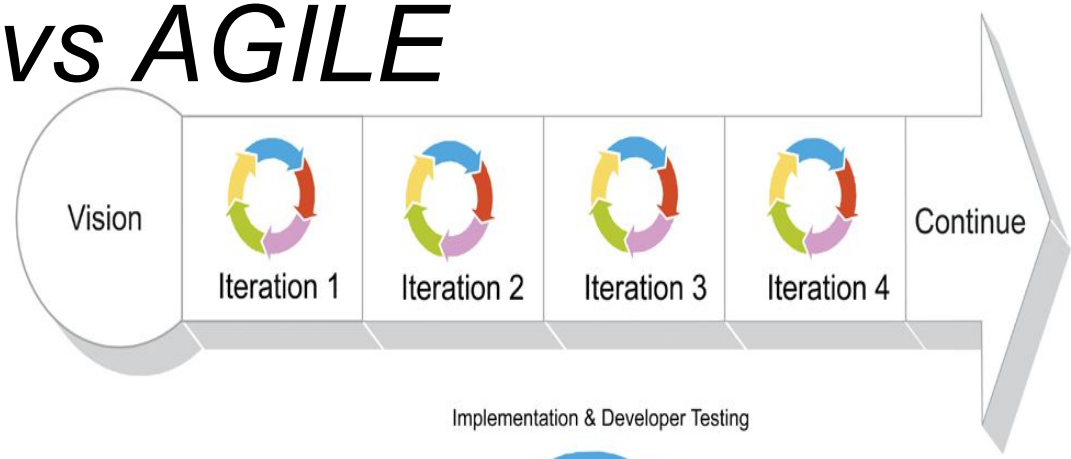
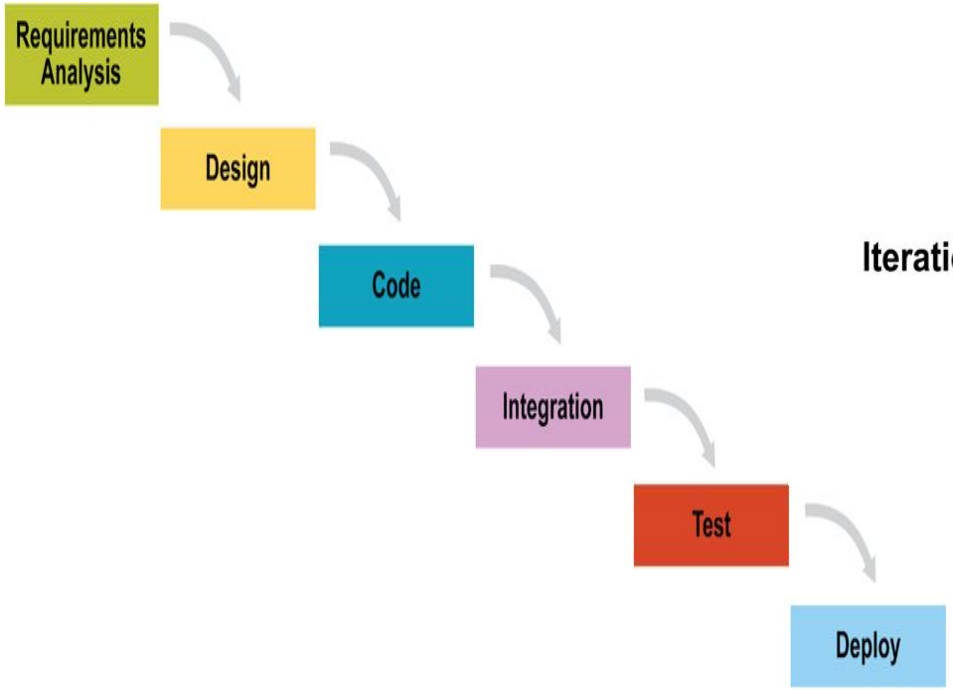
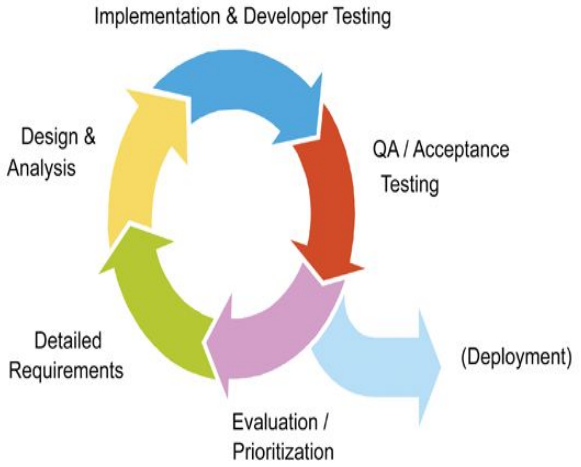
An Introduction to **Agile Methodology**

WATERFALL vs AGILE





Iteration Detail



Introduction

Classical methods of software development have many disadvantages:

- *huge effort during the planning phase*
- *poor requirements conversion in a rapid changing environment*
- *Heavy documentation*

- *New methods:*

  Agile Software Development Methodology

What is Agile ?

Customer involvement	The customer should be closely involved throughout the development process. Their role is provide and prioritise new system requirements and to evaluate the iterations of the system.
Incremental delivery	The software is developed in increments with the customer specifying the requirements to be included in each increment.
People not process	The skills of the development team should be recognised and exploited. The team should be left to develop their own ways of working without prescriptive processes.
Embrace change	Expect the system requirements to change and design the system so that it can accommodate these changes.
Maintain simplicity	Focus on simplicity in both the software being developed and in the development process used. Wherever possible, actively work to eliminate complexity from the system.

Contd…

- *Agile methods are considered*
  - *Lightweight*
  - *People-based rather than Plan-based*
- *Several agile methods*
- *No single definition*
- *Agile Manifesto closest to a definition*
  - *Set of principles*
  - *Developed by Agile Alliance*

Agile Manifesto

A Statement of Values

- *Individuals and interactions over processes and tools*
- *Working software over comprehensive documentation*
- *Customer collaboration over contract negotiation*
- *Responding to change over following a plan*
- *http://www.agilemanifesto.org*

Agile Methods

- ***Scrum: Widely used***
- *Extreme Programming (XP)*
- *Dynamic Systems Development Method (DSDM)*
- *Feature-Driven Development (FDD)*
- *Lean and Kanban Software Development*
- *Crystal*

History of Scrum

- ***1995:***
  - *analysis of common software development processes not suitable for empirical, unpredictable and non-repeatable processes*
  - *Design of a new method: Scrum by Jeff Sutherland & Ken Schwaber*
  - *Enhancement of Scrum by Mike Beedle & combination of Scrum with Extreme Programming*

