



ESG WHITE PAPER

Expediting IT in the Wake of Ever-increasing Demands and Problematic Talent Shortages

Intelligent, Automated Infrastructure Means Increased Speed and Agility, and Better Customer Service with Less Hassle

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Overview

IT innovation comes in waves. Cloud IT disrupted the last decade, and server virtualization disrupted the decade before that. Looking forward, the next wave of disruption will likely center on intelligent infrastructure.

That's partly because demands for IT services are increasing across data centers, the cloud, and the edge. But right now, the true bottleneck to effective IT relates to people: Even as IT demands are increasing, talent is becoming scarcer. For example, 32% of senior IT decision makers surveyed by ESG reported that they are experiencing problematic skill shortages in the area of IT architecture and planning,¹ an increase of 9 points over the past five years (32% versus 23%).²

Amidst this talent scarcity, digital business opportunities continue to fuel increased investment in data-centric initiatives, which add burdens on IT—namely, a greater demand for technical expertise. When a business has an urgent need for people with higher-order skills to do things such as support business applications, incorporate automation, and oversee data mining programs, it means that fewer talented people are available to look after more routine IT administrative tasks. Assuming that firms can find enough people, the talent scarcity often drives up the cost of labor. Left unchecked, that state of affairs will inhibit a modern digital business.

ESG's research with line-of-business (LOB) executives reveals that their companies' IT organizations are not keeping pace with its LOB executives' expectations. Only 6% of the surveyed LOB executives said they regard their company's IT group as a competitive facilitator/differentiator for the business, while 25% actually consider IT to be a business inhibitor. Among the execs who view IT as an inhibitor, 43% said it is because the IT organization takes too long to deploy new services.³

In response to those concerns, IT organizations are increasing their investments in automation. The intent is to alleviate management-related burdens by instituting more self-service operation. But within a traditional IT infrastructure, investments such as those will go only so far.

The IT infrastructure itself must get smarter, leveraging advancing learning techniques such as machine learning, in order to understand the whole environment, including the unique demands of different applications. A smart infrastructure will not only better inform IT admins, it will also be able to leverage automation to take effective action to overcome problems, and ultimately resolve issues by itself.

Modern Business Drives IT Complexity, Fueling Demand for Automation

Rises in IT complexity are real, and their impact is especially apparent within digital businesses. Overall, nearly half (47%) of IT managers surveyed by ESG said IT is more complex now compared with two years ago, and 17% believe it's significantly more complex.

That complexity is poised to increase further as digital transformation efforts continue to unfold. ESG has found that organizations with mature digital transformation initiatives are three times more likely than those with no digital transformation initiatives (29% versus 9%) to consider IT to be significantly more complex today.

This current climate of IT complexity is compelling many organizations to revisit automation's potential as a solution. For example, the top data center modernization areas cited by respondents this year (see Figure 1) include increasing the use of IT automation (mentioned by 25% of respondents) and leveraging machine learning in management tasks (23%).

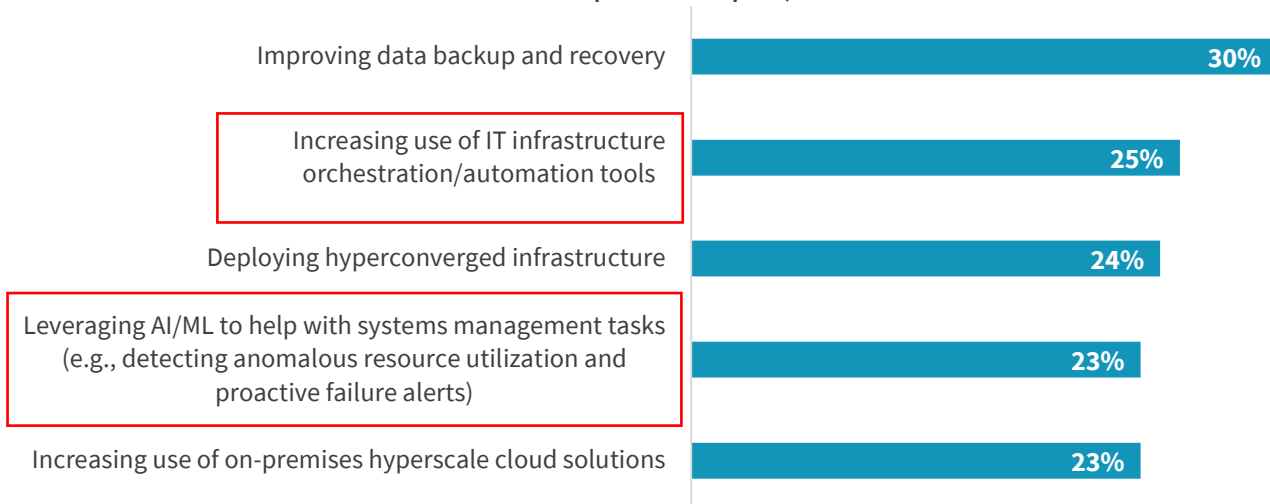
¹ Source: ESG Master Survey Results, [2020 Technology Spending Intentions Survey](#), January 2020. All ESG research references and charts in this white paper have been taken from this master survey results set, unless otherwise noted.

