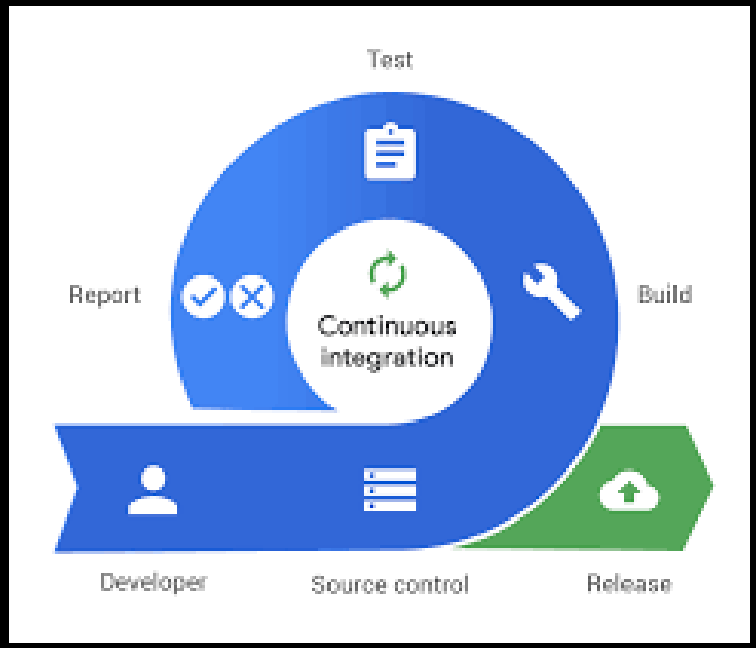
Fundamentals and Benefits of CI/CD

CI OVERVIEW

In software engineering, continuous integration is the practice of merging all developers' working copies to a shared mainline several times a day.

CI aims to provide rapid feedback so that when a defect is introduced into the code base, it is identified and corrected as soon as possible



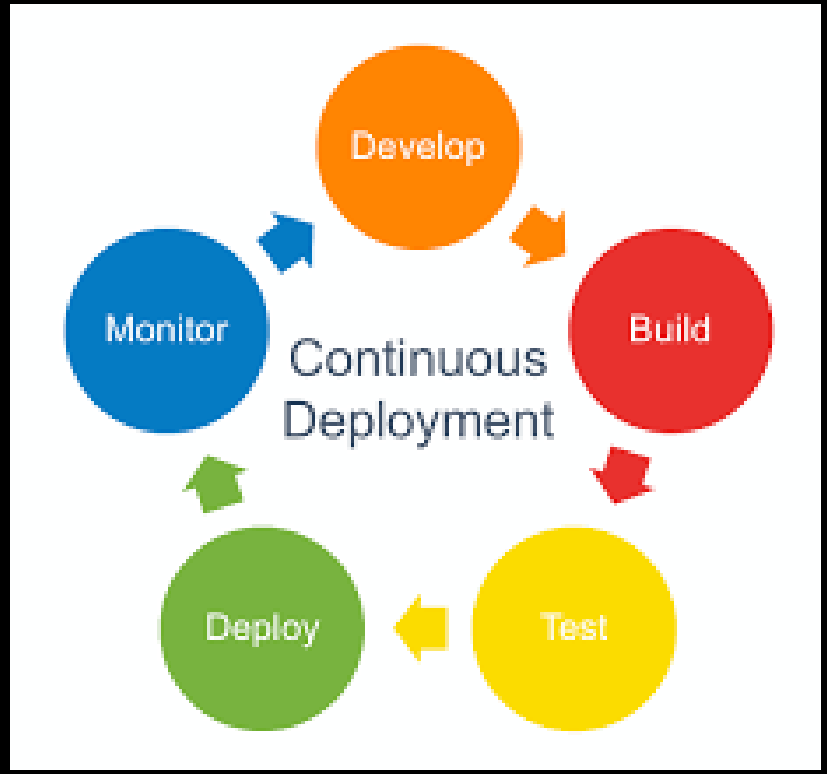
CI OVERVIEW CONTINUE.....

The best practices of CI include:

- **Frequent code commits;**
- **Developer test categorization;**
- **A dedicated integration build machine;**
- **Continuous feedback mechanisms; and**
- **Staging builds.**

