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PATHFINDER REPORT

S&P Global Market Intelligence

Keeping the Customer Experience at the Center of the Digital Business

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About this paper

A Pathfinder paper navigates decision-makers through the issues surrounding a specific technology or business case, explores the business value of adoption, and recommends the range of considerations and concrete next steps in the decision-making process.

ABOUT THE AUTHOR



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Previously, Nancy wrote about a wide range of technology subjects, both on staff for a variety of publications and on a freelance basis. She has covered everything from the switch to digital cellular communications to the emergence of cloud computing. Her writing has appeared in The New Stack, Wired, MIT Technology Review, The Economist (Babbage blog), Computerworld and The New York Times.

Executive Summary

Digital transformation initiatives may have different goals depending on the enterprise and sector, but they have one thing in common: the customer is the central driver. Customers may be internal constituents using an app to boost productivity, or end users consuming services or buying products online. Either way, the customer experience is critical to business success.

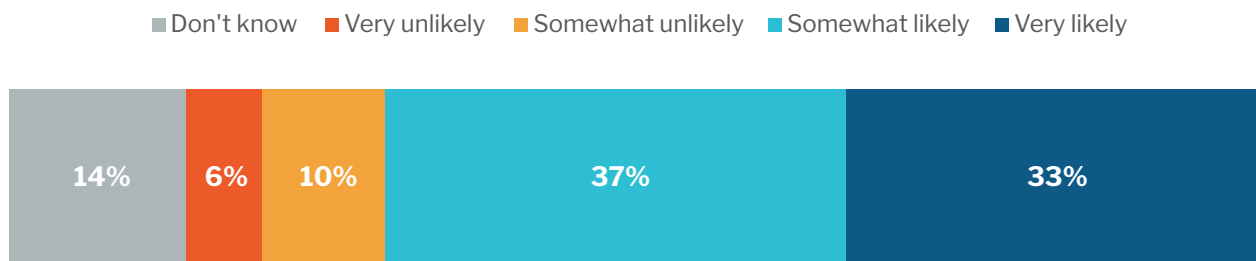
However, understanding the customer experience – including whether technology performance problems impact users and whether performance issues are important in the context of business goals – comes with a host of challenges, particularly in today's complex, dynamic technology environment. Technologies like containers, Kubernetes and microservices architectures generate a much larger volume of operations data than more traditional application stacks. The result is so much data that operations and DevOps teams have trouble attaining visibility into the source and impact of performance problems.

Despite those challenges, delivering the best customer experience is more important than ever, since revenue and other important business success measures may depend on the performance of an app or service. In a recent survey, we found that 70% of consumer respondents said they would switch brands or providers if the service they were using was slow or buggy.

Figure 1: The importance of performance

Source: 451 Research's Voice of the Connected User Landscape: Communications & Media Q2 2019

Q: If an online app/service you use performs poorly (e.g., slow, buggy, unavailable), how likely are you to switch to a different brand/provider as a result?



Depending on the application, the loss of those users could have a significant impact on the enterprise. If the application or service is customer-facing, it could lead to a revenue drop. When applications used by internal employees perform poorly, the reduction in productivity could similarly impact the bottom line. Being able to connect the dots to determine the impact of performance issues on the business becomes an important capability to prioritize the response.

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To achieve the optimum customer experience, IT teams should focus on a few key practices:

- Align the customer experience with business goals.
- Embrace sophisticated technologies including artificial intelligence/machine learning (AI/ML).
- Employ automation.
- Ensure internal skills can support emerging techniques.

These approaches enable organizations to best serve customers and, in doing so, support the key mission of the business.

