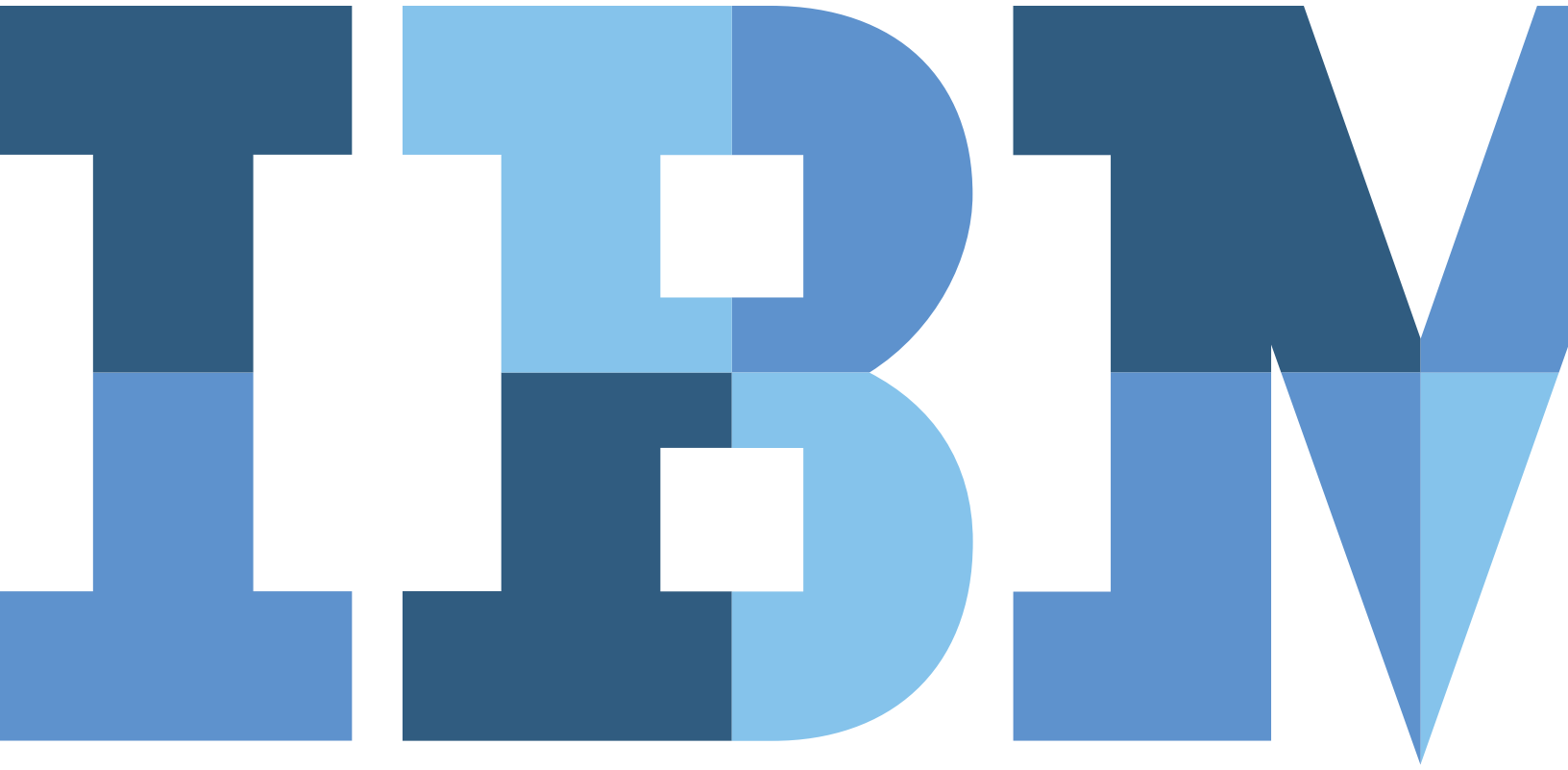
Application Performance Management and DevOps: A banking and financial markets perspective

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



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APM and DevOps: Agile, responsive application development for the banking and financial market industries

Globalization and technical advances are driving rapid changes to how, where and when banking and financial markets do business. Your organization is navigating rising costs, ever-narrowing margins, shifting operating models and complex regulatory requirements.[1] You also face empowered consumers (often digital natives), emerging markets, sophisticated security threats and nontraditional fintech competitors that erode market share.

