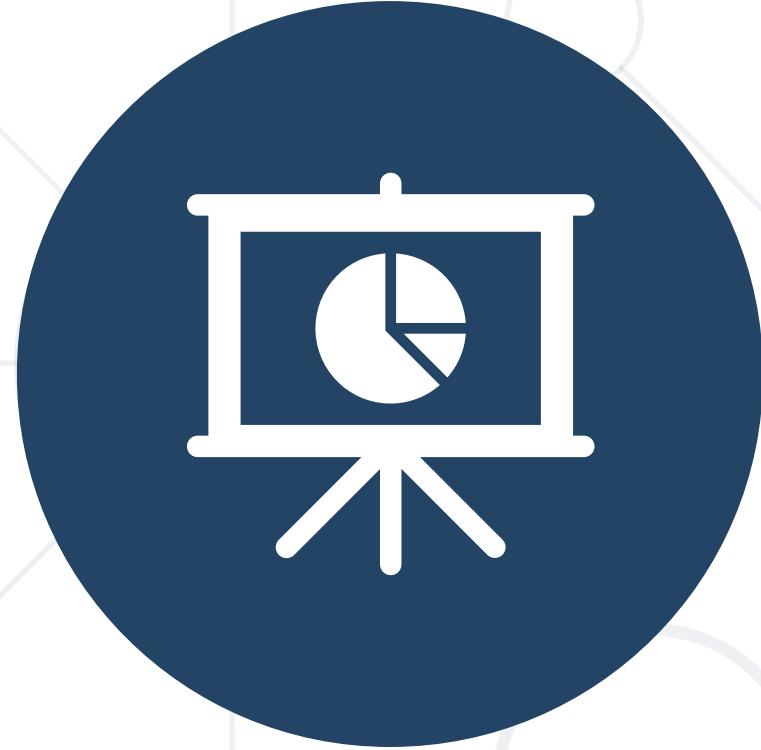
sli.do

#Dev-Ops

# Table of Content

1. Software Project Management
2. Development Methodologies
3. Agile Development Principles
4. Kanban
5. Scrum
6. Scrumban
7. Project Tracking Tools





# Software Project Management

Plan, Monitor and Control Project Development

# What is Project Management?

- **Project management** == **organizing** and **managing** work and resources in order to successfully complete a project
- "Successfully" meaning within defined **scope, quality, time** and **cost** constraints
- **Project** == temporary undertaking that aims to deliver some specific result
- **Project manager** == person who plans, monitors and manages the project
  - Often this is the "**team leader**"



# What is Software Project Management?

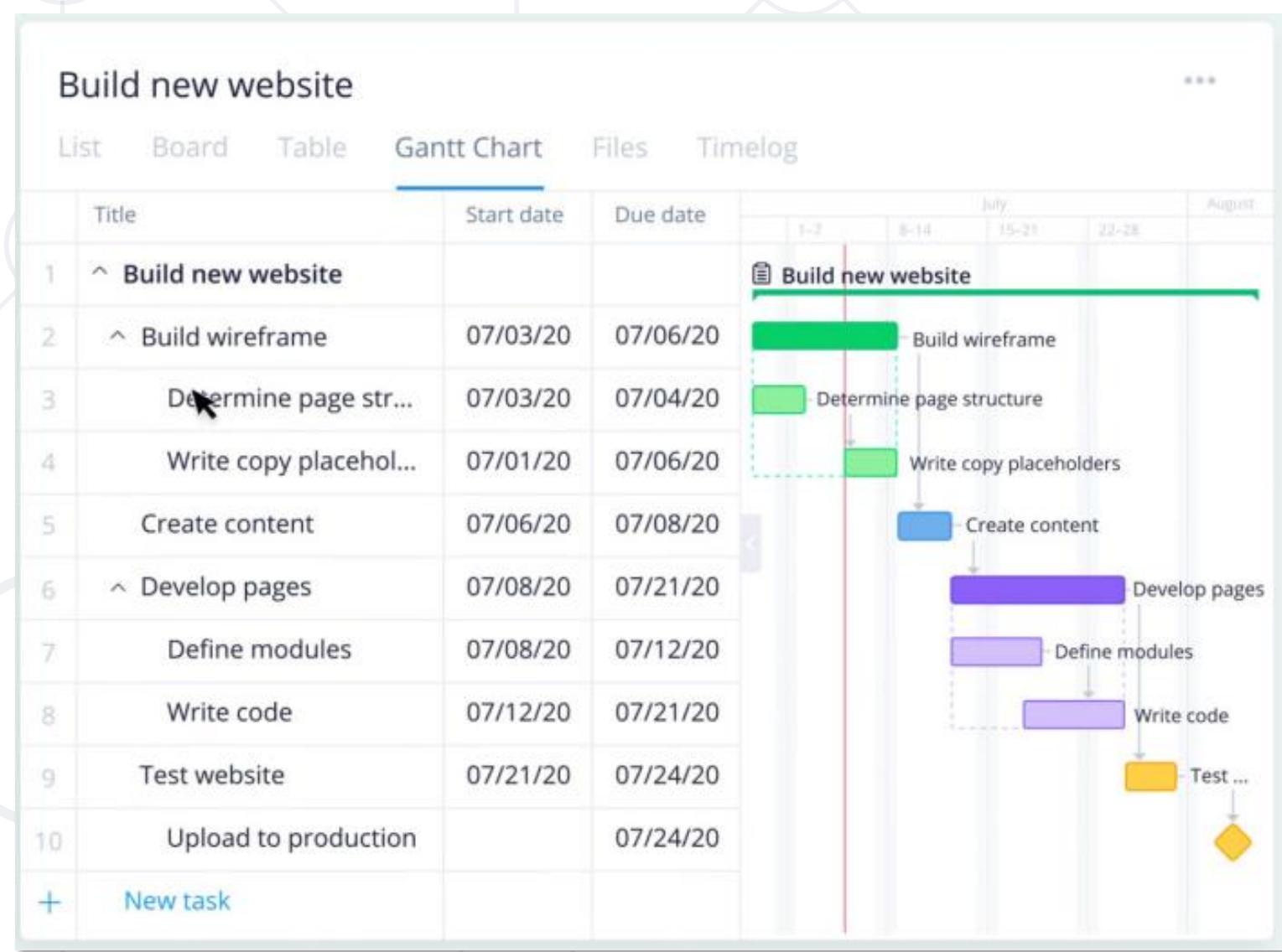
- **Software project management**
  - Management discipline about **planning**, **monitoring** and **controlling** software projects
- **Project planning**
  - Identify the scope, estimate the work, identify tasks and milestones, and create a schedule
- **Project monitoring and control**
  - Monitor the project progress, manage risks, discuss and address issues, problems and delays



# What is a Project Plan?

- The **project plan** == a document describing how project work will be organized
  - A chart / diagram / spreadsheet
  - Contains **tasks, resources, schedule, milestones**, progress indicators, etc.
  - Tasks may have **start, end, assigned resources** (team members), **% complete, dependencies, nested tasks, cost**, etc.
- **Project management tools** (like MS Project, Zoho Projects, Monday.com) simplify **creating** and **monitoring** project plans

# Project Plan – Example (1)



# Project Plan – Example (2)

Jira Your work Projects ▾ Filters ▾ Dashboards ▾ People Plans ▾ Apps Create Search Give feedback Auto-schedule Share Review changes 2

Travel Booking Division

Roadmap Teams Releases

Hierarchy: Epic to Story Filters 3m 1y Fit Custom View settings

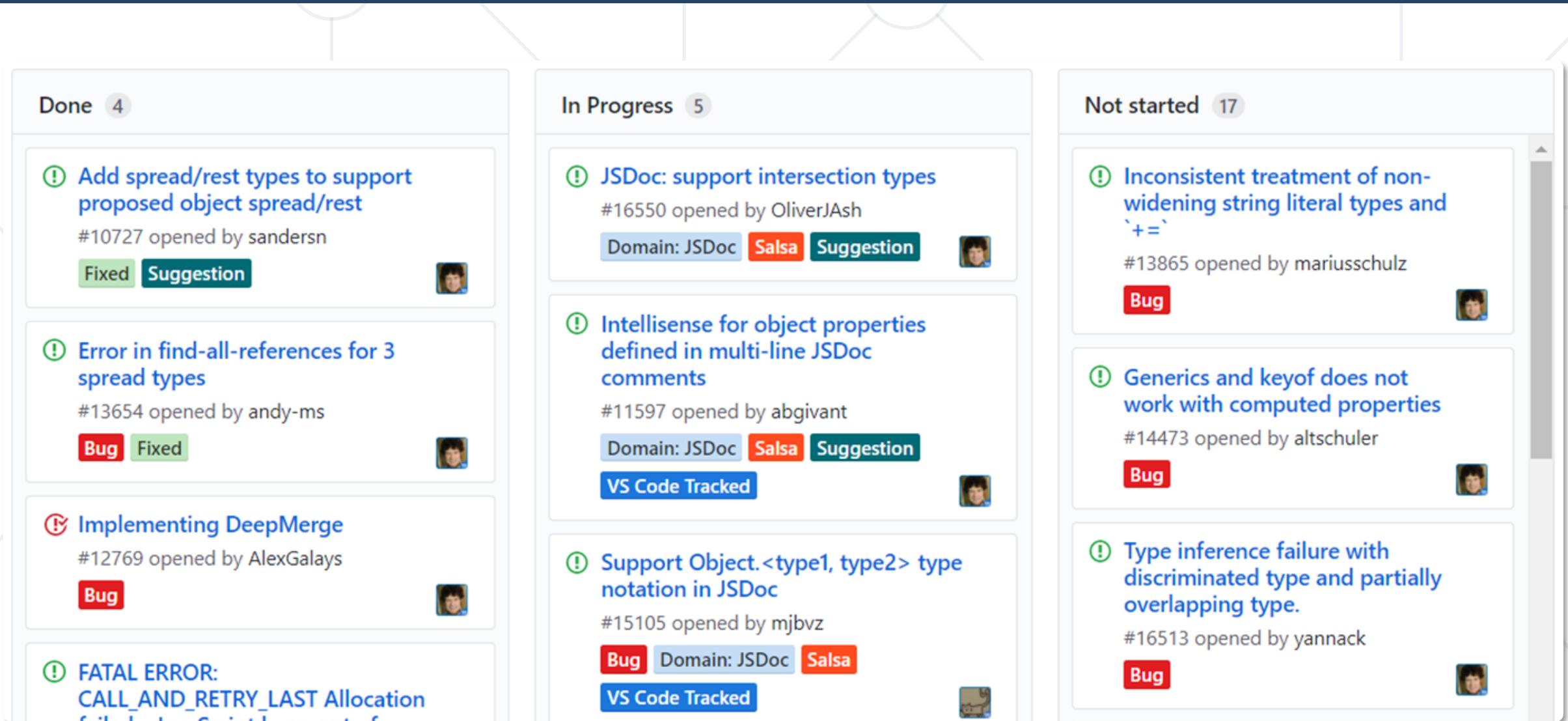
SCOPE	FIELDS	Mar 2	Mar 9	Mar 16	Mar 23	Mar 30	Apr 6	Apr 13	Apr 20	Apr 27	May
# Issue	Status Start date Due date										
Android Team	+ Create issue										
1 ADR-104 App basics - Android	IN PROGRESS 25/Feb/20 23/Mar/20	Sprint 9	Sprint 10	Sprint 11	Sprint 12	Sprint 13					
ADR-401 As a user I can log...	IN PROGRESS s 10/Mar/20 s 23/Mar/20										
ADR-402 As a user I access...	IN PROGRESS s 10/Mar/20 s 23/Mar/20										
ADR-403 Implement booking...	DONE s 10/Mar/20 s 23/Mar/20										
2 ADR-105 Invite and share	TO DO 25/Mar/20 20/Apr/20										
ADR-107 Adapt apps to new pa...	TO DO 20/Apr/20 16/May/20										
ADR-424 Adapt Android app...	TO DO 20/Apr/20 04/May/20										
iOS Team		Shark	Koala	Crocodile	Dingo	Emu	Wombat				
1 IOS-543 Social media integration	IN PROGRESS 25/Feb/20 23/Mar/20										

