DevOps Overview:

DevOps is a culture where collaboration between development, operations, and business teams is considered a critical aspect of the DevOps journey. It's not solely about the tools and DevOps in an organization that creates continuous value for customers. Tools are only one of the pillars, the other being People and Processes.

Instead of releasing a large number of application features, companies are trying to see if a small number of features can be rolled-out to their customers through a series of release iterations. This has several advantages like better quality of software, quick feedback from customers, etc. which in turn ensures high customer satisfaction. To achieve these objectives, companies are required to:

- The lower failure rate for new releases
- Increase deployment frequency
- Quicker mean time to recovery in the event of a new release crashing the application

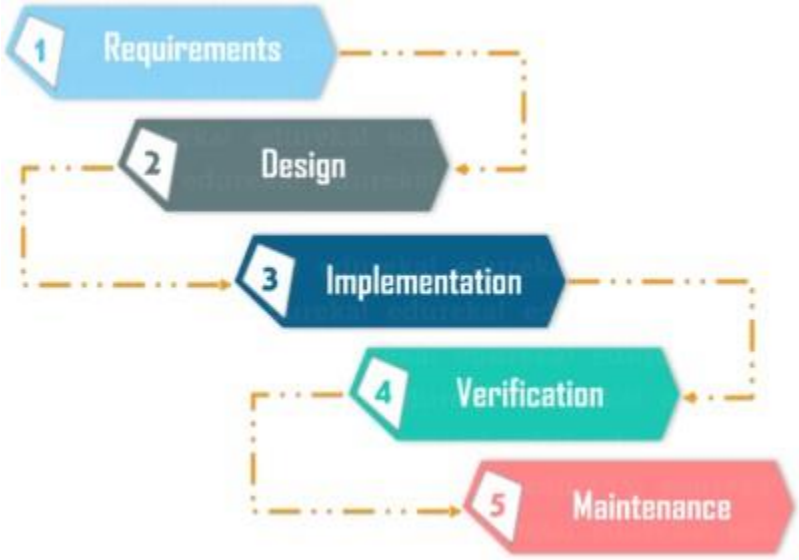
Shortened lead time between fixes

History of DevOps:

Before DevOps, We had two approaches for software development namely the Waterfall and the Agile.

Waterfall Model:

- The waterfall model is a software development model that is straight forward and linear. This model follows a top-down approach.



Agile Methodology:

Agile Methodology is an iterative based software development approach where the software project is broken down into various iterations or sprints. Each iteration has phases like the waterfall model such as Requirements Gathering, Design, Development, Testing, and Maintenance. The duration of each iteration is generally 2-8 weeks.