Banks and financial markets must radically reduce costs and redirect investments to business and operating models that can unlock data and reimagine experiences that create value. You need to find insights faster, transact quicker and innovate more meaningfully to grow and retain your customer base. In response to these market shifts, banking and financial markets are turning to digital transformation. According to IDC, IT strategies are evolving along definitive trendlines:

- Disruptive technologies, including cognitive, robotic process automation and blockchain, will be in use at 50 percent of banks worldwide by 2020, accelerating digital transformation by 30 percent.
- Investment in third-party platforms and innovation accelerators will grow at twice the rate of overall Financial Service Institution (FSI) IT spend through 2020 as global IT spending surpasses half a trillion US dollars.
- In an effort to boost live chat customer interactions, 20 percent of banks will begin proof-of-concept projects to integrate conversational interfaces in their omni-channel strategy in 2017.[2]

Because of the need to create meaningful, transactional customer experiences, banking and financial markets are more likely than cross-industry organizations to develop applications for external end users across a range of platforms, including:

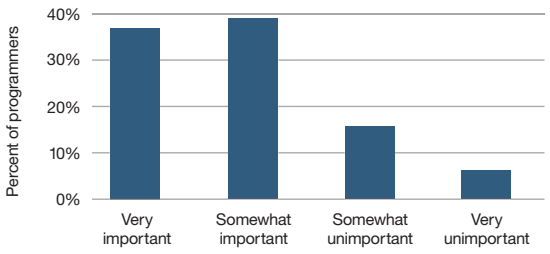
- Web apps (90 percent versus 68 percent)
- Communication/social/collaboration apps (80 percent versus 56 percent)
- Mobile apps (74 percent versus 52 percent)[3]

As a result, the length of an application development cycle is market- and customer-driven, 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 the iterative, responsive and agile development cycles that your industry requires.

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 developers polled across industries considering DevOps to be very or somewhat important for their future (see Figure 1).[4]

How important is DevOps to your overall digital strategy?

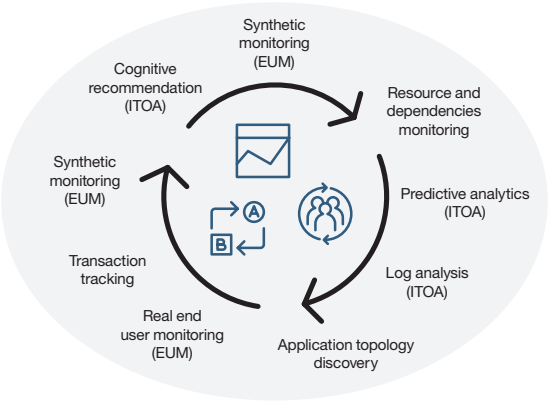


Source: Global Development Survey: Vol. 1, © 2016 Evans Data Corp., Date published: 05/31/2016.

Figure 1. A combined 76 percent of developers polled across industries 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 across industries 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) 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 lifecycle, 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.

Banking and financial market organizations comprised 72 of the 519 participants. This paper outlines key research findings across all industries, and highlights areas in which banking and financial markets diverge from typical cross-industry responses.

APM solutions: Who's accountable?

About a third of cross-industry respondents say 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.

However, organizations in banking and financial markets are less likely than overall respondents to involve application development managers (18 percent versus 37 percent) and application developers (27 percent versus 41 percent) in APM. They are also far less likely to engage end-user support or help desk staff (18 percent versus 29 percent)—a trend that can explain a slightly greater emphasis on investments in monitoring/management tools that are more automated and easier to use (37 percent, ranking fourth among nine industries).

When it comes to purchasing APM tools, the function across industries 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 cross-industry respondents state that preventing application performance issues from arising in the first place is key. Banking and financial market companies fall in line with that trend.

However, 61 percent of banking and financial market respondents say they want to better diagnose performance issues efficiently and accurately—while only 41 percent of respondents in general cite that as a priority. (See Figure 3.) This reflects the customer-facing nature of apps in these industries.