# Agile Project Management and Task Boards

- **Classical project management:** create a plan and execute it
- **Agile project management:** less planning and more flexibility
  - Changes are welcome
- **Task boards** visualize, and organize the project tasks / people / progress
  - Typical columns:  
TODO, Doing, Done
- Examples: [Trello](#), [Asana](#), [GitHub Projects](#), [Azure Boards](#)



# Task Board – Example



The task board displays three columns of issues:

- Done** (4 items):
  - ! Add spread/rest types to support proposed object spread/rest  
#10727 opened by sandersn  
**Fixed** **Suggestion**
  - ! Error in find-all-references for 3 spread types  
#13654 opened by andy-ms  
**Bug** **Fixed**
  - ! Implementing DeepMerge  
#12769 opened by AlexGalays  
**Bug**
  - ! FATAL ERROR:  
CALL\_AND\_RETRY\_LAST Allocation  
#11111 opened by yannack
- In Progress** (5 items):
  - ! JSDoc: support intersection types  
#16550 opened by OliverJAsh  
**Domain: JSDoc** **Salsa** **Suggestion**
  - ! Intellisense for object properties defined in multi-line JSDoc comments  
#11597 opened by abgivant  
**Domain: JSDoc** **Salsa** **Suggestion**  
**VS Code Tracked**
  - ! Support Object.<type1, type2> type notation in JSDoc  
#15105 opened by mjbvz  
**Bug** **Domain: JSDoc** **Salsa**  
**VS Code Tracked**
- Not started** (17 items):
  - ! Inconsistent treatment of non-widening string literal types and `+=`  
#13865 opened by mariusschulz  
**Bug**
  - ! Generics and keyof does not work with computed properties  
#14473 opened by altschuler  
**Bug**
  - ! Type inference failure with discriminated type and partially overlapping type.  
#16513 opened by yannack  
**Bug**



# Project Taskboard

Live Demo

<https://github.com/microsoft/TypeScript/projects/13>



# Development Methodologies

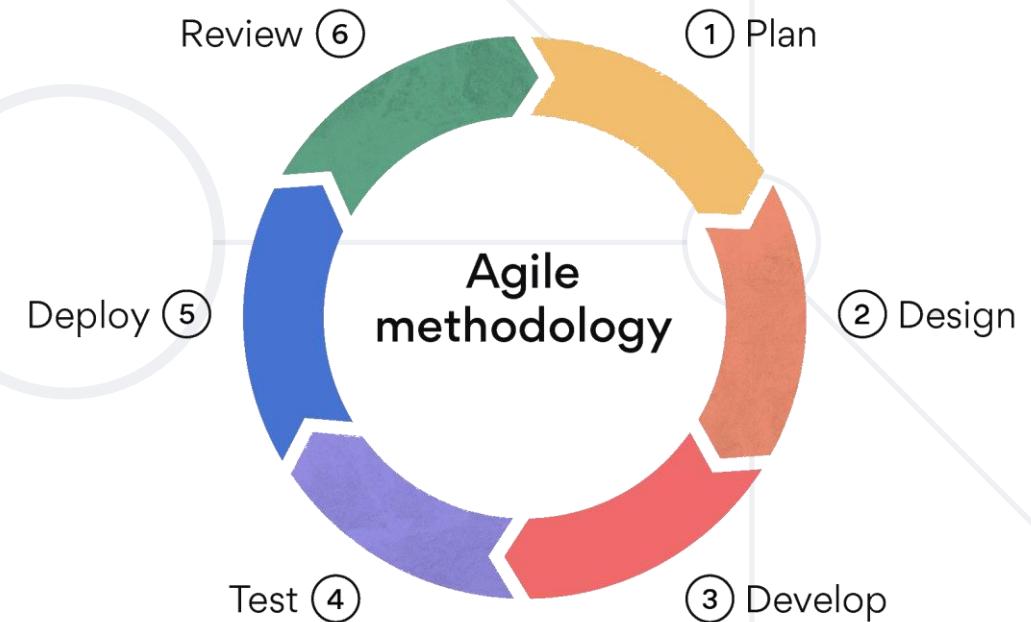
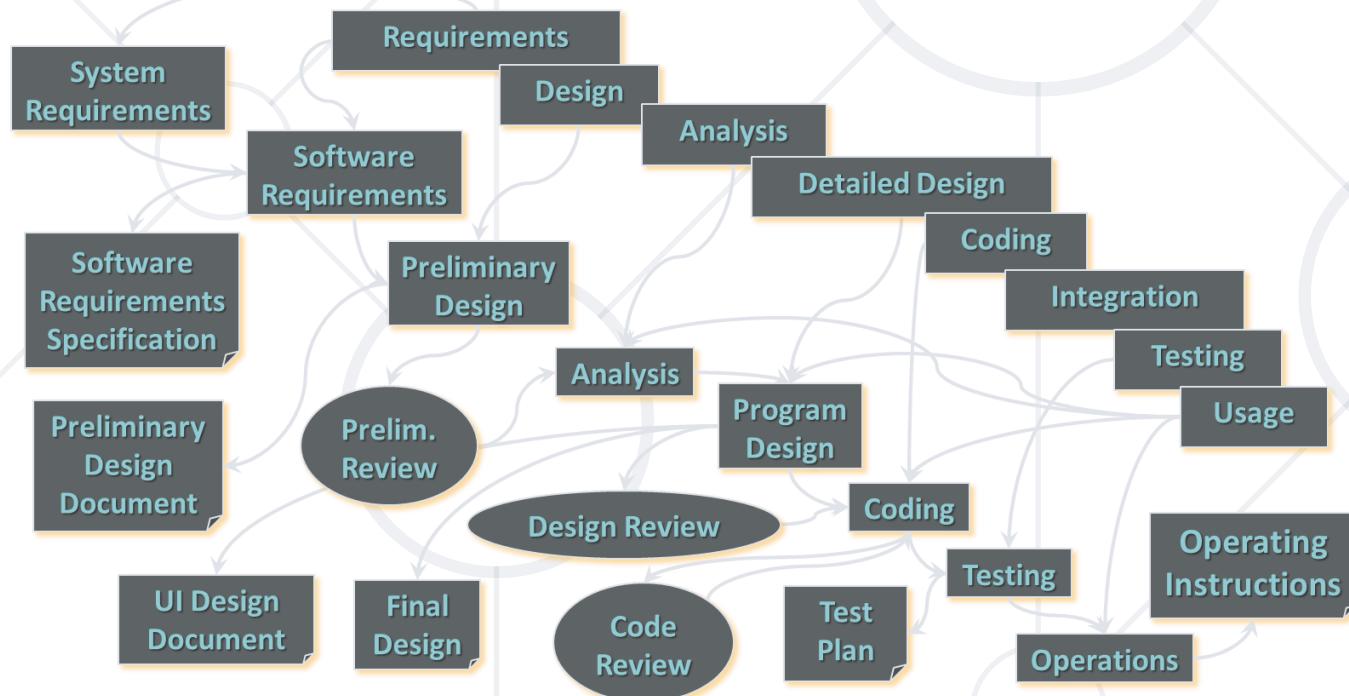
Waterfall, Scrum, Kanban, Extreme Programming

# What is a Development Methodology?

- **Software development methodology** == a set of **practices** and **procedures** for organizing the **development process**
  - A systematical, **engineering approach** for organizing and managing software projects
  - A set of **principles**, **conventions**, **processes** and **procedures** the organization decides to follow
  - A set of **rules** that developers must follow
  - **Principles** and **processes** to define how to order tasks, perform monitoring, and control

