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What, When and Why of Continuous Integration and Continuous Delivery for Reliable Software Deployment

Continuous Integration and Continuous Delivery (CI/CD) has become an essential piece of software and application development. For many years many software projects have come to rely on a solid and dependable delivery CI/CD process. By answering what, when and why of CI/CD you will understand its benefits and consider it a must have for any software project – be it an organisation's digital transformation down to small home hobby projects.

What is CI/CD?

CI – Continuous Integration - is the process of regularly taking changes to code or configuration and compiling and testing those changes with the shared codebase. As an automated process CI is used to analyse or lint the source code, test code (typically unit testing), compile and build binaries, and generate deployable or installable artifacts. The important aspect is for the process to be continuously repeated to give fast feedback to identify issues or errors.

CD – Continuous Delivery – is where the artifacts or code/script that have passed the CI step and for it to be deployed to an environment, that is provision infrastructure and/or release the application. The software is deployed and running in an independent environment ready to be tested further or ready for users.

But why?

It may seem like extra effort setting up an automated multiple step process for every change when I can just compile or deploy the changes myself.
Following a simple programming paradigm – "separation of concerns" – CI/CD separates the development (writing code) from the deployment (releasing code).
There are many benefits to having a process to 'build and deploy' the software including:

- Faster compiling and deploying
- Fast feedback on errors
- Quicker response to critical or 'hot fix' deployments, or even rolling back an introduced bug is trivial
- Reliable and repeatable builds with predicable deployments
- Recorded builds with history and artifacts
- Reduced manual labour time with added cost saving

- Better team collaboration
- Improved and consistent code quality checks and code testing
- Automatic steps can be built in, such as security and compliance checks
- For Cloud related deployments, it gives a reliable deployment to multiple environments

So simply by moving away from self-building, self-deploying and employing an automated process immediately a developer can focus more on developing software and less on the deployment or build process.

Once the automated process is in place adding steps like linting, running unit tests, security checks, deploying to several environments, running of integration tests (integration, smoke, etc) becomes easy.

Also, if a team is practicing any form of Agile development, the CI/CD process ties in well with the iterative and fast feedback culture it promotes.

When is a good time?

CI/CD should be implemented and used as early as practical in the software project. If the CI/CD process is established early this means the benefits can also be leveraged as soon as possible. The team will see feedback on change, will see results from and encourage the development of unit testing and achieve early goals in delivering solid software.

The other 'when' is how often should the CI/CD be run. Running the CI/CD pipeline with every change, although tempting, is not practical. At a minimum the CI/CD pipeline should be triggered before merging to the 'main' or 'development' branch and again once the merge is complete. CI/CD pipelines should also be available to run manually on any 'branch' of code, giving the developer flexibility to self-check changes.

CI/CD is not new

CI/CD is not a new process and has been well established since the early 2010s. If a software project is not employing CI/CD, it and the organisation are simply missing out. There are many service offerings to support and execute builds and deployment pipeline which can uplift and accompany a team's current workflow.

It doesn't matter if your project is a simple web page, or a full digital transformation using cloud infrastructure, you can benefit from implementing CI/CD and help deliver reliable software.

At Fujitsu Data and AI we can help move projects and organisations to modern ways of working and developing with CI/CD as one part of a software solution. To see how CI/CD can benefit your business's software journey, contact one of our specialists by emailing us today or call 03 9924 3000.

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