

# APM in the Digital Economy

## What's Hot, What's Not, and What's on the Horizon

### REPORT SUMMARY

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# Report Summary – APM in the Digital Economy: What’s Hot, What’s Not, and What’s on the Horizon

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# Report Summary – APM in the Digital Economy: What's Hot, What's Not, and What's on the Horizon

## Overview

Agility in the utilization of technology in the development and delivery of differentiating business services is a hallmark of companies succeeding in the “Digital Economy.” And in the midst of a tidal wave of new technologies, software applications have become the functional core supporting digital transformation in virtually every area of the business. Modern software development, deployment, and delivery techniques are enabling new models for revenue generation, new roads to mutually beneficial partnerships, and improvements in personalized customer interaction.

Multiple ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) studies have made it clear that the road to digital transformation is not necessarily impediment free. IT practitioners know that introducing change to a stable system has its risks, and change is at the core of digital transformation. Many such initiatives are dependent on broad adoption of execution ecosystems supported by mobile access, web services, API-connected transactions, containers, cloud services, and/or virtualization in general. And while these technologies do provide a foundation for improved scalability and elasticity, they have also made execution ecosystems more dynamic and levels of service consumption less predictable. This inherent unpredictability raises the risks of adverse impact to performance and availability at the same time as software applications gain prominence as business-critical assets.

Dramatic transformations on both the technology and business fronts are driving digital transformation initiatives in almost every industry vertical. EMA conducted dual studies on the topic in 2015. The first, “Digital and IT Transformation: A Global View of Trends and Requirements,” was published in September 2015.<sup>1</sup> It examined the convergence of IT and business services and the impact of this convergence on IT culture and organization. The second, “Automating for Digital Transformation: Tools-Driven DevOps and Continuous Software Delivery in the Enterprise,” was published in December 2015.<sup>2</sup> It highlighted the software-related aspects of digital transformation and assessed the challenges and outcomes of DevOps and Continuous Delivery initiatives in modern business. Both studies uncovered strong links between digital transformation initiatives and positive business outcomes.

They also uncovered links between digital initiatives and Application Performance Management (APM).<sup>3</sup> DevOps and Continuous Delivery are two areas in which the links are particularly strong. One key takeaway, for example, is the fact that, without application-focused management solutions, the adverse impact of Continuous Delivery on production systems becomes a bottleneck impeding software delivery at scale.

EMA research has repeatedly confirmed the value proposition of automation. The adverse impacts of escalating rates of change can be mitigated only by offsetting manual support approaches with automated, intelligent enterprise management tools. From the application support perspective, those tools capable of incorporating and modeling changes into existing management-related topologies can be particularly effective in helping IT practitioners mitigate the impact of change. However without APM and User Experience Management (UEM) solutions supported by sophisticated analytical engines, IT organizations are increasingly caught in the crossfire between business requirements for acceleration of software delivery and escalating demands for higher service quality.

**Modern software development, deployment, and delivery techniques are enabling new models for revenue generation, new roads to mutually beneficial partnerships, and improvements in personalized customer interaction.**

<sup>1</sup> EMA, [Digital and IT Transformation: A Global View of Trends and Requirements](#), September 2015

<sup>2</sup> EMA, [Automating for Digital Transformation: Tools-Driven DevOps and Continuous Software Delivery in the Enterprise](#), December 2015

<sup>3</sup> Since the “APM” acronym is such a broad term, in this and all EMA studies “APM” is used to describe application-focused management solutions supporting performance as well as availability and troubleshooting. Solutions supporting performance measurements only are referred to as Application Monitoring or User Experience solutions.

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This research report summarizes the results of survey-based research conducted during the spring of 2016<sup>4</sup>. It assessed the top challenges encountered by IT organizations as they adapt to the collective impacts of the consumer economy, the growth of the public cloud, the rise of abstraction in the form of “software-defined everything,” and the growing importance of software as an agent of change. Survey topics covered technology usage, current management practices supporting production applications running on- and off- premises, software development/delivery practices, tooling requirements, and API usage.

The survey also assessed APM requirements for companies of every size running a wide variety of application and transaction types. Questions covered virtually every “flavor” of Application Management and User Experience solutions, including synthetics, application-aware networking, Real User Monitoring (RUM), browser/code injection, endpoint monitoring, Application Discovery and Dependency Mapping (ADDM), APM platforms and suites, and on- and off-premises hosted solutions. The result is a comprehensive perspective on APM usage, requirements, gaps, and near-term APM-related purchasing plans.

## APM in the Digital Economy

Several key findings from prior EMA studies are particularly relevant to the content of this paper, and these findings are covered in this section.

The “Automating for Digital Transformation”<sup>5</sup> study found that companies that increased the frequency of code delivery by 10% or more in a given year via Continuous Delivery practices were 2.5 times more likely to experience double-digit ( $\geq 10\%$ ) revenue growth than those companies in which delivery frequency increased by less than double digits, was flat, or decreased. This revenue growth was generated by direct and indirect improvements to the services delivered to employee stakeholders, partners, and customers.

Figure 1 summarizes the business benefits of Continuous Delivery, all of which are likely contributors to higher levels of revenue growth. They include improved customer satisfaction, faster revenue generation, improved agility, and a more positive social media presence.

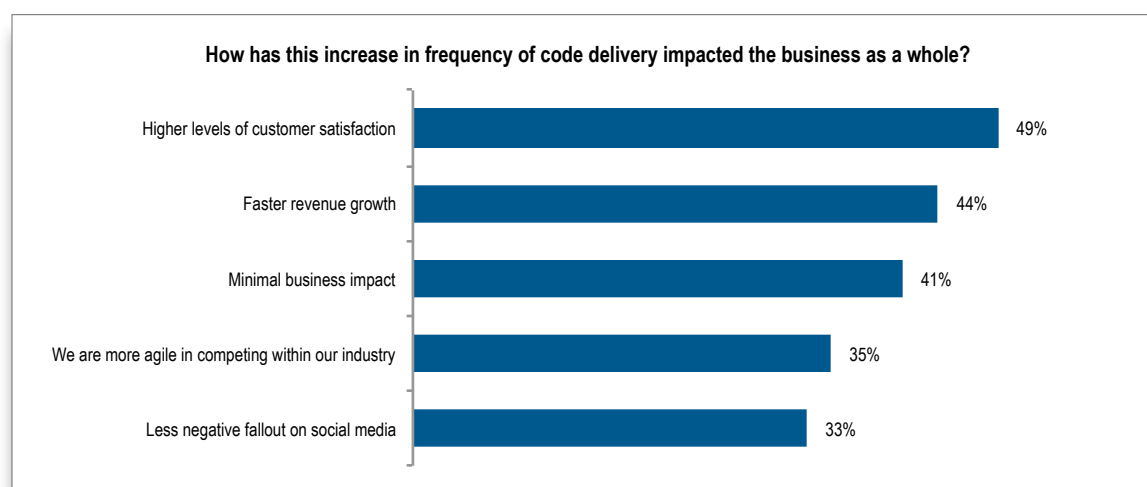


Figure 1. Accelerating code delivery frequency has multiple business benefits.<sup>6</sup>

<sup>4</sup> The full report is available for purchase at [www.enterprisemanagement.com](http://www.enterprisemanagement.com)

<sup>5</sup> EMA, *Automating for Digital Transformation: Tools-Driven DevOps and Continuous Software Delivery in the Enterprise*, December 2015

<sup>6</sup> *ibid*

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However, while the business benefits can be significant, accelerated delivery too often wreaks havoc on IT. As Figure 2 shows, more than 50% of companies indicated that, due to higher delivery velocity, Operations was spending more time managing production environments. In addition, slightly less than 50% said that Development was spending more time supporting production. Forty-five percent (45%) said service levels have degraded, and more than 35% cited an increase in the number of performance and availability problems.

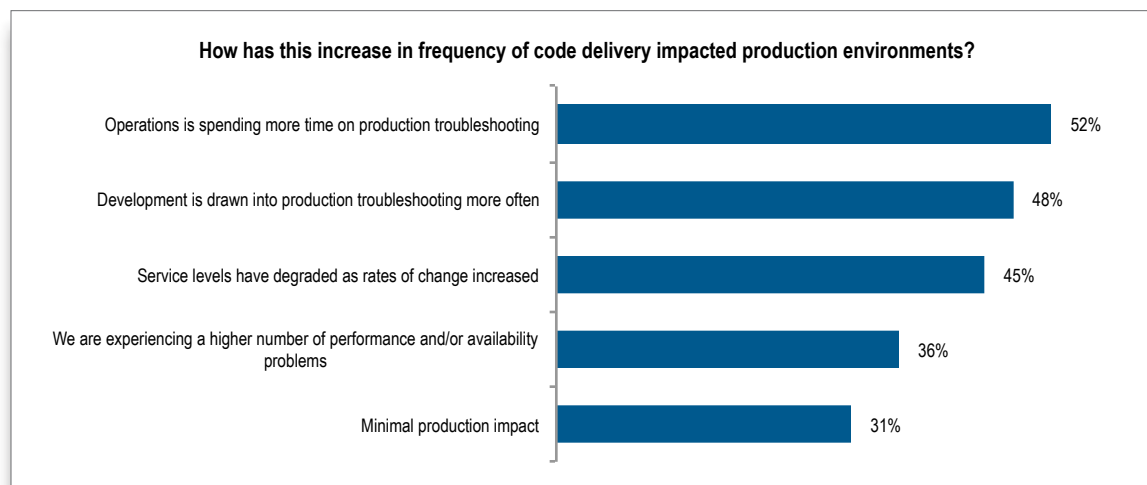


Figure 2. Accelerating frequency of code delivery taxes IT resources.<sup>7</sup>

In the same EMA study<sup>8</sup> 82% of respondents overall viewed APM as “important” or “very important” for digital/IT transformation; only 14% said APM was not a part of their Agile/DevOps initiatives. And in both surveys the majority of respondents agreed that APM investments can have a profound impact on the success of digital transformation initiatives.