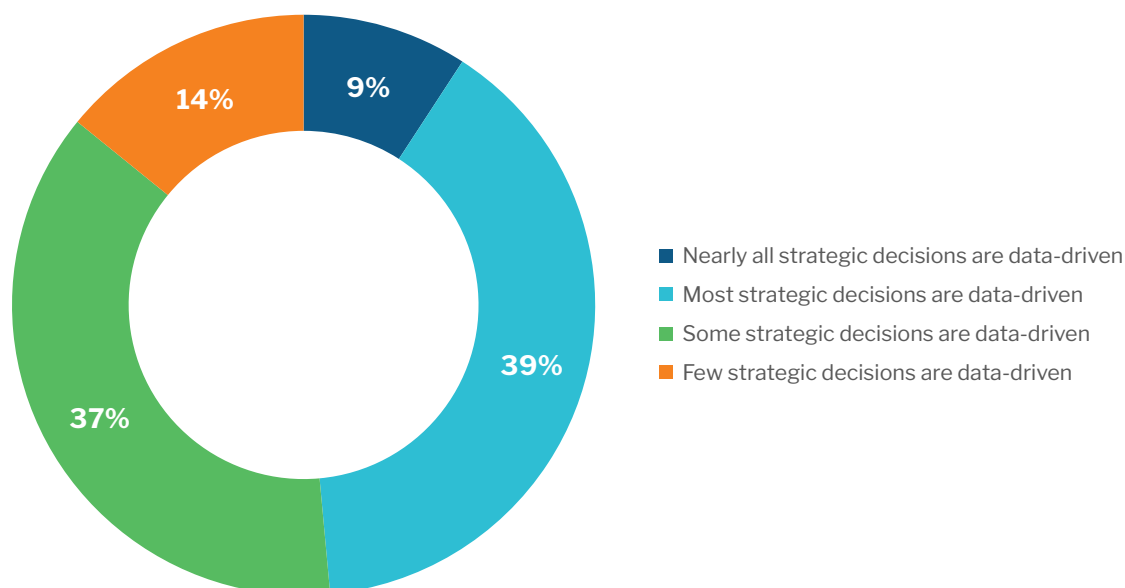
Analyze Technology in Context of the Business

In order to best serve their customers, enterprises need to be able measure the customer experience in the context of the business. With so many potential customer touch points – IoT devices, continuously updated apps, mobile phones and third-party properties to name a few – prioritizing problem areas is crucial, especially when most organizations are being asked to do more without increasing staff.

We know that using data to drive strategic decisions, including about incident response and product development, is important to many businesses, although many organizations still say that strategic decisions aren't being made based on data. In our 451 Research Voice of the Enterprise Consumer Experience & Commerce survey, we asked executives about their use of data to make strategic decisions. Only 9% said 'nearly all' strategic decisions are data-driven, although 39% said most and 37% said some strategic decisions are data-driven. A further 14% said that only few strategic decisions are driven by data. While there's room for improvement here, with plenty of strategic decisions made based on instinct or other non-quantifiable direction, it's clear that most business leaders recognize the value of data.

Figure 2: Influence of data on strategic decisions

Source: 451 Research's Voice of the Enterprise: Customer Experience & Commerce, Organizational Dynamics & Budgets Q1 2019
All respondents



When it comes to improving the customer experience, many organizations are drowning in operations data that indicates the existence of technology performance problems but without providing business context. Where once it was enough to know that CPU usage on a server was running too high, today that's just one data point in a sea of operations data that may have no impact on the end user.

One way that we've seen enterprises examine performance through the lens of the business is by setting technology performance goals based on what's important to the business. For instance, teams responsible for performance are tracking when latency of a particular call is too high, leading customers to leave the app, or when shopping cart abandonments are too high. With those goals – which can have a direct impact on the business – in mind, technology teams can prioritize the technology anomalies that are most important so they can address those first. Doing so ensures that the customer experience is at the center of work being done by operations and development teams.

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Use AI/ML to Find and Fix Issues Faster

Not only are businesses offering more digital properties including apps, online services and websites, but those products and services are being built on increasingly complex and dynamic technologies. With the adoption of containers, Kubernetes, microservices architectures and software-defined networking to name a few, teams responsible for operations are faced with too much data and too little insight.

