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CSD380

Module 1.3 Assignment

The History of DevOps

DevOps represents a fundamental shift in how organizations approach software development and IT operations. It isn't just a set of tool or processes, but a combination of cultural philosophies, practices, and tools designed to increase an organization's ability to deliver applications and services quickly. DevOps breaks down the traditional barriers between developers and operations. It fosters a culture of collaboration and communication around a shared set of principles and values, enabling cross-functional teams to navigate the technology value stream from idea/issue to deployed value efficiently.

A central objective of DevOps is achieving speed and velocity, enabling organizations to innovate faster, adapt more quickly to market changes, and respond rapidly to customer needs or defects. This translates into rapid delivery, increasing the frequency and pace of software releases through practices like Continuous Integration (CI) and Continuous Delivery (CD). Traditional development involved lengthy planning and development cycles where deployments occurred in the timeframe of months to years. Elite DevOps teams achieve multiple code deployments per day enabling the business to stay competitive and react quickly in the fast-paced market. DevOps emphasizes ensuring the quality, safety, and stability of application updates and infrastructure changes to maintain a positive end-user experience. Improved collaboration is another key goal, fostering effective teams built on principles of ownership, accountability, and shared workflows. Efficiency is pursued through the streamlining of processes and the aggressive elimination of waste, drawing inspiration from Lean manufacturing principles. Finally, DevOps mandates a hyperfocus on customer needs, utilizing short feedback loops and continuous improvement cycles to ensure delivered software provides real value.

DevOps is built upon and influenced by the Lean manufacturing principles developed in the Toyota Production system, The Agile revolution in software development, and the technical practices of the Continuous Delivery movement.

The core principles of Toyota's Lean manufacturing – that lead them to being one of the top auto manufactures in the world, are the elimination of waste, continuous improvement, value stream mapping, flow, pull systems or just-in-time, automation, and respect for its people (giving anyone the chance to stop process when issues arise or inefficiencies are identified).

Lean provided a foundation, and the Agile Revolution brought those changes to software development. In February 2001, seventeen software developers met in Snowbird, Utah and created the Agile Manifesto. They created it in response to their frustration with the rigid and slow methodologies at the time, like waterfall. It includes 4 values and 12 principles that Agile software teams should embrace to deliver valuable software efficiently.

The four values are

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 are

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

Business people and developers must work together daily throughout the project.

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

Working software is the primary measure of progress.

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

> Continuous attention to technical excellence
> and good design enhances agility.
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> Simplicity--the art of maximizing the amount
> of work not done--is essential.
>
> The best architectures, requirements, and designs
> emerge from self-organizing teams.
>
> At regular intervals, the team reflects on how
> to become more effective, then tunes and adjusts
> its behavior accordingly.

Continuous Delivery provides the technical practices and automation needed to bridge the gap between development completion and deployment. Continuous Delivery emerged as a logical extension of Continuous Integration and Agile principles. Continuous Integration is where developers frequently merge their code changes into a central, shared repository, often multiple times a day. Each integration triggers and automated process that builds the software and runs automated tests with the goal of identifying issues quickly. Continuous Delivery takes CI a step further. Code changes that pass CI are automatically prepared and deployed.

The principles from Lean, Agile, and CI/CD have significantly influenced the way software teams run, from the tools they use to the way projects are managed. Well executed DevOps teams drive towards delivering value to users faster, more frequently, and more reliably.

Sources

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