Fundamentals and Benefits of CI/CD to Achieve, Build, and Deploy Automation for UdaPeople Cloud-Based Software

Challenges

- Build and Deployment: The build and deployment process can be automated.

- Integration: Code reconciliation is labor-intensive and necessitates a waiting period while batches of code are aggregated, tested, and developed. This frequently results in time loss since it prevents early finishers from going on to the next assignment, which costs money.

- Security Analysis: The time spent on manual testing might be applied to creating the following key feature, which would cut down on the time needed to create a solution and thus lower the cost of production.

- Testing: Tests are typically carried out by devoted staff members who devote a large portion of their time to these tests, which might be automated. Automating these tests will free up staff time for them to work on other profitable tasks that will boost sales.

- Maintenance: Due to a lack of metrics from monitoring, maintenance is now challenging to perform and makes it difficult to identify mistakes, anticipate potential downtime, and prevent service failure. We can use CI/CD to help with monitoring and prediction, which will reduce costly downtime, win over more loyal consumers, and save money.

Introduction to CI/CD Pipeline.

CI/CD pipelines 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:

- Build
- Test
- Release
- Deploy
- Validate

Benefits of CI/CD to udapeople

CICD Stage	Description	Financial Beefit
Code Integration	CI is the practice of automating the integration of code changes from multiple contributors into a single software project. Less time is wasted on fixing bugs and waiting for others.	Reduce cost
Code Testing	Code-based testing involves testing out each line of code of a program to identify bugs or errors during the software development process. Issues are detected early and do not make it into production.	Avoid cost
Security Checks	The integration of security into CI/CD typically involves adding security checks or safeguards to each key stage of the CI/CD pipeline. Security risks and loopholes are detected early.	Avoid potential cost from code error, and bugs.
Deployment	Continuous deployment automates releasing an app to production. Less human error, faster deployments, less time to ship new features to market, reduced downtime from crashes and cyber-attacks.	Avoid unnecessary cost.
Roll Back	If any new code changes break the production application, you can immediately return the application to its previous state. Usually, the last successful build gets immediately deployed to prevent production outages.	Protect Revenue

Conclusion

All phases of the development lifecycle, the customer experience, and the overall business strategy are impacted by the advantages of CI/CD. It is essential to the development and delivery of software because it enables udapeople teams to work more quickly, adapt to frequent changes, and take into account real-time feedback, all of which result in lower costs, increased profitability, and higher-quality final products.