

# DevOps: What, Why & How?

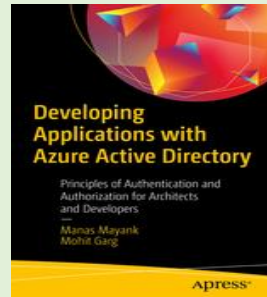
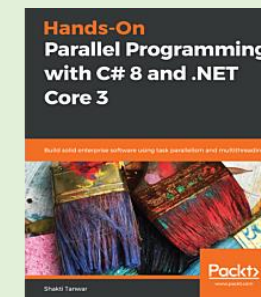
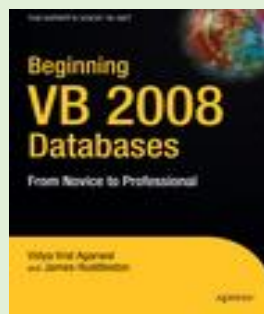
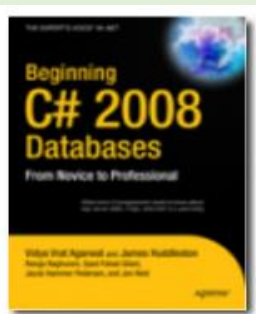
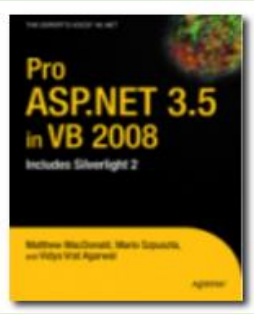
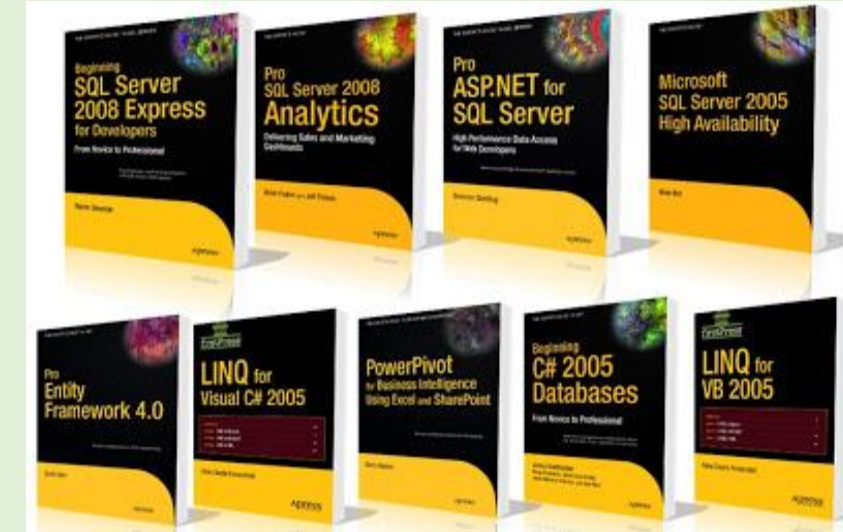
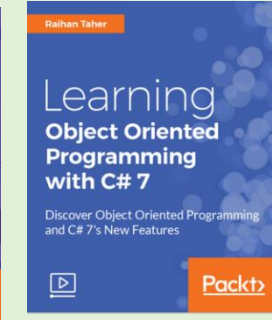
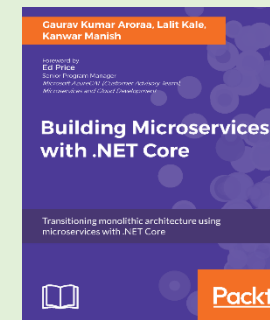
**Vidya Vrat Agarwal**

[www.MyPassionFor.Net](http://www.MyPassionFor.Net) | [@dotNetAuthor](https://twitter.com/dotNetAuthor)

<https://www.linkedin.com/in/vidyavrat/>

# About Me

- 18+ years of industry experience
- Principal Architect with T-Mobile
- Microsoft MVP Since 2014 | C# Corner MVP Since 2013
- TOGAF Certified Architect
- Certified Scrum Master (CSM)
- Certified Associate in Project Management (CAPM)
- Microsoft Certified (MCT, MCSD / MCAD .NET, MCTS etc.)
- Published Author (5), and Technical Reviewer (over a dozen)



