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CSD-380 Assignment 1.3

6/1/2025

DevOps is a major trend in the world of operations. As someone who was responsible for a legacy operations team I can attest to the fact that even just a few years ago it was hard to attend a conference or view a sales presentation that did not in some way lean on how to utilize their products to achieve greater agility on the road to a DevOps transformation. The ideals of decreasing lead time by reducing waste and embracing automation all sound great and the story of how DevOps became the new gold standard for operations can give some good insight into why it has been so successful.

There are a few different proposals for how DevOps began with some claiming it started at Google from what is now referred to as Site Reliability Engineering looking to quickly react to disruptions and outages in the environment in ways that provided little to no impact on the end users. Whether this was the beginning or not it seems to be relatively undisputed the movement really began to pick up momentum as a result of a fateful 2008 meeting between Patrick Debois and Andrew Shafer where they discussed the idea of agile infrastructure, as they both were becoming frustrated with roadblocks for operations and the impact it had on development teams and deployments. This meeting led to the formation of an Agile System Administrator Group. From there Debois saw a livestream from the O'Reilly Velocity Conference titled 10+ Deploys Per Day: Dev and Ops Cooperation at Flickr. This led Debois to create a conference of his own called DevOps Days and from there the movement gained momentum especially among cloud native organizations, like Amazon, Netflix, and Google. Amazon is recognized as one of the first organizations to fully embrace DevOps heavily utilizing automation to enable a significant decrease in lead time for deployments. Geeks for Geeks asserts that shifting to a DevOps model “This resulted in faster feedback cycles and improved software quality, which helped Amazon stay ahead of the competition.”

One of the guiding principles of DevOps is the Lean Movement. The lean movement really begins with the 1990 book by Womack, Roos, and Jones about Toyota and their production lines called The Machine That Changed the World. The movement was refined further by the followup effort from Womack and Jones in their 1996 book Lean Thinking which dove deeply into mapping out the value stream. Nanette Brown of Carnegie Mellon University quotes the following entry from Womack and Jones from their Book Lean Thinking “When we start thinking about ways to line up all of the essential steps needed to get a job done into a steady, continuous flow, with no wasted motions, no interruptions, no batches, no queues, it changes everything: how we work together, the kinds of tools we devise to help with our work, the organizations we create to facilitate the flow, the kinds of careers we pursue, the nature of business firms (including nonprofit service providers) and their linkages to each other and society.” This quote does a great job of illustrating how the lean movement was all about optimizing processes and removing waste. These principles are deeply tied with the original goals of DevOps where they were frustrated with the obstacles in their workflows and wanted to remove as many burdens as possible to provide better service.

In February of 2001, a group of seventeen developers put together a document with 12 principles called The Agile Manifesto. This document along with a growing frustration around the pitfalls of the Waterfall Development method led to the beginning of the Agile method of project management and software development. Alek Sharma of the circleci blog writes “Waterfall was slow and rigid. It couldn’t adapt to change, so engineers tried to control it. But that wasn’t responsive enough to deliver quality software customers actually wanted, when they needed it. Agile methodology was a response to this weakness, and its advocates realized that they could never completely eliminate risk or uncertainty from a project. Instead, they focused on containing risk through rapid development and constant validation that their work was heading the right way.” If this sounds familiar to the original goals of Debois and Shafer, well it is. The idea of DevOps formed out of a desire to more closely align operations with the principles of agile development.

Continuous Delivery is one of the goals of DevOps as it looks to improve the delivery of software changes. The goal of this movement is to have higher deployment rates and to offer a continual improvement of processes. The Continuous Delivery Movement largely grew out of the ideas that were introduced with the principles of lean. On their production lines Toyota worked to build only what they needed and when they needed it. They also worked to constantly improve processes, immediately jumping to address any issues rather than pushing the issue aside to deal with it later. The ideas of Continuous development looked at these concepts and built ideas around doing work in order as needed designing processes to make sure things occurred in the correct order and the next step was not waiting inordinate amounts of time for the step before. They also embraced the idea of immediately hopping on problems to address issues rather than incurring technical debt, realizing that deferring the maintenance just leads to repeated occurrences of the problem and larger backlogs. These principles led to methods that are always improving and lead to what we refer to as a CI/CD Continuous Integration / Continuous Delivery pipeline.

There is a strong foundation of Agile and Lean that led to DevOps and the CI/CD pipelines that have dramatically improved the deployment time of our software today. Shafer and Debois were able to apply the learnings of these ideas from other disciplines and dramatically reduce lead time providing a better experience for everyone involved and creating one of the frameworks that has become so instrumental in giving us an internet with constant improvements and minimal downtime, DevOps!

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