

What is CI/CD ?

Continuous integration and continuous deployment (CI/CD) is a set of ideas, processes, and capabilities that enables software changes to be delivered to users in a timely, repeatable, and secure manner by introducing automation into software development processes.



Continuous Integration & continuous Delivery:

- CI: An approach to be continually validating the state of a codebase through automated testing, it is best achieved through automated testing.
- CD: An approach to regularly deploying artifacts that successfully pass the CI phase to ensure confidence around the deployment.



Benefits of CI/CD



- **Higher efficiency of web development**: Increased productivity is one of the leading advantages of a CI/CD pipeline. You should automate your process if you have a review process that includes deploying code to development, testing, and production environments and entering multiple commands across several domains. This creates the need for a CI/CD framework.
- **Reduced risk of defects**: Finding and resolving defects late in the development process is costly and time-consuming. This is particularly true when problems arise with features already released to production.
- **Faster product delivery**: CD enables your team to provide customers with frequent and timely updates. When CI/CD is used, the entire team's efficiency increases, including the release of new features and fixes to problems. Businesses can address market shifts, security challenges, consumer needs, and financial pressures faster.
- **Exclusive log generation**: Logging information plays a vital role in observability. Logs provide a large volume of information to decipher what's happening beneath the UI and study program behavior. A CI/CD pipeline generates a lot of logging data at every level of the software development process.
- **Easier rollback of code changes**: One of the most exclusive benefits of a CI/CD pipeline is that it leads to the quick and easy rollback of code changes if there are any issues in the production environment after a release.



Business benefits



- **Better quality software.** With CI/CD, your developers are handling smaller sections of code, meaning that if problems do emerge, it will be simpler and quicker to find a resolution. It also lowers the chance that errors make it into the production environment. Additionally, by incorporating automated testing, CI/CD can resolve many bugs before they make it into end users' hands, boosting user satisfaction.
- **Faster time to market.** Whether your product is new or an update, CI/CD gives you a literal pipeline straight to your market while ensuring that thorough testing still takes place. And since requirements can change often during development, these changes can be incorporated easily, leading to a better-quality product once it's released. This means you're going to start seeing value sooner as well as maintain a competitive edge.
- **Fail fast.** It may sound undesirable to hope something will fail quickly, but this is actually one of the most important principles of CI/CD. When new functions and features go wrong, you'll get immediate feedback and can fix the product quickly.

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- **Data stream.** With its modern, business-oriented tooling, CI/CD offers the flexibility to generate, track, and report on valuable metrics across the entire SDLC.
 - **Ensuring observability.** This is not only a function of CI/CD. Essentially, modern software development environments are distributed, meaning they may be spread across physical locations or in the cloud. With code changing often, it is possible that something that previously functioned properly may stop working, and then it can be tough to track down the issue that caused the application to break.
 - **Greater customer satisfaction:** Ultimately, the goal of CI/CD is to make customers happy. When dealing with buggy software, your company's reputation is damaged, and customers become irritated. By shipping new features regularly, fixing bugs immediately, and reacting to feedback, you will delight the end-users of your application
 - **Increased business sustainability :** Most businesses don't aim to win a sprint — their goal is to win a marathon. Cutting ahead of the competition isn't easy and doing it consistently is even harder. By automating manual tasks, you can prevent your team from burning down all the way before your business becomes successful.