- ***1996:***

  introduction of Scrum at OOPSLA conference

- ***2001:***

  publication "Agile Software Development with Scrum" by

  Ken Schwaber & Mike Beedle

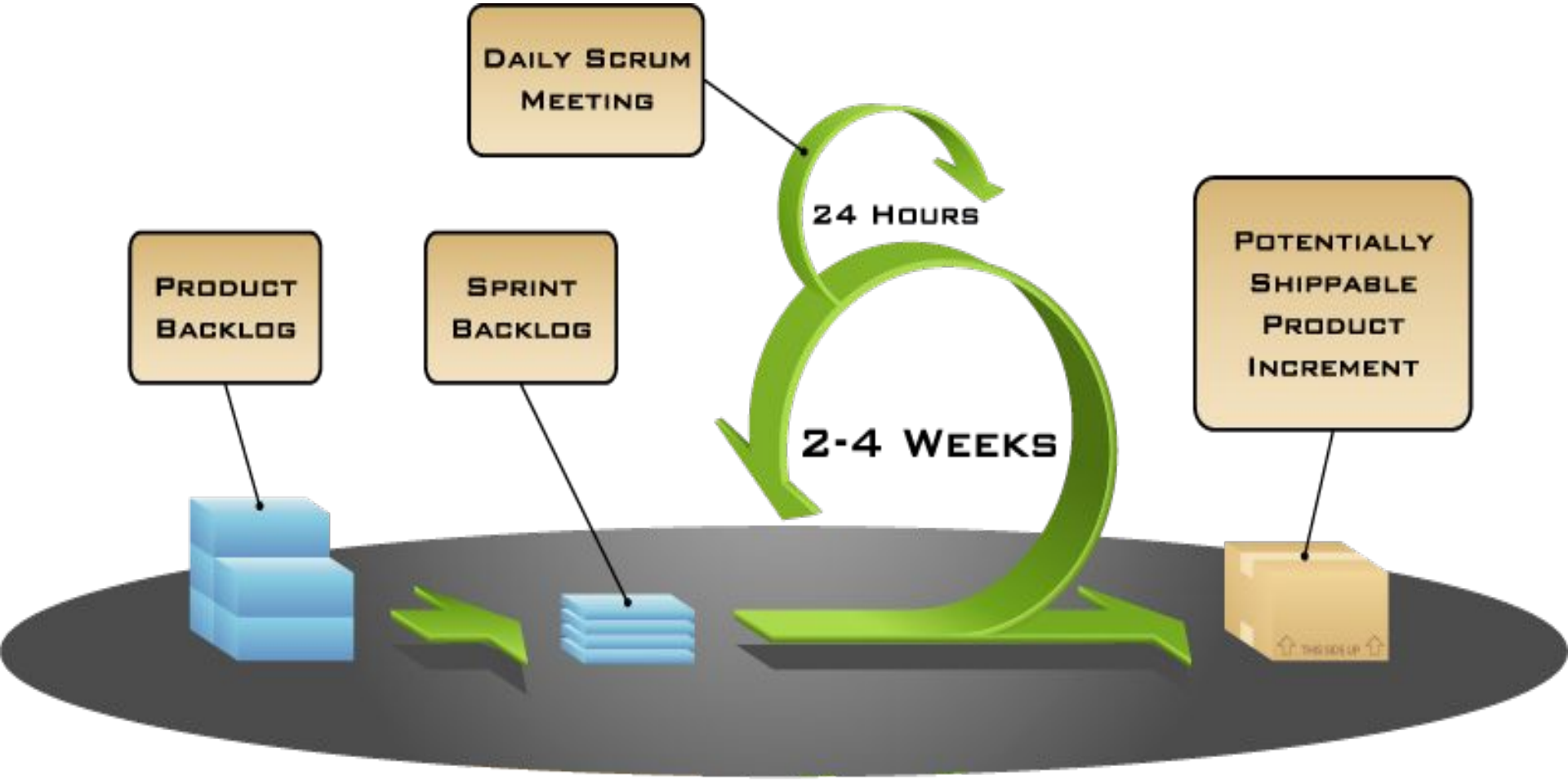
  Successful appliance of Scrum in over 50 companies

  Founders are members in the Agile Alliance

Characteristics

- *Self-organizing teams*
- *Product progresses in a series of month-long “sprints”*
- *Requirements are captured as items in a list of “product backlog.*
- *Uses generative rules to create an agile environment for delivering projects*
- *One of the “agile processes”*

How Scrum Works?



Things we do in Scrum

a.k.a Scrum terminologies

The project/ product is described as a list of features: the **backlog**.

The features are described in terms of **user stories**.

The scrum team **estimates** the **work** associated with each story.

Features in the backlog are **ranked** in order of importance.

Result: a **ranked** and **weighted** list of product features, a **roadmap**.

Daily scrum meeting to discuss **What did you do y'day**? **What will you do today**? **Any obstacles**?

Sprint

- Is an iteration
- Can have 1 day of sprint planning, 4 days of work and 1 day of sprint review
- Sprints are short duration milestones
- Sprints range from a couple of days to 30 days
- Need atleast 4 to a dozen sprints to get to the release

Sprints

- *Scrum projects make progress in a series of "sprints"*
  - *Analogous to XP iterations*
- *Target duration is one month*
  - *+/- a week or two*
    - *But, a constant duration leads to a better rhythm*
- *Product is designed, coded, and tested during the sprint*

Scrum Framework

- *Roles : Product Owner, ScrumMaster, Team*
- *Ceremonies : Sprint Planning, Sprint Review, Sprint Retrospective, & Daily Scrum Meeting*
- *Artifacts : Product Backlog, Sprint Backlog, and Burndown Chart*

