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White paper

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Application Performance Management and DevOps: A winning combination

A research study exploring a path to higher application quality and performance

IBM

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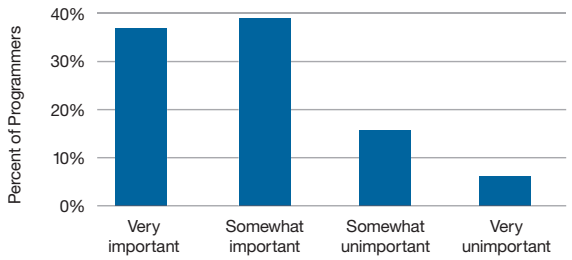
APM and DevOps: A complementary approach to agile, responsive development

Digital transformation has profound ramifications for your organization—disrupted business models, higher customer expectations, emerging industries and channels. And the length of an application development cycle? That's no longer decided by you. Instead, it's driven by customers and the competitive marketplace, and the time between releases grows ever shorter. Often, you're starting the next version of an application before the previous version is even completed. *An environment that incorporates both DevOps and end-to-end application performance management (APM) is critical to keeping pace with iterative, responsive and agile development cycles.*

DevOps is a vital component of digital transformation. In fact, a recent study by Evans Data illustrates the importance of DevOps, with a combined 76 percent of the developers polled considering DevOps to be very or somewhat important for their future (see Figure 1).[1]

How important is DevOps to your overall digital strategy?

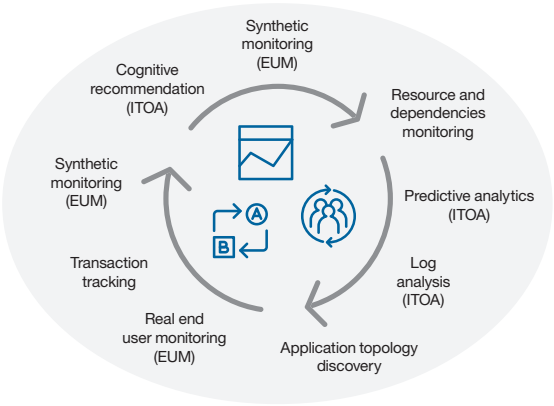


Source: Global Development Survey: Vol. 1, ©2016 Evans Data Corp., Date published: 05/31/2016.

Figure 1: A combined 76 percent of developers polled consider DevOps to be very or somewhat important to their future.

From a process and tools perspective, DevOps breaks down the barrier between development and operations to help deliver three key value propositions, including:

- Accelerating the delivery of innovation with frequent application updates (daily, weekly and monthly)
- Facilitating reduced operational costs of delivering releases—costs that have traditionally hindered agile delivery
- Engaging directly with the user base to align limited development resources with high value efforts



Source research study data provided by IBM Market Development & Insights.

Figure 2: As more organizations adopt DevOps models, these APM tools and capabilities are expanding from operations into development.

Note: ITOA = IT operations analytics, EUM = end user monitoring.

On the *APM* side of the equation, such tools were traditionally focused on production operations. But as more organizations adopt DevOps models, APM tools and capabilities (as shown in Figure 2) are expanding from operations into development. Development and testing environments now bear close technical resemblance to production environments, which makes APM easier to expand and implement. This helps enable development to take advantage of traditionally production-oriented APM capabilities such as:

- Low overhead and reduced cost monitoring
- Management of complex dependencies and end-user experience
- Highly scalable and flexible deployments with effective collaboration across development and operations

As one chief information officer (CIO) of a retail organization summarized, "You're increasing productivity because you're giving the users their applications faster. You're reducing IT resources and getting more things done."