² Source: ESG Research Report, [2015 IT Spending Intentions Survey](#), February 2015.

³ Source: ESG Master Survey Results, [2019 Technology Spending Intentions Survey](#), March 2019.

Figure 1. Top Five Data Center Modernization Investment Areas

In which of the following areas of data center modernization will your organization make the most significant investments over the next 12-18 months? (Percent of respondents, N=658, five responses accepted)



Source: Enterprise Strategy Group

“Achieving automation” is not always simple, however. IT orchestration and automation expertise is the second most commonly identified problematic skill shortage (34%), behind only cybersecurity (44%). That situation highlights a serious problem: If adding automation is actually exacerbating the skill-shortage problem, then it defeats automation’s originally intended purpose.

So what’s the answer? An infrastructure must be designed with enough embedded intelligence to properly enable automation to deliver the benefits it is supposed to provide, while also offering a strong amount of self-optimization and problem self-resolution.

Intelligent Infrastructure Is Essential for the Future of IT

Intelligent infrastructure is a term used to describe the act of expediting IT despite ever-increasing demands and chronic talent shortages. Integrating intelligence into an IT infrastructure is the best way to maximize the value of automation. Arguably, intelligence-related characteristics should now be the top infrastructure purchasing driver.

ESG asked IT decision makers about their opinions of equipment and systems that leverage artificial intelligence and machine learning as an embedded feature for intelligently automating processes (e.g., processes such as identifying anomalous behavior by infrastructure resources, correlating data protection policies to data sets, or detecting and mitigating network intrusions). Among the respondents:

- 45% want such systems to serve as a **recommendation engine only** based on learned behavior from automated real-time and/or historic data analysis, with admins being responsible for actually implementing and executing the recommendations—it appears most organizations aren’t ready to cede full IT system control to AI.
- Yet nearly a quarter (22%) do want their system to **automatically detect, analyze, recommend, and apply changes** as needed, with the staff able to review the outcomes and make changes if required.⁴

⁴ Source: ESG Master Survey Results, [Artificial Intelligence and Machine Learning: Gauging the Value of Infrastructure](#), March 2019.

Whether these engines are recommendation-only or are actually applying changes, they are forms of intelligent infrastructure. They collect detailed telemetry information on the infrastructure and the available application environment. They might leverage that telemetry data to:

- Recommend deployments and configurations.
- Recommend ways to optimize the environment.
- Automatically optimize the infrastructure (self-optimize).
- Automatically diagnose issues and recommend actions (self-diagnose).
- Automatically diagnose issues, and then apply proper resolutions (self-resolve).
- Collect information on the application/data environment and recommend how to leverage the data.

Empowering Self-service

The capabilities listed in the previous section are also essential for self-service. They are quickly becoming must-haves for short-staffed digital organizations that want to keep pace with rising business demands.

Consider what traditionally happens when a database administrator needs help from the company's IT infrastructure team. In the past, that DBA would have to submit a ticket, and then a human infrastructure admin would process it in accordance with the DBA's requirements—for example, by creating a test scenario with ten thousand virtual desktops and the company's biggest SQL Server database.

That is an enormous request for one help ticket. The fact is, database admins and VM admins *should not be required to ask the infrastructure team for anything*. The downstream admins who have, until now, always been the infrastructure team's "customers" can instead evolve into truly self-reliant power users.

Endlessly ramping up human capital investments is not a long-term answer. People are expensive, often hard to find and recruit, and they quit when different opportunities come along. But more importantly, people are error-prone when they perform tasks. An organization cannot scale an IT infrastructure enough to achieve what needs to be done using only humans to perform low-value, routine tasks. IT demands and IT complexity are increasing faster than the numbers of personnel are.

It is through automation, intelligence, and ML that businesses will be able to scale reliably in this decade going forward. Humans will still be the ones making strategic decisions about what's to be done at a macro level. But it will be up to AI and automation to keep the IT organization and the rest of the business on the right path.

The Bigger Truth

When a company does not have enough experts to manage everything, the only choice is for hardware to manage itself, or at least dramatically reduce the demand for human involvement. That's the best way to overcome a skill shortage. Plus, the organization can retrain all its smart people for higher-value work, rather than trying to find additional smart people, which is expensive and painful.

Organizations choosing their next batch of on-prem storage infrastructure should look for solutions with intelligent infrastructure capabilities. If they don't, they are likely facing another three to five years (considering storage lifecycles) before they will have another opportunity to do so.

Yes, a standard infrastructure works. But it was never designed to learn. It was never designed to collect data to allow for not only predictive, but also real-time automation that will save IT thousands, or collectively millions, of hours.

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