Product Owner

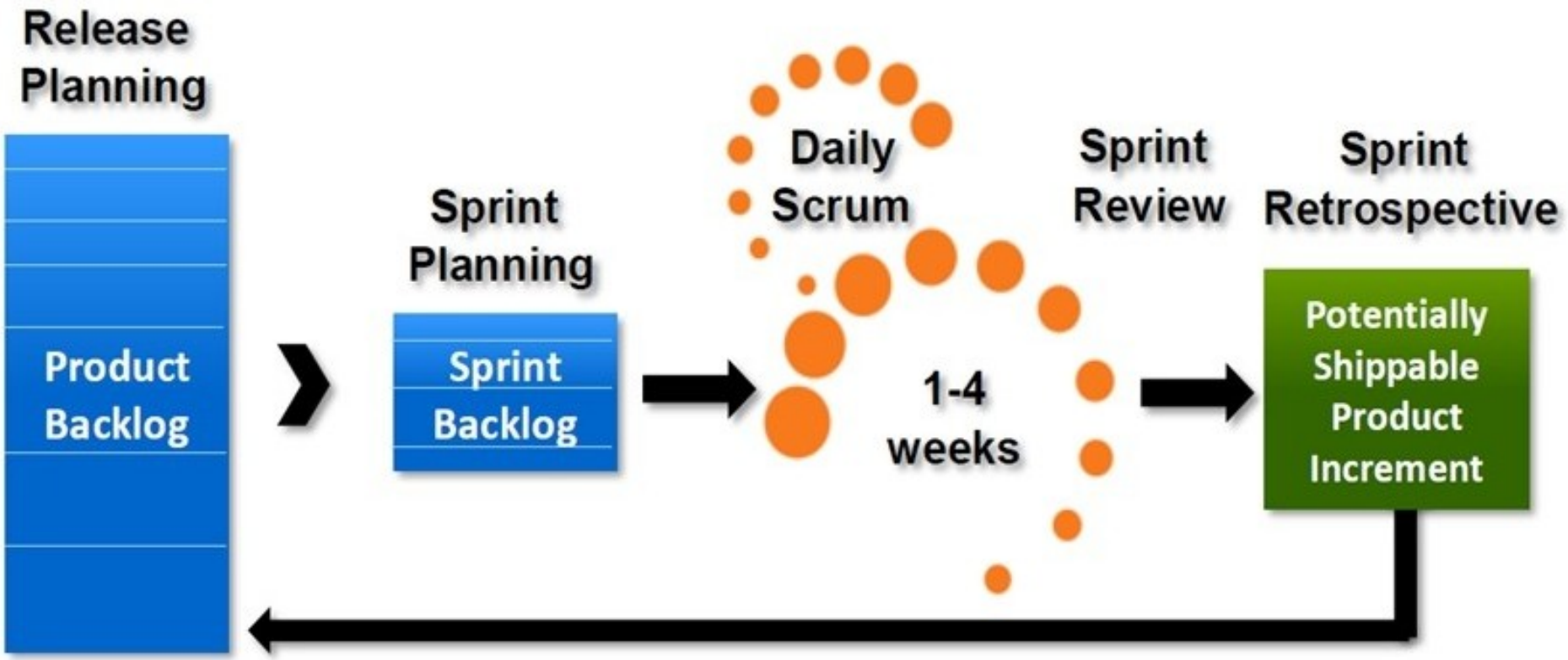
- *Define the features of the product*
- *Decide on release date and content*
- *Be responsible for the profitability of the product*
- *DOR,DOD*
- *Adjust features and priority every iteration, as needed*
- *Accept or reject work results.*

The Scrum Master

- *Represents management to the project*
- *Responsible for enacting Scrum values and practices*
- *Ensure that the team is fully functional and productive*
- *Enable close cooperation across all roles and functions*

Scrum Team

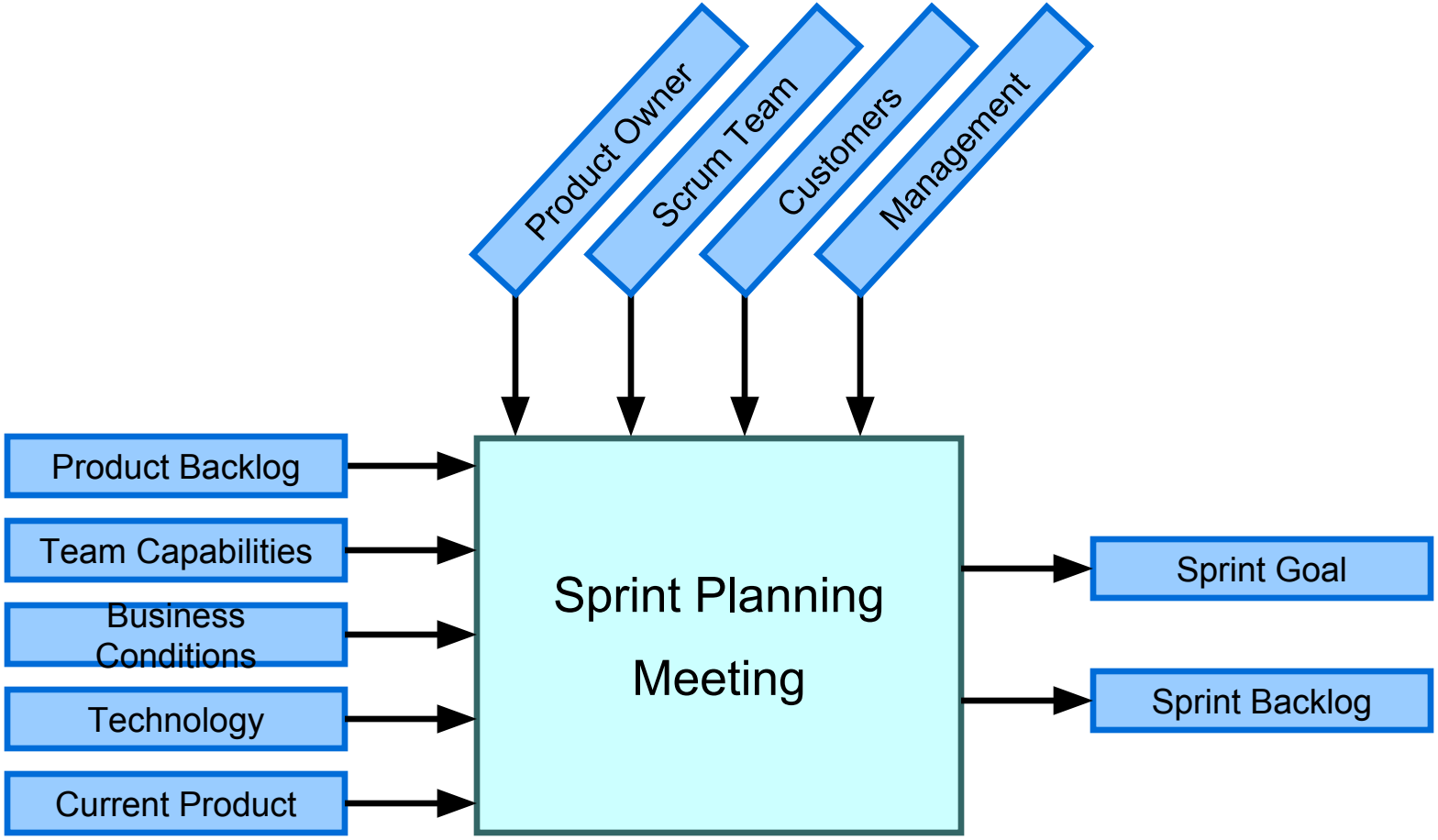
- *Typically 5-10 people*
- *Cross-functional*
- *QA, Programmers, UI Designers, etc.*
- *Members should be full-time*
- *Teams are self-organizing*
- *Membership can change only between sprints*


Release Planning
Product Backlog
Sprint Planning
Sprint Backlog
Daily Scrum
1-4 weeks
Sprint Review
Sprint Retrospective
Potentially Shippable Product Increment

Ceremonies

- *Sprint Planning Meeting*
- *Sprint*
- *Daily Scrum*
- *Sprint Review Meeting*

Spring Planning Meeting



Parts of Sprint Planning Meeting

- *1st Part:*
- *Creating Product Backlog*
- *Determining the Sprint Goal.*
- *Participants: Product Owner, Scrum Master, Scrum Team*
- *2nd Part:*
- *Participants: Scrum Master, Scrum Team*
- *Creating Sprint Backlog*