# Industry Trends for IT



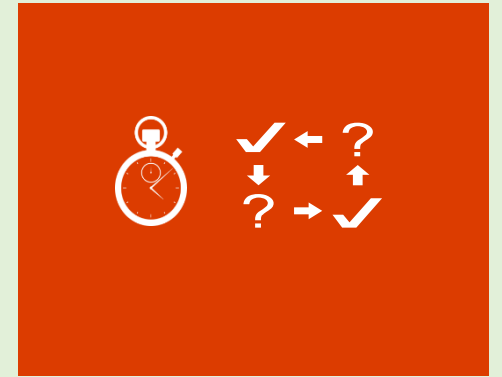
Heterogeneous  
devices and  
platforms



Hybrid IT

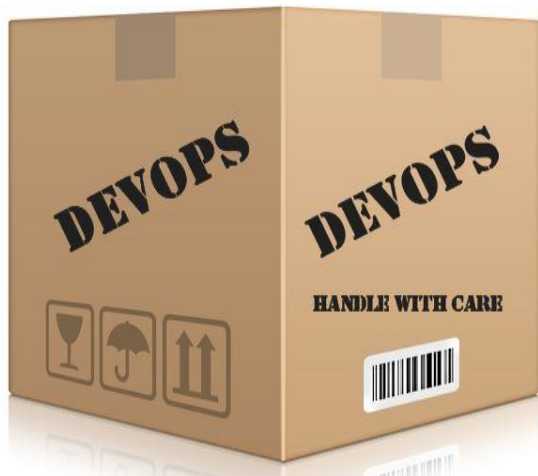


Distributed teams

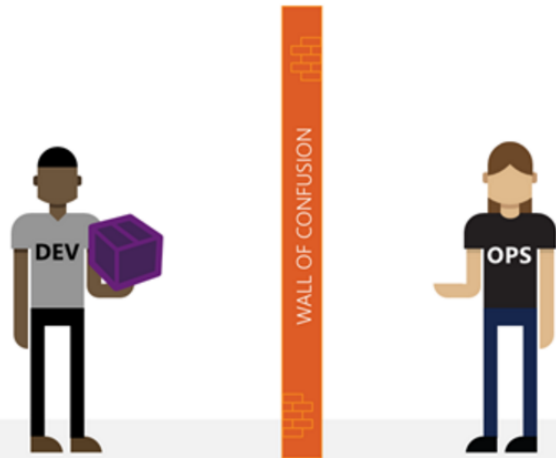


Delivery agility

# DevOps & It's key values

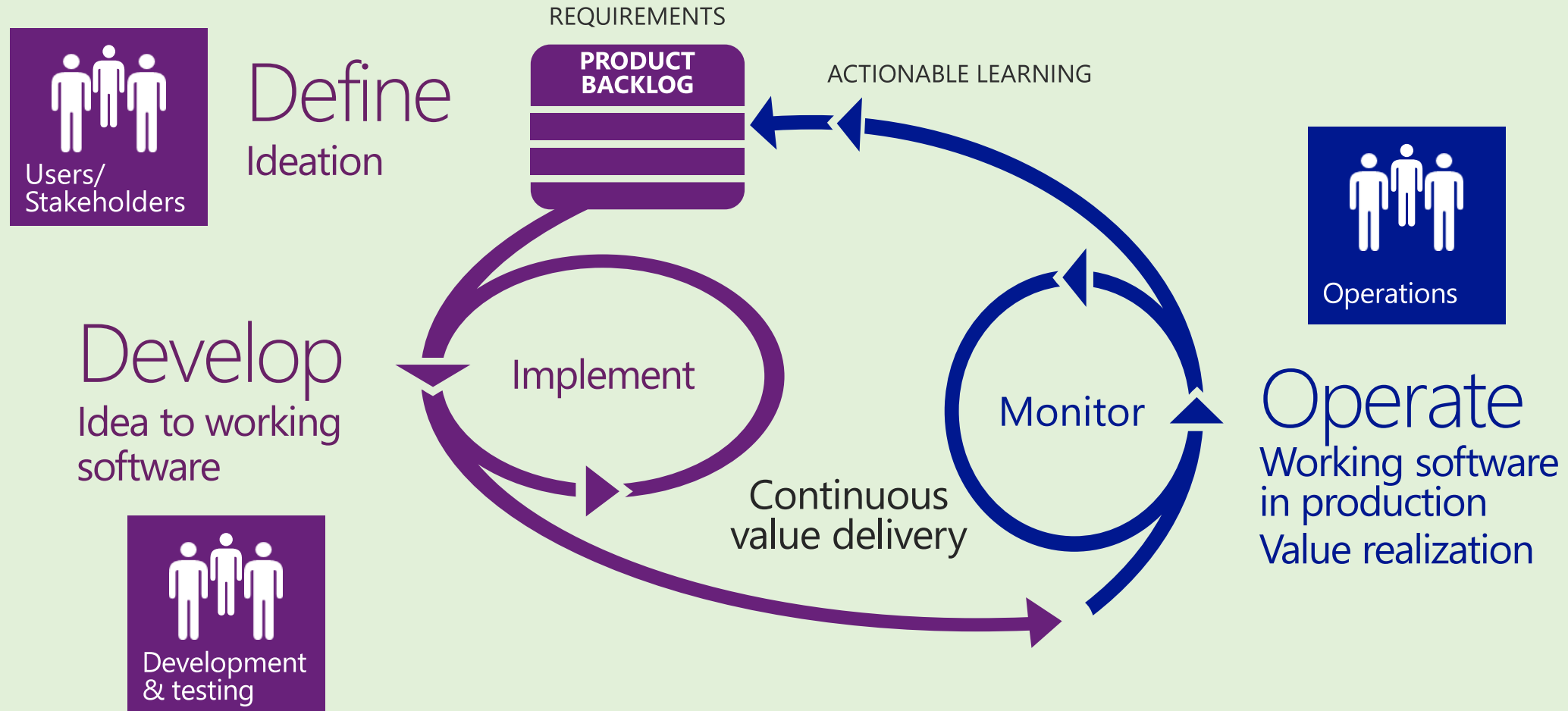


- You cannot buy DevOps and install it.
- "DevOps is the union of people, process, and products to enable "continuous delivery" of value to our end users." – *Donovan Brown, MSFT*