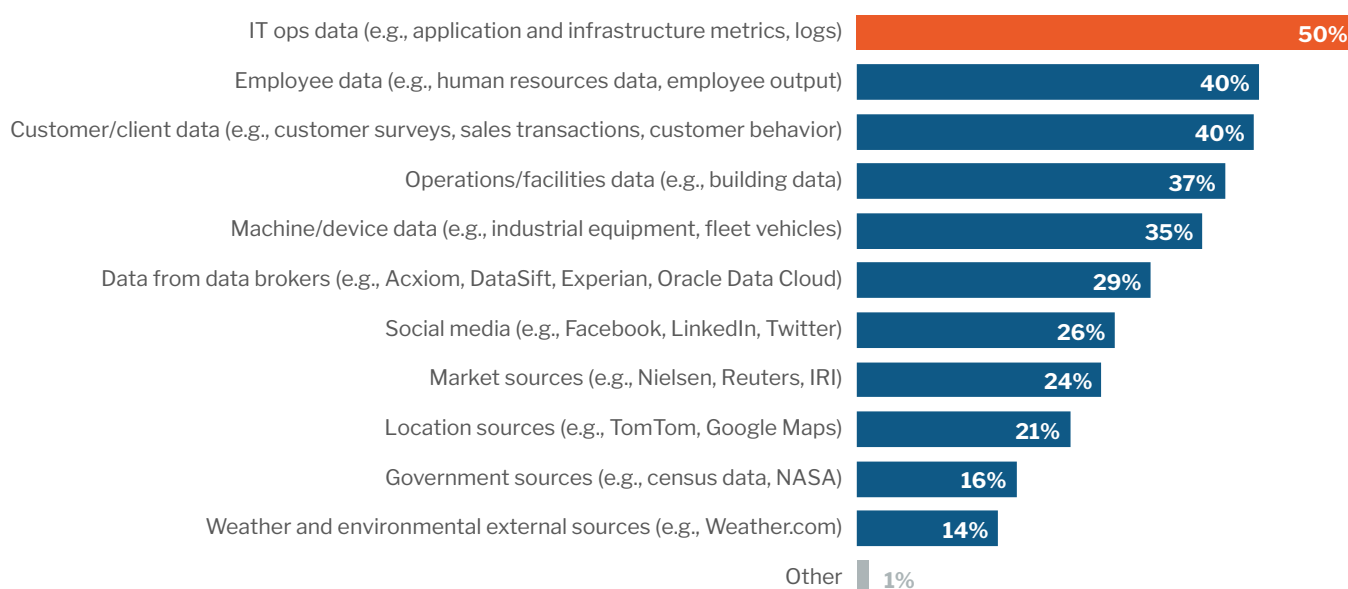
Enterprises are turning to AI/ML for help making sense of the growing volume of data. In our Voice of the Enterprise: AI and Machine Learning survey, we asked decision-makers which data sources feed their AI/ML workloads, and their top choice, with 50% of responses, was IT operations data such as application and infrastructure metrics and logs. By applying AI/ML techniques to IT ops data, operations and DevOps teams can solve some of the most pressing information-overload issues that they face.

Figure 3: Source of data for AI/ML workloads

Source: 451 Research's Voice of the Enterprise: AI and Machine Learning, Infrastructure 2019

Q: Data from which of the following sources is used as part of your AI/ML workloads? (n=388)

Base: Organizations with machine learning in use or in proof of concept



However, adopting AI/ML isn't always smooth. Many teams lack the requisite skills, which exacerbates the challenge of making sense of the operations data being generated by complex environments. Our research indicates that data expertise, ranging from general data analysis skills to sophisticated ML/AI skills, is in short supply at many businesses.