Pre-Project/Kickoff Meeting

- *A special form of Sprint Planning Meeting*
- *Meeting before the begin of the Project*

Sprint

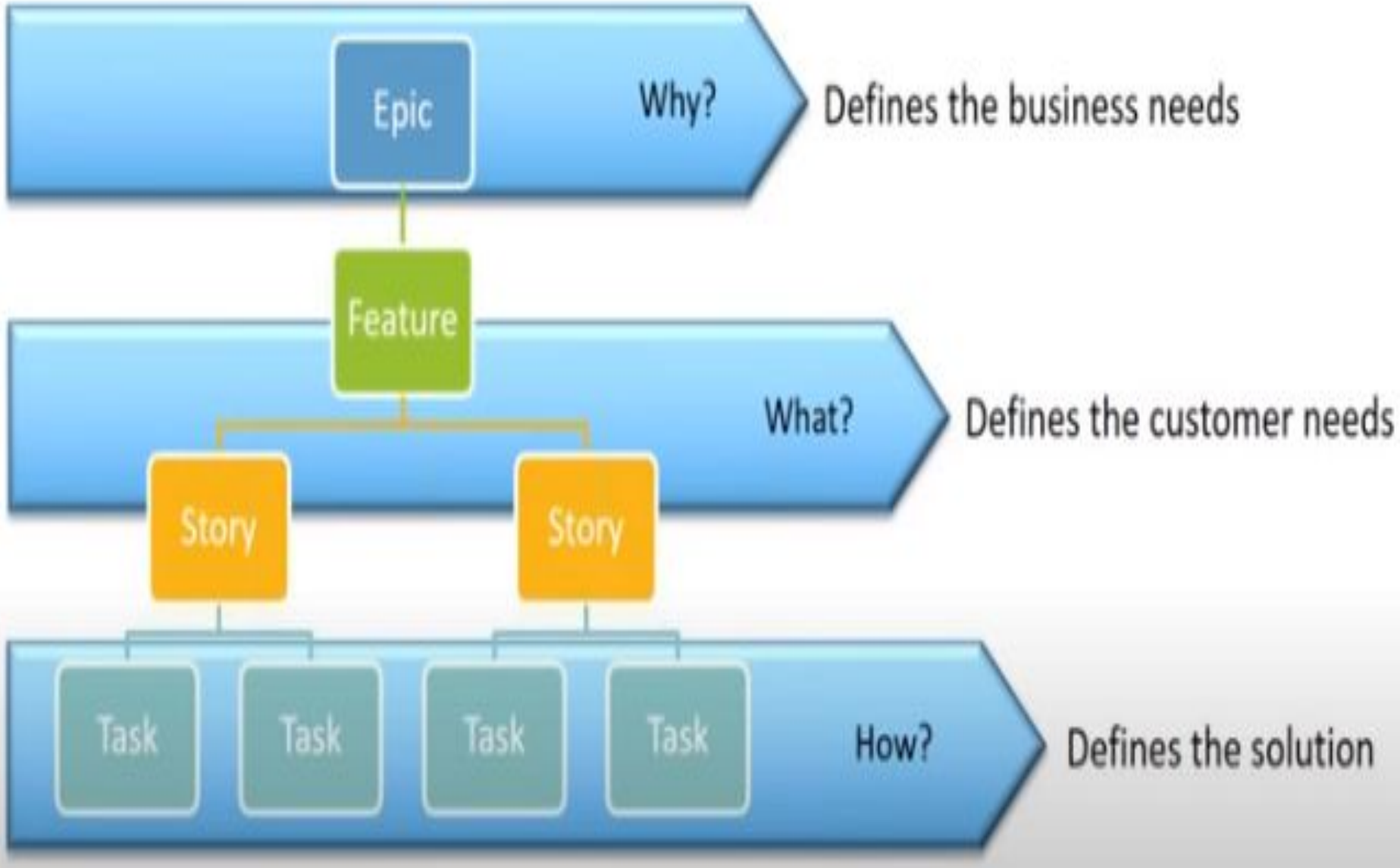
- *A month-long iteration, during which is incremented a product functionality*
- *NO outside influence can interfere with the Scrum team during the Sprint*
- *Each Sprint begins with the Daily Scrum Meeting*

Daily Scrum

- *Parameters*
- *Daily*
- *15-minutes*
- *Stand-up*
- *Not for problem solving*
- *Three questions:*
- *What did you do yesterday*
- *What will you do today?*
- *What obstacles are in your way?*

Daily Scrum

- *Is a meeting in which team members make commitments to each other and to the Scrum Master*
- *Is a good way for a Scrum Master to track the progress of the Team*


Epic
Why?
Defines the business needs
Feature
What?
Defines the customer needs
Story
Story
Task
Task
Task
Task
How?
Defines the solution

Product Backlog

- Contains all potential features, prioritized as an absolute ordering by business value.
- It is therefore the "What" that will be built, sorted by importance.
- It contains rough estimates of both business value and development effort.
- Those estimates help the Product Owner to gauge the timeline and, to a limited extent prioritize.

Product Backlog

- *Requirements for a system, expressed as a prioritized list of Backlog Items*
- *Is managed and owned by a Product Owner*
- *Spreadsheet (typically)*
- *Usually is created during the Sprint Planning Meeting*
- *Can be changed and re-prioritized before each PM*

Sample Product Backlog

Project	Dealmart.com
Stake holders /Customers/users	abc, xyz etc..
Created By	Name of the Product Owner

Epic	User Story ID	Feature/Title	User Story	Status	Acceptance Creteria
For a new e-commerce website to launch, the highest Business Value will be when a new user is able to buy an item from the website.	US001	First time visitor can make the payment as a guest user without having to register	As a First-time visitor to the e-commerce website, I want to be able to buy a listed product, So that I can use the product I buy.	New	
	US002	New user can register on the website	As a First time visitor to the website, I want to be able to register on the website, So that I can browse and buy listed products from the website.	New	
	US003	Registered User can Browse items listed	As a Registered Website User, I want to be able to browse listed products from the website, So that I can make my choice and buy a listed product from the website.	New	
	US004	Registered User can add items to the cart	As a Registered Website User, I want to be able to add items to the cart, So that I can buy a listed product from the website.	New	
	US005	Registered User can make payment for the items added to the cart.	As a Registered Website User, I want to be able to buy listed products, So that I can use the product I buy.	New	

Sprint Backlog

- Break Release backlog items into several tasks
- each sprint should deliver a fully tested product with all the features of that sprint backlog 100% complete
- late finish of the sprint is a great indicator that the project is not on schedule

Project	Dealmart.com
Srum Team	Dev, QA, PO, Scrum master, DecOps etc..
Created By	Name of the Product Owner