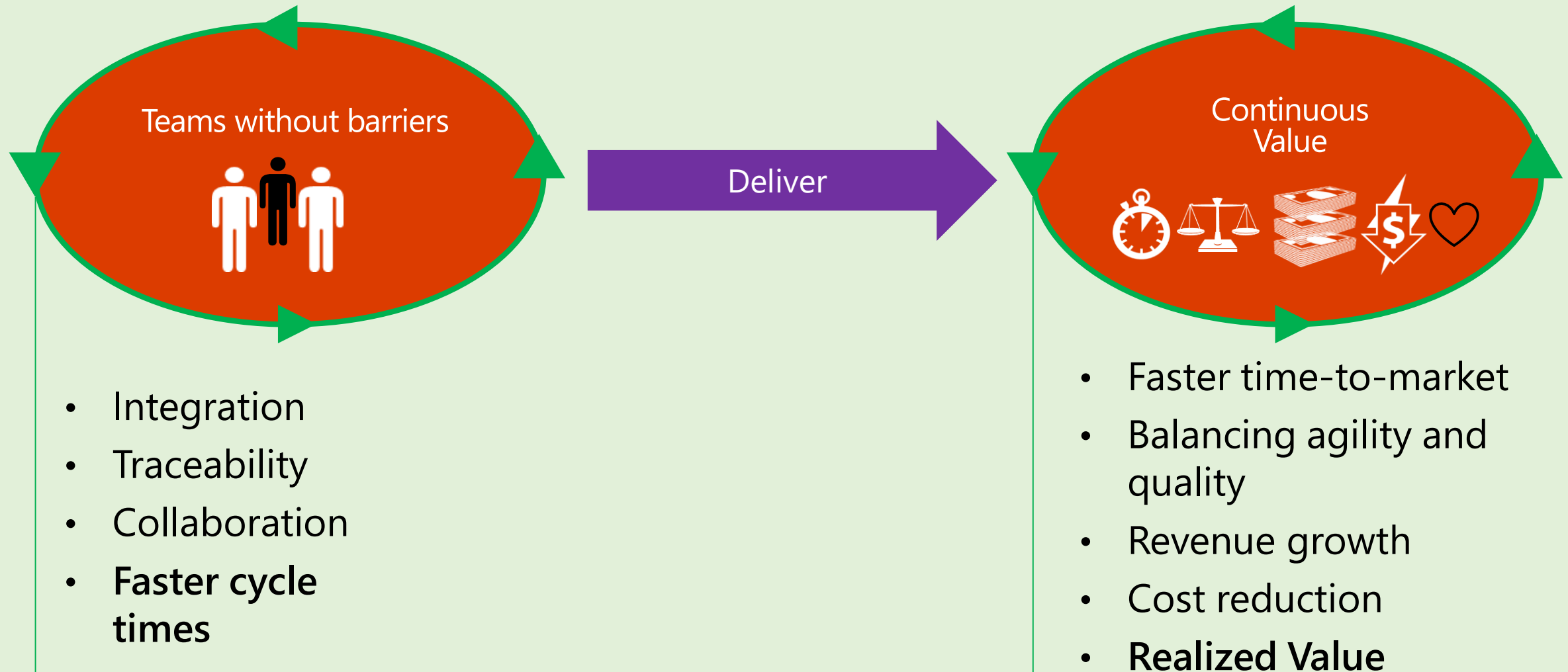


- Breaks walls of confusion between teams & fosters better communication and collaboration throughout the application development lifecycle.
- Delivers software more frequently & produces higher quality software.