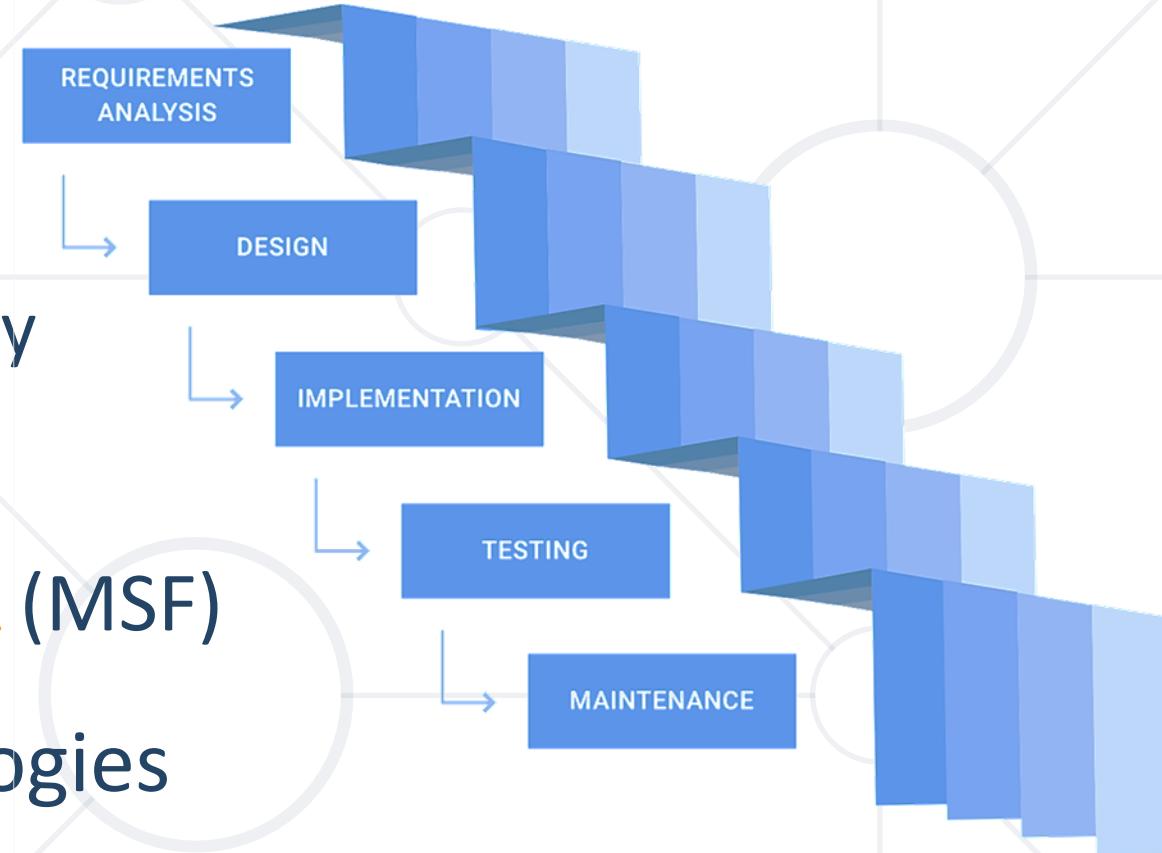
# Heavyweight and Agile Methodologies

- Heavy methodologies rely on formal procedures and documents
  - Lots of documents, diagrams, formal approvals, etc.
- Agile methodologies rely on small iterations and less formalities



# Development Methodologies

- Back in history
  - The "**Waterfall**" process
    - Old-fashioned, rarely used today
  - **Rational Unified Process (RUP)**
  - **Microsoft Solutions Framework (MSF)**
- Modern development methodologies
  - **Agile** development processes
  - **Scrum, Kanban, Lean Development, Scrumban, Hybrid, ...**





# Agile Development

Lightweight, Incremental, Responding to Change

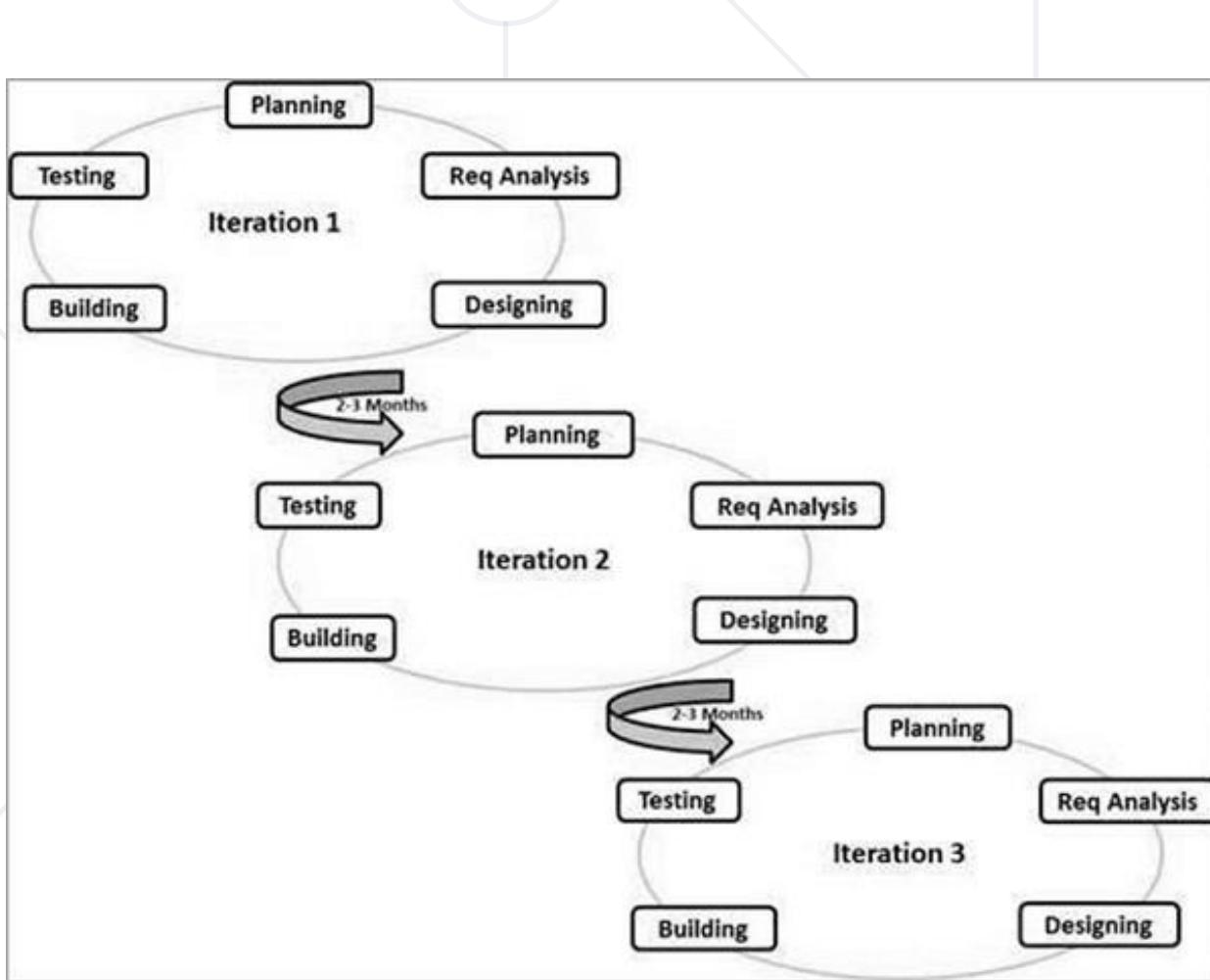
# The Agile Manifesto and Agile Spirit

- The **agile manifesto** (Kent Beck, Martin Fowler, Robert Martin, ...)

"Our highest priority is to satisfy the customer through early and continuous delivery of valuable software"

- The **agile spirit**
  - **Incremental**: working software frequently over heavy documentation
  - **Cooperation**: customer collaboration over contract negotiation
  - **Straightforward**: individuals + interactions over processes + tools
  - **Adaptive**: responding to change over following a plan

# Iterative and Incremental Development



- Agile development relies on **increments** (steps)
  - Small portions of software, developed in iterations
- Each **iteration** goes through own dev lifecycle
  - Requirements → design → code → test → deploy

# Agile Methodologies

- **Scrum**: sprint based, biggest market share
- **Kanban**: task board based
- **Scrumban**: Scrum + Kanban
- **Lean Software Development**
- **XP** (eXtreme Programming)
- **Hybrid** (multiple methods)