A global study: Investigating current and future APM and DevOps adoption

To explore the influential role that APM and DevOps play in an organization's digital transformation, IBM conducted a global study to explore adoption and usage patterns and impact. The study involved a web survey of 519 participants spanning the DevOps life cycle, residing in both the IT department and/or lines of business. Respondents were also responsible for at least one application and/or were involved in DevOps practices and methods. This paper outlines key findings.[2]

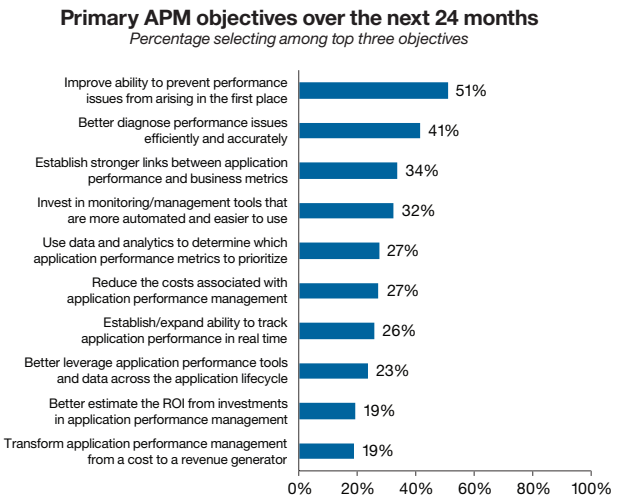
APM solutions: Who's accountable?

About a third of respondents said that both production and application Dev/Test roles assume responsibility for APM solutions. Predictably, these roles fall within traditional lines, with APM for application Dev/Test managed by development roles, and APM for production environments managed by operational roles. Respondents anticipate a merging of these APM roles, with the gap between development and operations narrowing over the next two years. This reflects the increasing synergies throughout the DevOps process.

When it comes to purchasing APM tools, the function is more centralized. Senior executives make the purchase decisions, with both development and operations managers influencing direction.

Primary objectives for APM: Preventing performance issues and much more

When asked about their primary objectives for implementing APM solutions over the next 24 months, over half (51 percent) of respondents state that preventing application performance issues from arising in the first place was key, while 41 percent say they want to better diagnose performance issues efficiently and accurately. Establishing stronger links between application performance and business metrics was important to 34 percent of respondents. (See Figure 3.)



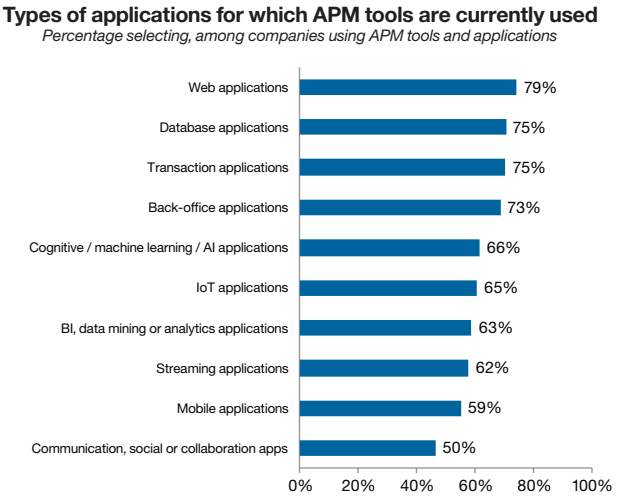
Source research study data provided by IBM Market Development & Insights.

Figure 3: Respondents cite a range of objectives for implementing APM solutions over the next 24 months.

Investing in automated, easier-to-use APM tools

Most companies have tools that alert them to application performance issues in production. Some also use dashboards that monitor real-time status and historical trends. In this scenario, proprietary vendor tools are usually used about 74 percent of the time, with just 40 percent of respondents stating they use open source tools. Almost one third plan to invest in monitoring and management tools that are more automated and easier to use.

Current APM tools are most commonly used to monitor web, database, transaction and back-office applications (see Figure 4) not only in production, but also in pre-production development and testing.



Source research study data provided by IBM Market Development & Insights.

Figure 4: This chart lists the types of applications for which APM tools are currently used. On average, companies use APM tools for 70% of their applications.

Analytical tools for APM: Organizations are ramping up

Seventy percent of participants say the most critical feature of an APM solution involves analytics tools that diagnose application performance issues, yet less than 40 percent of companies used such tools at the time of the survey. With 60 percent of those surveyed exploring analytics capabilities for their APM solutions, this should shift dramatically. The top APM objectives for the next 24 months are analytics related, with the goal of identifying and resolving application performance issues.