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To overcome hurdles related to data overload and a lack of internal skills, we recommend that enterprises look for tools that can handle the growing volume of operations data, as well as remove the complexity of analyzing it. Important AI/ML-driven capabilities to look for in tools include:

- **Correlation of data across systems/stacks:** The challenge of identifying the source of a performance problem and discovering whether it's impacting customers is often exacerbated by siloed data. Many organizations have scores of monitoring tools, many of which collect and retain operations data about a particular layer or technology. Modern tools can bring together operations data from across applications and infrastructure and correlate that data so that users understand when anomalies are related. Such correlations allow teams to focus on important events, eliminating those that aren't relevant or that are redundant.

Correlation approaches are increasingly sophisticated. For instance, tools that are aware of application and infrastructure topology can intelligently group problems into a single incident. Doing so may help guide users to the source of a performance problem so that they can more quickly solve it.

- **Insight into change and the relationship to performance problems:** Modern application environments change much more frequently than traditional stacks. Developers may push new code to production on a daily, hourly or even more frequent cadence. In addition, orchestration tools like Kubernetes make constant changes to infrastructure. Despite the best efforts of software engineers and operators, these changes can lead to performance problems.

Some tools can detect when a change like a new software push likely leads to a performance degradation. A tool that alerts operations and DevOps staff to this potential cause and effect can significantly shorten the amount of time it takes responders to identify that a change event has impacted performance, and then quickly roll back the change to solve the problem.

- **Predictive capabilities that can alert about potential problems:** Machine learning can also be used to examine trends to predict when a problem might occur. The simplest applications of these predictive features look at resources like memory, predicting when it might run out and impact application performance. More sophisticated applications are beginning to emerge that identify when multiple trends might converge to cause a performance problem, based on past similar scenarios.

Each of these use cases for machine learning represents an opportunity for operations professionals to more quickly learn about and fix performance problems that negatively impact the customer experience.

Embrace Automation

In addition to AI/ML, automation is playing an increasingly important role in ensuring that technology teams can support top customer experience. While automation has long been an important concept in operations and incident response, the complexity of modern environments has made automation a more crucial technique. So many new technologies make up modern applications, and there is so much change that most teams don't have enough people to execute all of the required management and monitoring functions. Our research indicates that the current adoption of automation in IT is relatively low, but interest in further investments in automation is significant, demonstrating that teams recognize the value of automation.

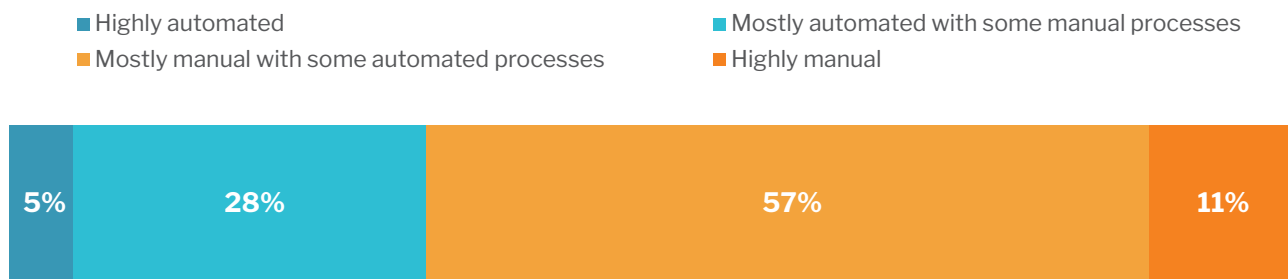
When we asked IT decision-makers about the current level of automation in their organizations, the bulk were primarily manual; 68% described their environments as either mostly manual or highly manual. Only 5% said they were highly automated, leaving significant room for improvement. However, it appears that teams recognize this shortcoming and the value of automation. We asked how they expected their investment in IT automation to change in the coming year, and the bulk – 74% – are planning a slight or significant increase. Twenty-one percent said they expect to retain the same level of investment.