- Shortens lead time and software delivery cycles.

# DevOps Workflow from Planning to Release



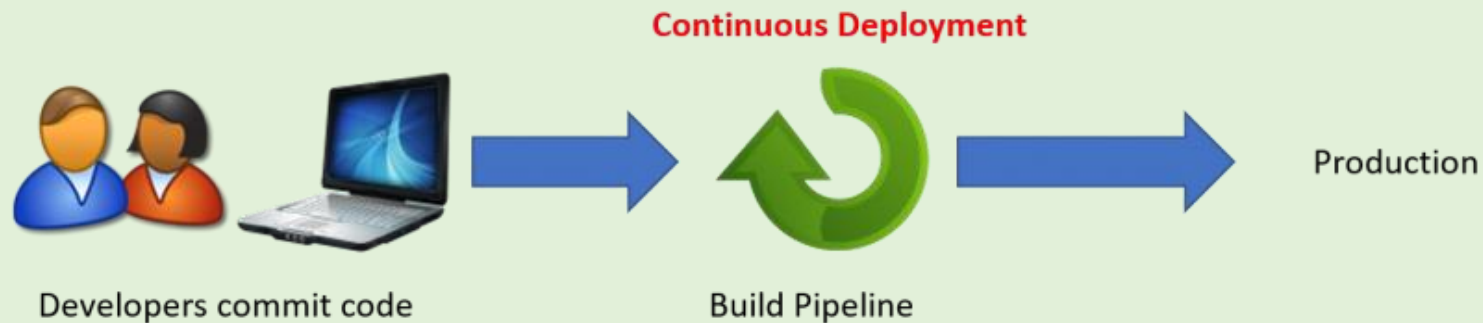
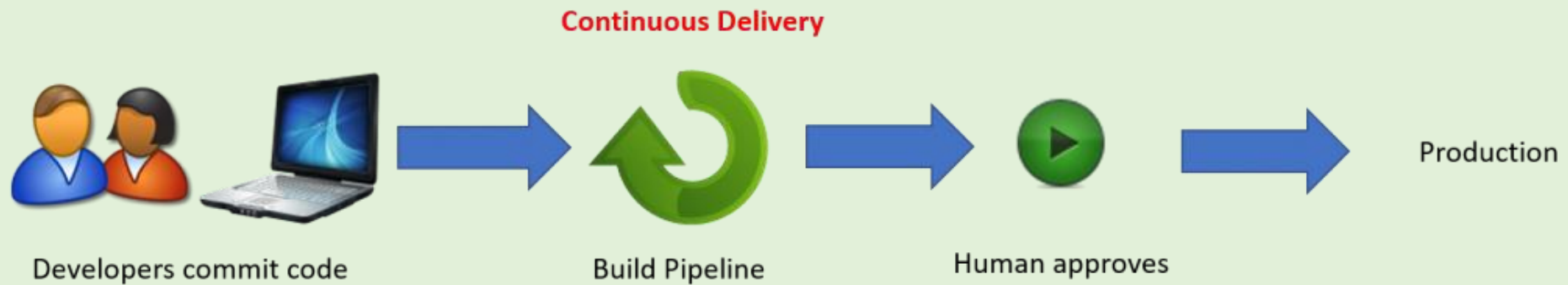
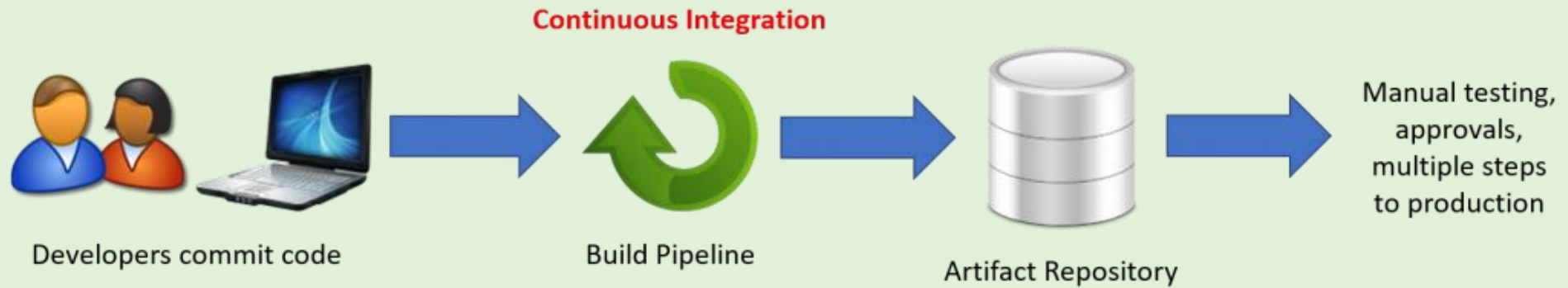
# Teams without barriers realize business value.



