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# CI/CD Implementation benefits for UdaPeople Project

Through this document we will discuss the benefits of implementing Continuous Integration / Continuous Deployment for UdaPeople project

## Introducción

We are currently about to start the development of our new product UdaPeople solution, a tool that will provide solutions to help businesses take care of their customers. Learning from the challenges faced during the development of previous applications, we are proposing the implementation of Continuous Integration and Continuous Deployment during the development of this application. Implementing these practices from the beginning of development will help us improve our processes of construction, testing, quality and delivery to the end user, making faster and easier to deploy changes, reducing the effort used in these development phases.

## What is Continuous Integration / Continuous Deployment?

CI / CD is a practice that, together with its respective tools, helps deliver a software product, from its compilation to its deployment to an end user. It is made up of two parts:

### Continuous Integration

This practice refers to all the steps that are carried out in the construction phase of the product:

- compiling the changes made by the programmers in a single code,

- compile it,
- perform unit test,
- analysis,
- integrity tests

By automating all these steps and performing them continuously, we streamline the construction of a high-quality product

## Continuous Deployment

Continuous deployment refers to the part of deliver the product and its updates to customers automatically and continuously, without the need for the intervention of any human resource, this helps to low costs, and minimize the errors that may occur during these phases:

- Create infrastructure automatically
- Provision Servers and configure them
- Deploy the application on the server
- Run tests
- Publish or update the application automatically
- Rollback to previous version in case something went wrong.

## Cost Benefits.

We explained what is CI/CD and how this practices could benefit our development process, but why is important to invest in its implementation?

## Improve resources use

Currently, we pay for a Github license to versioning code for our different projects, but we are underusing it, but by implementing CI/CD, we will be able to increase the use of Github functionalities, and using in conjunction with tools like CircleCI we can automate the CI/CD pipeline.

## Lower Costs

By experience, one of the main cost we have, are related with network infrastructure, using cloud solutions can become very expensive if it not manage correctly, thanks to CD and IoC we can automate the provisioning of servers and make our network grow or shrink according to our needs, thanks to monitoring and alert tools like Prometheus.

## Reduce human error

Automating this will reduce the involving of human interaction, that can create errors on some of the phases of the creation or deployment, for example, on older projects we were deploying manually the new versions of some applications, that means to manually shutdown applications, copying the new version to servers, replacing the older version, and pass manual tests, and if something went wrong to rollback manually the changes. Also having errors provisioning and configuring servers manually can lead to many human errors, like configuring the wrong database, can increase unnecessary cost, loss of reliability from users. Loss of information, security loss, and a lot of problems when humans are involve.

## Reduce Time

Time is money, and other benefits is reduce time, as we explained, making all integration or deployment phases manually take a long time to do, but thanks to CI/CD we can reduce the time on all this phases, from hours to just minutes, after we implement new features on our product to deliver to the users.

## Summary

In summary, the benefits of investment in the implementation of CI/CD practice, surpass the cost, the investment on licenses on Github, CircleCi, or Prometheus, are no cheap but the cost that will have using our current methodology can lead to wrong and costly server infrastructure. Human errors, even, on only of the integration or deployment steps, can have cost on time, reliability or security.