

ESG Research Insights Brief

Flash Storage Fuels IT Transformation

The Quantified Impacts of Organizational Flash Storage Use

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Introduction

IT Transformation is a concept that resonates with companies even more now than it did 12 months ago. Although not synonymous with digital transformation, the two concepts are fundamentally linked together, as *effective digital transformation cannot happen without IT Transformation*.

A company that transforms its IT infrastructure no longer has to rely on rigid, manual, siloed, legacy technologies. It sees a boost in IT operational speed, efficiency, scale, and cost effectiveness—tasks are automated, processes streamlined, and resources are freed up. Those IT-level improvements fuel a larger-scale digital transformation, allowing the company to thrive in today's digital economy. It is able to out-innovate, out-think, and out-pace its competitors—ultimately becoming the disruptor, not the disrupted.

It is possible to categorize a company's degree of IT Transformation according to how extensively it has adopted:

- **Modernized data center technologies**—e.g., All-Flash storage, software-defined networks and storage, server virtualization, scale-out and converged/hyper-converged infrastructure, and modern data protection.
- **Automated IT processes**—e.g., delivering IT as a service in a cloud operations model for cost transparency, efficiency, and responsiveness, automating server change configuration and storage provisioning, and offering self-service capabilities to end-users.
- **Transformed organizational dynamics**—e.g., regularly inspecting IT outcomes for effectiveness and making sure that the IT group has opportunities to contribute proactively to business-strategy decisions.

A direct, measurable relationship exists between IT Transformation and better agility, superior responsiveness, greater spending efficiency, more funding for innovation, faster time to market, higher stakeholder satisfaction, and greater competitiveness (see Figure 1).

Figure 1. IT Transformation Outcomes

Source: Enterprise Strategy Group

ESG was able to establish these correlations by conducting a survey commissioned by Dell EMC and Intel of 4,000 IT executives from private- and public-sector organizations across 16 countries.¹ All respondents were familiar with their organizations' IT modernization achievements and plans. ESG asked these respondents more than 60 questions about their IT environments and processes. Based on their responses, ESG ascribed an IT Transformation maturity score to each respondent's organization. ESG then grouped organizations by maturity score into one of four categories: *Legacy*, *Emerging*, *Evolving*, and finally *Transformed*. Only 6% of organizations achieved a Transformed ranking, although 81% of all respondents agreed their company will not be competitive if they do not embrace IT Transformation.

To learn more about this research, read [ESG's report here](#).

Flash Storage Is a Pillar of IT Transformation

Deciding to modernize a storage environment by incorporating All-Flash arrays is one of the most high-impact actions a company can take to boost its IT maturity.

All-Flash storage offers lower latency and greater IOPS per drive compared with legacy spinning disk. It dramatically accelerates the speed and efficiency of the applications it supports, bringing advantages to the whole business. But there's more: All-Flash enables workload consolidation, shrinks hardware footprints, reduces power consumption, and lowers management costs. Flash storage also works well with modern, feature-rich architectures and software solutions—an ability that helps companies better address their workload-specific needs in dynamically changing IT environments.

A major reason flash hasn't entirely eclipsed legacy HDDs already is that, rightly or wrongly, it has been typically thought to be expensive.

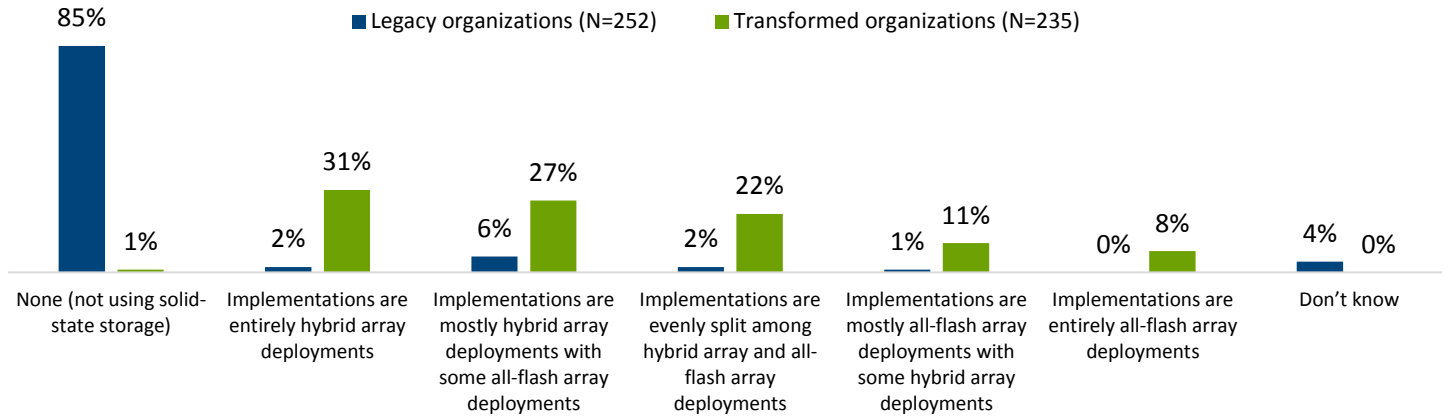
Perhaps defying that perception, only 1% of the Stage 4 *Transformed* companies surveyed by ESG are *not* leveraging flash; 99% are. Sixty-nine percent have taken the next step, deploying one or more All-Flash arrays.

