# The Road to DevOps Success

**Achieve CI/CD**
with Machine Data

The digital economy moves at Internet speed. Accordingly, businesses must deliver and refine new software and services faster than ever—with agile, iterative software development and delivery. Frequent, smaller updates empower developers to rapidly try new features and limit the risk of breaking something critical. They also keep apps fresh and top-of-mind with customers and enable quick responses to threats and changes to the business.

Rapid app release cycles are common in digital businesses, where organizations are being reshaped by technologies like cloud services with software-defined infrastructure, mobile apps and social communication channels. These cycles have prompted new architectures, design patterns, application stacks and continuous delivery release trains.

DevOps, a full lifecycle approach based on a culture of collaboration, is emerging as the leading way to develop, deliver and support applications. Businesses that adopt DevOps move faster, enabling them to keep up with customer demands in an ever-changing digital world.

Yet, the hopes and dreams of DevOps devotees are often dashed on the rocks of organizational reality. DevOps doesn't always live up to its promises, often due to technological and bureaucratic complexity. Creating an agile, responsive, data-driven culture and supporting processes is easier said than done. While there are many challenges along the way, machine data collection and analysis are frequent blockers to achieving DevOps excellence.

Machine data comes from applications, cloud, infrastructures, containers, mobile apps, databases, the IoT, streaming network data and more. Machine data goes beyond logs—it contains a definitive record of all the activity and performance of all apps, systems, customers, APIs, industrial systems and much more.

## The Reality of DevOps

DevOps introduces agile development methods into software-defined infrastructure and operations. It is about constant iteration. Code is defined, tested, deployed, monitored and measured. When problems are encountered, the code is modified and the process starts again. Rinse and repeat. The entire process requires speed, agility and an organizational mindset that embraces incremental improvements and fast failure—not big bang software releases.

The key to a successful DevOps feedback loop is software metrics—the measurement and analysis of usage, performance and errors. The flexible nature of analytics platforms to ingest and report on any type of data makes them well-suited to DevOps processes, which invariably include tools from various sources.

Complexity is the enemy of agility. A typical DevOps process includes eight major steps with different tools used at each stage (*Figure 1*). Since these tools are often open source or point products, there's little to no integration between them, creating overlaps and inefficiencies that cloud visibility of the overall process and hamper agility.
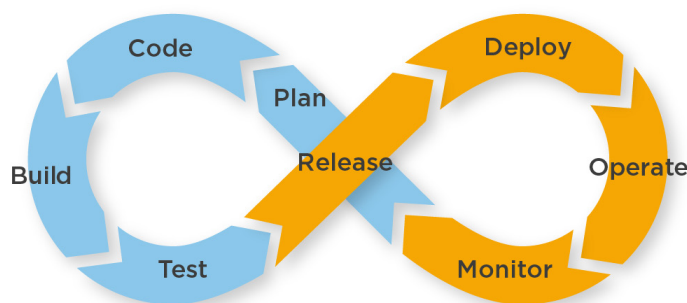


Figure 1: Major steps of a typical DevOps process

The infinity symbol is a common depiction of the stages of DevOps, since it nicely illustrates the two intertwined phases of the process. The left side deals with the software development and testing cycle (the "dev"), and the right represents the deployment and operations cycle (the "ops"). Yet each step in the

cycle represents distinct product markets for tools, where a dozen or more products are commonly used in each stage.

This abundance of choice is great for developers and operations teams, because each team can choose products that suit its needs and preferences. But the resulting stew is a nightmare for project managers, DevOps leads and business execs. A mix of DevOps systems, each exhausting data in isolation, obscures visibility into the overall process.

Flying blind in the DevOps world means there's no way to tell if "fixes" solve the root problem or just provide a temporary patch. If teams lack full visibility into the entire cycle of code development, release and usage data, they can't validate app quality, performance and security. For example, a security monitoring software can identify a vulnerability, but without a means of tracking the problem back to its source software module, the problem can't be fixed.