Correlating all of these data points in context—the value proposition of Continuous Delivery to the business, combined with the IT-related adverse impacts of Continuous Delivery—creates a very powerful argument for APM investments. Clearly, APM is, or should be, a key element of digital transformation initiatives as it can help accelerate the business benefits while mitigating adverse impact to end users, IT, or Line of Business (LOB).

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## A Note on APM and Escalating Complexity

Digital transformation initiatives operate within the broad industry trend toward service/application delivery via component-based, orchestrated services. Software components may be deployed to containers, IaaS instances, virtualized private clouds, or as part of ESB-supported Service Oriented Architecture (SOA) deployments; in each case the execution strategies are somewhat different and typically rely on different types of integration technologies.

Regardless of how component-based services are implemented, however, the research finds that more than 50% of IT organizations lack APM tools capable of tracing transaction execution across the tens, hundreds, or thousands of execution elements that can comprise a single component-based transaction. Questions relating to topologies and dependencies can make it difficult to assess which elements support which applications, making the root-cause analysis process time consuming at best, almost impossible at worst.

Scale is becoming an issue as well. Deploying multiple instances of the same code as microservices (a requirement for scaling in microservices environments) can have an unexpected impact on infrastructure elements that function as part of the execution chain. Data and database integrity, for example, are far more difficult to ensure in microservices deployments. In addition, performance problems can be created when too many microservice instances are deployed to a single physical or virtual device.

API usage is another factor impacting manageability. Applications running as orchestrated microservices, for example, execute via API calls between components or containers. API connections also add performance risks since each integration point is a potential point of failure.

In short, without tools capable of end-to-end monitoring—including integration points, API connections, network connections, component performance, and even performance of third-party services—these types of applications can be very difficult to troubleshoot, and therefore very expensive to support.

The fact that these types of applications are now part of normal “business as usual” in the majority of companies provides a powerful argument in favor of APM investments. This is particularly true in view of the fact that relatively few IT organizations are confident in their ability to manage them.

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## 10 Key Conclusions

This survey produced a wealth of data, too much to cover in a single paper. However, the following data points offer a snapshot of 10 key factors impacting APM and UEM usage and buyers:

- **Cost is once again cited as the top application support challenge.** Cost—as it relates both to delivery of new services and to ongoing service support—was once again cited by IT professionals at all levels as the top management-related challenge. This finding is directly relevant to many of the other findings of this report, most notably the issues of heterogeneity, scale, and the uncertainties associated with rapidly changing topologies and production environments.
- **Mainframes have taken on a new and essential role as a mainstay for consumer-facing transactions.** Approximately 25% of the organizations responding to this study reported running mainframes for production applications. Surprisingly, there were no statistically significant differences in this percentage across companies based on size. Not surprisingly, however, to those who have been following mainframe trends, the mainframe continues to be an important component supporting delivery of consumer-facing web and mobile applications.

In-depth analysis comparing platforms in use with revenue growth reveals that mainframes may well have an outsized impact on revenue generation. Despite the fact that only 25% of survey respondents were from mainframe shops, this segment comprised 47% of all survey respondents reporting ultra high revenue growth—revenue increases of 75% or more in the prior year.

Based on the revenue-generating potential of applications with mainframe components, a key conclusion of this study is that mainframe customers may well need APM solutions more than those running other types of platforms. In addition, because of the ongoing critical role of the mainframe in distributed and component-based applications, vendors promoting APM solutions are well advised to incorporate mainframe visibility into correlations, reporting, and topologies supporting end-to-end management scenarios.

- **Continuous Delivery continues to have a significant impact on both IT and business.** While impact on the bottom line is positive, the impact on service quality is questionable at best. When asked about the impact of Continuous Delivery on business, respondents' answers were generally positive. Forty-seven percent (47%) cited improved customer satisfaction, while 43% cited faster revenue growth. However, the impact on application quality is worrisome—almost 40% cited performance and availability issues.
- **Technologies such as video conferencing and streaming, as well as emerging “software-defined” technologies of various sorts, are beginning to impact application support.** More than 50% of the companies surveyed were hosting video conferencing, and slightly fewer were engaged in delivery of Software Defined Networks (SDNs) and/or Software Defined Data Centers (SDDCs). The evolution towards high-bandwidth applications will undoubtedly have an impact on overall performance, while software-defined environments will increase the frequency of variable, fluid application topologies. This again underlines a requirement for autodiscovery functionality within APM solutions, with features capable of supporting topology changes in dynamic application environments.

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- **Of all the emerging technologies surveyed, SDDCs showed an almost bewildering dichotomy between those companies reporting they are *best* prepared to support SDDCs with current tools (33%) and those reporting they are *least* prepared to do so (29%).** Prior studies have revealed a growing difference in agility across companies in terms of tools, skills, and the general wherewithal necessary to innovate. In this case, the gap is between companies well-prepared for SDDCs and those that are not. These distinct differences in operational readiness appear to be related both to skill sets and to the tools available to IT practitioners. Scale appears to be an additional factor that separates the best and least prepared, with mid-sized companies skewing towards the “best prepared” side, while enterprise-sized companies are the least prepared.
- **Of the various types of applications, IT organizations feel *best* prepared to support web and hybrid and *least* prepared to support SOA, distributed, and “packaged” applications.** This finding is interesting because both web and hybrid applications (defined as applications whose execution spans on-premises and public cloud) often execute, in part, on the Internet versus within the borders of the organizational data center. While this would, at first glance, appear to be a red flag in terms of application support, it appears that web applications are one type of application that IT organizations believe are well managed.

Conversely, SOA, distributed, and packaged applications are applications these organizations are least prepared to support. Not surprisingly, SOA-based and distributed applications/transactions require more sophisticated management tools than do web apps. This is due to their overall complexity in terms of componentization and connectedness, as well as the underlying heterogeneity and scale of supporting infrastructure. Packaged applications are often viewed as black boxes, at least from the software support standpoint, since most companies purchase vendor support agreements for enterprise-grade packages—such as Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM) products.

- **Survey respondents identified APM as the #1 automation product type supporting acceleration of Continuous Software Delivery.** This is one of the most important findings of this report as it, once again, establishes a clear link between APM solutions and the outcomes of Continuous Delivery practices. While a similar finding in 2015 was a surprise, this year it confirms the risks of adverse impact caused by high rates of production change. It also illustrates the mitigating impact of automated production support functions provided by application-specific toolsets.
- **Excessive time troubleshooting, excessive downtime, and lack of visibility are top support challenges for in-house hosted apps.** Of twelve potential problems being experienced with in-house hosted applications, only 7% of the respondents reported having “none of the above.” Excessive troubleshooting time, cost, lack of visibility, slow performance, and “intermittent problems, causes unknown” are all part of today’s application delivery landscape.
- **“Troubleshooting takes too long” was identified as the #1 inhibitor to problem resolution--and the #2 and #3 choices reveal why this is the case.** “Lack of trending information” was identified as the #2 issue, and “lack of information about application topology” was #3. As applications become increasingly complex, auto generated topologies, automated environmental self-learning, and trending based on storage of historical metrics all become essential to efficient application support—and, of course, these are key functions of APM solutions.

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- **Companies using on-premises delivered APM solutions report less downtime, fewer intermittent problems, less difficulty troubleshooting, and lower incidence of change-related production issues than those using SaaS-delivered APM solutions, or no APM solutions at all.** Companies utilizing on-premises APM and SaaS-based APM solutions were asked the following question: “Which of the following problems is your organization experiencing with applications delivered via in-house hosting?”

Those utilizing on-premises APM reported particularly significant outcomes, with less downtime, fewer intermittent problems, less difficulty troubleshooting, and reduced change-related impact. Those utilizing SaaS-based APM solutions reported reduced rates of “slow performance.”

These findings appear to be a validation that APM solutions, particularly on-premises hosted APM solutions, have a significant and measurable positive impact on application quality.

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- **SaaS-based APM, correlation/analytics tools, and log analysis were top APM-related choices for near-term purchase.** While SaaS-based APM solutions led as the top near-term acquisition choice overall, this option was far more likely to be favored as the top choice by executives versus line staff. Thirty-three percent (33%) of the executives selected this option, which ranked as the #1 choice for this group.