Figure 4: Adoption of Automation in IT

Source: 451 Research, Voice of the Enterprise, Digital Pulse, Q1 2020

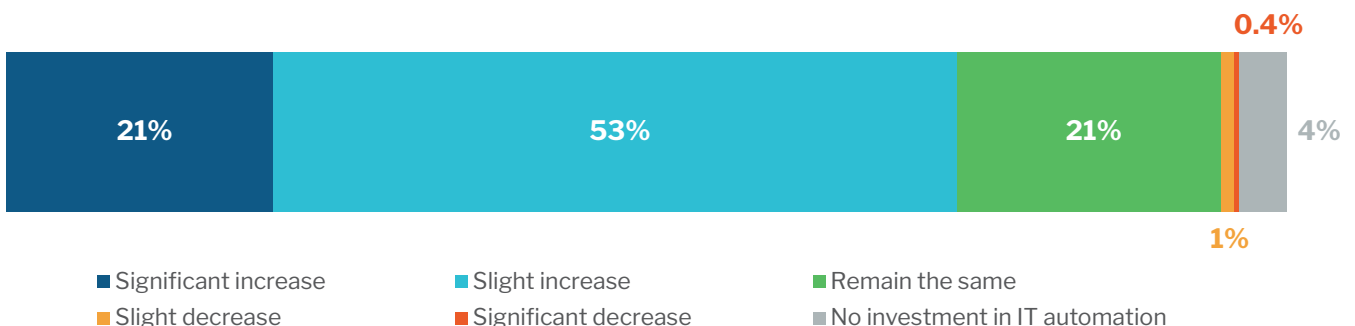
Q. How would you describe the current level of automation in your organization's IT environment?

Base: All respondents, abbreviated fielding (n=138)



Q. Looking ahead 12 months, do you expect your organization's investment in IT automation to increase, decrease or remain the same compared to the previous 12 months?

Base: All respondents (n=513)



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While automation can be applied to many processes in IT, we think auto-remediation has particular promise. In order to successfully embrace auto-remediation, though, organizations must have sophisticated monitoring tools in place since these tools must first accurately pinpoint the root cause of problems before kicking off remediation. Until end users have confidence that their monitoring tools are sophisticated enough to identify the source of a performance issue, they won't be able to employ auto-remediation.

Once the source of a problem is accurately pinpointed, the tool must be able to intelligently identify the remediation that will correct the issue. We're seeing some advancements in tools that are able to examine past responses to incidents and the outcomes of those responses to inform the choice of remediation in response to performance problems.

Adjust Internal Roles, Practices

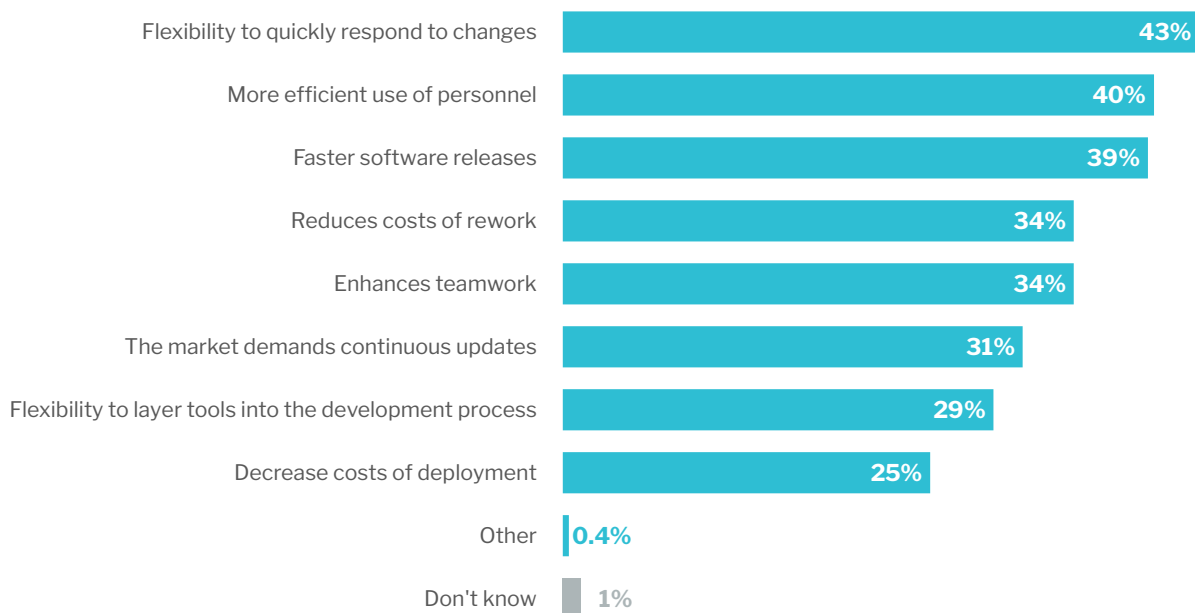
We've found that to support these modern approaches, most enterprises must make some internal adjustments to both team structures and roles. Embracing DevOps practices is one approach that helps many businesses move faster and make more efficient use of internal skills. In our Voice of the Enterprise, DevOps study, we asked IT decision-makers about the benefits of DevOps adoption, and many of their top responses support some of the approaches we describe here. Their top answer, at 43%, was that the flexibility to respond to changes was a benefit of DevOps adoption. More efficient use of personnel came in at number two with 40% of responses.