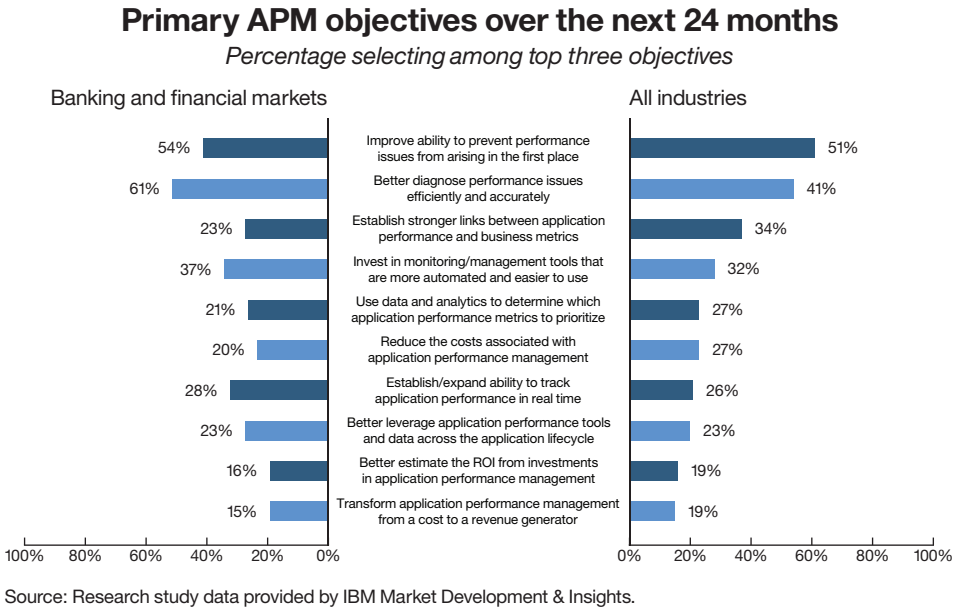


Figure 3. Respondents cite a range of objectives for implementing APM solutions over the next 24 months.

Investing in automated, easier-to-use APM tools

Most companies across industries 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 used about 74 percent of the time, with just 40 percent of respondents stating they use open source tools.

Banking and financial markets are more likely to use automatic alerts when applications perform badly (84 percent versus 73 percent). *Again, this reflects a reliance upon automated monitoring to compensate for lower rates of traditional help desk or end user support.* Among cross-industry respondents, 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. Banking and financial market companies are enthusiastic adopters of APM tools overall—using them to monitor and manage 78 percent of their applications on average—more than the overall market (70 percent). Specifically, organizations in banking and financial markets indicate a greater interest in monitoring:

- Web applications (91 percent versus 79 percent)
- Transaction applications (90 percent versus 75 percent)
- Business intelligence/data mining/analytics applications (86 percent versus 63 percent)
- Mobile applications (84 percent versus 59 percent)

And, the industry is much more inclined to use mobile application monitoring (53 percent versus 31 percent), which supports their high adoption of mobile apps.

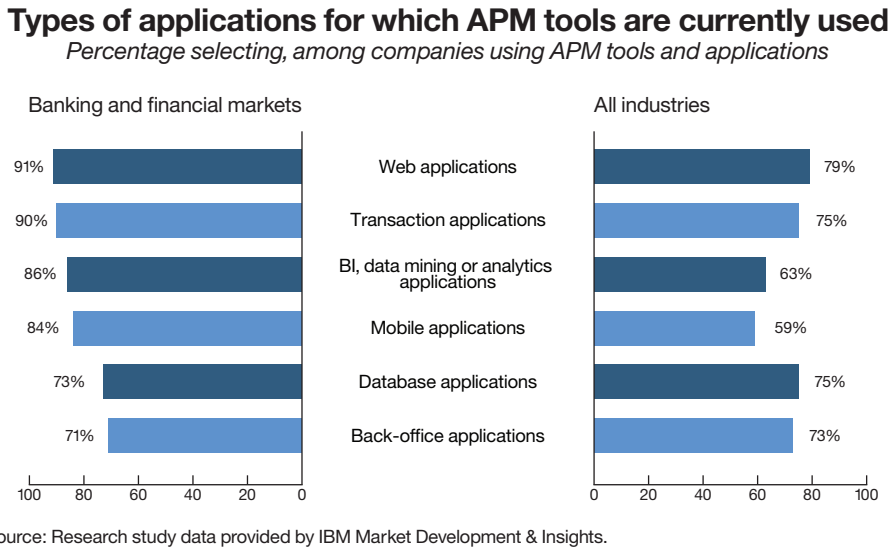


Figure 4. Types of applications for which APM tools are currently used.

Analytical tools for APM: Organizations are ramping up

Seventy percent of cross-industry survey 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 close to 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 goals of identifying and resolving application performance issues.

With applications that tend to be end-user focused, banking and financial markets are much more likely than general respondents to value analytics tools that are integrated with other performance monitoring tools (74 percent versus 59 percent).

"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, 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 across industries say that the need to use APM solutions earlier in the application lifecycle was an influential factor in their adoption of DevOps practices.* In fact, banking and financial markets express a greater likelihood to use continuous application performance monitoring than companies across industries (86 percent versus 77 percent).