Epic	User Story ID	Feature/Title	User Story	Story Points	Sprint
For a new e-commerce website to launch, the highest Business Value will be when a new user is able to buy an item from the website.	US001	First time visitor can make the payment as a guest user without having to register	As a First-time visitor to the e-commerce website, I want to be able to buy a listed product, So that I can use the product I buy.	8	1
	US002	New user can register on the website	As a First time visitor to the website, I want to be able to register on the website, So that I can browse and buy listed products from the website.	3	2
	US003	Registered User can Browse items listed	As a Registered Website User, I want to be able to browse listed products from the website, So that I can make my choice and buy a listed product from the website.	5	2
	US004	Registered User can add items to the cart	As a Registered Website User, I want to be able to add items to the cart, So that I can buy a listed product from the website.	5	3
	US005	Registered User can make payment for the items added to the cart.	As a Registered Website User, I want to be able to buy listed products, So that I can use the product I buy.		3

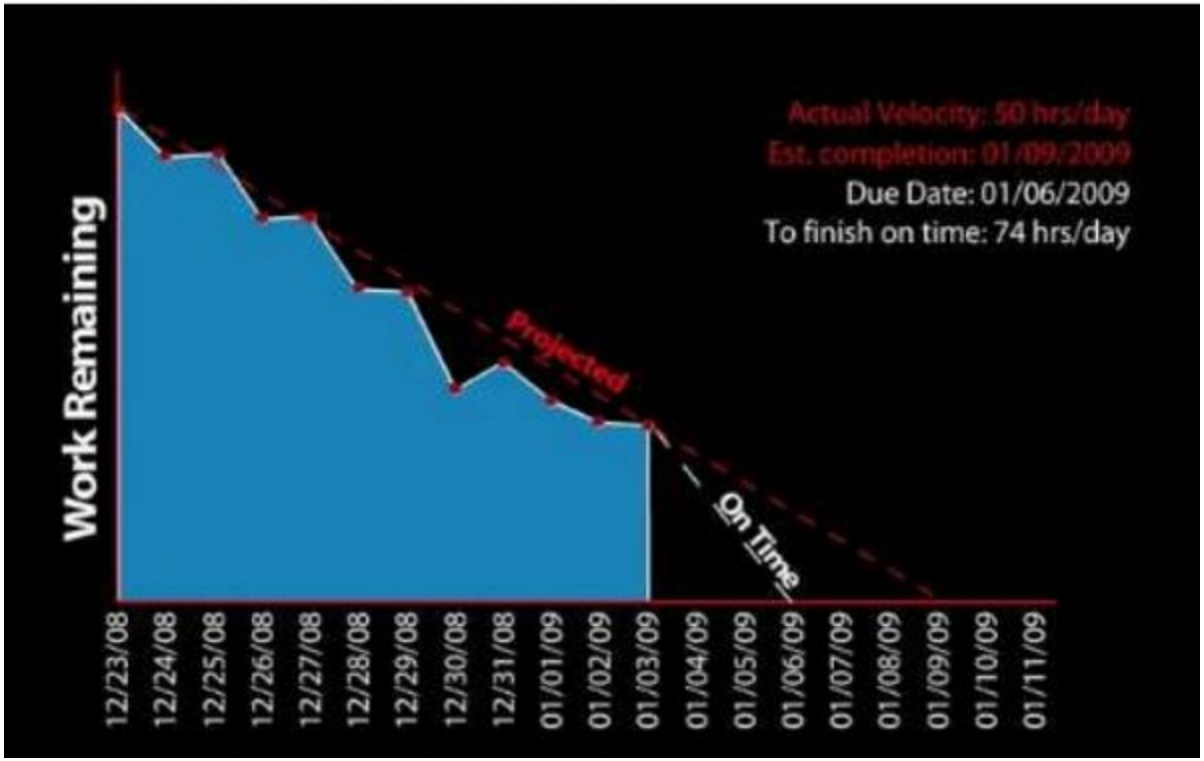
Sprint Burn down Chart

- *Depicts the total Sprint Backlog hours remaining per day*
- *Shows the estimated amount of time to release*
- *Ideally should burn down to zero to the end of the Sprint*
- *Actually is not a straight line*
- *Can bump UP*

Release Burndown Chart

- *Will the release be done on right time?*
- *X-axis: sprints*
- *Y-axis: amount of hours remaining*
- *The estimated work remaining can also burn up*

Burndown Chart



Defect Backlogs

- Tracks bugs separately from features in their own Defect Backlog
- Any bug found relating to the feature should be dealt with immediately before marking the feature complete
- Plan for 1-2 sprints focused only on Defect backlogs

Scalability of Scrum

- *A typical Scrum team is 6-10 people*
- *Jeff Sutherland - up to over 800 people*
- *"Scrum of Scrums" or what called "Meta-Scrum“*
- *Frequency of meetings is based on the degree of coupling between packets*

Pros/Cons

- *Advantages*
- *Completely developed and tested features in short iterations*
- *Simplicity of the process*
- *Clearly defined rules*
- *Increasing productivity*
- *Self-organizing*
- *each team member carries a lot of responsibility*