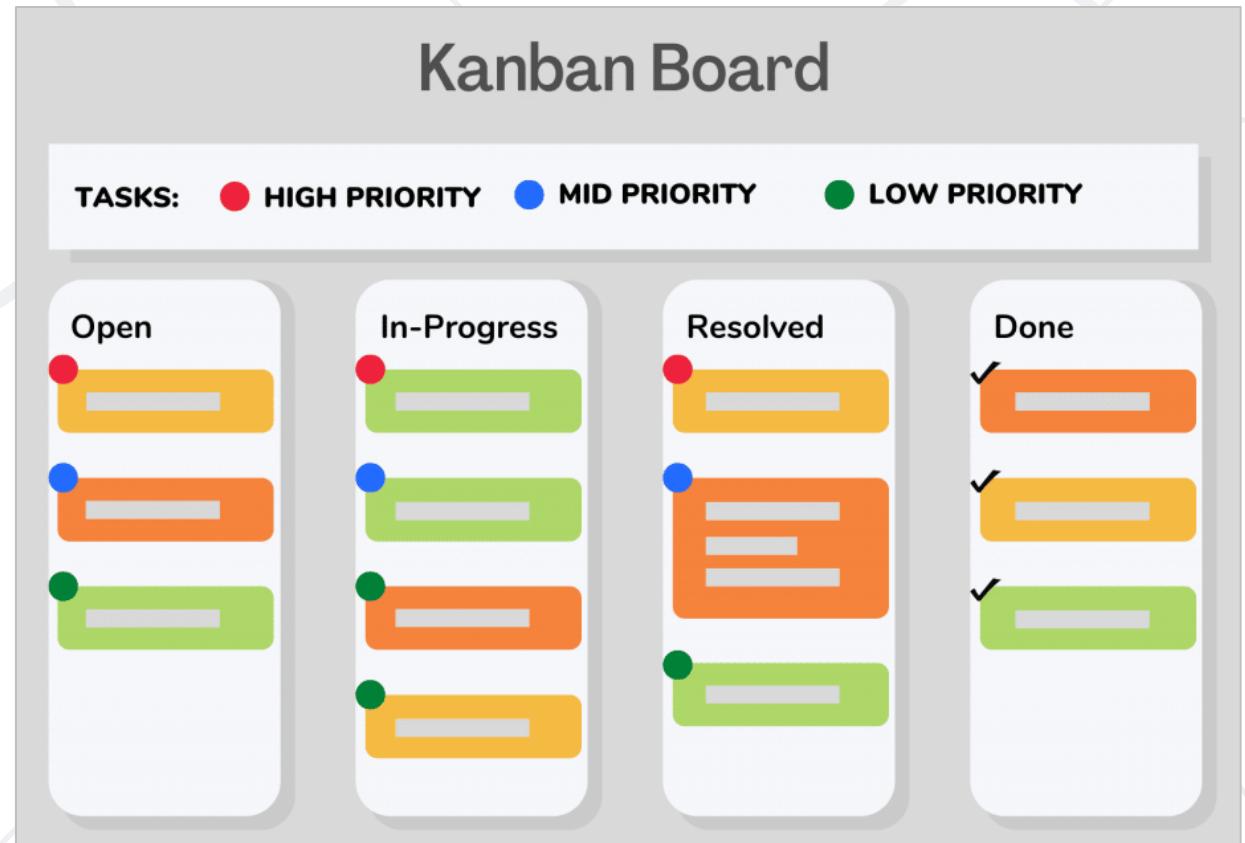


# Kanban

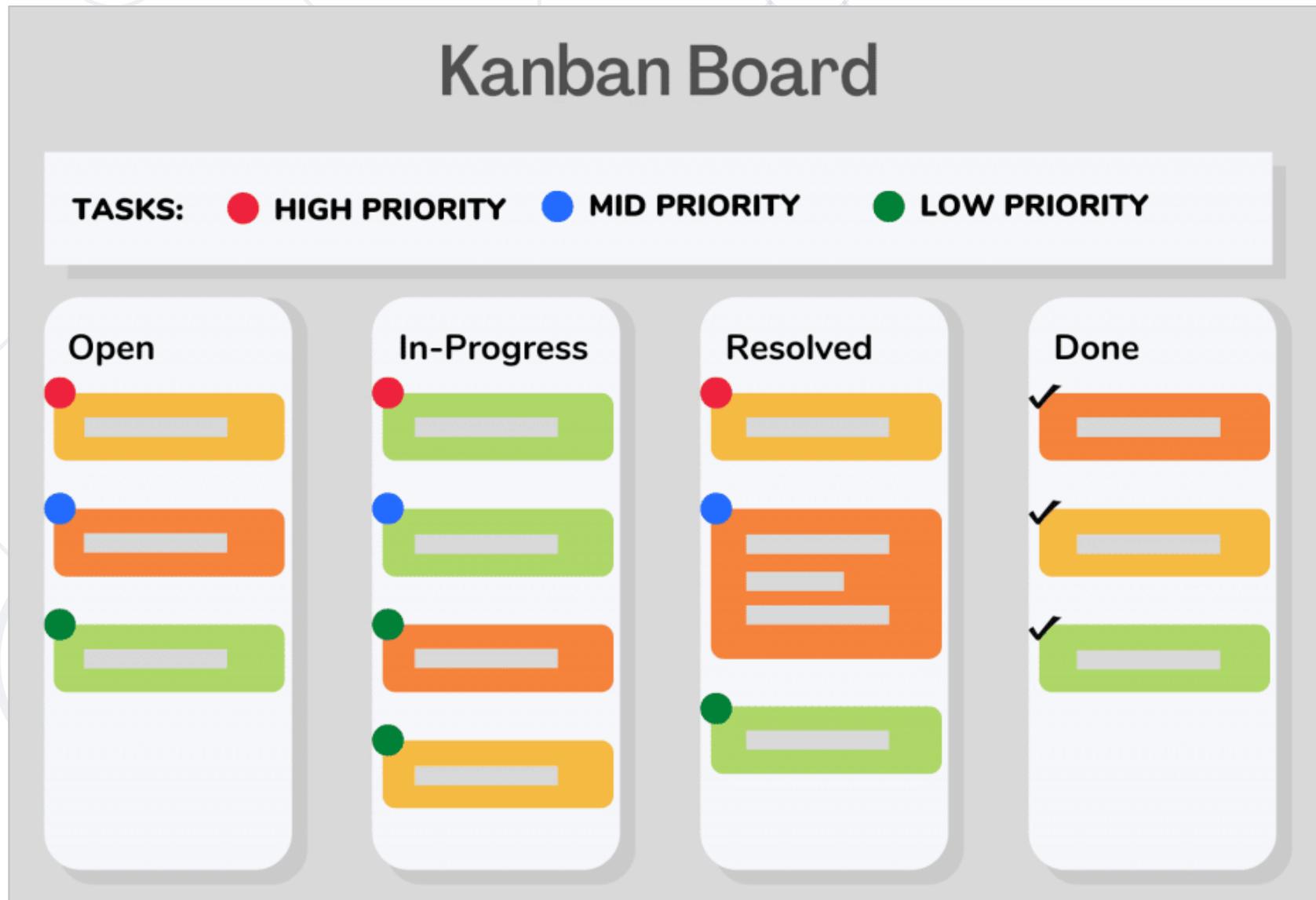
Kanban, Principles, Tasks, Flow, Kanban Boards

# Kanban

- **Kanban** == popular agile project management framework
- **Visualization**
  - Shared Kanban board
- **Flow of tasks**
  - Open → In-Progress → Done
- **Limiting work in progress**
  - Minimize multi-tasking
- **Continuous improvement**
  - Monitor, analyze, improve