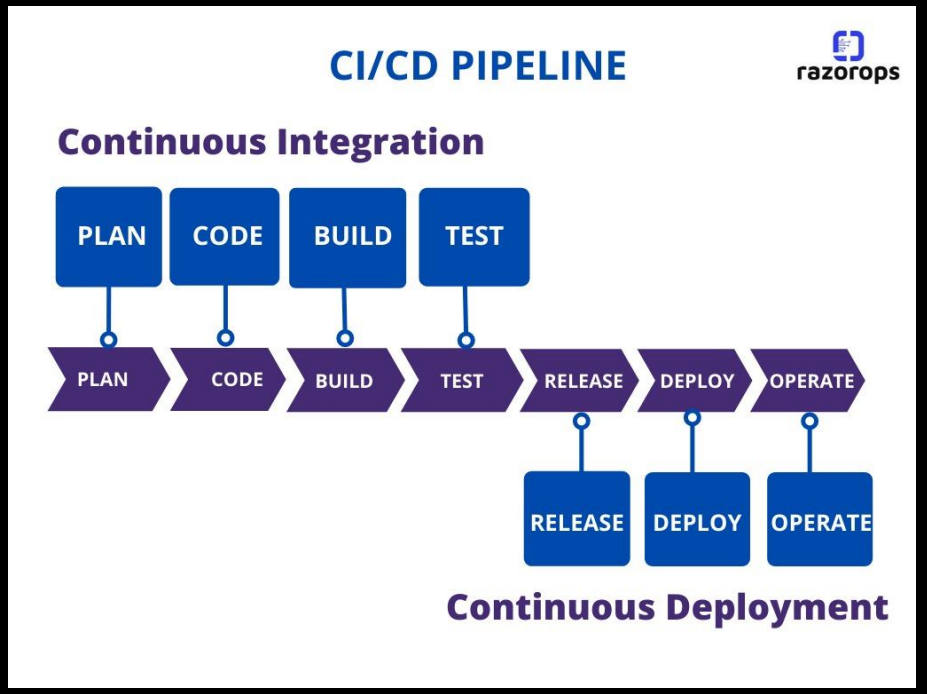
CI OVERVIEW

- **Continuous deployment is a strategy for software releases wherein any code commit that passes the automated testing phase is automatically released into the production environment, making changes that are visible to the software's users**



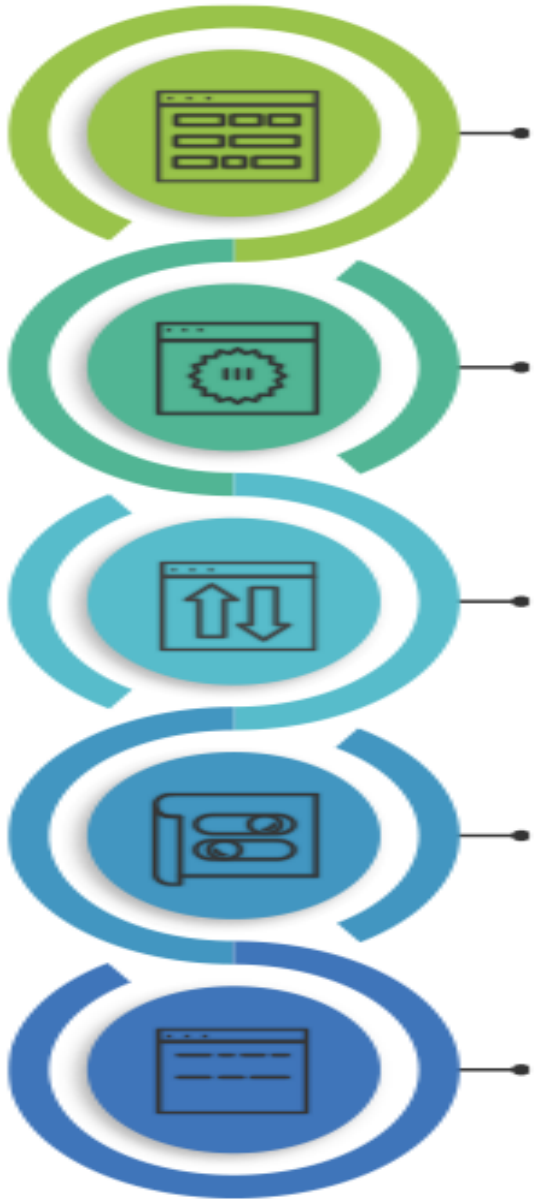
CD/CD

- **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..**



TOOLBOX™

BENEFITS OF CI/CD



- Higher efficiency of web development
- Reduced risk of defects
- Faster product delivery
- Exclusive log generation
- Easier rollback of code changes

BENEFITS OF CI/CD

1. **Higher efficiency**

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.

2. 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.

3. Faster product delivery

With a smooth CI/CD workflow, multiple daily releases can become a reality. Teams can automatically build, test, and deliver features with minimal manual intervention. Docker, Kubernetes, and Travis CI are some of the tools and frameworks that can be used to accomplish this.

BENEFITS OF CI/CD CONT ….

- 4. **Log generation**
- Observability is pivotal for DevOps. If something isn't right, you need to figure out why. You'll need a way to track the system's performance over time to determine essential performance indicators. Observability is a technical tool that aids in this endeavor.
- 5. **Quick rollback if required**
- 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. If any new code change breaks a feature or general application, you can revert to its previous stable version right away. You can deploy the most recent successful build instantly to avoid production interruptions.
- **6. Better planning**
- Organizational designs must be adaptable to changing economic conditions. However, it's difficult for development and testing teams to adapt to rapid changes in dynamic business conditions. A CI/CD pipeline enables organizations to accomplish this by ensuring that they have a well–organized surplus of items and a continuous line of communication with clients.

BENEFITS OF CI/CD CONT ….

7. Efficient testing & monitoring

Testing entails automating each test case and experimenting with the program. Any cycle that needs to be repeated over time should be automated, and there are enough innovations available to achieve this goal. Manual testing measures must be evaluated for possible automation outcomes, and in the vast majority of circumstances, there will be ways to automate the equivalent.

8. Cost-effectiveness

The CI/CD pipeline takes a different approach to software delivery. It can be compared to an assembling unit's delivery pipeline. In any business situation, time and assets are essential. Firms are expected to respond to client demands quickly and effectively with such requirements.