Top choices for line staff were “synthetic transactions” and “correlation/analytics tools that consolidate metrics from multiple management solutions,” while those for middle managers included “log analysis” and “correlation/analytics tools that consolidate metrics from multiple management solutions.”

Ironically, despite the positive outcomes of on-premises APM tools as noted under the prior bullet, none of the three groups selected “commercial Application Management products hosted in-house” as their top “wish-list” choice.

## In-Depth Analysis: Factors Contributing to Outsized Revenue Growth

Analysis of companies with high levels of revenue growth revealed differences in three key areas: platforms in use, use of Service-Oriented Architecture, and use of application-focused (versus silo-focused) management toolsets. In identifying these differentiating factors, EMA analysts specifically focused on the factors contributing to growth between 10% and 25%, 25% and 50%, 50% and 75%, and 75% and above.

Looking only at companies with revenue growth of 75% or above, three high-correlation factors were revealed:

- **Application-focused, versus silo-focused, management tools**
  - 94% of all respondents reporting ultra high revenue growth also indicated that their companies are “very successful” in deploying application-focused (versus silo-focused) management tools
  - Only 36% of companies reporting flat revenue growth self described as “very successful”.

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- **Mainframe and/or Linux usage**

- 47% of all respondents from high revenue companies report running mainframes (versus 29% of those whose revenue was reported as flat)
- 47% are running Linux (versus 11% of those reporting flat revenue)
- Only 24% are running Windows servers (versus 100% of companies with flat revenue).

- **Service-Oriented Architecture (SOA)**

- 47% of all respondents in the high growth category reported running SOA-based services (compared to 21% of those with flat revenue growth).

## Analysis Process

### Background, Methodology, and Respondent Characteristics

The data in this report was gathered during early Q2 2016 from technology professionals “on the front lines” of application delivery. Respondents came from multiple sources, including generic marketing lists, vendor lists, and links on social media and online publishing venues. The survey itself was extensive, consisting of approximately 70 questions and more than 200 data points. In all, it was completed by approximately 150 IT professionals.

In selecting respondents, the survey narrowed the field of potential respondents with questions designed to ensure that only those knowledgeable about the topic areas covered in the survey were included. Respondents represented virtually every industry vertical; however, IT professionals from the finance, manufacturing, retail, and high-tech sectors comprised almost 60% of the participants.

The survey only included respondents who met the following criteria:

- They were directly involved with or responsible for development or delivery of enterprise IT applications (defined as applications involving some level of complexity with examples including distributed/component-based applications, web applications, and client/server applications as opposed to desktop- or mobile-only applications). IT professionals whose primary roles were in adjacent areas, such as security or IT financial management, for example, were excluded.
- They had some knowledge of their company's IT budget and revenue growth.
- They were from companies that had a Software Development organization.

In addition, this particular study included U.S. participants only.

Respondents meeting all criteria were asked detailed questions related to their company's practices in five key areas:

- Technologies in use
- Software development practices
- API use cases
- Management strategies supporting on-premises and cloud-delivered services
- APM/UEM tools in current use and preferences for future purchases

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## Summarized Findings

### Application Support

This section provides a starting point for matching available tools with the functions they are designed to support. It also reflects the key application-related challenges confronting IT organizations, along with the opinions of IT practitioners on the front lines regarding potential mitigation strategies.

#### Figure 3

Figure 3 shows that costs and backlogs are IT's top concerns. In addition to being the top concern of the group overall, cost was the #1 concern across all roles and company sizes with only one exception: "Project backlog: software-related" was the #1 concern reported by respondents from enterprise-sized companies.

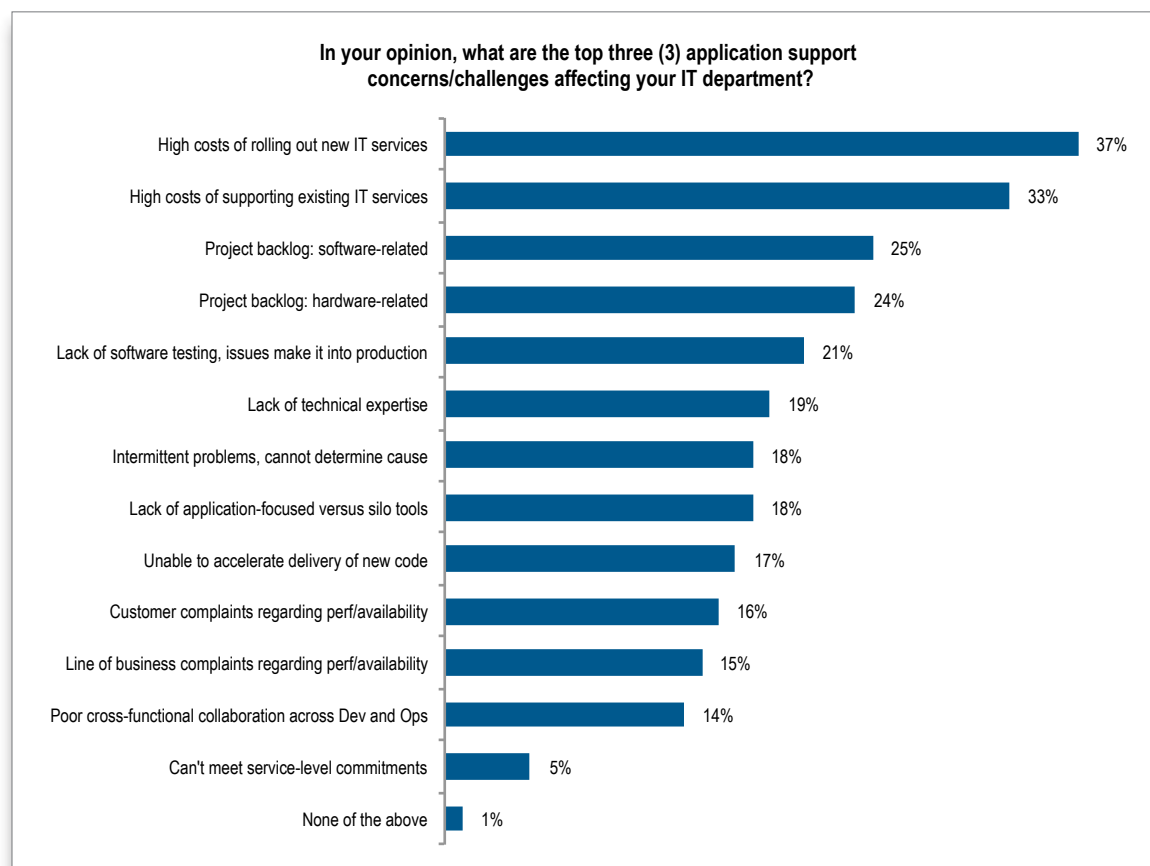


Figure 3. Top IT Challenges: Costs and Backlogs

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**Figure 4**

Figure 4 examines the usage frequencies of a variety of popular technology types. An analysis of this data reveals a number of significant findings:

- Traditional ESB/EAI technologies are still in broad use.
- Linux, in its various flavors, has largely replaced traditional, proprietary UNIX as a platform of choice.
- Data integration technologies—in which purpose-built solutions synchronize data between platforms (whether on-premises or in the cloud) —are now as commonplace as Windows servers.
- At the other end of the spectrum, Hadoop and Docker are still relatively rare, currently utilized for production purposes at less than 15% of companies.

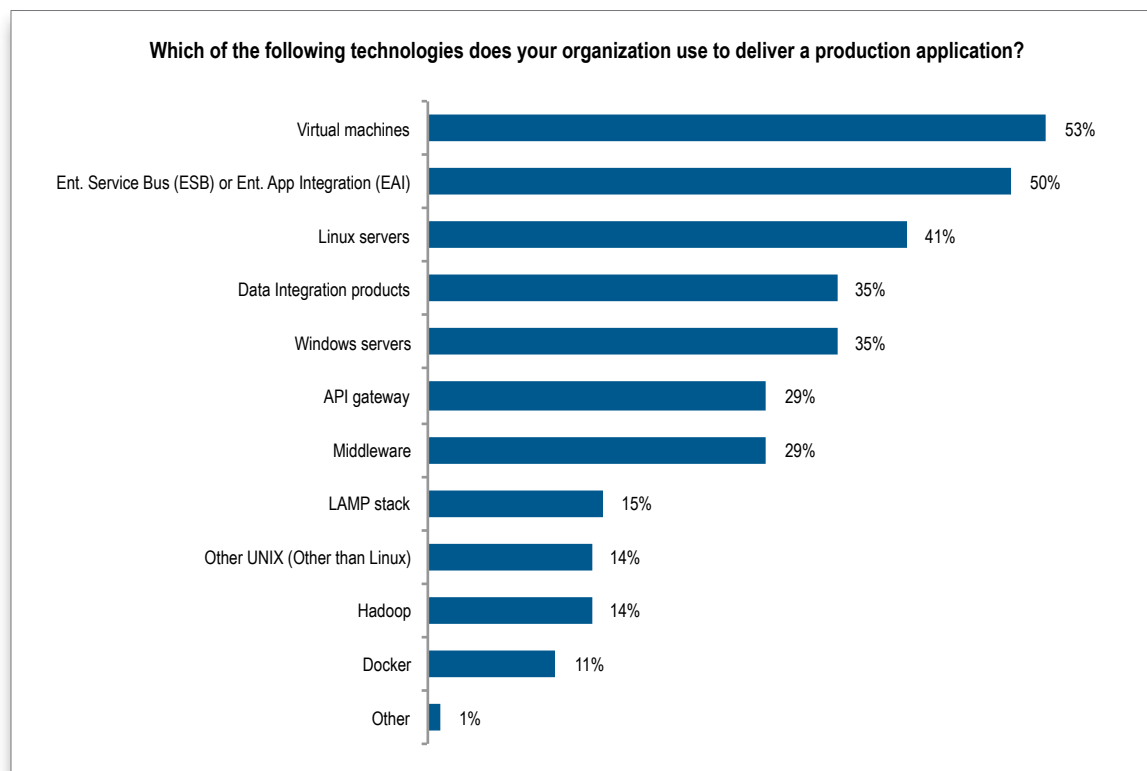


Figure 4. Virtual machines, ESB/EAI, Linux, and Data integration/Windows servers are top technologies in use.