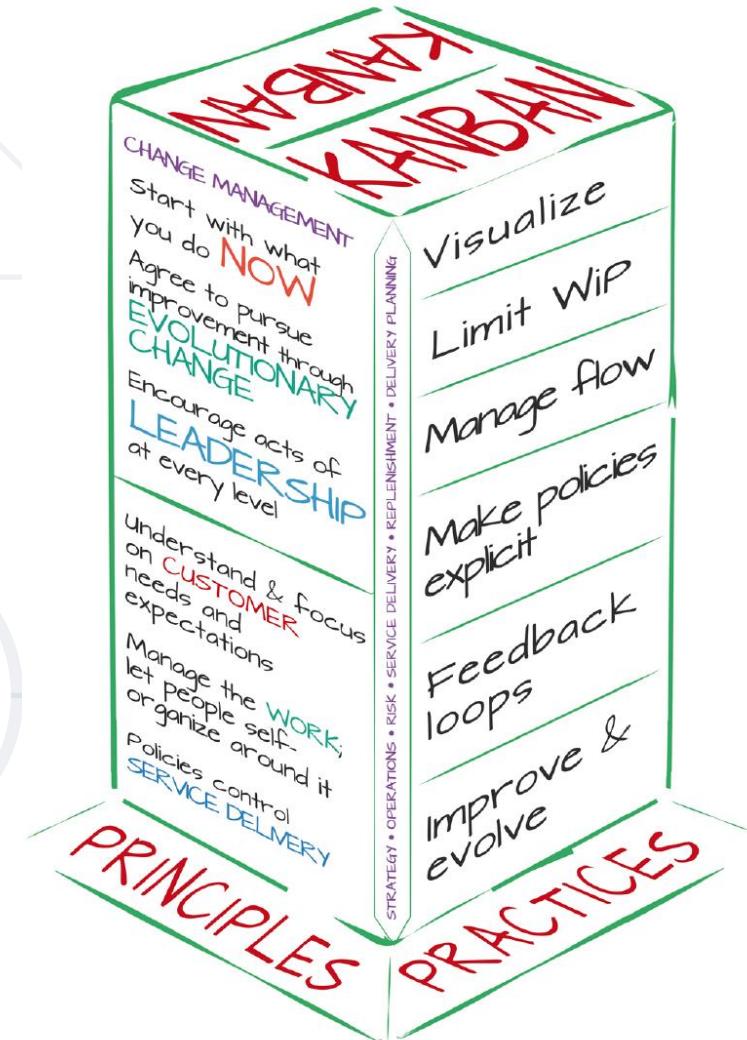


# Kanban Board: Structure

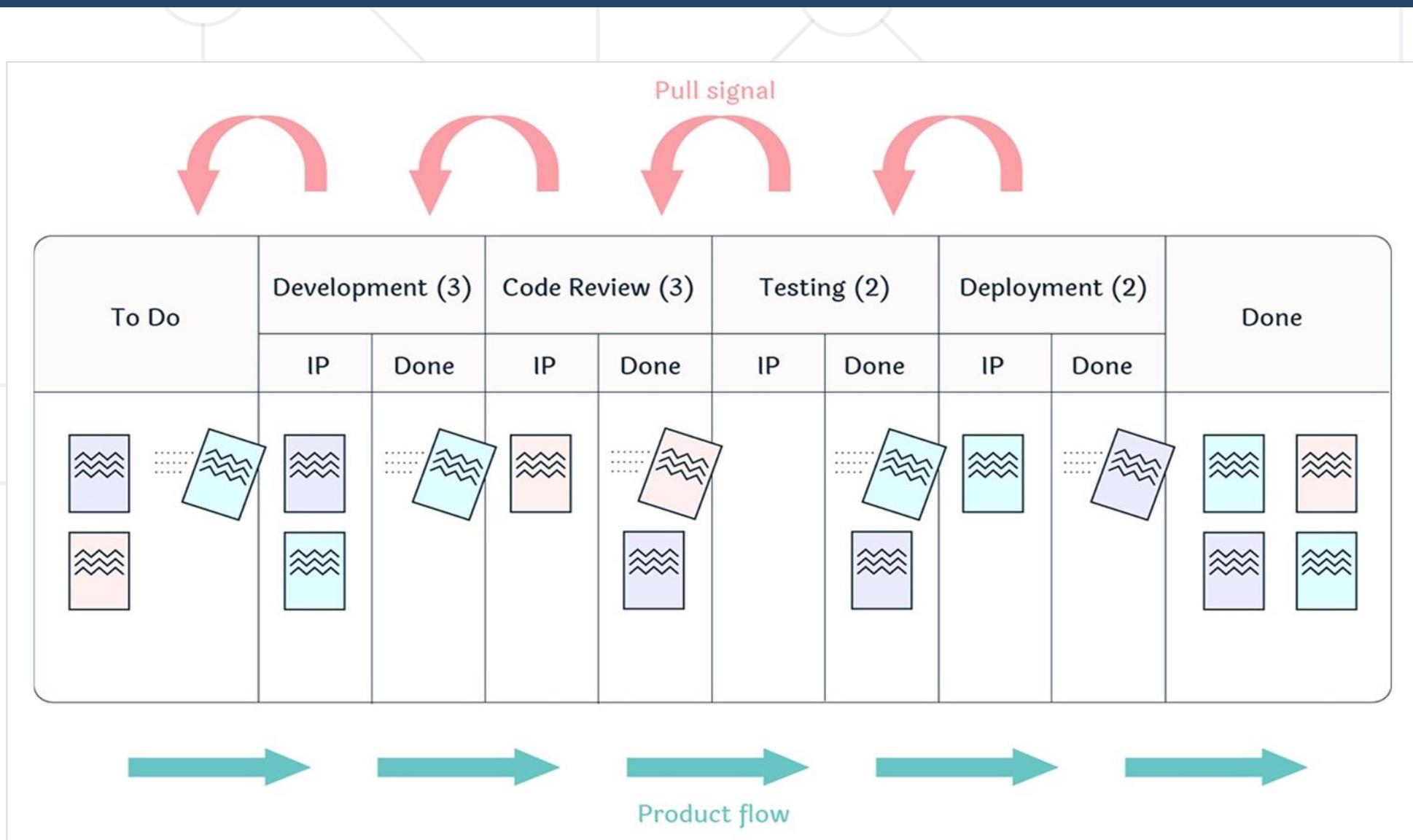


# Kanban Principles

- Start with **what you do now**
  - Respect the **current process**, roles, responsibilities, job titles
- **Visualize the workflow:** use Kanban board
- **Manage workflow:** fast smooth flow
  - **Limit the work-in-progress (WIP) items**
- **Incremental, evolutionary change**

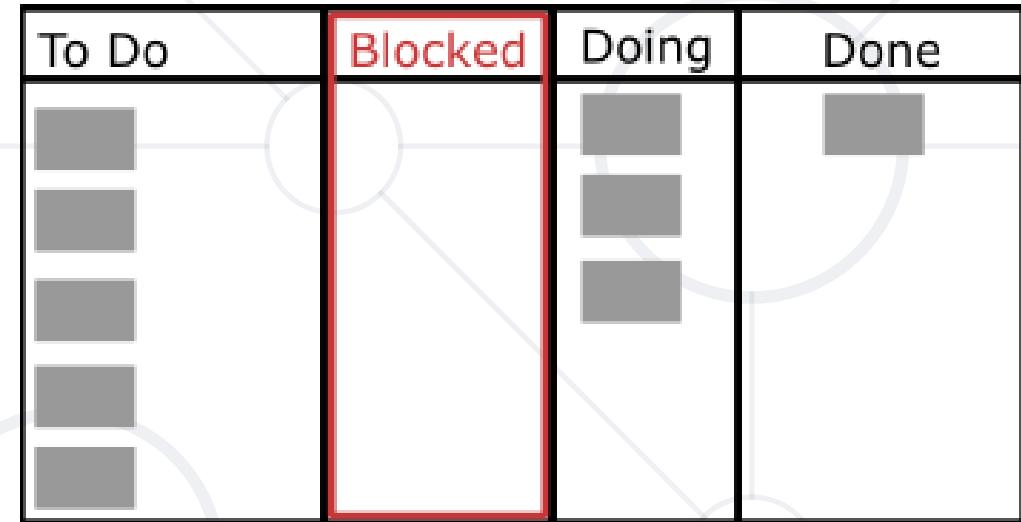


# Kanban in Software Development



# Kanban Methodology

- Most **Kanban boards** include the following **stages**
  - **Waiting** – typically **includes** the **backlog** of tasks that are waiting to be **opened up**
  - **In-progress** – **holds all the tasks** that are **currently being worked on**
  - **Completed** – holds **done** tasks
  - **Blocked** – when a task **can't be completed** or its progress is **halted, until it can be picked up again**