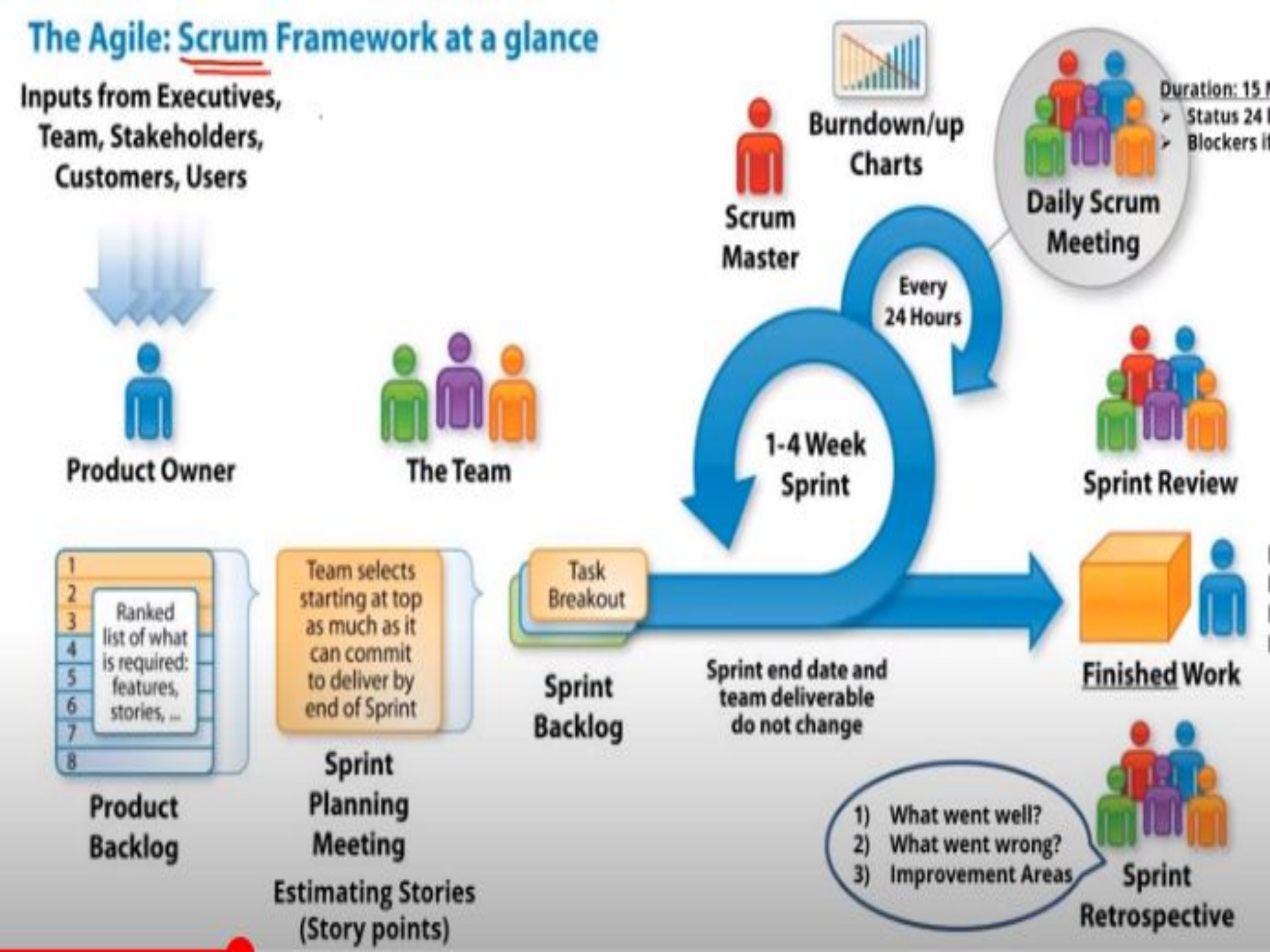
- *Drawbacks*
  - *“Undisciplined hacking” (no written documentation)*
  - *Violation of responsibility*
  - *Current mainly carried by the inventors*

Burndown Chart (Contd.)

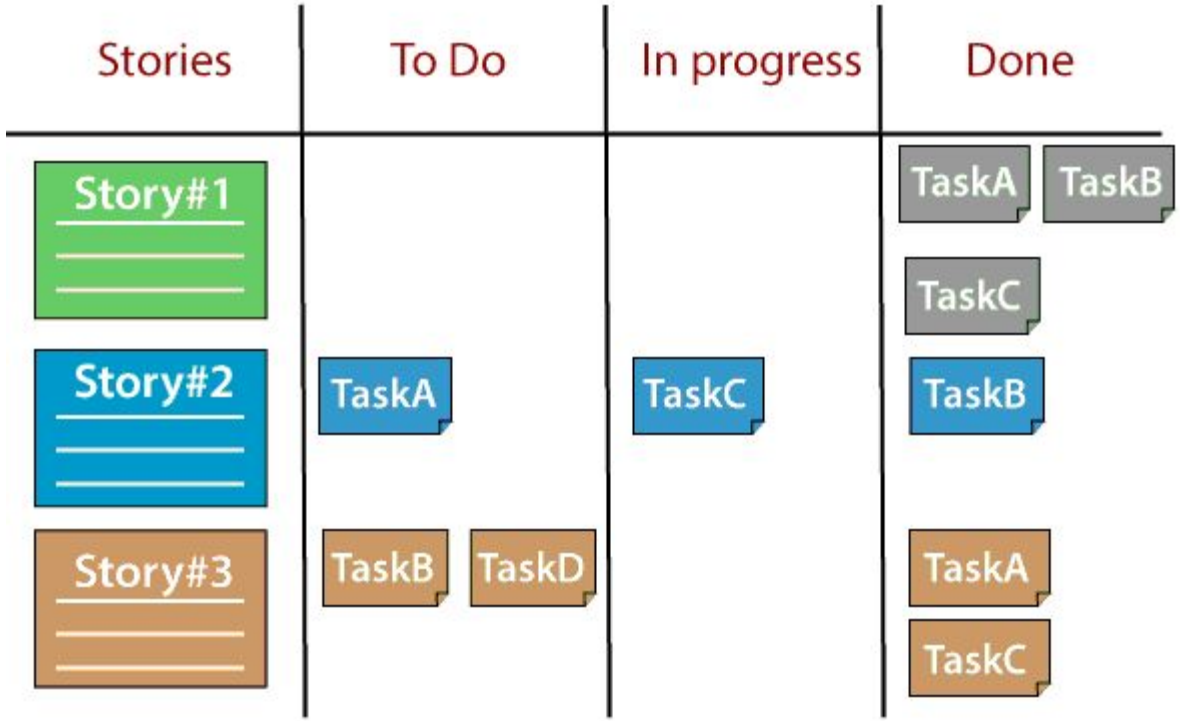
Actual estimates for each feature in the backlog during the initial planning process