Figure 5: Why organizations adopt DevOps

Source: 451 Research's Voice of the Enterprise: DevOps 1H 2019

Q: How is a DevOps approach benefiting your organization?

Base: All respondents (n=500)



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We're beginning to see some DevOps organizations employ monitoring tools earlier in the development cycle in ways that allow them to examine performance characteristics of new code before releasing it to production. They can also use techniques to easily compare the performance of updated software with production software to better understand how new releases would impact performance. These types of approaches support organizations seeking to speed software development but do so while delivering quality products without compromising the customer experience.

We continue to see the rise of site reliability engineering (SRE), where development skills are brought to the role of operations. The workflow is significantly automated, with site reliability engineers focused on reducing manual work associated with operations. As organizations adopt SRE tactics, they embrace new tools that support their goals. We see AI/ML as important enablers here, with SRE teams looking to the sophisticated analytics techniques to automatically correlate alerts, for instance, in ways that help pinpoint the root cause of problems. They also embrace tools that support auto-remediation in ways that remove the burden of repairing common performance problems.

We also see SRE teams keeping a close eye on the relationship between change in the environment and performance. When new software is released that inadvertently has a negative impact on the customer experience, SREs want tools that point to the culprit, such as a software deployment. With that insight, they can quickly roll back to a more reliable version and allow developers to address the problems.

The adoption of both DevOps and SRE practices requires organizational shifts that often create challenges for businesses that aren't prescriptive. But businesses that embrace these concepts are typically able to move faster to quickly respond to customer demands with reliable and resilient services.

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Conclusions

The growing reliance on digital products to drive revenue and the embrace of new technologies to build those products is putting dramatic pressure on teams responsible for application performance. This new paradigm is forcing shifts within organizations. Those that resist the changes required to thrive in this new environment risk a significant threat to their businesses because customer experience will suffer and along with it, the ability to drive revenue.

Best practices continue to emerge to support IT teams that recognize they must adapt. Among them is investing in the ability to analyze technology in the context of the business. With this ability, organizations can focus their work on tuning performance in terms of what matters most to the business and to end users.

In addition, forward-thinking teams are adopting targeted AI/ML-driven capabilities and automation, both of which can have significant impact on reducing the amount of time it takes to identify and solve problems that impact end users. We expect the adoption of these technologies to continue. We also have seen progress in the development of best practices for roles and responsibilities, namely including DevOps and SRE. While experimentation continues, these new internal models support the changing demands on the function of operations and can help operations teams keep the customer experience at the center of their work.



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