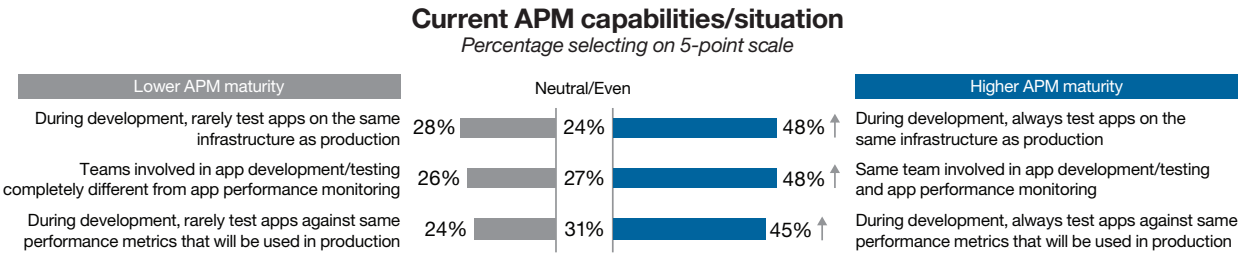
"You've coded an important application that's supposed to do an important piece of work for the company, which means revenue gained or revenue lost. Absolutely, time to market is accelerated. The quality of service is improved. All important reasons to comply with DevOps guidelines."

— CIO, Financial Markets, 1,000-4,999 employees

The influence of APM on the adoption of DevOps

As organizations manage toward ever-shortening development cycles, performance monitoring throughout all phases of the application lifecycle increases in importance. *Almost half of application owners say that the need to use APM solutions earlier in the application lifecycle was an influential factor in their adoption of DevOps practices.*

Once DevOps was integrated, almost half of respondents say the approach has actually improved the quality of their applications, while also helping to reduce downtime and increase customer satisfaction. Nearly all companies currently use or plan to adopt practices that will drive increased alignment between development and operations, including end-user feedback and continuous application performance monitoring.



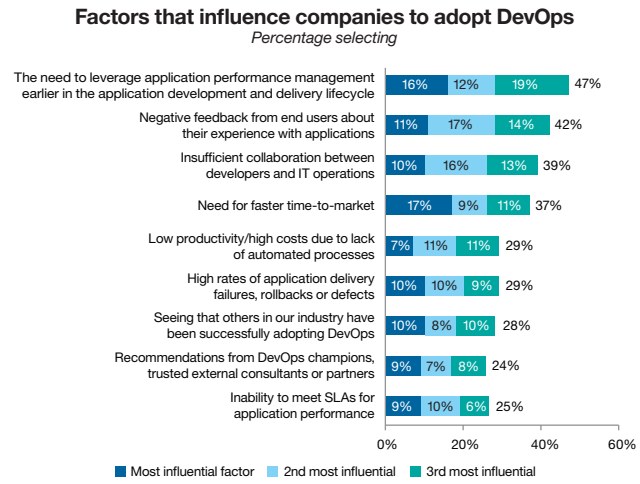
Source research study data provided by IBM Market Development & Insights.

Figure 5: This chart depicts practices that are indicative of lower and higher APM maturity. Up arrows indicate blue bars are significantly higher than gray bars.

Technical successes and challenges

Almost half (48 percent) of companies surveyed state that during application development, their applications were always tested on the same infrastructure as production, and that the same team involved in application Dev/Testing was also involved in application performance monitoring.

One challenge: Although 45 percent of respondents claim to always test applications in development against the same performance metrics that will be used in production (see Figure 5), *they rarely test applications under the same IT loads that will be experienced in a production environment*. One participant observes that although APM solutions are used in the application development phase, the application performance monitoring process uses separate dashboards and lacks an integrated solution to coordinate activities across the application lifecycle.