Once DevOps was integrated, almost half of cross-industry 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 across industries 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.

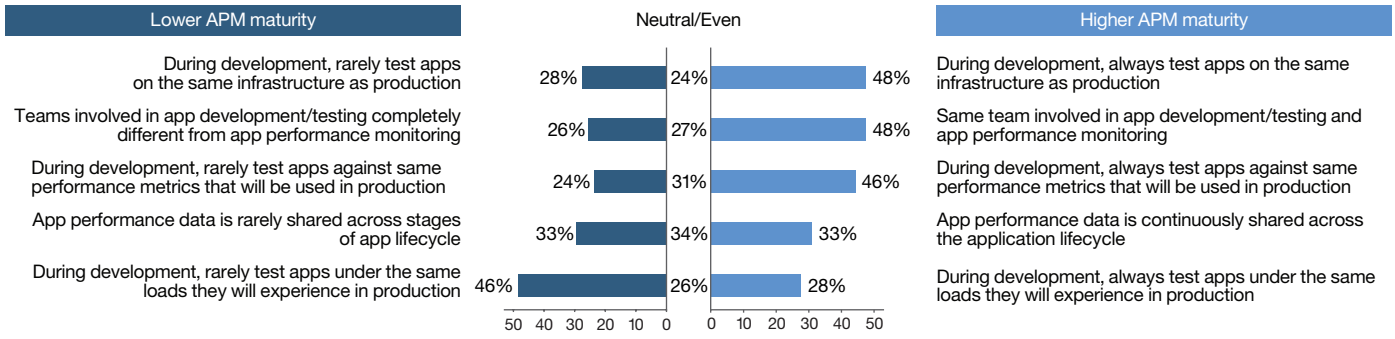
Technical successes and challenges

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

Organizations in banking and financial markets are more likely than general respondents (59 percent versus 45 percent) to test apps against the same performance metrics used in production during development. One challenge cited by respondents at large: *46 percent rarely test applications under the same IT loads that will be experienced in a production environment.* (See Figure 5.) Some participants observe 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.

Current APM capabilities/situation across industries

Percentage selecting on 5-point scale



Source: Research study data provider by IBM Market Development & Insights

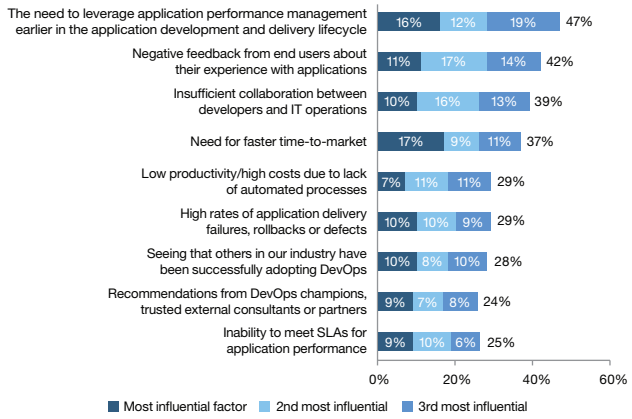
Figure 5. Practices that are indicative of lower and higher APM maturity.

Why adopt DevOps practices? Anticipated benefits and critical drivers

As noted, *the need to use APM earlier in the application development and delivery lifecycle drives DevOps adoption* — according to 47 percent of cross-industry 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.)

Factors that influence companies across industries to adopt DevOps

Percentage selecting



Source: Research study data provided by IBM Market Development & Insights.