# DevOps Practices

- Continuous Integration
- Continuous Delivery
- Continuous Deployment
- Infrastructure as Code
- Test Automation
- Application Performance Monitoring









# Any Language, Any Platform

## **Program in any language**

.NET  
Java  
Python  
Ruby  
Nodejs  
...

## **Develop on any OS**

Linux  
Mac  
Windows

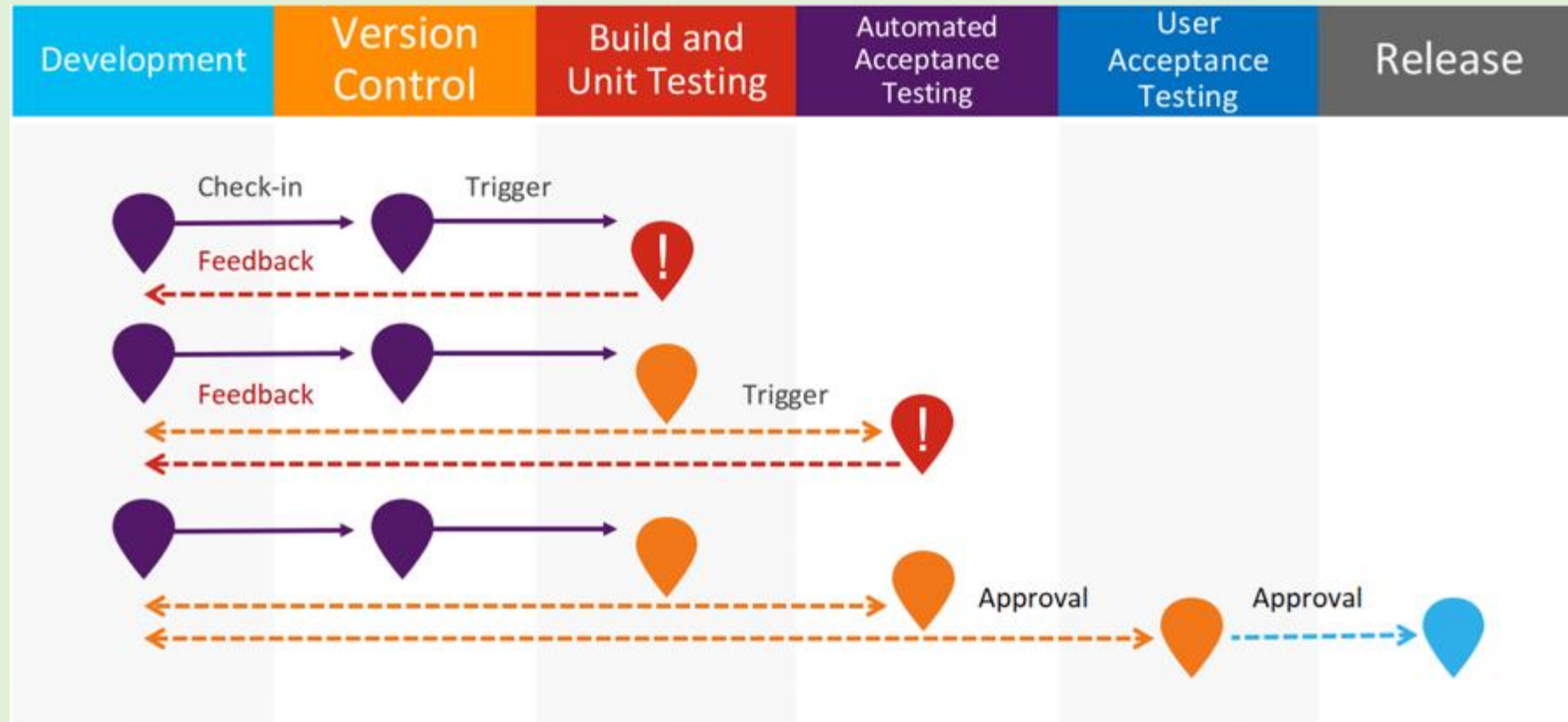
## **Deploy to any Platform**

- Android
- iOS
- Docker
- Kubernetes
- Azure
- AWS
- Serverless
- APIs
- Web Apps

# DevOps Metrics



# DevOps Automation



# DevOps Toolchain

DevOps is technology agnostic and any development environment on any platform can fully adopt DevOps culture and can continuously deliver quality software to their customers.