Additionally, when organizations lack visibility into DevOps metrics, they can't achieve the agility needed to try new ideas or iterate in response to changing business conditions. And without a data feedback loop covering the entire app delivery lifecycle, organizations struggle identifying errors in code development, testing, QA and production. The result is poor quality, which can lead to customer dissatisfaction and churn.

Disjointed DevOps-build pipelines result in multiple, time-consuming handoffs throughout the application delivery process, which risks the introduction of redundant features and lowers efficiency through task-switching that drain everyone's resources. A disconnected delivery workflow also means impaired collaboration (with cross-departmental gaps by teams using different terminologies and having different viewpoints on the overall project). Together, the friction in communication and information sharing undermines trust and cooperation and runs counter to the core premise of DevOps.

Without a platform to provide data-driven feedback, DevOps is unlikely to be successful. The only way organizations can avoid this pitfall is to use data to measure, report and demonstrate the success of DevOps, while using data-driven insights to optimize and improve it over time.

### Realizing the Full Value of DevOps

DevOps is a buzzword for most executives, and a lack of familiarity often leads to unrealistic expectations. They have high hopes for what it can achieve, but lacking a proper understanding of the principles, process and challenges sets them up for disappointment.

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### DevOps in Practice

Agile companies are tuned into customer needs. Being tuned in requires a data-driven platform that provides constant feedback to help all areas of an organization: IT, app developers, line of business execs, security teams, auditors and others. By providing fact-based insights and decision support, a DevOps data platform enables businesses to move swiftly to embrace good ideas and eliminate bad ones.

To do this correctly, DevOps requires data, tools and processes that provide all stakeholders with continuous insights into the DevOps workflow necessary to run business units, application development and IT operations. Machine data provides the raw materials for these insights and decisions, and used properly, delivers many benefits (*Table 1*).

## Table 1. Benefits of Using Machine Data for DevOps Analytics

| Benefit | Impact on the Business |
|---|---|
| Better decision making | Machine data uncovers a single version of the truth. All parties—IT ops, dev and line of business—have the same view from information correlated across the development and delivery chain. |
| Easier access to data | Business stakeholders can measure the effect of ideas and releases on customer experience, revenue, retention and other metrics. |
| Enhanced security and compliance | Security and audit teams can assure compliance through visibility into pre-production environments and QA testing for code compliance, vulnerabilities and various attack vectors. |
| Improved uptime | IT ops teams are engaged earlier by collaborating with development teams on the measurements to prevent and minimize production service disruptions and outages. |
| Faster development time | Developers iterate faster with less risk by using insights gleaned throughout the app development and delivery process. They can demonstrably see how their apps run in production and if the latest updates caused production problems. |

In practice, successfully coupling DevOps with comprehensive, data-driven analytics provides three key benefits: faster application delivery, better application quality and better business quality.

## Deliver Applications Faster Using Data Analytics

Achieving agility and customer satisfaction requires DevOps teams to have four key capabilities:

- **Monitoring:** Every component of the DevOps build and delivery workflow must be instrumented with the data collected into a master repository for further analysis. Without data, it's impossible to understand and remediate app delivery issues.

- **Iteration:** Code fixes and improvements must be rapidly identified, triaged and developed using data correlated from throughout the tool chain to provide deeper application insights.

- **Collaboration:** Rapid delivery requires that DevOps teams are on the same page, use the same data and take action based on the same measurements.

- **Optimization:** DevOps managers must constantly strive to improve the process by making fact based decisions. Process optimization requires data-driven answers to questions such as:

  - What is our rate of "idea-to-cash," our end-to-end throughput to profitability?

  - How long is each phase of our delivery pipeline?

  - How much time do teams spend writing, testing or reviewing code?

  - Which development teams are the most productive?

> The benefits of data-driven DevOps flow directly to the bottom line—improving the business through greater efficiency and developer productivity, faster application delivery, lower costs, higher customer satisfaction and greater revenue.