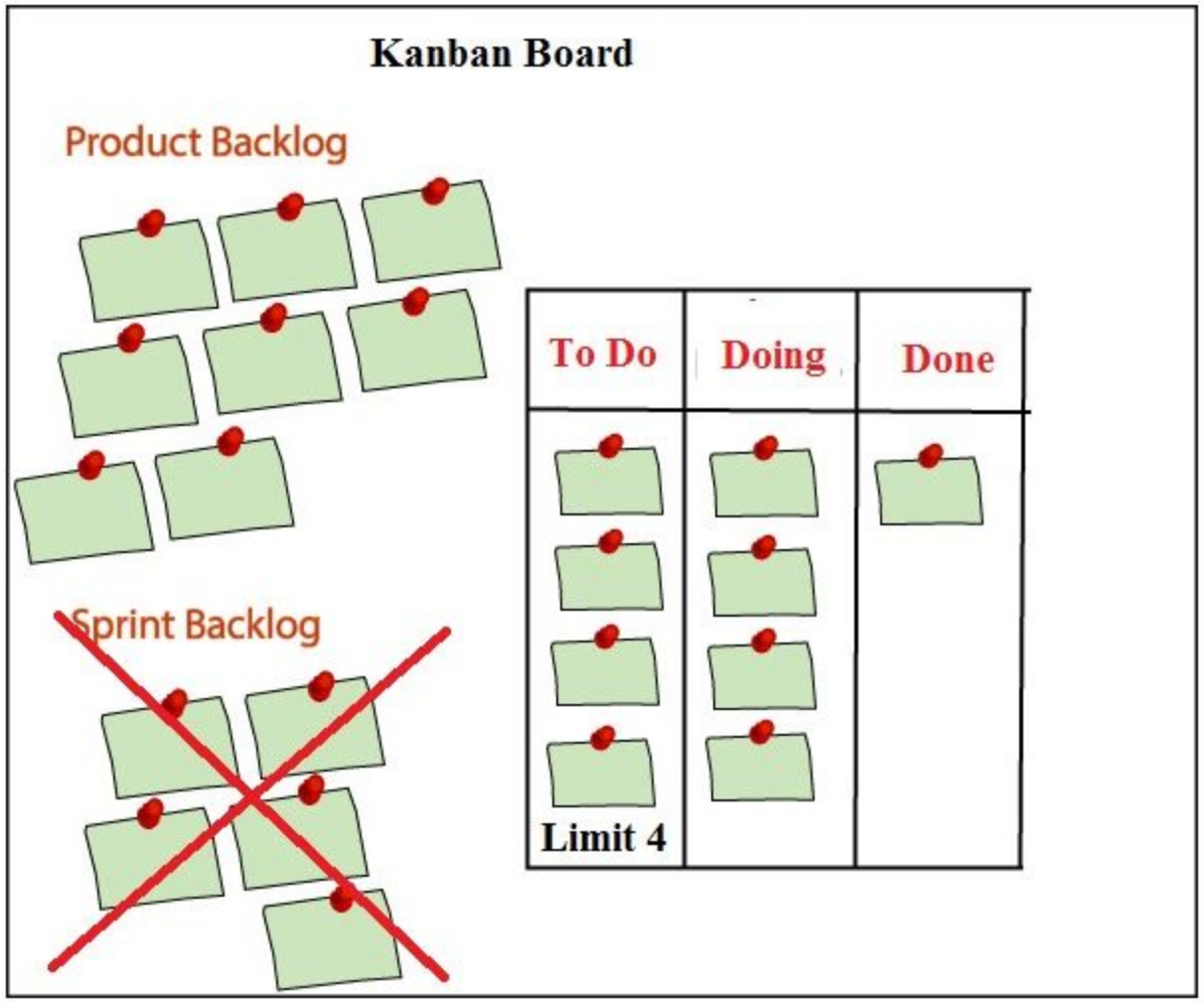
Daily progress on one ore more features is updated by team member by updating the amount of time remaining for each of their items

The Agile: Scrum Framework at a glance



SCRUM

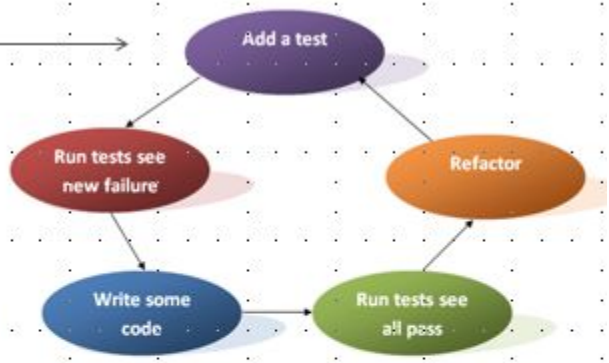

Stories
To Do
In progress
Done
Story#1
Story#2
Story#3
TaskA
TaskB
TaskC
TaskA
TaskC
TaskB
TaskB
TaskD
TaskA
TaskB
TaskC

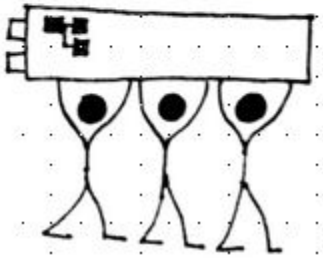

Kanban Board
Product Backlog
Sprint Backlog
To Do
Doing
Done
Limit 4

	Scrum	Kanban
Planning	It has fixed planning. It focussed on planning. It starts with the sprint planning and ends with the sprint review, retrospective. The daily meeting is held so that the team knows the next steps, priorities, and the learnings from the previous steps.	It has no fixed planning, and no daily meetings are conducted. In Kanban, changes can occur at any time, i.e., frequent changes occur.
Timeline	In scrum, we work on the sprint that has the fixed-time duration means that after some fixed-time, we are delivering something to the client.	Kanban does not have the concept of a sprint, so it has no fixed timeline for delivering the product to the client.
Task estimates	During sprint planning, it is decided that how many activities are to be pulled from the product backlog and add in a sprint backlog. For example, if the sprint is for two weeks, then the number of activities are selected in such a way that they can be completed within the sprint, i.e., in two weeks.	It does not estimate the task.
Scrum Master	In scrum methodology, we have one scrum master who handles the team and conducts the meeting on a daily basis.	In Kanban methodology, we do not have any scrum master. It's the responsibility of each individual to deliver a valuable product.

Extreme Programming

- Test Driven Development
- Test Automation
- Continuous Integration
- Collective Code Ownership
- Pair Programming





- *XP is short for eXtreme Programming, a framework which focuses heavily on ensuring the quality of delivered software and which prescribes engineering solutions towards that end.*
- *An XP team (comprised of all who contribute to the project) engage in Release Planning and Iteration Planning. They work in very short development cycles so that changes requested by the customer (who works on-site with the team) can be incorporated frequently.*

- *The value that XP practices can add though is undisputable and many organisations which use Scrum adopt Pair Programming, Test Driven Development and Refactoring as practices which improve quality, speed up the release process and/or reduce the need to revisit work due to technical debt.*

Atlassian Jira

- *Jira is a bug tracking tool developed by an Australian company Atlassian in 2002. It is used for project management, issue tracking, and bug tracking. Jira is not an open-source tool, i.e., Jira software is not available at free of cost; it's a paid service.*
- *It is used to prioritize the tasks.*
- *One can easily get to know about the next release of the build as Jira tool provides better visibility.*
- *It provides a better flexibility workflow so that the team can adjust accordingly.*

In Jira tool, following are the phases that occur in the workflow:

- **TODO state**
- **In Progress state**
- **Done state**

- Issue Creation
- Summary and Additional Details

- Assignee
- Work Review
- Quality Analyst

- Release to production

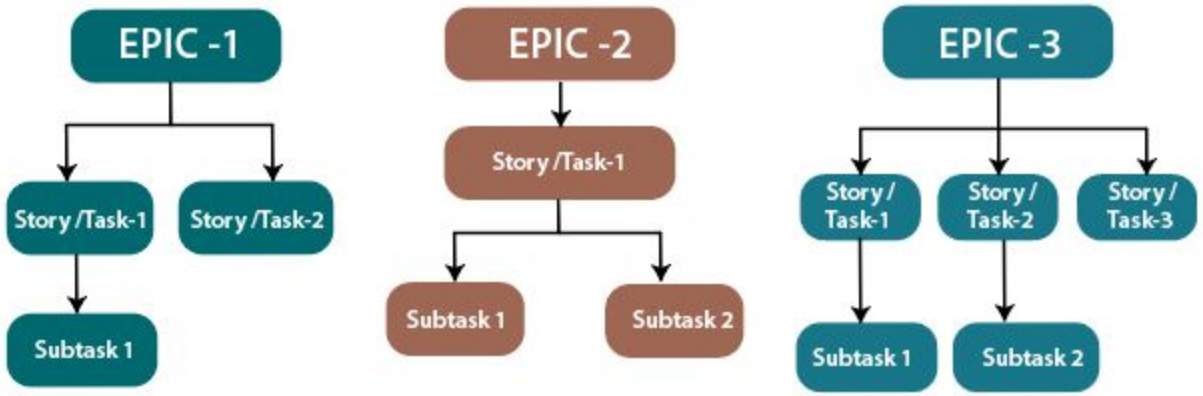
- *An issue in Jira can be a bug, feature, task, or any project work. Each Jira project comes with default issue types, and these issue types depend on the type of project that you are using.*
- *There are three types of Jira projects:*
- *Jira Core (business projects)*
- *Jira Software (software projects)*
- *Jira Service Desk (service desk projects*)