## **Planning and Analysis**

Capturing and tracking (TFS, VSTS, JIRA, ServiceNow).

Documentation or Wiki page (SharePoint, Confluence).

Collaboration (Slack, HipChat, Microsoft Teams).

## **Design and Development**

SCM (TFS, VSTS, Subversion, Git, Mercurial).

IDE (Eclipse, IntelliJ, Visual Studio).

## **Build and Release (CI/CD)**

Repository management (Artifactory, Nexus).

Build tools (MSBuild, Jenkins, Bamboo).

Configuration management (Chef, Puppet, Ansible).

Cloud (AWS, Azure, OpenStack).

Containers (Docker).

## **Integration and Testing**

Source code verification (SonarQube).

Security testing (HP Fortify).

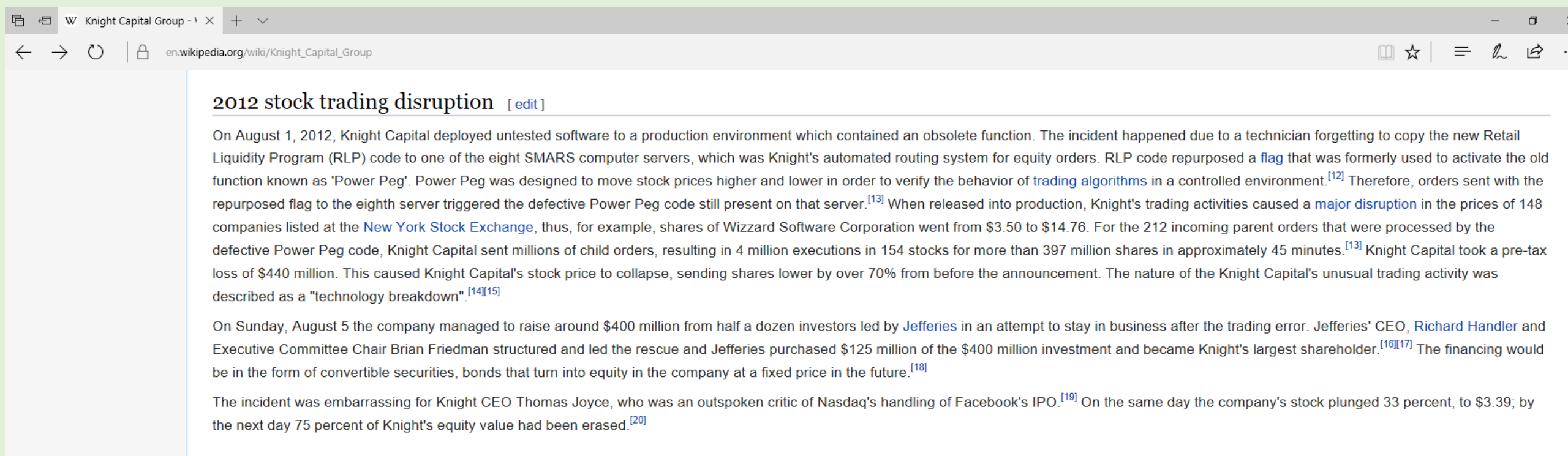
Functional testing (MSTest, NUnit, JUnit, Cucumber, Selenium).