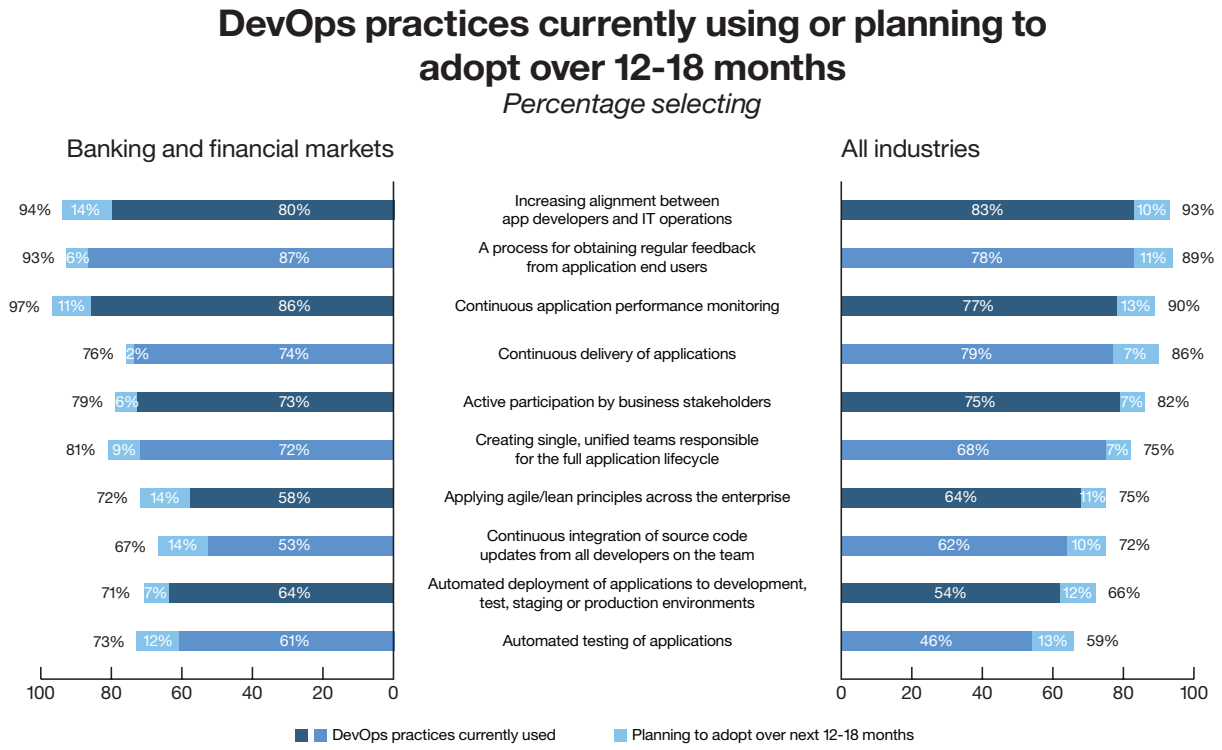
Figure 6. Cross-industry respondents cite numerous factors as influencing their decision to adopt DevOps.

As shown in Figure 7, cross-industry organizations advance their DevOps journeys by adopting a number of practices. Banking and financial market organizations and cross-industry respondents demonstrate similar rates of increasing alignment between application developers and operations and also facilitating continuous delivery of applications. However, the study also revealed differences in terms of how banking and financial market companies approach DevOps. They gravitate towards:

- Seeking regular feedback from end users (87 percent versus 78 percent)
- Using continuous application performance monitoring (86 percent versus 77 percent)
- Using automated testing of applications (61 percent versus 46 percent)

"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, 5,000+ employees



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.

Incorporating APM solutions across DevOps: Significant results across industries

As companies across industries 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 decreases
- Better governance and risk management
- More advanced and flexible skills among employees

Degree to which companies across industries are experiencing business benefits from adoption of DevOps.
Percentage rating 4 or 5 on 5-point scale

Source: Research study data provided by IBM Market Development & Insights.

Figure 8. Many respondents across industries report significant business benefits from adopting DevOps.

These benefits impact not only a company's business performance at the top line 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 cross-industry companies further along the DevOps and APM maturity curve introduced 46 percent more applications over the past three years versus companies that are lagging. And almost two-thirds of banking and financial market companies are seeing improved app quality/fewer defects from adopting DevOps.

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.

Going forward: The trend toward integrating APM with DevOps

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

Because banking and financial market organizations use more customer-facing apps than the general market, these issues stand out as paramount concerns. *As a result, banking and financial market companies place much greater importance on diagnosing performance issues efficiently and accurately than the overall market (61 percent versus 41 percent).*

In fact, banking and financial markets are the top industries in terms of wanting to prevent performance issues from arising in the first place. As we've noted earlier, these companies are more likely than cross-industry respondents to support that objective by:

- Seeking regular feedback from end users (87 percent versus 78 percent)
- Using continuous application performance monitoring (86 percent vs. 77 percent)
- Using mobile application monitoring (53 percent versus 31 percent)
- Using APM tools to monitor and manage their applications (78 percent versus 70 percent)
- Valuing analytics tools that are integrated with other performance monitoring tools (74 percent versus 59 percent)

Across industries, 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 by 2018, almost 30 percent of cross-industry companies will have analytics capabilities fully integrated with APM tools. And, roles and responsibilities will 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, 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 cross-industry 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 helping:

- Decrease time to customer feedback
- Increase quality
- Reduce risk and cost
- Unify 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/products/devops/. Also, check out an introduction of IBM DevOps processes, including availability monitoring for IBM Bluemix®, at ibm.co/2jmS518.

For more information

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