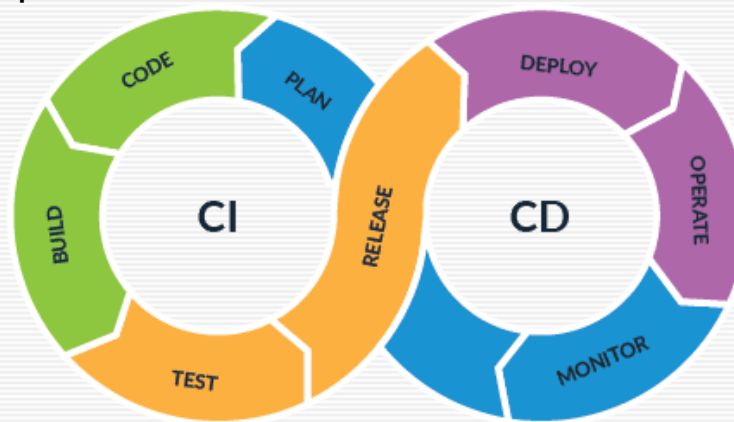


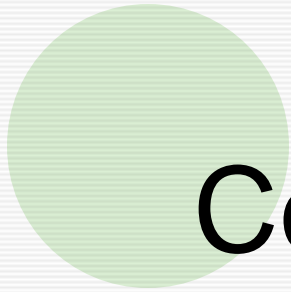


CI / CD




What is CI/CD?

- **Continuous integration/continuous delivery (CI/CD)** is a software development practice that combines development and operations teams and their day-to-day tasks. It applies automation to developing, testing, and delivering applications.
- By unifying these processes under one strategy, CI/CD supports a smoother deployment process, brings more structure to the entire code and the development process, and enables more frequent updates with fewer disruptions.








Continuous Integration (CI)

	Definition	Continuous integration is a software development process, where teams integrate code early and often into a central repository, where they can run frequent tests and validate changes.
	Goal	Speed up the release process by enabling teams to identify and fix problems early in the development lifecycle.
	Benefits	<ul style="list-style-type: none">▪ CI reduces the amount of time spent on bug fixes and regression testing▪ CI ensures that everyone has a deep understanding of what's happening inside the codebase and what features they're developing for end-users.



Continuous Delivery (CD)

	Definition	Continuous Delivery is the practice of getting all updates, fixes, features, and configuration changes either into production or into the hands of end-users as quickly (and safely) as possible.
	Goal	Streamline the delivery/deployment process so that predictable tasks can be performed on-demand.
	Benefits	<ul style="list-style-type: none">▪ Code is always in a deployable state, even with developers making continuous updates to the codebase by bringing integration and testing together▪ If any errors are detected during production, they can be addressed immediately by simply rolling out the next update.



CI/CD Pipeline

CI/CD Pipeline are a series of steps that must be completed to deliver a new software release. The aim is to improve the software delivery process by introducing monitoring and automation to improve the development and delivery process.

The CI/CD pipeline typically breaks down into the following stages:

1. Build
2. Test
3. Release
4. Deploy
5. Validate

! The real value of CI/CD is realized through automation.



Business Benefits of CI/CD

1. Improved code quality
2. Shorter time-to-market of new features
3. Automation to reduce costs and labour
4. The benefits of rapid feedback
5. Streamlined communication
6. Gathering metrics about application performance
7. Improved customer satisfaction



Business Benefits of CI/CD: Improved code quality

- CI/CD improves overall code quality. Since code is released in small batches, it is possible to test it thoroughly (e.g. using unit tests) detecting and fixing the most serious bugs before software is deployed to production.
- Gradual changes to the code are also more manageable.
- Probability that a critical bug is detected once your product goes live is lowered considerably.
- Additionally, automated tests allow you to fix bugs immediately, which is much easier and less costly than allowing them to fester.



Business Benefits of CI/CD: Shorter time-to-market of new features

- If code changes are small, you can release software builds faster—essentially, on demand.
- This improves flexibility and the ability to ship new functionalities.
- Now when users ask for new features or competitors introduce enhancements, your reaction can be faster.



Business Benefits of CI/CD: Automation reduces costs and labour

- Automation is one of the most important reasons to implement a CI/CD pipeline.
- Build automation, automated testing and deployment not only make the life of the DevOps team easier, but also slash costs.
- Automated actions are also less susceptible to human error and easier to manage.
- Ideally, every deployment into the production environment should be performed without human intervention.



Business Benefits of CI/CD: Rapid feedback

- What is so great about the CI/CD process is the instant feedback you get about your code and new build.
- As failure is a normal occurrence, you should apply the principle of failing fast. This can be achieved by automating tests. When automated tests detect a bug, it can be fixed rapidly.
- The same is true for automated deployment: if the metrics being monitored suggest there's an issue with a new update, it will automatically be rolled back, thus protecting your company's reputation from any harm it may suffer when faulty software is released to the public.



Business Benefits of CI/CD: Streamlined communication

- Every successful CI/CD process is based on effective communication.
- A CI/CD pipeline is a common framework for all developers, testers and product managers working on software development.
- A flat management structure allows for more flexibility and initiative while enhancing the sense of responsibility among team members for delivering an outstanding product to end users.
- This increases the business value of the company.



Business Benefits of CI/CD:

Gathering metrics about application performance

- Every application after its release should be monitored carefully for possible issues.
- Continuous monitoring and observability the backbone of your CI/CD pipeline allow you to monitor health, performance and reliability and to take the necessary actions when needed.
- Monitoring metrics will also allow you to create actionable insight and further improve your software product.



Business Benefits of CI/CD: Improved customer satisfaction

- The ultimate goal of every CI/CD implementation is to make customers/clients happy. Buggy software can harm a company's reputation, sometimes irreparably.
- Fast and frequent releases, new features shipped regularly, bugs fixed promptly and immediate reaction to feedback—these are the major factors that will make end-users happy to pay for your software.