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**Figure 5**

Figure 5 reveals the platforms and application types in use at the companies surveyed. Key takeaways include:

- The use of microservices for production is on the rise. In Q4 2015, approximately 25% of companies were using microservices versus 36% in Q2 2016. In other words, usage has grown by 44% in the past six months.
- Further analysis reveals significant differences by company size:
  - SOA services are twice as prevalent in enterprise-sized versus small or medium-sized companies
  - Adoption rates for microservices are almost identical across small and large companies; however, medium-sized companies are half as likely to be using them for production delivery.
  - Enterprise-sized companies are more than twice as likely to be optimizing mobile for web as medium-sized companies.

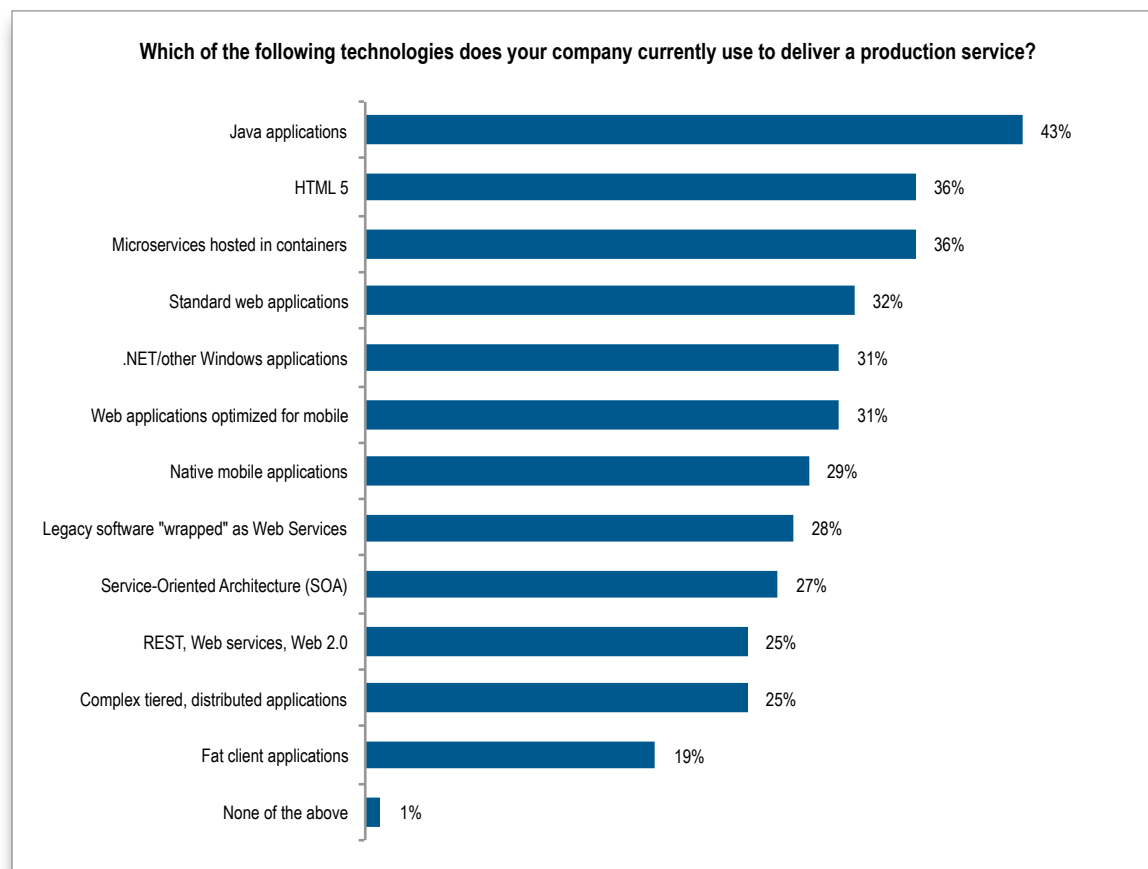


Figure 5. Microservices gaining ground, approximately 30% delivering native and/or web optimized mobile applications

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**Figure 6**

Approximately 25% of survey respondents overall reported running mainframes for production purposes. It is interesting to note, however, that mainframe-hosted services have become a mainstay supporting delivery of mobile and component-based services. Clearly, the mainframe has evolved far beyond the traditionally held view of mainframe-hosted applications as running COBOL code in stand-alone mode as overnight batch jobs.

Figure 6 reveals the types of transactions that most commonly execute in organizations running mainframes. These findings are particularly intriguing when considered in context with the insights previously revealed in the section entitled “In-Depth Analysis: Factors Contributing to Outsized Revenue Growth.” That analysis revealed that of all survey respondents reporting revenue growth of 75% or more in the prior year, 47% were from mainframe shops.

In considering the importance of the mainframe, it becomes clear that this platform has become an essential component supporting both business- and consumer-facing applications. In fact, in support of this transition, IBM launched the z13 mainframe in January 2015<sup>9</sup>. The platform is optimized to deliver highly secure and scalable back-end connectivity for mobile applications (and high-scale, real-time transactions in general).

It is also true that mainframe users as a cohort exhibit higher levels of transaction complexity than companies not running mainframes. The vast majority of mainframe services—more than 80%—run as tiered services spanning both mainframe and non-mainframe platforms.

For mainframe customers, APM solutions supporting visibility to the mainframe as part of end-to-end execution are no longer optional. Due to the complexity of the services mainframes are now supporting, such solutions provide the best, and potentially the only, route to cost optimization. Based on this heterogeneity, a final mainframe-related conclusion is that mainframe customers may well need APM solutions more than those running other platform types.

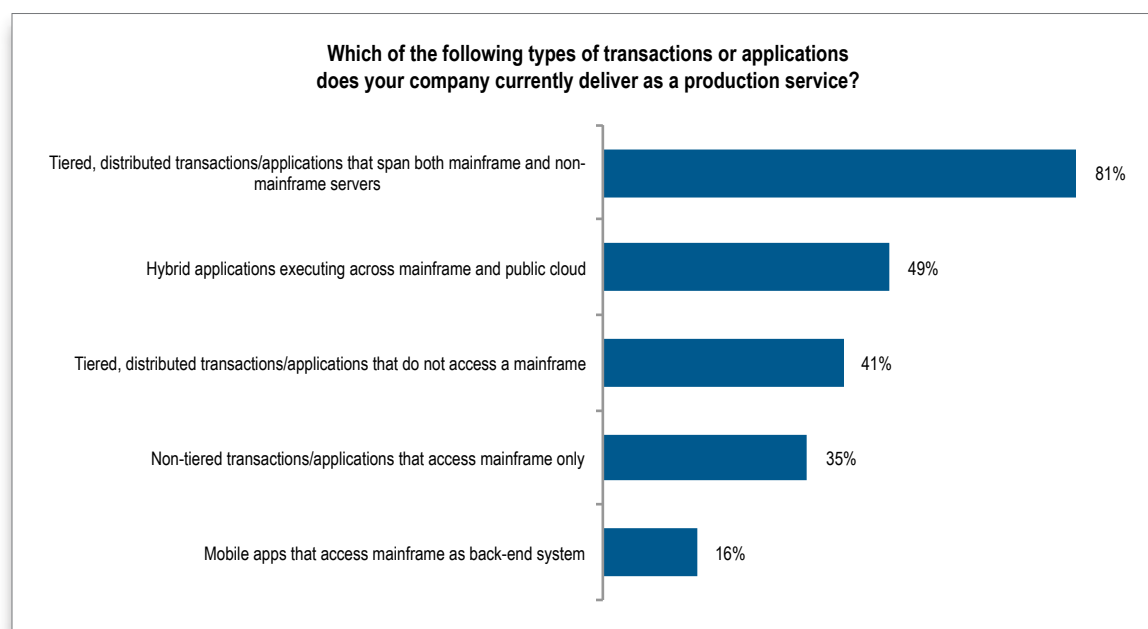


Figure 6. For mainframe customers, complex, tiered applications are the rule versus the exception.

