UDACITY

CI/CD
UDAPEOPLE

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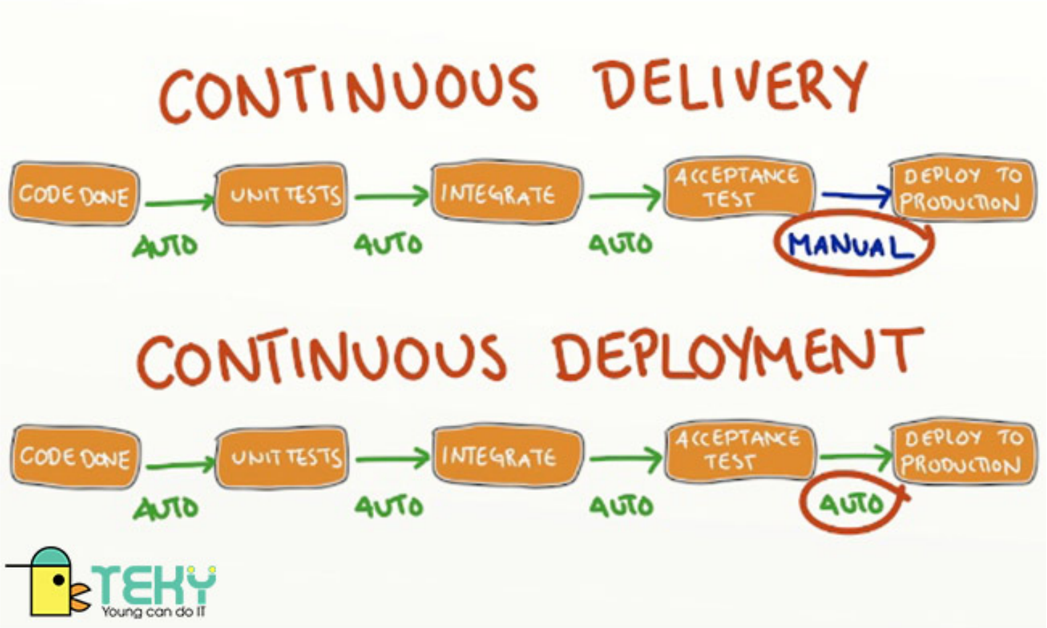
FUNDAMENTALS OF CI/CD



- Continuous Integration (CI):
- Definition: CI involves the automatic integration of code changes from multiple developers into a shared repository.
- Benefits:
  - Early bug detection
  - Collaboration
  - Code quality
- Continuous Deployment (CD):
- Definition: CD focuses on automating the release and deployment of applications to various environments.
- Benefits:
  - Faster time to market
  - Increased reliability
  - Rollbacks and roll-forwards

Benefits of CI/CD for Cloud-Based Software Products

1. Increased Developer Productivity:
    a. CI/CD streamlines the development workflow by automating time-consuming and repetitive tasks, such as code integration, testing, and deployment.
    b. Developers can focus more on writing code and delivering value, rather than being burdened by manual processes.

Benefits of CI/CD for Cloud-Based Software Products

1. Agile Development and Iteration:
    a. CI/CD fosters an agile development environment, enabling rapid iteration and continuous improvement.
    b. Implement user feedback quickly, iterate on features, and adapt to evolving market needs with ease.

BENEFITS OF CI/CD

- Less developer time on issues from new developer code: Continuous delivery helps to ensure that new code is of high quality and free of bugs, which can save developers a lot of time in the long run. This is because continuous delivery automates the testing process, so developers can focus on writing code instead of debugging it.
- Less bugs in production and less time in testing: Continuous delivery also helps to reduce the number of bugs that make it into production. This is because new code is constantly being tested in a staging environment before it is deployed to production. This means that any bugs are likely to be found and fixed before they cause problems for users.
- Prevent embarrassing or costly security holes: Continuous delivery can also help to prevent security holes from being introduced into production. This is because new code is constantly being scanned for security vulnerabilities before it is deployed. This helps to ensure that your software is as secure as possible.
- Less human error, faster deployments: Continuous delivery can also help to reduce the number of human errors that occur during the deployment process. This is because the deployment process is automated, so there is less room for human error. This can lead to faster deployments, which can help you to stay ahead of the competition.
- Less infrastructure costs from unused resources: Continuous delivery can also help you to reduce your infrastructure costs. This is because you can use smaller, more cost-effective infrastructure resources when you are able to deploy new code more frequently.
- New value generating features released more quickly: Continuous delivery can help you to release new features more quickly. This is because you can deploy new code more frequently, without having to worry about breaking your production environment. This can help you to stay ahead of the competition and meet the needs of your users.
- Less time to market: Continuous delivery can also help you to reduce the time it takes to get your product to market. This is because you can release new features more quickly and easily. This can help you to gain a competitive advantage and meet the needs of your customers.
- Quick undo to return production to working state: Continuous delivery can also help you to quickly undo a deployment that has gone wrong. This is because you can roll back to a previous version of your code with a single click. This can help you to minimize the impact of a deployment failure and keep your production environment running smoothly.

Benefits of CI/CD

Catch Compile Errors After Merge

- CI/CD enables immediate error detection after code is written and stored in the repository, reducing post-merge bug detection efforts.
- Smaller, frequent merges save time and effort compared to waiting for a large release, where detecting and resolving errors becomes challenging.
- Early error detection helps avoid excessive overtime costs for IT departments, preventing the exhaustion of budget allocated for resolving post-merge issues.

Faster and More Frequent Production Deployments

- CI/CD enables faster deployment of software products, leading to quicker feedback from customers.
- Rapid customer feedback allows for prompt issue resolution, providing an enhanced shopping experience and improved customer service.
- Increased customer satisfaction and engagement lead to higher revenue generation through repeat purchases, positive reviews, and word-of-mouth referrals.
- CI/CD's ability to iterate and deliver new features quickly allows for capturing market opportunities swiftly, further driving revenue growth.

Automate Infrastructure Cleanup

- Manually removing infrastructure components can lead to oversight and unnecessary costs.
- CI/CD automates the cleanup process efficiently, ensuring all unused infrastructure is promptly removed after tests pass.
- Eliminating unused infrastructure reduces expenses associated with maintaining and paying for unnecessary resources.
- With automated cleanup, there is no more wasted time or money on unused infrastructure, resulting in significant cost savings.