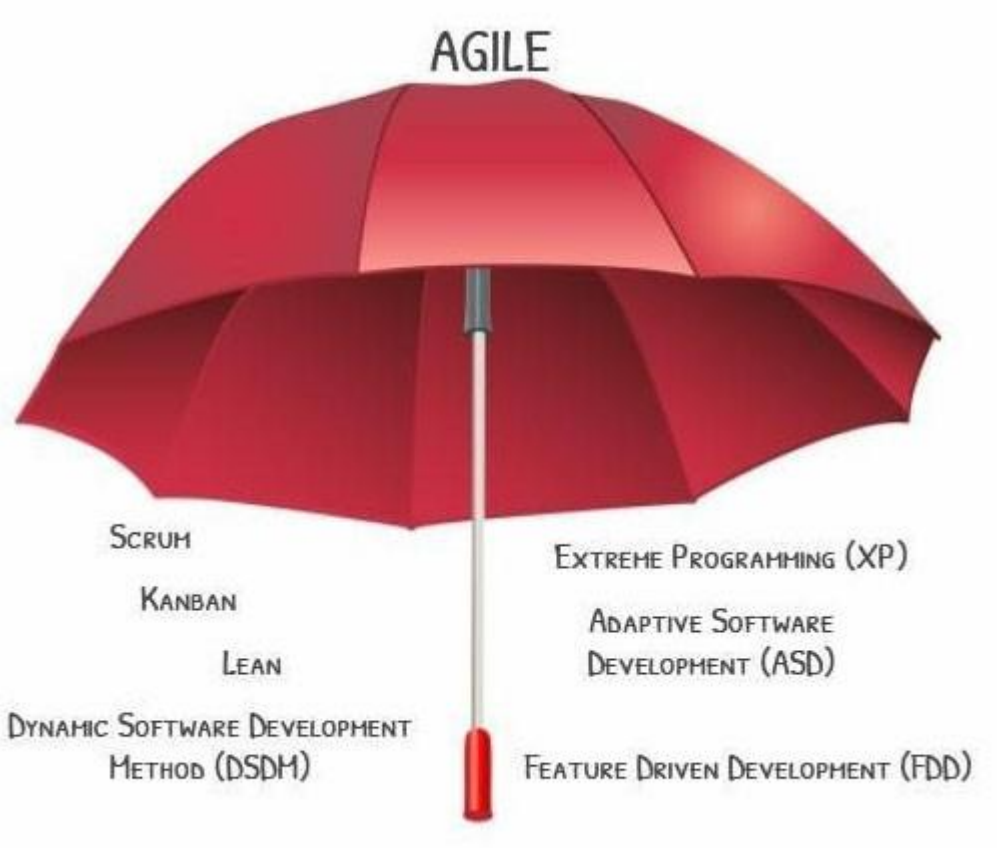
Agile Process:

- In Agile, a company releases the application with some high priority features in the first iteration.
- After its release, the end-users or the customers give you feedback about the performance of the application.
- Then you make the necessary changes into the application along with some new features and the application is again released which is the second iteration.
- You repeat this entire procedure until you achieve the desired software quality.

Key Agile Methodologies:

Agile is an umbrella term for several methods and practices. Let's look at some of the popular methodologies:

- Scrum
- Extreme Programming (XP)
- Adaptive Softtware Development (ASD)
- Dynamic Softtware Development Method (DSDM)
- Feature Driven Development (FDD)
- Kanban
- Behaviour Driven Development (BDD)



Agile 12 Principles:

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable softtware.
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- Deliver tworking softtware frequently, from a couple of tweeks to a couple of months, twith a preference to the shorter timescale.
- Businesspeople and developers must twork together daily throughout the project.
- Build projects around motivated individuals. Give them the environment and support they need and trust them to get the job done.

- The most efficient and efective method of conveying information to and twithin a development team is face-to-face conversation.
- Working softtware is the primary measure of progress.
- Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- Continuous attention to technical excellence and good design enhances agility.
- Simplicity–the art of maximizing the amount of twork not done–is essential.
- The best architectures, requirements, and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on hotw to become more efective, then tunes and adjusts its behaviour accordingly.

SCRUM:

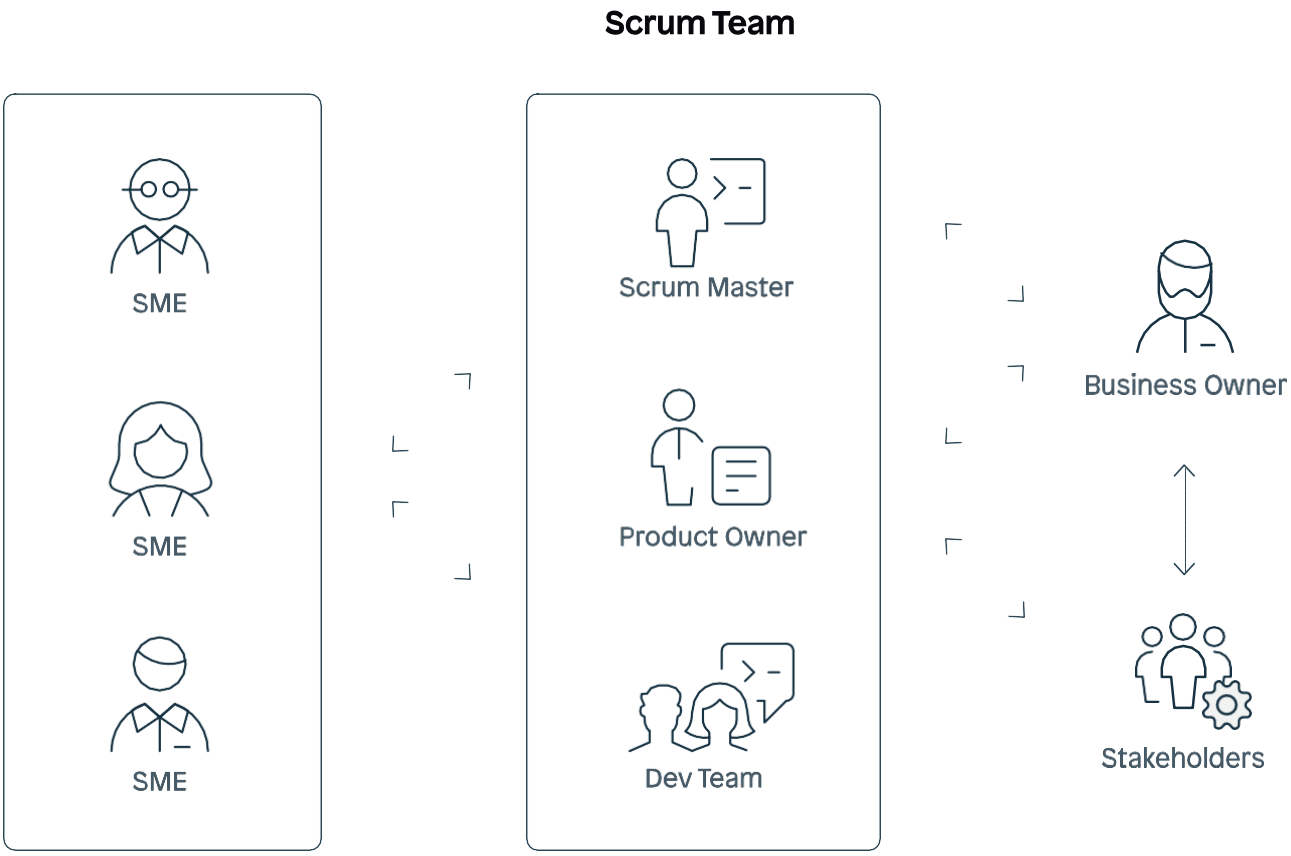
Scrum is one of the more popular and widely used Agile frameworks. Within the Agile framework called Scrum, there are two primary roles to fill: Scrum Master and Product Owner.

Scrum Master:

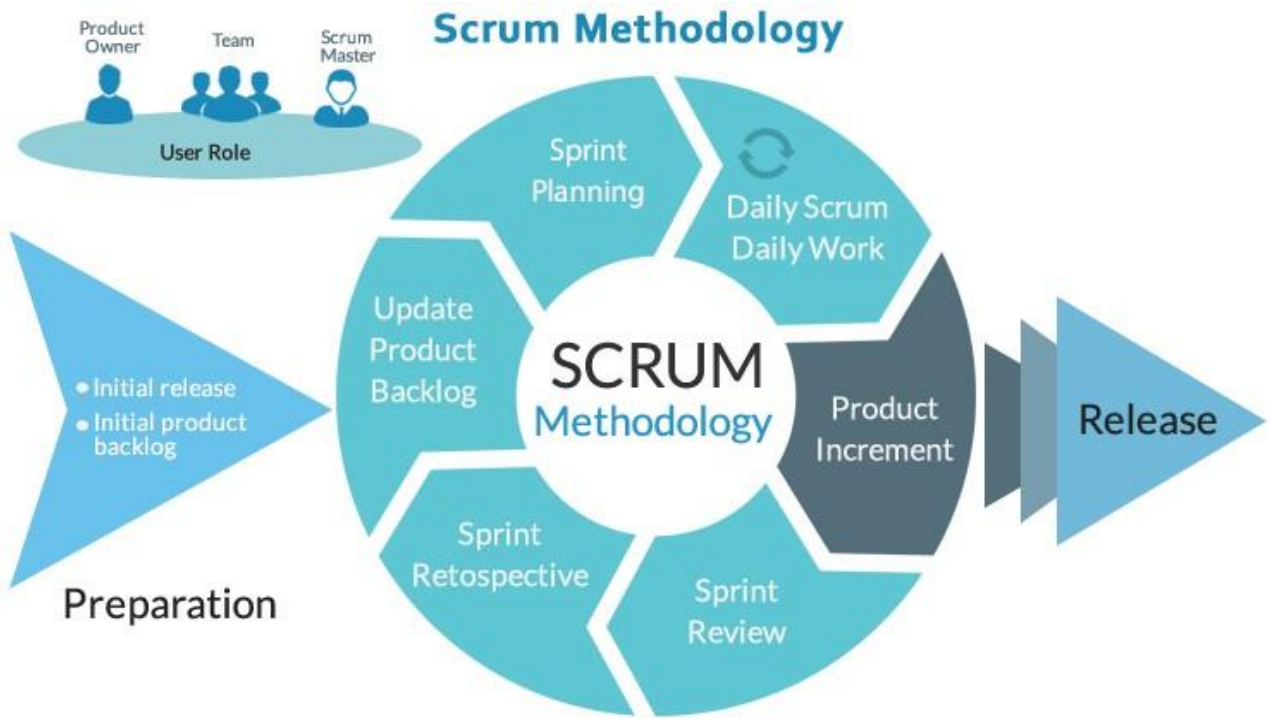
Your Scrum Master is the coach and the gatekeeper. The Scrum Master establishes responsibility for following the Agile framework, providing guidance and education to your Scrum Team and removing impediments and distractions that keep the team from doing work.

Product Owner:

The Product Owner of your Scrum Team is first and foremost the subject matter expert for the given project. The Product Owner keeps track of the projects' stakeholders' expectations and defines and gathers the required tools and resources that the Scrum Team needs. In addition, the Product Owner communicates their vision to the team to help set priorities.



Typical SCRUM Flow:

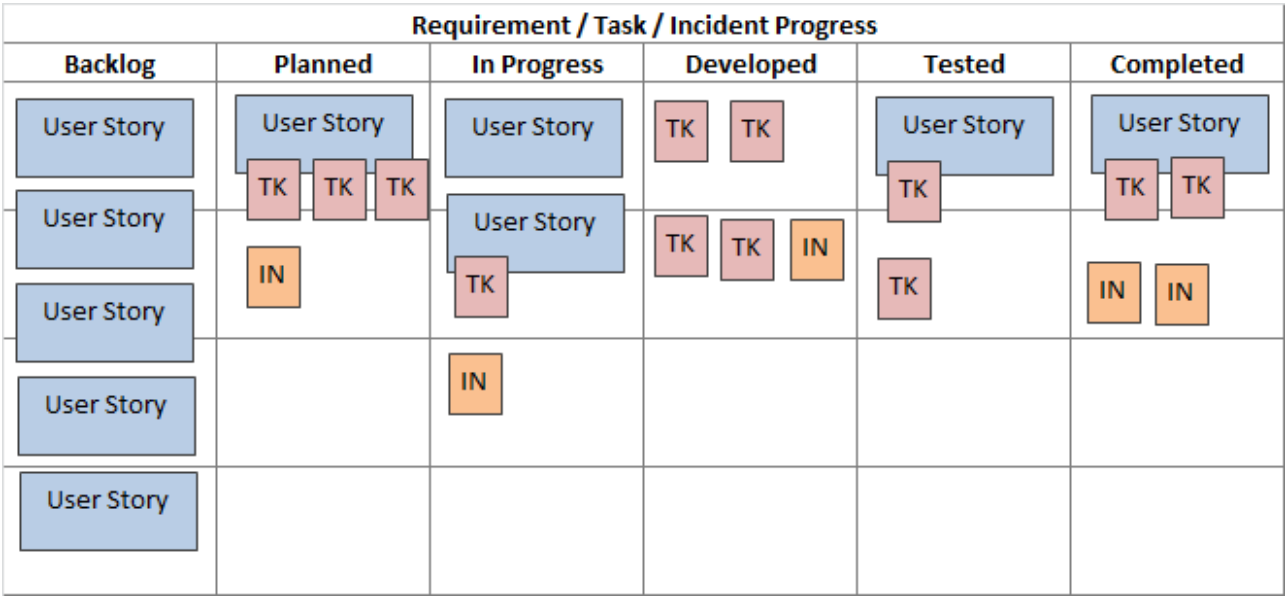


LEAN Development Process:

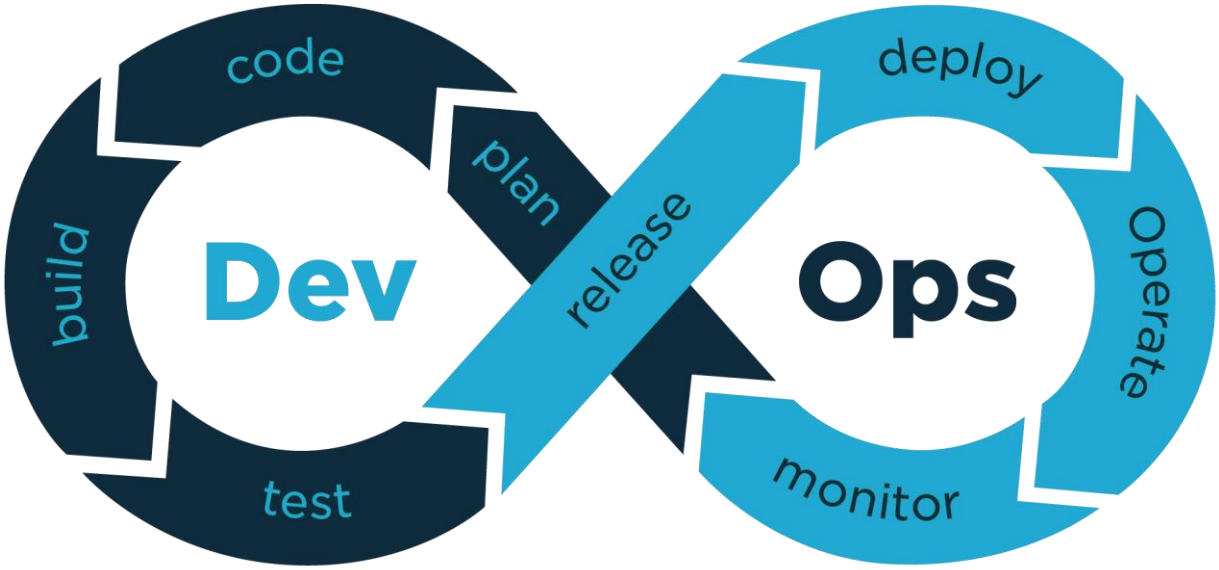
Lean Software Development is a set of principles to deliver software according to the principles of lean manufacturing. Essentially, lean is centred on preserving value with less work. Lean approaches are often called six-sigma or Just-In Time (JIT).

KANBAN Overview:

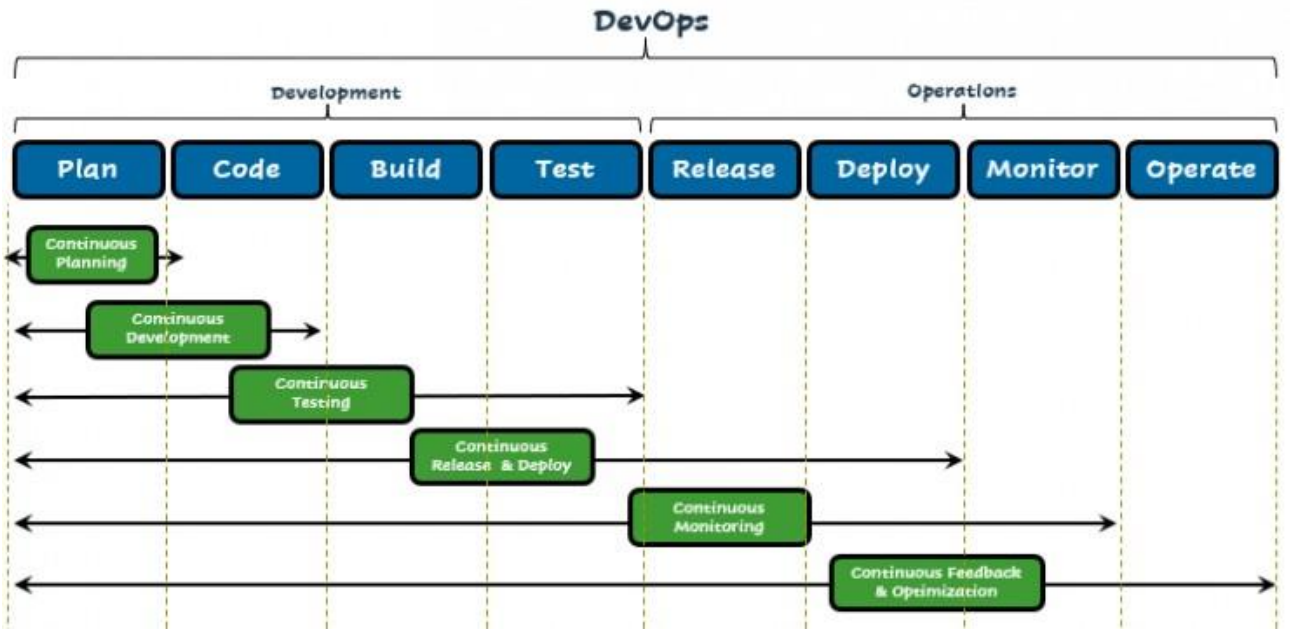
- Kanban is a scheduling system for lean and other JIT processes
- There are physical (or virtual) “cards” called Kanban that move through the process from start to finish.
- The aim is to keep a constant flow of Kanban so that as inventory is required at the end of the process, just that much is created at the start.



DevOps Life Cycle:



- ➔ Continuous Planning
- ➔ Collaborative Deployment
- ➔ Continuous Testing
- ➔ Continuous Release and Deployment
- ➔ Continuous Monitoring
- ➔ Continuous Feedback and Optimization



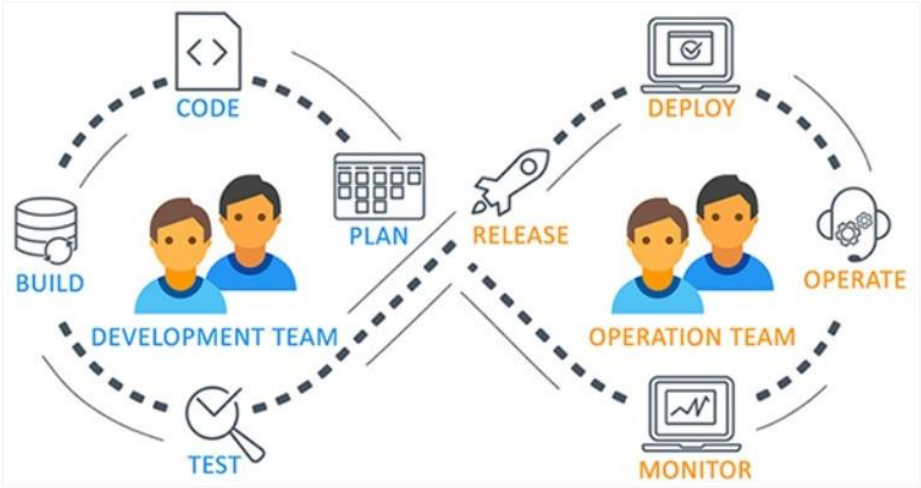
Benefits of DevOps:

- Predictability
- Maintainability

- Reproducibility
- Greater Quality
- Time to market
- Reduced Risk
- Cost Efficiency
- Resiliency

Azure DevOps:

DevOps is the union of people, processes, and products to enable continuous delivery of value to the end users. Using Azure DevOps, you can plan smarter, collaborate better, and deliver reliable software faster with a set of modern services.