Performance testing (Apache Test Bench, Microsoft Load and Performance Test).

# With / Without DevOps

Category	Without DevOps	With DevOps
Quality of code check-ins	Unknown	Validated through unit tests
Environment creation	Manual	Automated
Deployment Frequency	1-2 times a month	Several times per day
Deployment Process	Requires meeting/planning	Push button deployment
Deployment Validation	Manual	Automated
Monitoring	Manual to None	Health & Performance Monitoring
Dev & Ops Relationship	Culture of Blame	Culture of Trust

# Cost of NOT Deploying to just ONE server



The screenshot shows a web browser window with the address bar displaying 'en.wikipedia.org/wiki/Knight\_Capital\_Group'. The page content is titled '2012 stock trading disruption' with an '[ edit ]' link. The text describes a major trading error by Knight Capital on August 1, 2012, where untested software caused a \$460 million loss. It details how a technician forgot to copy new code, leaving old 'Power Peg' code on a server, which triggered a massive sell-off of 148 companies' stocks. The error was corrected on August 5, but the damage was done.

**2012 stock trading disruption** [ edit ]

On August 1, 2012, Knight Capital deployed untested software to a production environment which contained an obsolete function. The incident happened due to a technician forgetting to copy the new Retail Liquidity Program (RLP) code to one of the eight SMARS computer servers, which was Knight's automated routing system for equity orders. RLP code repurposed a [flag](#) that was formerly used to activate the old function known as 'Power Peg'. Power Peg was designed to move stock prices higher and lower in order to verify the behavior of [trading algorithms](#) in a controlled environment.<sup>[12]</sup> Therefore, orders sent with the repurposed flag to the eighth server triggered the defective Power Peg code still present on that server.<sup>[13]</sup> When released into production, Knight's trading activities caused a [major disruption](#) in the prices of 148 companies listed at the [New York Stock Exchange](#), thus, for example, shares of Wizzard Software Corporation went from \$3.50 to \$14.76. For the 212 incoming parent orders that were processed by the defective Power Peg code, Knight Capital sent millions of child orders, resulting in 4 million executions in 154 stocks for more than 397 million shares in approximately 45 minutes.<sup>[13]</sup> Knight Capital took a pre-tax loss of \$440 million. This caused Knight Capital's stock price to collapse, sending shares lower by over 70% from before the announcement. The nature of the Knight Capital's unusual trading activity was described as a "technology breakdown".<sup>[14][15]</sup>

On Sunday, August 5 the company managed to raise around \$400 million from half a dozen investors led by [Jefferies](#) in an attempt to stay in business after the trading error. Jefferies' CEO, [Richard Handler](#) and Executive Committee Chair Brian Friedman structured and led the rescue and Jefferies purchased \$125 million of the \$400 million investment and became Knight's largest shareholder.<sup>[16][17]</sup> The financing would be in the form of convertible securities, bonds that turn into equity in the company at a fixed price in the future.<sup>[18]</sup>

The incident was embarrassing for Knight CEO Thomas Joyce, who was an outspoken critic of Nasdaq's handling of Facebook's IPO.<sup>[19]</sup> On the same day the company's stock plunged 33 percent, to \$3.39; by the next day 75 percent of Knight's equity value had been erased.<sup>[20]</sup>

<https://www.bugsnap.com/blog/bug-day-460m-loss>

[www.MyPassionFor.Net](http://www.MyPassionFor.Net) | [@dotNetAuthor](#) | <https://www.linkedin.com/in/vidyavrat/>



# Thank You

Vidya Vrat Agarwal

[www.MyPassionFor.Net](http://www.MyPassionFor.Net) | [@dotNetAuthor](#)

<https://www.linkedin.com/in/vidyavrat/>