<sup>9</sup> For more information, visit <https://www.ibm.com/press/us/en/pressrelease/45808.wss>.



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**Figure 7**

Because previous EMA research uncovered links between accelerated software delivery, business impact, and IT impact, this study also included questions related to DevOps and Continuous Delivery. The purpose was to determine whether the prior results could be duplicated. And, in fact, the findings are very similar.

Figure 7 summarizes the outcomes—pro and con—of Continuous Delivery initiatives<sup>10</sup> overall. It clearly demonstrates the dichotomy between companies on two sides of the Continuous Delivery maturity scale. Companies adept at Continuous Delivery practices (and those that have automated Continuous Delivery) indicate that overall service quality has improved. Those companies that may not, as yet, have matured their Continuous Delivery practices indicate that overall service quality has degraded. Furthermore, the differences between the two data sets (32% versus 28%) are not statistically significant, indicating that the incidence of the two disparate cases is approximately equal.

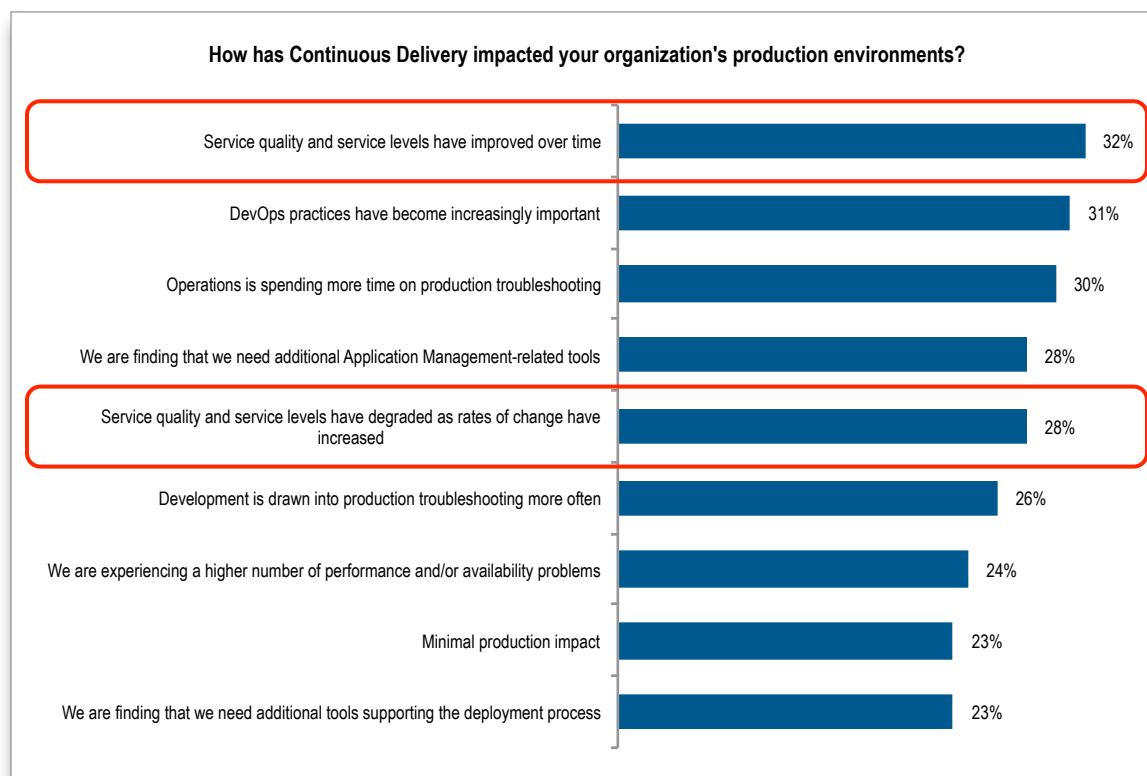


Figure 7. The Double-Edged Sword of Continuous (Software) Delivery

<sup>10</sup> EMA, ["Automating for Digital Transformation: Tools-Driven DevOps and Continuous Software Delivery in the Enterprise."](#) December 2015..

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**Figure 8**

Figure 8 shows the impact of emerging technologies, such as streaming, IoT, and software-defined use cases on production support. Almost half of companies surveyed are hosting video conferencing and/or SDN, and almost as many are building SDDC-based deployments.

From the production support, APM, and UEM perspectives, each of the technologies shown in this figure introduces unique challenges. As a group, they utilize protocols and architectures which are not, as yet, well supported by many existing toolsets. Since virtually all are heavily network dependent, managing applications utilizing them requires visibility both to the network and to the application running over it. And each is distinctive in its characteristics and execution patterns.

Video conferencing and streaming technologies are bandwidth intensive and highly sensitive to latency. Best monitored by UEM solutions but requiring APM and/or network management solutions for troubleshooting/root-cause analysis, these technologies can be difficult to deliver in a seamless fashion that is transparent to users. Depending on the quality of service promised to business stakeholders, it may be difficult to support these types of applications at required service levels. This is particularly true in view of the cost-related constraints identified earlier.

There are other support-related considerations as well. One is that many IT organizations lack tools with visibility to streaming traffic and find it difficult to monitor and quantify performance. Software-defined networks and data centers imply a level of real-time dynamism that is absent in more traditional production ecosystems. Networks and data center infrastructure can theoretically be configured, provisioned, and/or modified on the fly, wreaking havoc on traditional static topology modeling toolsets.

Based on the transient nature of software-defined systems, real-time, 24x7 visibility, ongoing change monitoring, and real-time topology updates, have become key requirements for APM solutions. Going forward, as software-defined elements proliferate and become increasingly dynamic, APM vendors will have to ensure that APM ecosystems are automated to the point where little, if any, manual intervention is necessary to support them.

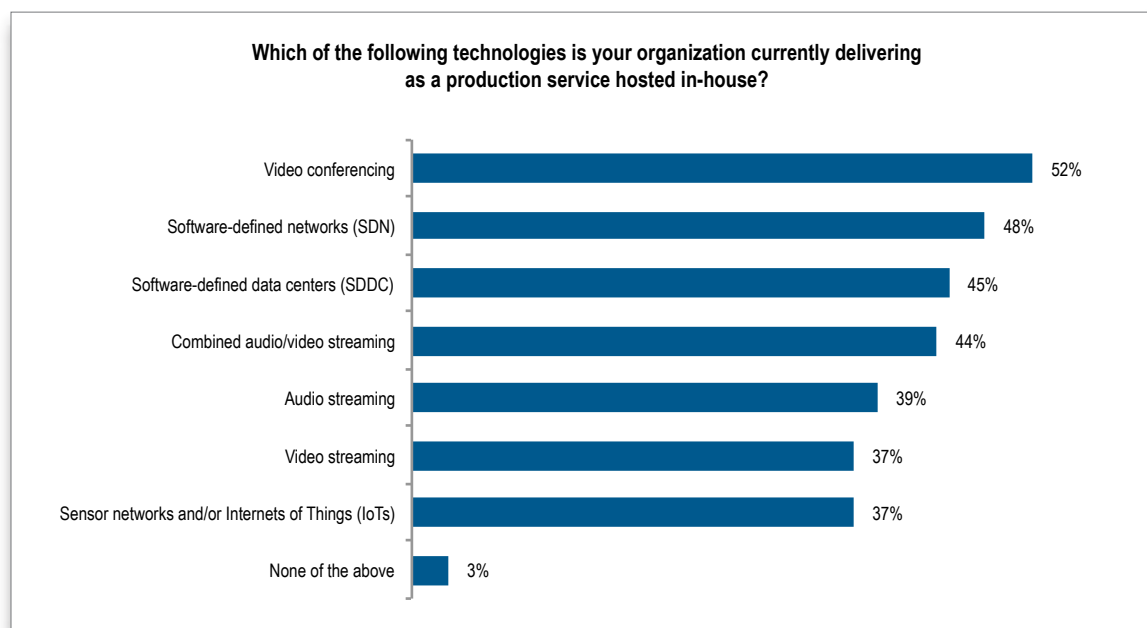


Figure 8. Approximately 50% of companies report hosting video conferencing, SDN.

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**Figure 9**

Figure 9 reveals the *technologies* that today’s IT organizations feel they are best prepared to support.

Noteworthy takeaways include:

- “Transactions traversing the public Internet” appear to be a blind spot in terms of enterprise management technologies. This is particularly interesting in view of the fact that a few vendors specializing in User Experience Management solutions have now instrumented the Internet from a variety of vantage points to provide visibility into what has always been a “black box” to virtually everyone except carriers.
- Supporting “consumer” APIs is a bigger challenge than supporting “provider” API ecosystems. Previous EMA research<sup>11</sup> supports this assertion and reveals additional reasons as to why this is the case.
- Containers and microservices appear to be less of a concern at this point than more mainstream technologies such as streaming and software-defined infrastructure.

