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CSD 380 Secure Software Development

Module 1.3 Assignment: History of DevOps

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**The History of DevOps**

DevOps is a modern approach that bridges the gap between software development and IT operations. It was created to solve long-standing problems with software delivery, such as delays, communication breakdowns, and unreliable releases. DevOps brings together ideas from the Lean movement, the Agile Manifesto, and the Continuous Delivery movement. Each played a key role in shaping what DevOps is today; a culture and set of practices focused on collaboration, speed, and reliability.

**Lean: Improving Flow and Reducing Waste**

The Lean movement began in manufacturing, especially at Toyota, with a focus on eliminating waste and improving the flow of work. These ideas later influenced the tech industry. In IT, Lean helped teams think beyond individual tasks and focused on improving the whole software delivery process.

According to Doss (2019), Lean inspired early concepts like "agile operations," which eventually led to DevOps. By encouraging teams to eliminate delays and streamline workflows, Lean provided a foundation for faster, more efficient software development and deployment.

**Agile: A Shift in How Software Is Built**

In 2001, the Agile Manifesto was introduced by a group of developers who wanted to make software development more flexible and responsive. Agile focuses on working software, customer feedback, and adapting to change rather than sticking to strict plans.

Quick (2023) explains that Agile helped speed up development but often stopped short of solving deployment challenges. Code might be written faster, but it still had to go through slow and manual operational processes. DevOps builds on Agile by applying those same flexible and collaborative principles to both development and operations.

**Continuous Delivery: Automating and Releasing with Confidence**

Continuous Delivery (CD) is the practice of automatically building, testing, and preparing software for release. Its goal is to make software ready to deploy at any time, with minimal manual effort and reduced risk.

Kim et al. (2021) describe CD as a key part of DevOps, enabling frequent and reliable software releases. Automated pipelines for integration, testing, and deployment allow teams to deliver updates quickly and safely. Fenton (2022) adds that CD works alongside Lean and Agile. Lean improves the flow of work, Agile accelerates development, and CD ensures smooth, safe releases.

**DevOps: The Combination of All Three**

DevOps became popular around 2009 when developers and system administrators began working more closely together to solve real-world deployment issues. As Iheanacho (2023) notes, DevOps promotes collaboration across teams, automation of tasks, and shared ownership of the software lifecycle.

DevOps includes practices like Infrastructure as Code (IaC), Continuous Integration and Delivery (CI/CD), real-time monitoring, and feedback loops. More importantly, it’s a culture shift that breaks down silos and encourages constant learning and improvement.

**Conclusion**

DevOps was born from the need to improve how software is delivered. It blends the Lean focus on efficiency, the Agile focus on adaptability, and the Continuous Delivery focus on automation. Together, these movements formed the foundation for DevOps, which continues to help teams deliver better software faster and with greater reliability.

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