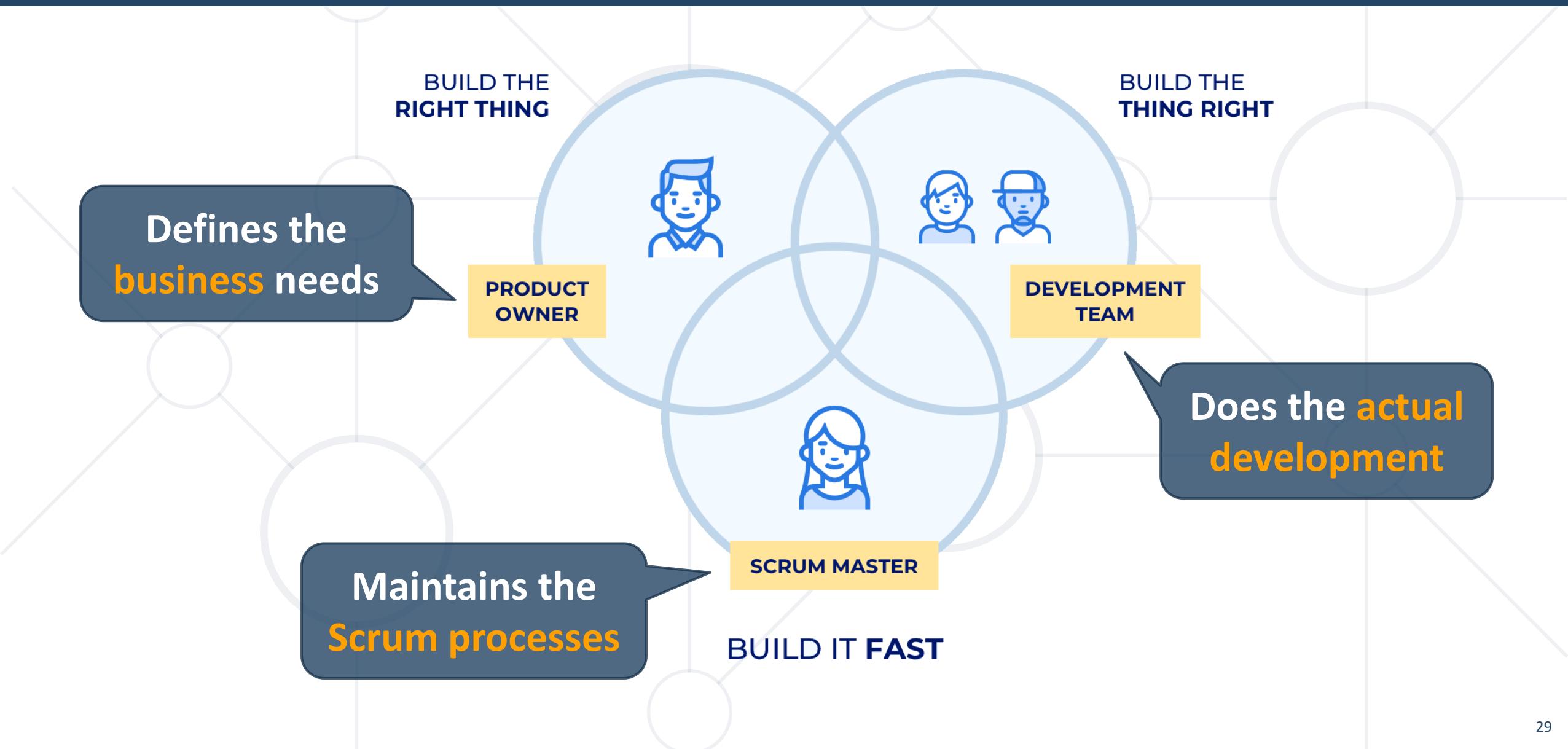


# Scrum

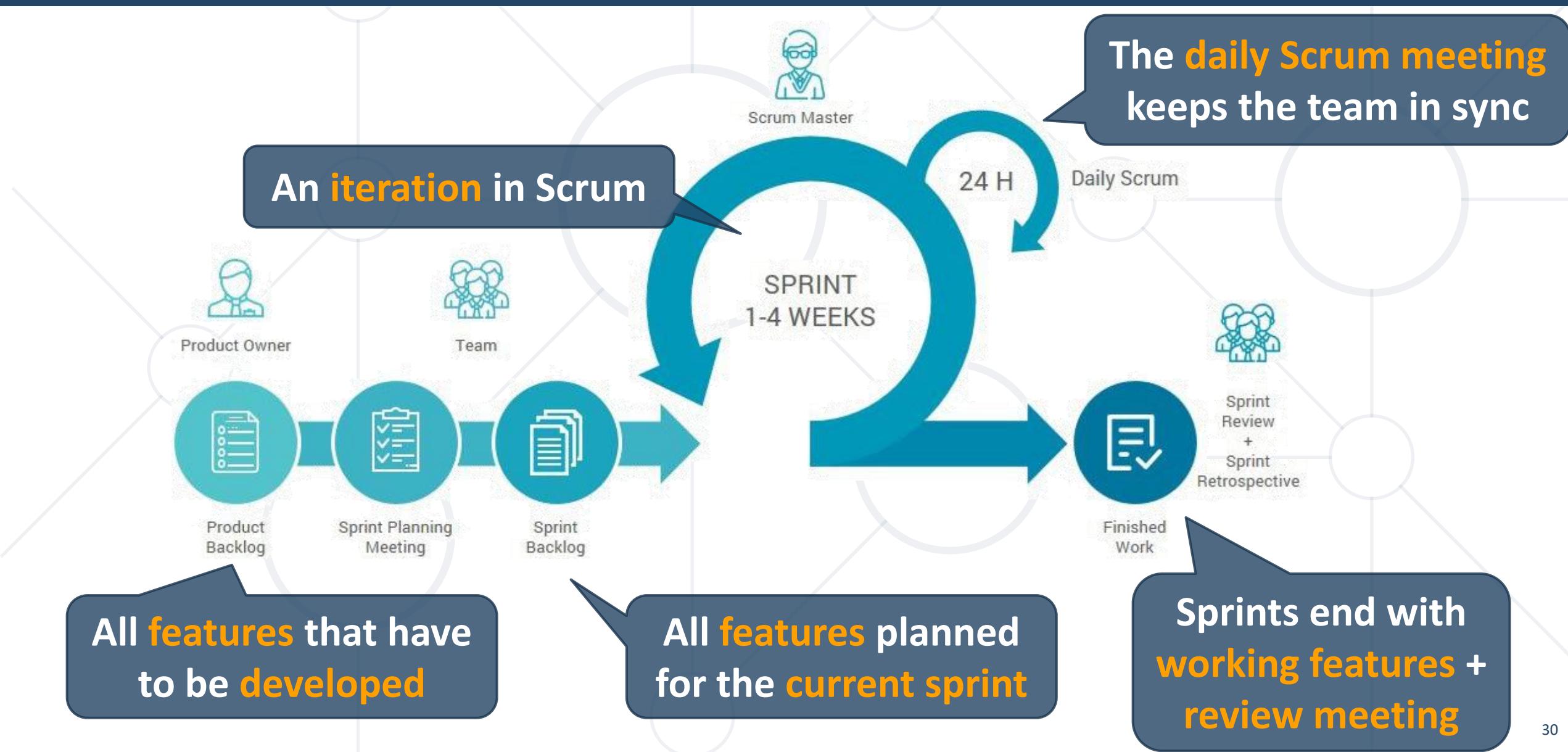
Backlog, Sprints, Daily Scrum, Scrum Roles

- **Scrum** == an iterative and incremental **agile software development methodology** for product development
  - Highly popular in the software industry (50%+ market share)
  - Product features (user stories) stay in the product "**backlog**"
  - Software is developed in iterations, called "**sprints**"
    - At each sprint, a **set of user stories** are implemented
    - A sprint lasts ≈ **1-4 weeks**
    - At the end, the team delivers fully **working features**

# Scrum Roles

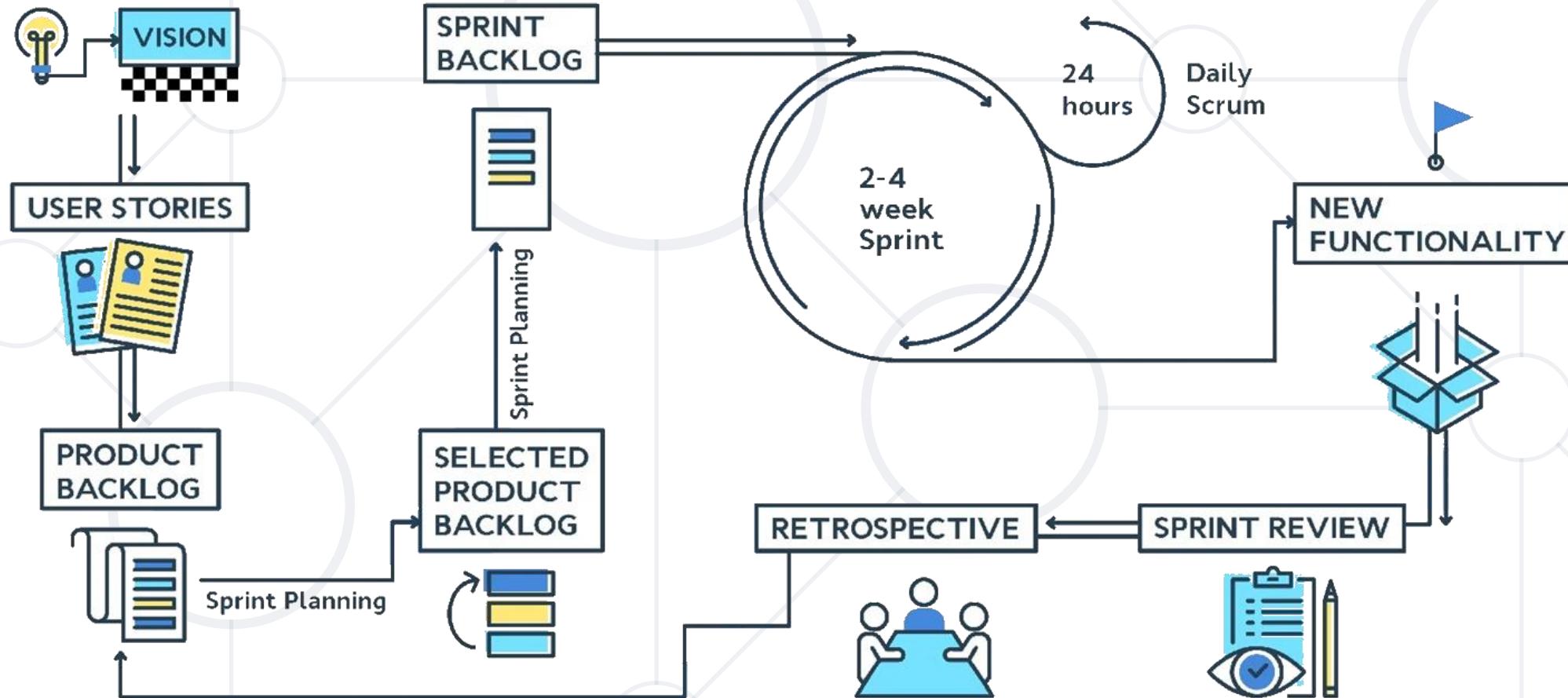


# Scrum Terminology



# The Scrum Process Framework

## SCRUM PROCESS



# Scrum Practices

- **Sprint Planning Meeting**
  - At the beginning of the sprint cycle
  - Establish the Sprint backlog
- **Daily Scrum stand-up meeting**
  - Each day during the sprint
  - Project status from each team member
  - Timeboxed to 15 minutes
- **Sprint Review Meeting**
  - Review the work completed / not completed





# Scrumban

Hybrid between Scrum and Kanban

- **Scrumban** == a hybrid between **Scrum** and **Kanban**
  - Combines the **structure of Scrum** with the **continuous flow** of work, **flexibility** and **visualization of Kanban**
  - Work performed in **short iterations**
  - **Limited** number of **work-in-progress** items
  - Monitored and tracked with **Kanban boards**
  - **No sprints** → work can be introduced and prioritized at any time
  - **No team roles** → more flexibility

# Differences Between Kanban and Scrum

		Kanban	Scrum
Roles	Roles are <b>fluid</b> . Project manager optional.	Roles are <b>predefined</b> . Scrum master required.	
Tasks	Tasks are <b>shared</b> by everyone.	Tasks have <b>assigned</b> owners.	
Timeline	Timelines <b>evolve</b> on an as needed basis (more flexible).	Timelines are <b>timeboxed</b> into sprints.	
Changes	Changes in work items and their priorities can be made <b>at any time</b> .	Changes can only be made <b>between sprints</b> (upon completion of a sprint).	
Productivity	Productivity is measured by the <b>cycle time</b> of the complete project.	Productivity is measured by the <b>story points</b> completed in each sprint.	



# Project Tracking Tools

Task Management Tools/ Issue Tracker Systems

- GitHub Projects == a free Kanban board in GitHub
  - Microsoft example



VSCode Git/SCM		
	General	Github
-status:" Done" 17 X		
Title	...	Assignees
23 Git: Prevent running git operations during sync #60630	...	joaomoreno and lszomoru
24 Git: Sync Changes Button Should Not Pull When There Are No Incoming Changes #163934	...	lszomoru
25 SCM title menu Create Pull Request action is unavailable when in a Remote window #3911	...	alexro0 and lszomoru
26 Git error (Cannot fast-forward to multiple branches.) when syncing during autofetch #158309	...	lszomoru
29 [Bug] editor could not be opened if a file have conflict with added by us #153639	...	lszomoru
31 VS Code does not respect the diff flag in .gitattributes #154815	...	lszomoru
33 After VSCode is updated, git@github.com: Permission denied (publickey). #149622	...	lszomoru

# Trello

- Trello == the **visual tool** that empowers your team to **manage** any **type** of **project**, **workflow**, or **task tracking**
- Trello's look and feel are based on the **principles** of a **Kanban board**
- **Visual tool** made up of **cards** and **columns** to **track progress**
- Think of **Trello** as a **digital**, **living whiteboard** in **motion**



# Trello – A Simple Kanban Board

**Enhanced Analytics** |  Colleagues BC |  Team Visible |  DG  HE  RC +7 |  Invite |  Calendar |  Butler |  Jira |  New Done List |  Slack |  Sort |  Show Menu |  Add another board |  Show Menu

