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CSD-380 Assignment 1.3
17 August 2025

The History of DevOps

According to Damon Edwards, DevOps, or the blend of development and operations into a cohesive workflow, was born in roughly 2009. As an author at IT Revolution, the organization responsible for the DevOps Handbook, Edwards should be considered a fairly reliable source of information about the history of DevOps, but the exact birth of the DevOps movement is a bit tricky to pin down—especially since some of its core underlying philosophies have roots in much earlier time periods. Three of these important philosophies include the Lean Movement, the Agile Manifesto, and the Continuous Delivery Movement.

The Lean Movement

The Lean Enterprise Institute's article on a brief history of Lean cites examples of process thinking (or early touches of Lean thinking) as early as the 1450s, but puts forward Henry Ford's production process for the Model T as the forerunner of Lean (n.d.). The article calls his production process revolutionary, but also points out its flaw: a highly rigid product design with no real room for flexibility.

The next stage, then, in moving toward what would eventually become the Lean ideal was the Toyota Production System, which worked up from the foundation provided by Ford's production process to create something much more flexible while maintaining the high speed and low cost afforded by automating the production of vehicles.

In 1996, the Lean ideology gained its name and was distilled down to five key principles:

1. Identify value
2. Map the Value Stream
3. Create Flow
4. Establish Pull
5. Seek Perfection

At its core, this philosophy is all about figuring out exactly what the customer wants and eliminating any unnecessary steps to provide that value, ensuring that the process is as efficient and continuous as possible.

The Agile Manifesto

In February of 2001, developers from a variety of groups both familiar and unfamiliar (SCRUM, Pragmatic Programming, etc.) gathered together to chat and walked away with the Agile Software Development Manifesto (Highsmith, 2001). Together, they formed the Agile Alliance, and the twelve principles they agreed upon are still highly relevant to this day.

The group professes that, through their experience developing software and helping others to do the same, they have come to value:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

The twelve principles of their manifesto are a bit lengthy to include wholesale in this paper, but a few notable ones are: "Simplicity—the art of maximizing the amount of work not done—is essential"; "Working software is the primary measure of progress"; and "Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done."

The Continuous Delivery Movement

According to a Medium article by Digger HQ (2023), continuous integration and continuous delivery (CI/CD) emerged as a concept in the 1990s, but did not go mainstream until the early 2010s. It arose in response to a couple key concepts. First, software released more frequently (with smaller batches of changes) was more stable, and second, developers began to recognize the importance of ensuring a consistent environment in which changes are built and tested. To best support these concepts, something different was needed, and so CI/CD began to grow in popularity.

Initially, CI/CD was accomplished with special software on a physical server. Over time, CI/CD as a service became a thing, with Git and other tools being developed. More recently, CI/CD has begun to be integrated into git hosting. GitLab started this in 2015, with GitHub following suit in 2018.

The Modern State of DevOps

In 2009, DevOps as it is known today emerged from the first DevOpsDays conference in Ghent, Belgium. The conference was founded by Patrick Debois, a consultant from Belgium. In many ways, it brought together concepts like those in the Lean Movement,

Agile Manifesto, and CI/CD movement to encourage an integration of development and operations that ensures value is provided to the customer efficiently, effectively, and continuously.

I had the opportunity to work in the DevOps department of a software development company that I interned with this summer, and it was truly enlightening to see the model in action and learn how to contribute to it myself. I was able to build a CI/CD pipeline that automated the nested virtualization of Windows virtual machines in a vSphere-hosted Windows VM running Hyper-V. To do this, I learned about Packer for automating the building of virtual machines, Terraform for automating their deployment into vSphere, Ansible for provisioning them to meet customer requirements, and YAML for providing instructions to the GitLab CI/CD pipeline and these tools. It was really cool to piece together a pipeline that could be run with specific keywords or variables to spin up exactly the type of Windows VM desired. All of this was in support of automating the deployment of the sort of architecture that would be required to test software tools built by other teams at the company, which helped me to see how different development teams must be able to work together in these sorts of situations.

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