## Create Better Applications With Real-Time Insights

Machine data from across the DevOps tool chain provides information that enables proactive response to issues early in the development and testing cycle. With machine data, developers and operations teams can see and fix problems before customers and users experience the frustration of broken features and crashing apps. This type of proactive response requires a common data platform that DevOps teams can use as a single version of the truth that is comparable to the way source code control systems empowers developers to consolidate and share work results.

Instrumenting and analyzing the entire DevOps process can demonstrate the actual performance, usage and error data that are critical to improving both the end product and overall process. A common data platform enables information to be correlated across tools and infrastructure and can proactively alert to problems. For example, correlating data from code checks with performance monitoring systems can reveal problems before users file bug reports.

Consolidating data from throughout the DevOps delivery cycle requires a platform that can ingest data in real time from across tools used in the eight-phase cycle described earlier. Development tools are constantly changing, and so is the data.

Data is the raw material of DevOps measurement, but it must come from objective metrics that can quantify whether code meets functional and operational specs and quality SLAs. Using a common data repository to analyze the entire DevOps process can help achieve:

- Quantifiable measurement of code review and resolution times

- A single data repository for bug analysis and project tracking tools

- Consistent, measurable and trackable benchmarks for bug rates across development teams and code releases

- Increased visibility of test and software quality assurance metrics that allow problems to be identified before production release

- Tighter integration of security into the development process, or what is increasingly known as *DevSecOps*. By gathering applications and security intelligence analysis early in a build cycle, development teams can deliver more secure and compliant code by spotting and eliminating vulnerabilities early. A common DevOps data platform means that security audit data is collected and easily available in one place. The net result of real-time, data-driven insights from the application build pipeline enables security teams to communicate, alert and avert new potential threats before applications are deployed.

## Get Better Business Results

The benefits of data-driven DevOps flow directly to the bottom line—improving the business through greater efficiency and developer productivity, faster application delivery, lower costs, higher customer satisfaction and greater revenue. Organizations that expand use of a comprehensive data analytics platform like **Splunk** from its traditional role in IT operations to DevOps can expect:

- Real-time visibility of usage, performance, reliability, errors and security incidents for new applications releases, not delayed by hours or days as when using ad hoc reporting

- Dramatically lower MTTR, up to 70 percent faster production and 40 percent faster pre-production problem resolution

- Greater efficiency through automated data ingestion and analysis. Developers and operations teams can focus on meeting the business needs and not wasting time on building and maintaining monitoring tools

Ensuring DevOps teams stay aligned with business requires a continuous delivery process with frequent releases that are measured and correlated with actual business results. A DevOps analytics platform can ingest business-relevant data from a variety of sources in the cloud or on premises. Consolidated, universal data indexing and correlation not only provide visibility into the delivery status of key features, but also help draw connections between DevOps activity and relevant customer and business metrics.

Fact-driven DevOps improves the customer experience by delivering better performing and more useful code. Better code means happier customers, and happier customers are more loyal. Using data from across the DevOps-build pipeline means customer satisfaction can be directly tied to code releases by analyzing metrics like application usage and sales. Other common DevOps-related business metrics include:

- The rate of customer signups and downloads and revenue changes looking for peaks and troughs associated with product releases

- Changes in customer engagement and sell through or cart abandonment

## Analytics Quantifies and Enhances DevOps Benefits

Success in the digital world requires agility. This is achieved through an efficient DevOps release process, and data analytics are needed to get the most out of a DevOps program.

DevOps practitioners must continuously improve responsiveness, collaboration, security and regulatory compliance—all of which directly enhance business reputation and customer satisfaction through rapid development of innovative products. Yet, adopting DevOps comes with many challenges that are often the result of complex processes and tool chains. Business execs, IT leaders and development teams must understand not only the benefits of DevOps, but how to successfully achieve them.

The secret to DevOps success is quantified validation. The adage "If you can't measure it, you can't improve it" still applies, and a consolidated data analytics platform provides the ideal system for measurement and evaluation.

Learn more about **Splunk for DevOps** or try Splunk software for **free**.

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