**Q2&Q3 2020 Solutioning Project Phases**

**Implement**  
(Project Goals) Veterans Mental Health Innovation Project Accelerator - Solutioning

**EA 1**  
1: Plan Solutioning Approach  
 1  
 1

**EA 2**  
2. Engage VAC Innovation Fellows team in Design Contest learning and Doing  
 4

**EA 3**  
3: Plan Collaborathon for launch  


**30 Day Activities**

**EA 1**  
1.1: Draft Design Contest approach deck  
 0/3

**EA 2**  
2.1: Design learning program and learning engagement  
 3/4

**EA 2**  
2.2: Conduct VAC Fellows Design Contest learning and doing  
 2/3

**EA 3**  
3.1: Configure design contest  
 2  3/5

**EA 3**  
3.2: Plan and Begin engagement

**Current Sprint In Progress**

**EA 1**  
1.1.2 Drafted Design Contest RFS  
 1 

**EA 3**  
3.2.1 Draft Solutioning Campaign Deck (ppt)  
 1  HE  
 2 Done: 25%

**EA 3**  
3.1.3 Develop evaluation tool  
 1 

**EA 3**  
3.1.4 Finalize T&Cs  
 1 

**EA 3**  
3.1.5 Configure and test workflow

**Current Sprint Done**

**EA 2**  
2.1.4 Revised VAC Internal Video Clips  
 1  4 Done: 75%  

**EA 3**  
3.2.1 Draft Solutioning Campaign  
 1  HE  
 2 Done: 25%  HE

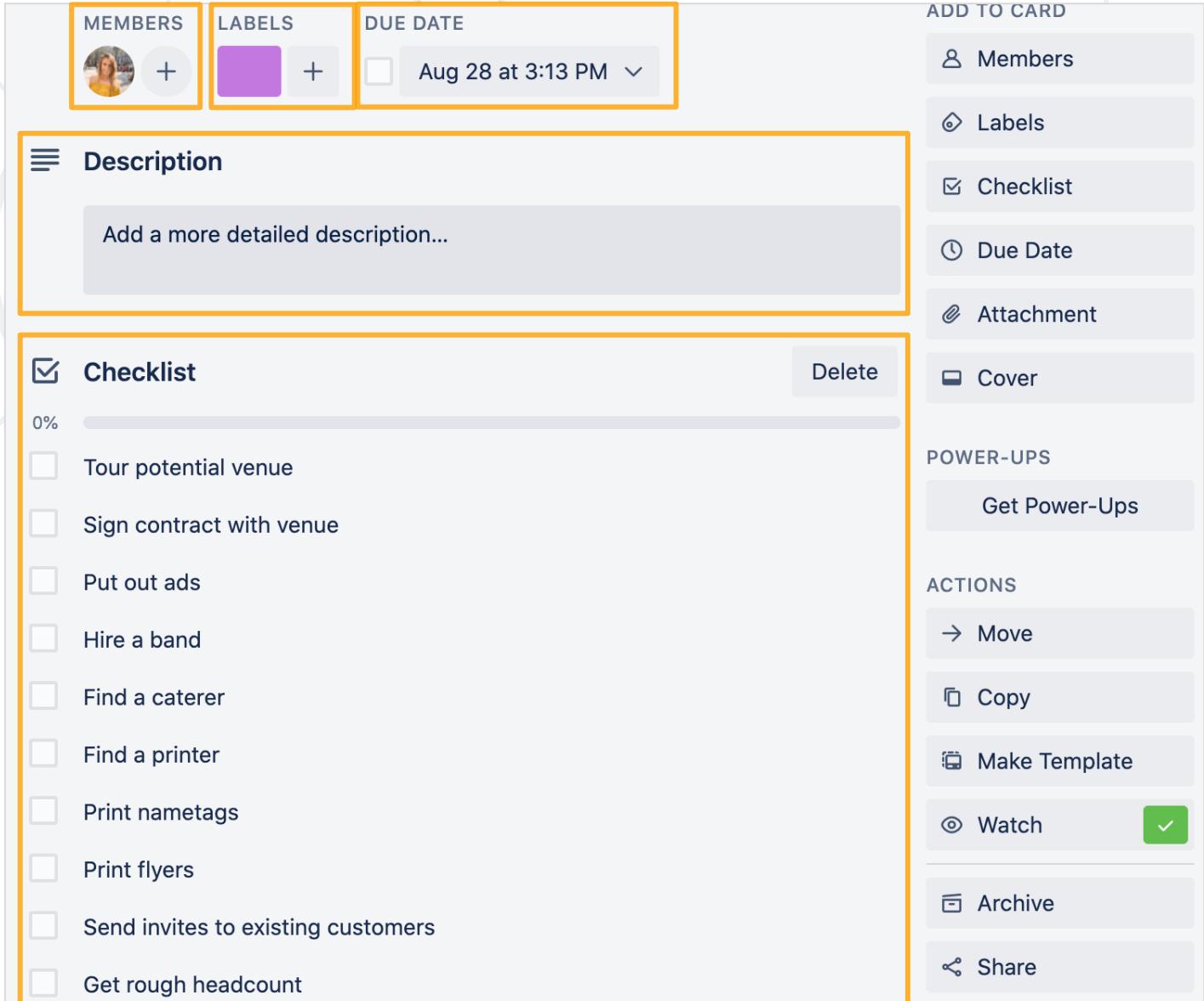
**EA 2**  
2.2.1: Complete solutioning summary documents  
 4 Done: 25%   

**EA 2**  
2.1.1 Design contest course outline  
 1  MN

**practices**

# Trello – Example (1)

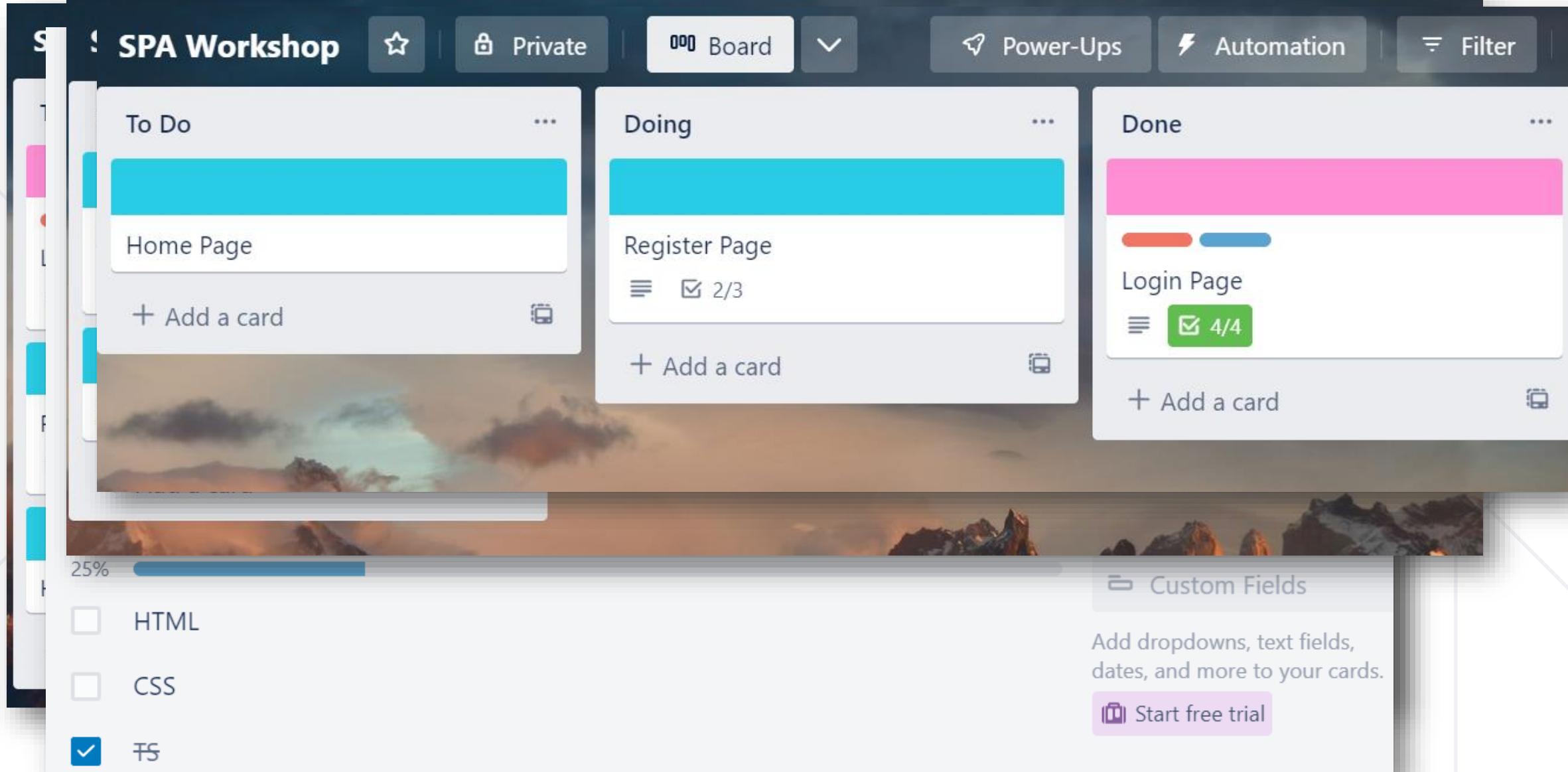
- A card may have
  - Title
  - Members
  - Labels
  - Due date
  - Description
  - Attachments
  - Tasks checklist
  - Activity
  - Comments



The screenshot shows a Trello card with the following details:

- Members:** A placeholder for a member profile picture with a plus sign.
- Labels:** A placeholder for a label color swatch with a plus sign.
- Due Date:** Set to "Aug 28 at 3:13 PM".
- Description:** Placeholder text "Add a more detailed description...".
- Checklist:** A checklist titled "Checklist" with a progress bar at 0% completion. It contains the following items:
  - Tour potential venue
  - Sign contract with venue
  - Put out ads
  - Hire a band
  - Find a caterer
  - Find a printer
  - Print nametags
  - Print flyers
  - Send invites to existing customers
  - Get rough headcount
- Add To Card:** A sidebar with options: Members (disabled), Labels (disabled), Checklist (selected), Due Date, Attachment, Cover.
- POWER-UPS:** Get Power-Ups.
- ACTIONS:** Move, Copy, Make Template, Watch (selected), Archive, Share.