- *Two types of issue exist in Jira Core:*
- *Task:The task is a work that needs to be completed.*
- *Subtask:Subtask is a piece of work which needs to be done to complete a task.*
- *Five types of issue exist in Jira Software:*
- *Bug:A bug is a problem that exists in the functionality of a product.*
- *Epic:Epic is a big user story which needs to be broken into smaller stories.*
- *Subtask:Subtask is a piece of work which needs to be done to complete a task.*
- *Task:Task is a work that needs to be completed.*

Eight types of issue exist in Jira Service Desk:

- *Change*
  It requests a change in a current IT profile.
- *IT help*
  It requests for help related to an IT-related problem.
- *Incident*
  It is used for reporting an incident.
- *New feature*
  It requests for adding a new feature or capability in software.
- *Problem*
  It is used for investigating and reporting the root cause of multiple incidents.
- *Service request*
  It is requesting for help from an internal or customer service desk.
- *Service request with approval*
  It is used for requesting help that requires the approval of a manager or a board.
- *Support*
  It is used for requesting help for customer support related issues.

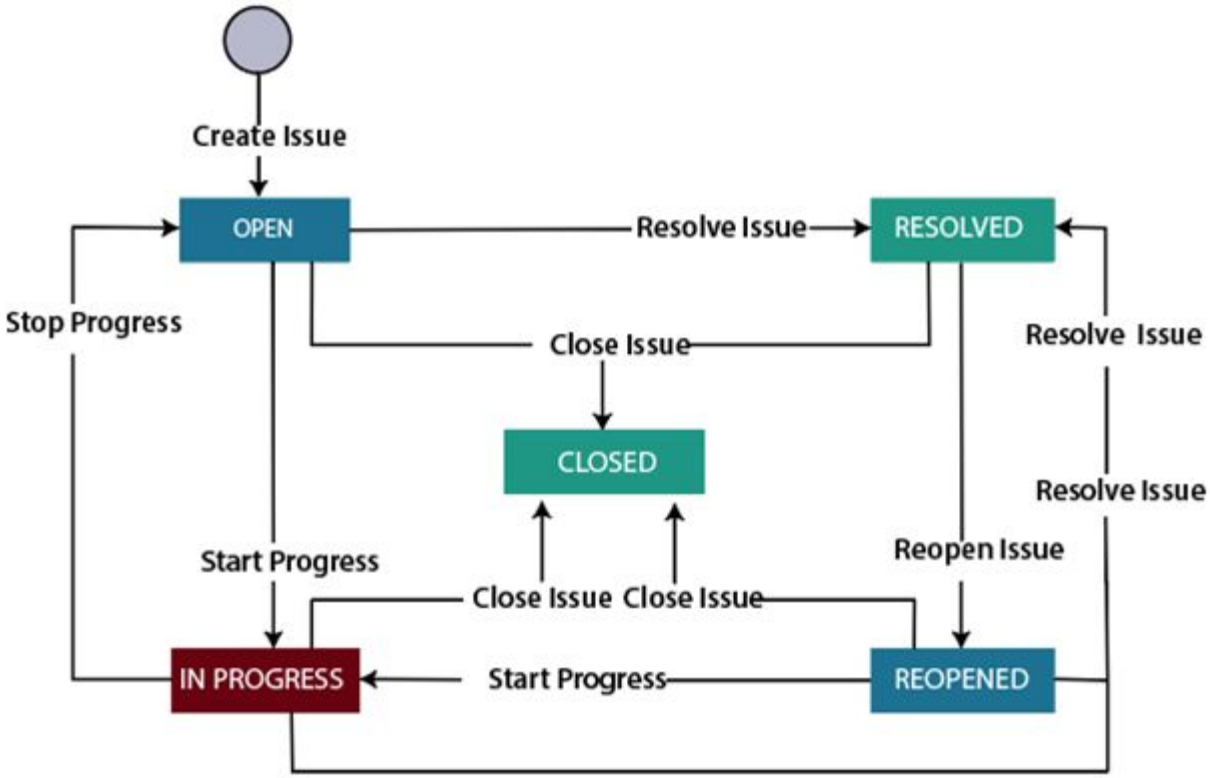
- *JIRA application can be used to break the pieces of work into issues. Issues can be represented as tasks, subtasks, bug, epic, feature requests, or other pieces of work.*
- *Bug*
  A bug is the problem or defect that occurs in the functions of a product.
-



- *Epic is a large user story which is to be broken into smaller stories*
- *It cannot be achieved in a single sprint.*
- *The whole epic is completed in months.*
- *Epic refers to a set of activities which are not converted into user stories yet.*
- *First, Epics are converted into user stories, and then user stories are converted into several tasks on which agile team work.*

- *Subtask*
  Subtask is a piece of work which is to be done to complete the whole work.
- *Task*
  The task is the work which is to be completed or done to achieve the team's goal.
- *Story The story is a list of tasks that need to be completed within a project.*
- *It defines the high-level design of project requirements.*
- *It defines the short and simple descriptions of the whole project.*
- *It is owned by the product owner of a company, but anyone can write the user story.*

- *The Jira workflow is known as defect lifecycle or bug lifecycle. The bug lifecycle consists of the following phases:*
- *Open issue*
  When the issue is created by the tester, then the issue is assigned to the software developer, and they start working on it.
- *In Progress*
  This is the phase where the software developers start working on the issue.
- *Resolved issue*
  When the issue is resolved by the software developer and waiting for the verification by the software tester. If the verification is successful, then the issue is closed; otherwise, the issue gets reopened.
- *Reopened issue*
  If the verification is unsuccessful, then the issue is reopened and assigned to the software developer.
- *Close issue*
  If the verification of the fixed bug is successful, then the issue is closed by the tester.


Create Issue
OPEN
Resolve Issue
RESOLVED
Stop Progress
Close Issue
Resolve Issue
CLOSED
Resolve Issue
Start Progress
Reopen Issue
Close Issue
Close Issue
IN PROGRESS
Start Progress
REOPENED