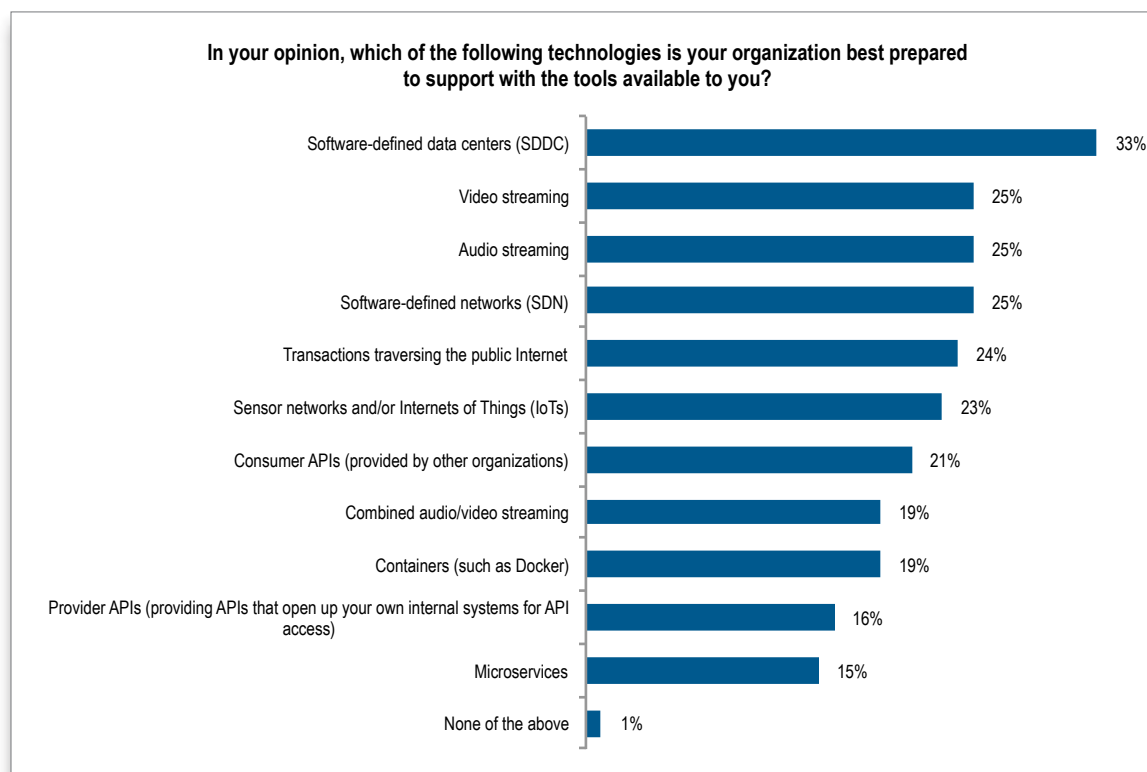


Figure 9. Better prepared to support SDDC than Microservices

<sup>11</sup> EMA, “[Back to the Future with the API Economy: Management Strategies for a New Wave of Integrated Applications.](#)” July 2015.

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**Figure 10**

Figure 10 reveals the *application types* that today's IT organizations feel they are *best* prepared to support. Not surprisingly, web applications top the list. A wealth of APM and UEM solutions are aimed at monitoring web performance. Most IT organizations have, at minimum, access to synthetic transaction capabilities running on either on-premise or cloud-based platforms.

One very interesting finding relates to cloud monitoring. This data supports the idea that companies generally feel more confident in their public cloud monitoring capabilities than they are in their ability to manage complex on-premise-hosted transactions. While this may be true, it is more likely based on a false assumption that applications delivered by an external entity are “their problem” versus “our problem.”

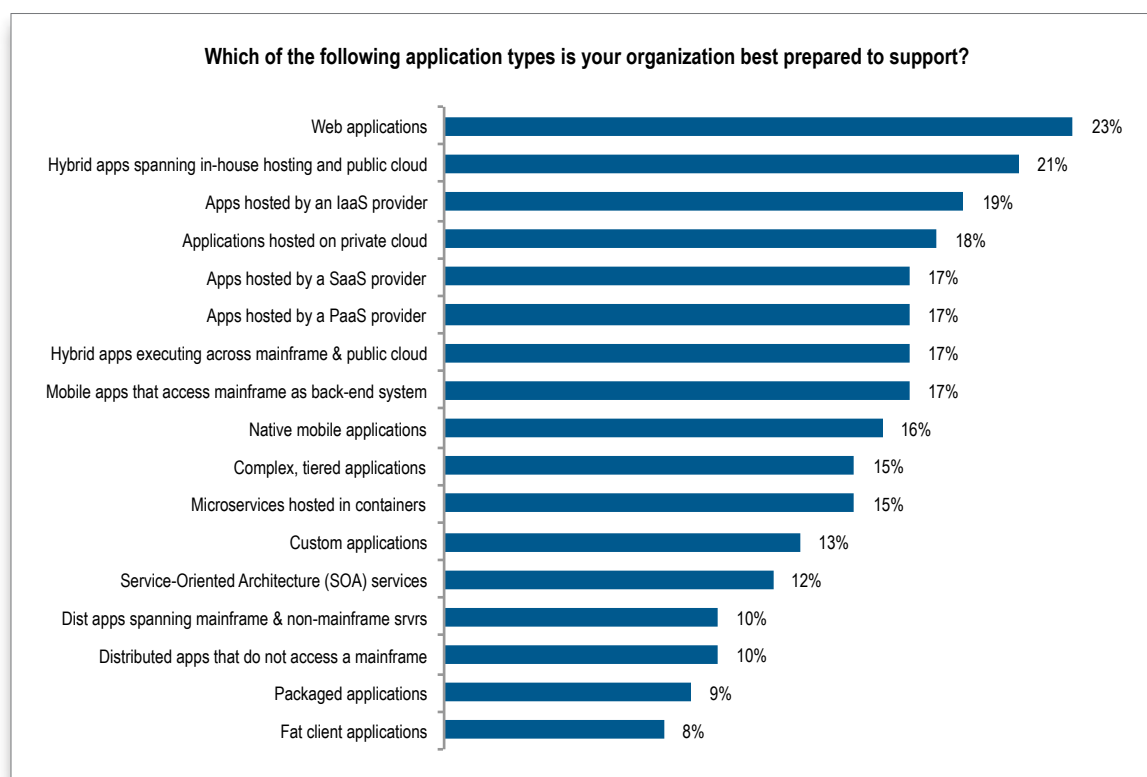


Figure 10. Best prepared to support web, hybrid on-premise/cloud, IaaS-hosted applications

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## Software and Testing Practices

**Figure 11**

This chart shows that survey respondents consider APM solutions to be the number 1 factor, automation-wise, in accelerating the Continuous Delivery pipeline. Fully automating the pipeline itself (via Release Management investments and product integrations) came in as the number two choice. These are both important takeaways, as they highlight the importance of APM to digital transformation efforts in the form of Continuous Delivery.

Prior EMA research (see footnote #3) found a strong link between accelerating the release of new software features and overall revenue growth. The goal of this question was to assess the relative role of a wide range of enterprise management solutions in facilitating this acceleration.

At the same time, prior research also identified production troubleshooting as the #1 Continuous Delivery bottleneck due to the adverse impact of high rates of change. Both APM and Release Automation solutions can clear that bottleneck. APM solutions eliminate much of the manual labor associated with topology modeling, troubleshooting, and root cause analysis. Release Automation reduces the chances of manual errors inherent to non-automated software deployments. Both contribute to higher levels of service quality and reduce the man-hour related resources necessary for production support.

By reducing the bottlenecks associated with Continuous Delivery, and therefore facilitating the positive impact of accelerated Continuous Delivery on revenue, APM solutions may well be viewed as revenue-enhancing tools as well.

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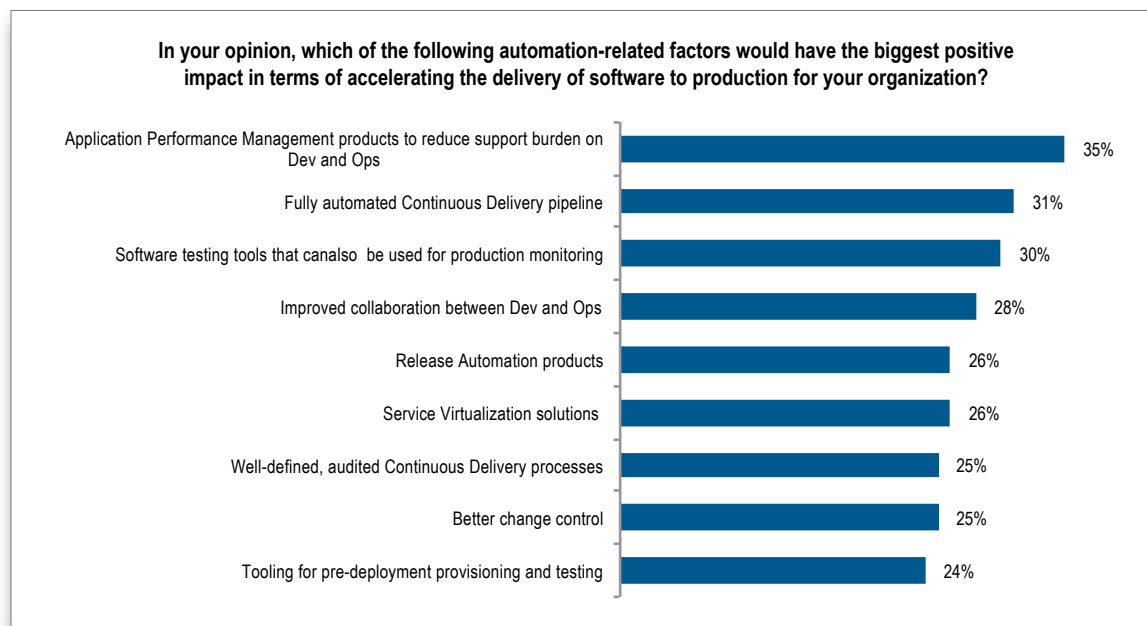


Figure 11. APM identified as #1 automation product supporting acceleration of software delivery

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## Management of Apps Hosted On-Premises

**Figure 12**

Troubleshooting (including root-cause analysis) continues to be the #1 challenge of application support. Two likely reasons for this finding include:

- The proliferation of complex applications such as those identified in Figures 5 and 6
- A lack of tools capable of maintaining topologies and tracing application execution across the ecosystem.