Azure DevOps Components include the following:

- Azure Boards
- Azure Repos
- Azure Pipelines
- Azure Test Plans
- Azure Artifacts

Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.

Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.

Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.

Azure Test Plans

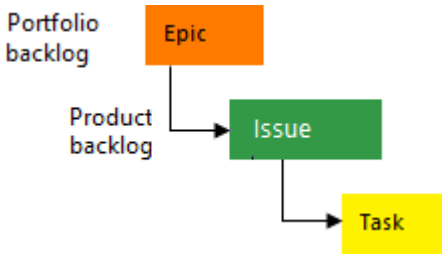
Test and ship with confidence using manual and exploratory testing tools.

Azure Artifacts

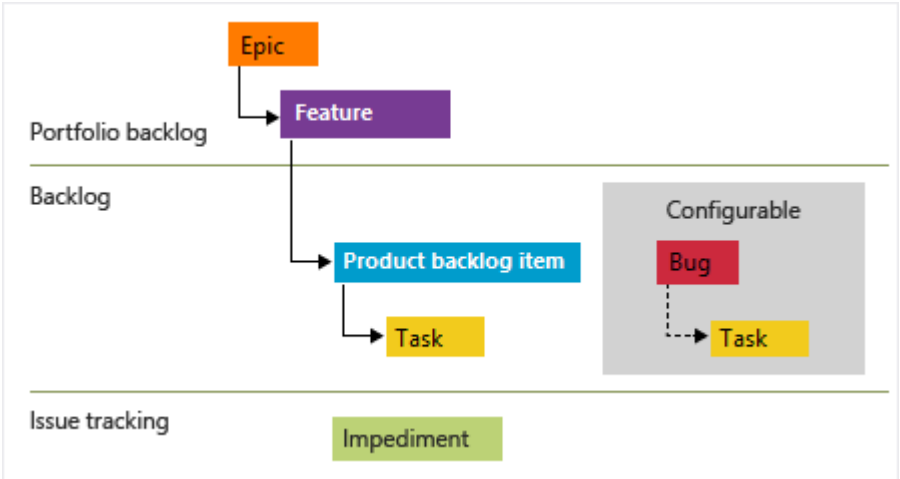
Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.

https://azure.com/devops

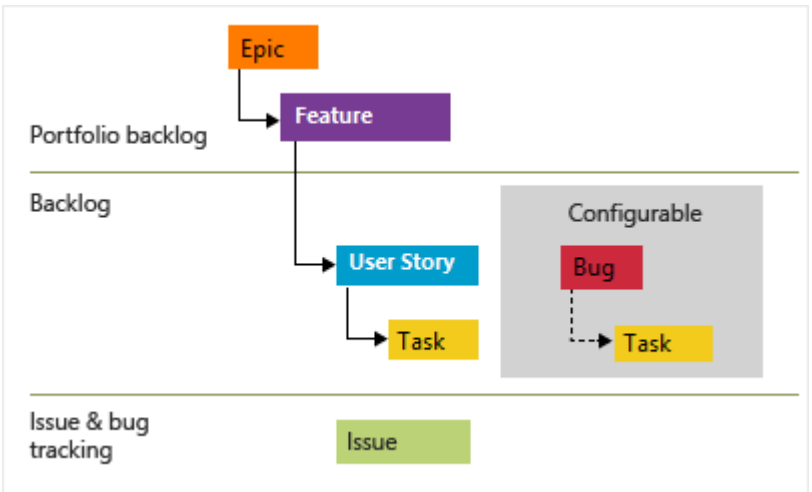
Basic:



Scrum:



Agile:



CMMI: (Capability Maturity Model Integration)