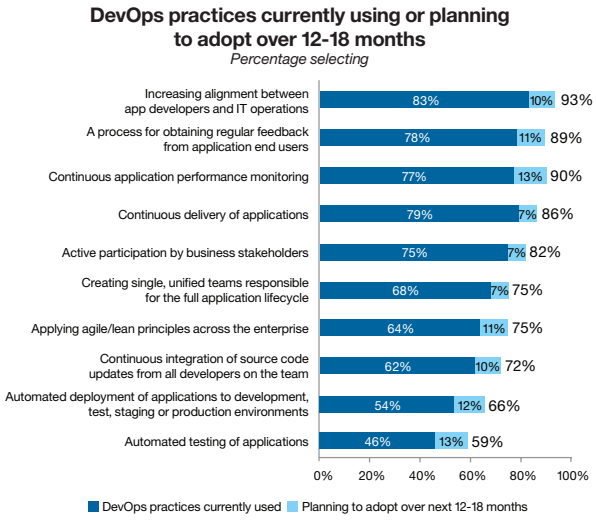


Source research study data provided by IBM Market Development & Insights.

Figure 6: Respondents cite numerous factors as influencing their decision to adopt DevOps.

Why adopt DevOps practices? Anticipated benefits and critical drivers

As noted earlier, *DevOps adoption is driven by the need to leverage APM earlier in the application development and delivery life cycle*—according to 48 percent of respondents who cite it as a critical influence. Companies are also drawn to DevOps practices as a way to improve customer satisfaction by avoiding negative feedback from end users about their application experience. Additionally, a DevOps environment alleviates a lack of collaboration between application developers and operations, and enables companies to deliver applications faster into the market. (See Figure 6.)



Source research study data provided by IBM Market Development & Insights.

Figure 7: Respondents indicate a number of practices that they are currently using or plan to adopt over the next 12 to 18 months.

Note: Study participants were required to have a sufficient level of DevOps adoption.

As shown in Figure 7, many companies advance their DevOps journey by:

- Increasing alignment between application developers and operations
- Enabling a process for obtaining regular feedback from application end users—resulting in higher rates of customer engagement and retention
- Driving continuous application performance monitors
- Facilitating continuous delivery of applications

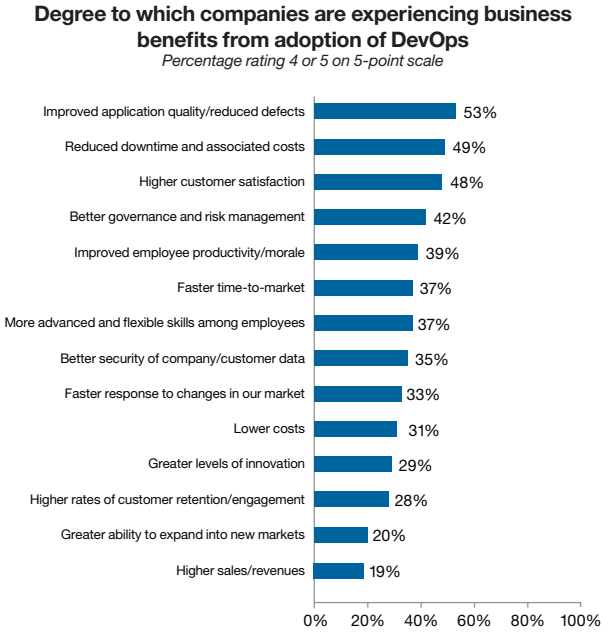
"What used to happen was, you provided customers a finished product that could have taken a lot of development hours. And the customer could say, 'I want this changed.' We have to throw out thousands of those hours. This approach saves money."

— Mid-level IT manager, CPG, 5,000+ employees

Incorporating APM solutions across DevOps: Significant results

As companies adopt DevOps and incorporate APM solutions—not just in application deployment, but during application development and testing as well—the results are significant, as shown in Figure 8:

- Application quality improves and defects decrease
- Costs from application downtime decrease
- Customer satisfaction increases
- Time-to-market for new applications increases
- Better governance and risk management
- More advanced flexible skills among employees



Source research study data provided by IBM Market Development & Insights.

Figure 8: Many respondents report experiencing significant business benefits from adopting DevOps.