# Trello – Example (2)



SPA Workshop

Private Board Power-Ups Automation Filter

To Do

Home Page

+ Add a card

Doing

Register Page

2/3

+ Add a card

Done

Login Page

4/4

+ Add a card

Custom Fields

Add dropdowns, text fields, dates, and more to your cards.

Start free trial

HTML

CSS

TS



# Trello Boards: Examples

<https://trello.com/b/1Jz6SorC/the-dev-board> , <https://trello.com/b/HPpU2eCV/company-web-site>,

<https://trello.com/b/33VWywtX/start-a-business> , <https://trello.com/b/cPC4jGzZ/project-manager-sample-board>

- A tool that allows agents to manage various cases and track their progress during the resolution process, beginning to end

- Tools

- Jira

- GitHub Issues



# Sample GitHub Issue

Missing comments after applying refactor/codefix #29972  
gabritto opened this issue on Feb 19, 2019 · 2 comments

 jsjoeio commented on Nov 21, 2019

May I take this?

 jsjoeio mentioned this issue on Dec 23, 2019

**Fix part 1 of issue 29972 jsjoeio/TypeScript#1**

 jsjoeio mentioned this issue on Dec 31, 2019

**fix(refactor): keep comments after refactor #35937**

 4 tasks

 minestarks assigned jessetrinity on Mar 28, 2020

 minestarks added this to Backlog in JS/TS team bugs on Sep 29, 2020

 minestarks moved this from Backlog to Committed in JS/TS team bugs on Sep 29, 2020

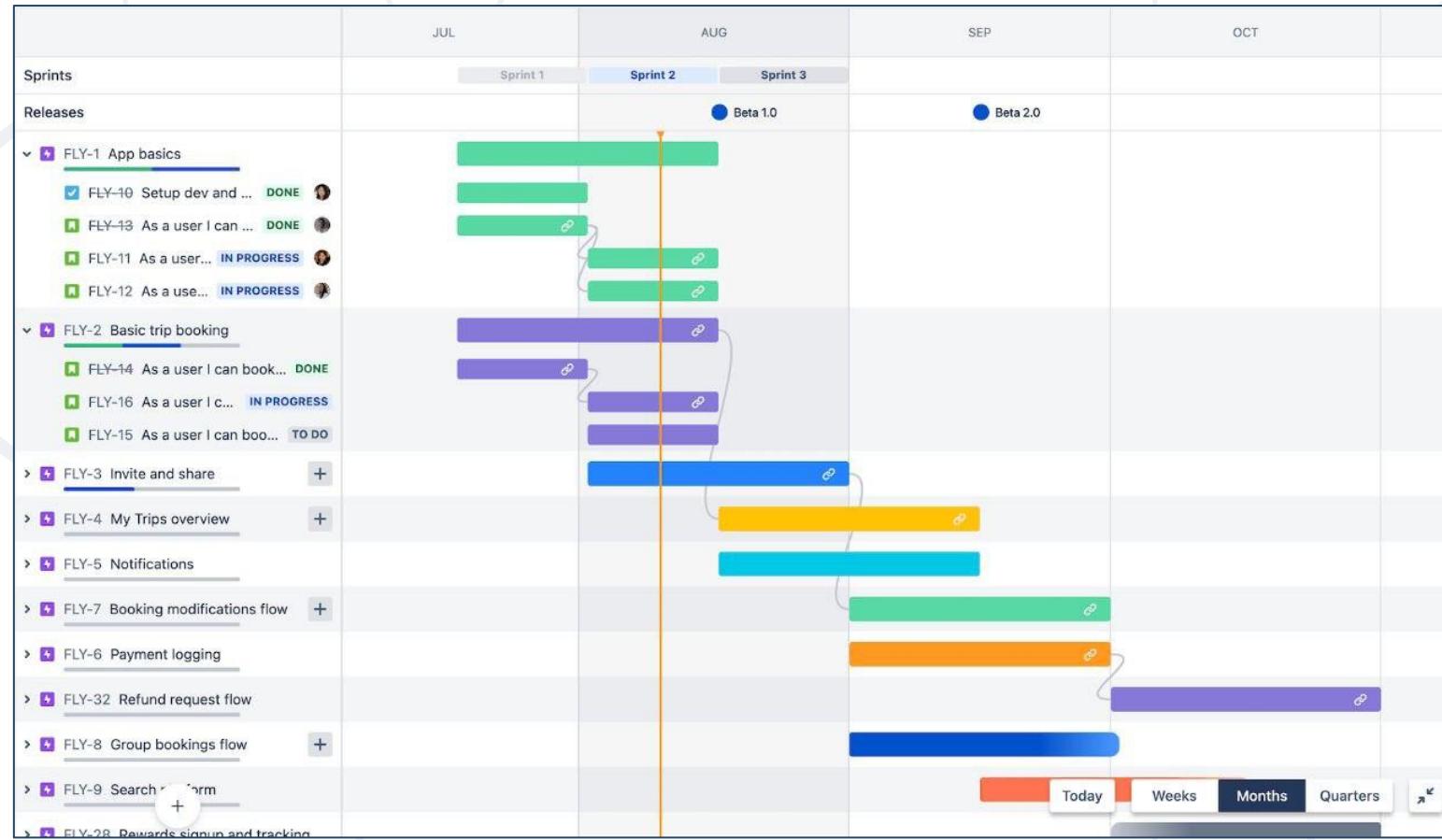
- Widely used **project management** and **issue-tracking tool**
- Primarily designed to **help teams plan, track, and manage their work efficiently**
- Provides a **robust set of features** and **capabilities**



Jira Software

# Key features of Jira

- Issue Tracking
- Project Management
- Customization and Extensibility
- Collaboration and Communication
- Integration Ecosystem
- Scalability and Deployment Options



# Main concepts in Jira

- **Project** == collection of issues and related information
- **Issue** == work item, task, or a unit of work that needs to be tracked, managed, and resolved
  - **Work item** == bugs, features, user stories, tasks, or any other form of work that requires attention and action
- **Workflow** == series of steps or statuses through which an issue progresses during its lifecycle
  - Typically, it consists of a set of statuses (e.g., Open, In Progress, Resolved, Closed) and transitions between them

# Sample Jira Issue



Jira Dashboards Projects Issues Boards Portfolio Power Apps Insight Assets Create Search ?

SCRUM / SCRUM-4  
Copy&Sync Demo

Edit Comment Assign More To Do Done Submitted Admin

Details

Type: Task Status: TO DO (View Workflow)  
Priority: Medium Resolution: Unresolved  
Affects Version/s: None Fix Version/s: 2.1.0  
Component/s: Demo  
Labels: SCRUM-Sprint-1  
Sprint: SCRUM Sprint 1

Description

Copy & Sync demo

Elements Checklist

Attachments

Drop files to attach, or browse.

Available Operations

a CLONE COPYST Test Nel Escalate issue to the operations team More Operations

Issue Links Display as graph

Wiki Page

People

Assignee: Unassigned Assign to me  
Reporter: Admin  
Votes: 0  
Watchers: Stop watching this issue

Dates

Created: 2019-08-22 01:44:53 PM  
Updated: 24 minutes ago

Agile

Future Sprint: SCRUM Sprint 1  
View on Board

+

# Summary

- Software **project management** == **organizing** and **managing** work
- Development **methodology** == **heavyweight** and **agile**
- **Agile** development == relies on **increments**, each iteration goes through its **own lifecycle**
- **Kanban** == popular **agile** project **management framework**
- **Scrum** == **agile** software **development methodology** for product development
- **Scrumban** == **hybrid** between **Scrum** and **Kanban**
- Use **task management tools** (Trello, GitHub Projects, Asana)
- Use **issue trackers** for bugs/tickets (GitHub Issues, JIRA)



# Questions?



SoftUni



Software  
University



SoftUni  
Creative



SoftUni  
Digital



SoftUni  
Foundation



SoftUni  
Kids



Finance  
Academy

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Bulgaria**

 **AMBITIONED**

**createX**

 **DXC  
TECHNOLOGY**

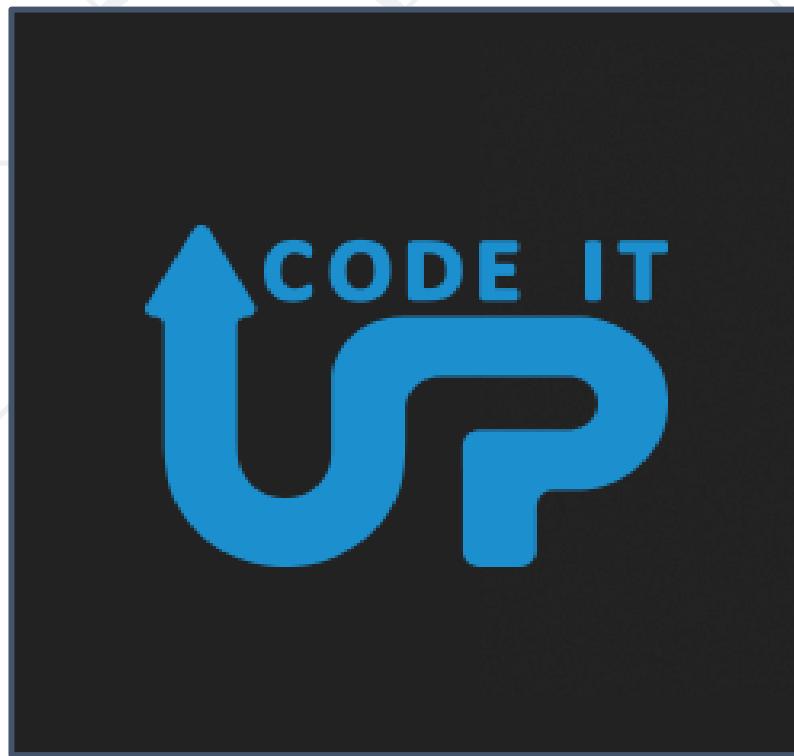
 **POKERSTARS**  
POKER | CASINO | SPORTS  
a Flutter International brand

 **DRAFT  
KINGS**

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Software  
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