This combination of factors, in contributing to the reported difficulties with root cause analysis, is also a likely factor in the high ongoing costs associated with application support.

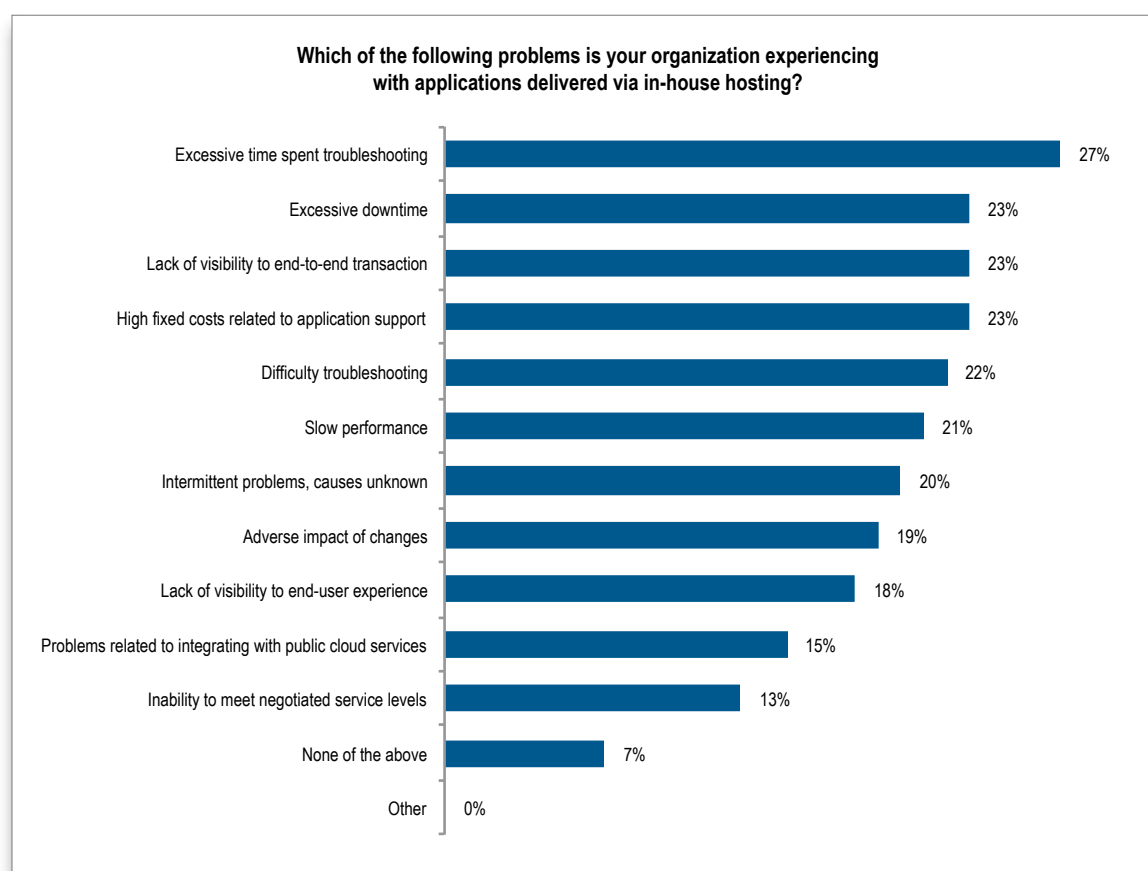


Figure 12: Excessive time troubleshooting, excessive downtime, and lack of visibility are top support challenges for in-house hosted apps



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**Figure 13**

Figure 13 examines the factors contributing to difficulties in resolving application-related problems. While manual processes are again identified as the #1 issue, it is also interesting to note that “lack of trending” information is the #2 issue. This reinforces the efforts of APM vendors, many of which have built support for both real-time notifications and historical trending based on storage of log files and/or metrics for periods spanning months to years, depending on the vendor.

“Lack of topology” knowledge is identified as the #3 challenge, and this is another area that top-quality APM solutions address. In particular, many agent-based solutions can monitor, track, and model topologies based on detected changes. This ensures that changes are reflected in real time and topology maps are always accurate.

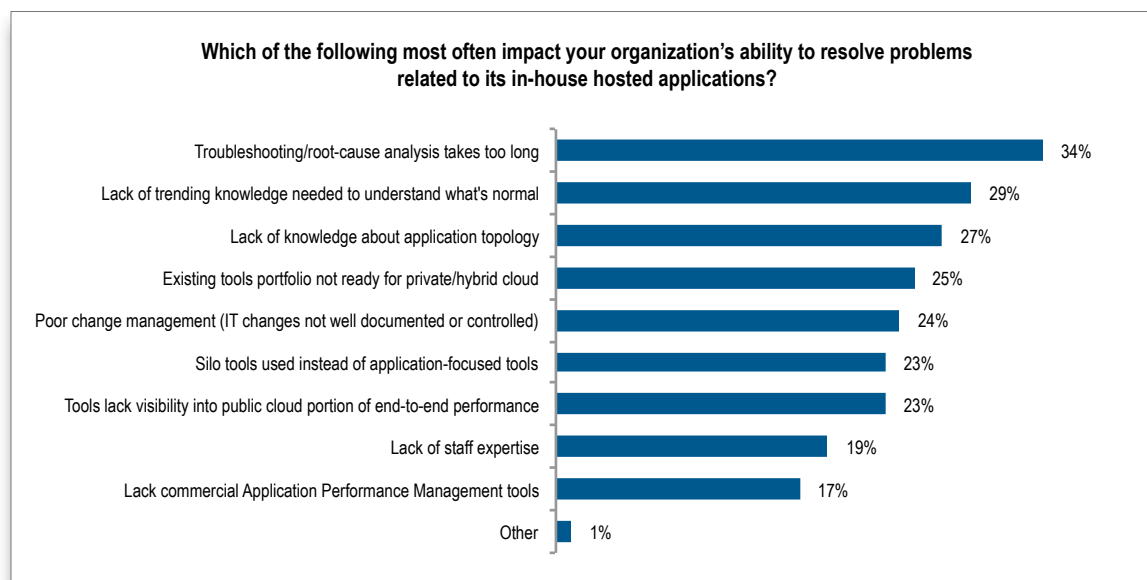


Figure 13. Lack of time, lack of visibility to “normal,” and lack of accurate topologies all impact efficiency of problem resolution process

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**Figure 14**

Figure 14 reveals the top tools identified as being “most essential to enabling IT to resolve problems with in-house hosted applications more quickly.” The respondents showed a clear preference for SaaS-based versus on-premise hosted APM solutions; SaaS-based APM and Change Management solutions tied for first place.

Also interesting to note is that, compared to prior studies, “improved Change Management” is viewed as a necessity by line staff, but not by executives. This is another area of enterprise management which executives apparently feel is well covered, yet which day to day support personnel still see as a problem.

The group as a whole also identified “homegrown monitoring tools” as the #2 option. However—and this is a significant caveat—when analyzed by role it again becomes clear that executives are far more enthusiastic about homegrown tools than line staff are by a factor of 2 to 1. In fact, line staff ranked “homegrown tools” as their second-lowest ranking selection, exceeded only by “endpoint monitoring.”