These benefits impact not only a company's business performance at the topline with higher revenues realized through greater customer satisfaction, but at the bottom line as well, translating to cost savings from reduced downtime.

Greater adoption of DevOps, integrated with APM solutions, also helps companies achieve greater innovation than competitors. *The study shows that companies further along the DevOps and APM maturity curve introduced more applications over the past three years vs. companies that are lagging.* Such companies are also more likely to use APM tools today, as well as plan to adopt even more in the future—with particular emphasis on the analytics components of those solutions. By continuing to enhance APM across the DevOps lifecycle, businesses can achieve even greater competitive advantages.

"The biggest impact so far is increased productivity. We have much less down time than we did before. The next biggest impact is we are able to turn out newer technology faster. We're actually working on a better mobile solution that will reduce our cost on the mobility side and make our customers much more productive. This next release will also include a much enhanced web interface. I think our customers are going to be extremely pleased. None of this would have happened if we hadn't started down this DevOps road."

— CIO, Wholesale, 1,000-4,999

Going forward: The trend toward integrating APM with DevOps

IBM anticipates an increased correlation between the implementation of DevOps practices and the value placed on key features and functions of APM solutions. These include analytics capabilities, application quality, customer satisfaction and governance.

More than half of companies use or anticipate using diagnostic tools to identify root causes of application issues by analyzing log data/message activity, while almost half put emphasis on predictive analytics capabilities.

The survey predicts that over the next 24 months, almost 30 percent of companies will have analytics capabilities fully integrated with APM tools. And, roles and responsibilities will also continue to evolve and merge as DevOps reaches higher heights on its adoption curve.

"When our end customers notice that we're moving forward, they're excited about the changes and they can see the benefits."

— App Developer, Wholesaler, 1,000-4,999 employees

What's next for you?

If you're looking to achieve the benefits of incorporating APM solutions across DevOps, consider some of the best practices implemented by respondents who are higher on the DevOps and APM adoption curve. Their organizations tend to:

- Test applications on the same infrastructure and loads used in production environments
- Use the same team across application development, testing and production
- Test applications against the same performance metrics that will be used in production
- Use an integrated APM solution across development, testing and production—including a single, unified dashboard
- Automate all application performance monitoring

Perhaps you are just now considering an APM and DevOps strategy. Or perhaps you have embarked on this journey but are experiencing challenges. Maybe you are already using APM across the DevOps phases, but you want to enhance your approach. IBM® DevOps and APM solutions can help you, no matter where you are in your APM and DevOps evolution.

The IBM APM portfolio

The IBM APM portfolio helps you detect and address software application issues, so your end users have a quality experience. IBM offers a single user interface to help you easily monitor your internal and external applications. For example, IBM can:

- Extend your hybrid management environment capabilities
- Measure the customer experience from multiple locations
- Further eliminate blind spots in your application environment
- Improve application quality and stability
- Accelerate release cycles and reduce costs

For more information on how the IBM APM portfolio can help you, visit ibm.co/LearnIBMAPM. You can see a five-minute walkthrough of availability monitoring at ibm.co/2jxAWPS.

The IBM DevOps approach

The IBM DevOps approach helps organizations incrementally adopt DevOps practices, enabling them to accelerate innovation without tradeoffs in terms of cost, quality or risk. Organizations can make the most of existing investments and build an environment in which open source and proprietary lifecycle tools coexist and interoperate. IBM DevOps solutions can accelerate application updates and innovation by:

- Reducing time to customer feedback
- Increasing quality
- Lowering risk and cost
- Unifying processes, cultures and tools across the application lifecycle

To learn more on how the IBM DevOps approach can help you, visit **ibm.com**/cloud-computing/bluemix/devops. Also check out an introduction of IBM DevOps processes, including availability monitoring for Bluemix, at ibm.co/2jmS518.

For more information

Please visit our IBM APM website at ibm.co/LearnIBMAPM2. Also, check out the IBM APM demo at ibm.co/APMdemo3.

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1 Evans Data Corporation. Global Development Survey 2016 Volume I. May 31, 2016. www.evansdata.com.

2 Source research study data provided by IBM Market Development & Insights.

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