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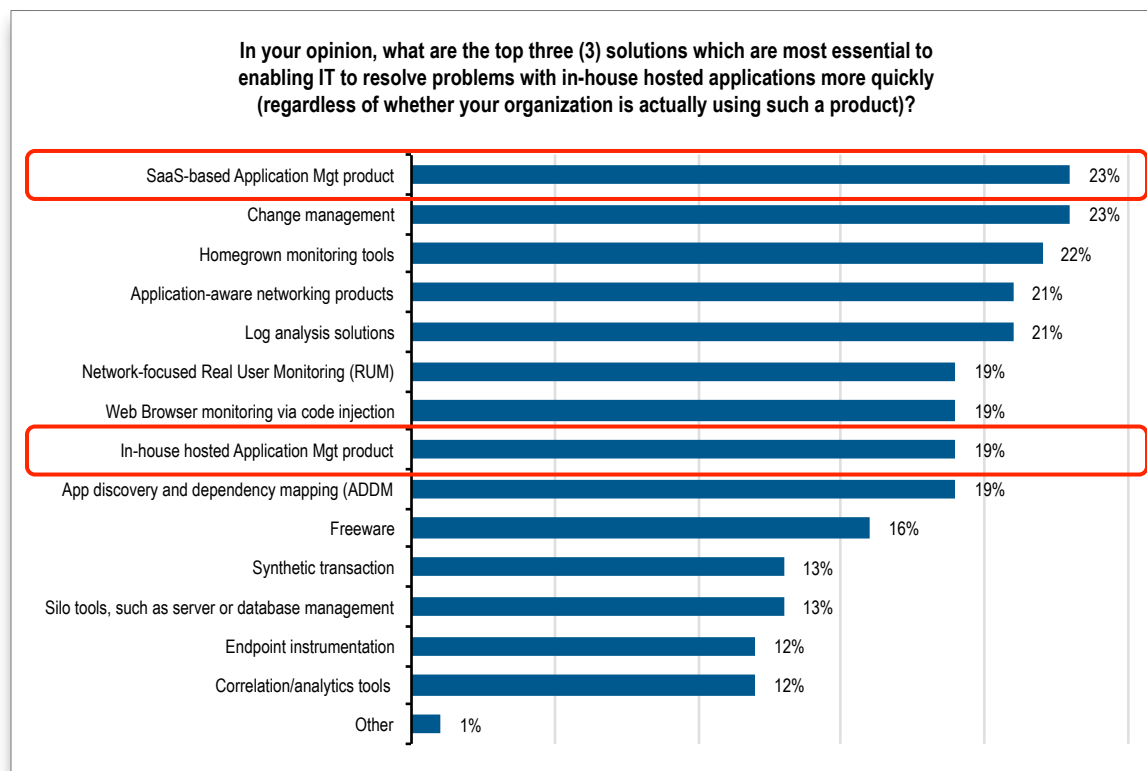


Figure 14. Strong preference for SaaS-based APM form factor

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## APM/UEM Tools Usage and Wish Lists

**Figure 15**

Finally, Figure 15 shows the top (and bottom) “wish list” products in the eyes of IT professionals overall. SaaS-based APM solutions top the list, and this is the second confirmation in this survey highlighting a clear preference for the SaaS-delivered form factor in APM acquisitions.

Segmentation of the results by role and company size reveals two significant differences, both around Log Analysis solutions. Selected as the third “most wanted” option overall, they are the #1 option for middle managers. They were also selected as the top option overall by small companies, defined as those having fewer than 1000 employees.

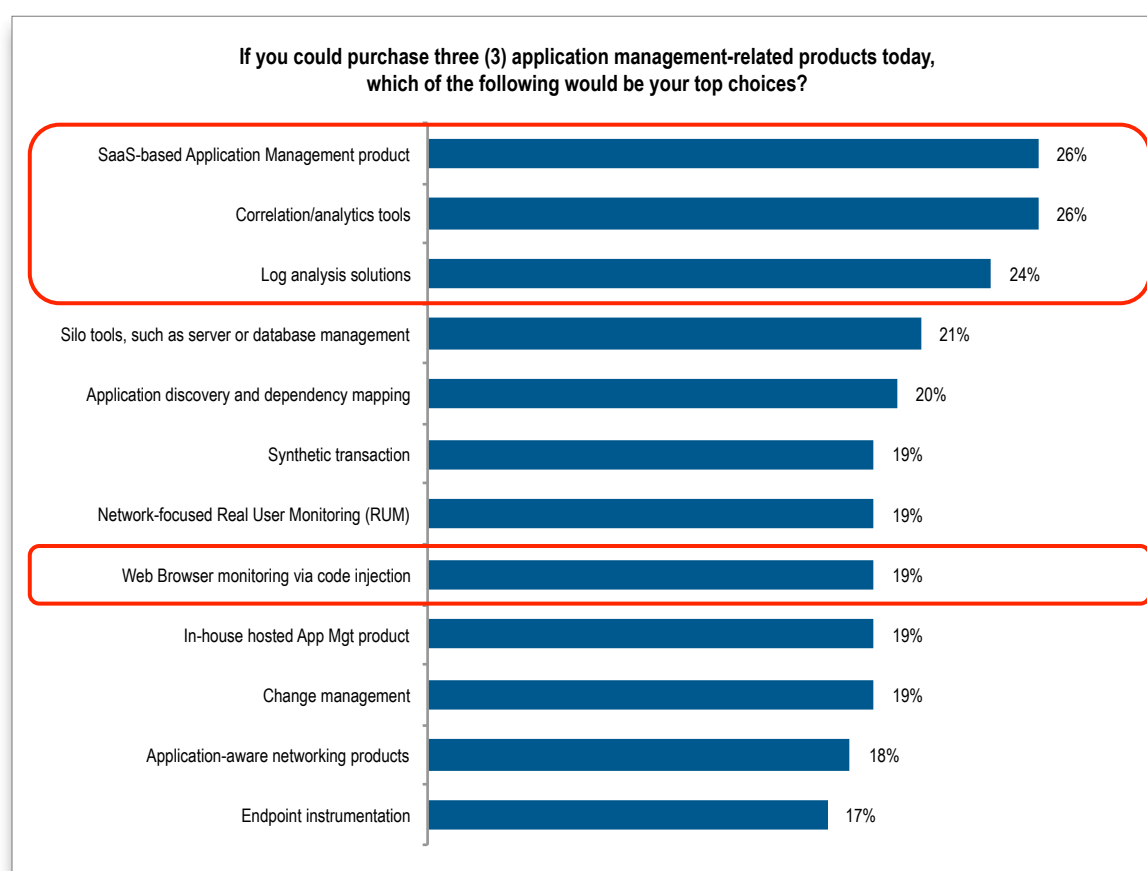


Figure 15. “Wish-List” Tools

Figure 15 shows the top (and bottom) “wish list” products in the eyes of IT professionals overall. SaaS-based APM solutions top the list, and this is the second confirmation in this survey highlighting a clear preference for the SaaS-delivered form factor in APM acquisitions.

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## Summary

As the pace of business accelerates, industry leaders are recognizing the fact that the ability to keep up with technology advances and incorporate them into the services they deliver can be a fundamental factor supporting business differentiation.

At the same time, enterprise-wide initiatives such as digital transformation, DevOps, and Continuous Delivery<sup>12</sup> efforts all require that silo-based thinking and planning are replaced with cross-functional, cross-organizational collaboration. Much of the momentum for these types of initiatives is driven by executives seeking shorter “times to innovation” via faster delivery of digital products and services. In fact, EMA’s 2015 digital transformation research found that, for almost 80% of respondents, “accelerating the delivery of new software functionality” is a “critical” or “very important” priority.

At the same time, a new generation of cutting-edge management solutions is keeping pace with technology innovation and doing so in a variety of ways. Solutions that functionally combine APM and UEM capabilities, incorporate both IT and business-facing analytics, those that feature intelligent self-learning algorithms, and those that automate topology mapping are now available. Platforms supporting the latest developments in containers, microservices, mobile devices, and (increasingly) big operational data are also coming to market, as are new form factors and cloud options for the APM solutions themselves.

We are in a time of rapid digital change brought about by accelerated advancements in both technology and analytics. Within this fast-moving environment, one key function of enterprise management solutions is to mask complexity. A primary function of APM solutions which often goes unrecognized is the fact that these products embody the inherent expertise necessary to support complex applications running over the latest technologies. Leading edge APM solutions “understand” the data received from every corner of the application ecosystem in the context of application execution. They use this information to build an internal model and metadata set capable of modeling and tracking the current state of the environment. In doing so, such tools not only act as “expert engines” with the ability to detect and report on application health, they also do so at a speed that is far beyond human capacity.

As a final note, application ecosystems have grown so large and so complicated that they are beyond the capabilities of human teams to support in a timely manner. This research demonstrates that APM investments—particularly investments in full-blown, on-premise hosted solutions—can have measurable benefits, including accelerated software delivery and improved service levels, cost containment, and customer satisfaction.

**A primary function of APM solutions which often goes unrecognized is the fact that these products embody the inherent expertise necessary to support complex applications running over the latest technologies. Leading edge APM solutions “understand” the data received from every corner of the application ecosystem in the context of application execution. They use this information to build an internal model and metadata set capable of modeling and tracking the current state of the environment. In doing so, such tools not only act as “expert engines” with the ability to detect and report on application health, they also do so at a speed that is far beyond human capacity.**

<sup>12</sup> EMA research describes DevOps processes in particular as spanning the lifecycle and encompassing stakeholders representing IT, Development, and Line of Business.

### About Enterprise Management Associates, Inc.

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