Conversely, 85% of the surveyed Stage 1 *Legacy* organizations haven't yet deployed any flash media at all (see Figure 2).

¹ Source: ESG Research Insights Paper, [Research Proves IT Transformation's Persistent Link to Agility, Innovation, and Business Value](#), March 2018.

Figure 2. Flash Storage Implementation Type

For workloads that utilize solid-state storage, what is the primary implementation type (i.e., the implementation that supports the largest number of workloads)? (percent of respondents)



Source: Enterprise Strategy Group

Research Validates the Transformational Benefits of Flash

The market understands and appreciates the performance-accelerating capabilities of flash storage. When ESG asked respondents to identify the most significant benefits their organizations have achieved with flash, nearly three-fifths of them (58%) mentioned improvements in application performance (see Figure 3).

Performance Gets Faster

But how big is that benefit? To find out, ESG asked the respondents to estimate how much improvement they've seen in terms of response time, latency, and concurrent users supported.

Flash users collectively reported a 36% average improvement over the speeds they achieved before flash deployment. Specifically, among the respondents using All-Flash storage, application performance has increased by an impressive 49%.

OpEx Expenses Get Lower

Given the fundamentals of flash technology, i.e., no moving parts, trivial heat output, increased performance density, and ever-increasing drive sizes, it is not surprising that 42% of flash users cited reduced operational costs as a benefit. Those respondents estimated they have reduced their operational costs by 25%, on average. Their power/cooling costs have shrunk, and they no longer have to

Flash Storage Accelerates IT Transformation

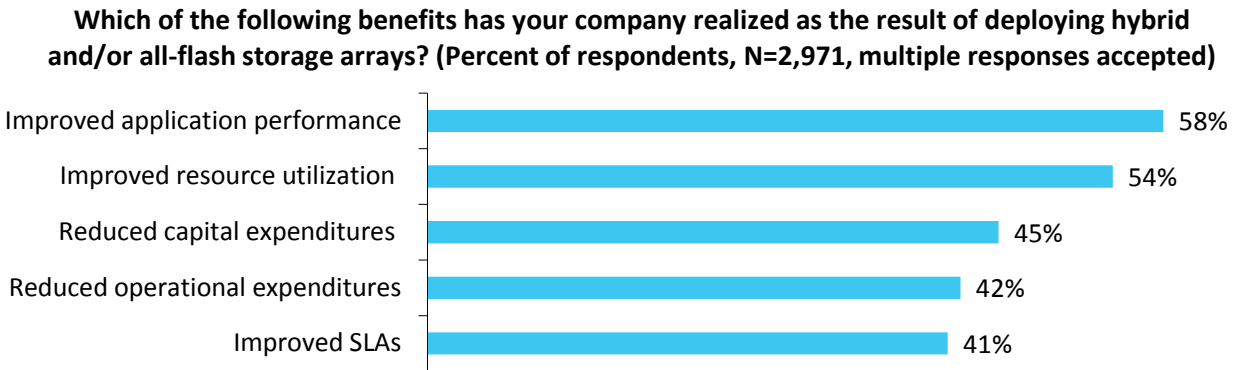
When analyzing the maturity level and benefits enjoyed by transformed organizations, ESG identified that companies using flash, particularly All-Flash:

- Were **3.5X** as likely to make better, faster, data-driven decisions than their competitors (22% versus 6%).
- Reported **24%** and **25%** reductions in storage CapEx and OpEx respectively.
- Were **2X** more likely to execute most application deployments ahead of schedule (28% versus 15%).
- Reported an average **36%** improvement in application performance, on average. Companies utilizing All-Flash arrays saw an average **49%** improvement.
- Were greater than **2X** more likely to have made excellent progress enabling an elastic data center and virtually pooling infrastructure resources.

maintain frames full of HDDs short-stroked to achieve the IOPS required by high-performing workloads.

That advantage is important. For legacy HDDs to perform at their maximum potential, the number of spindles needs to be high, which equates to more infrastructure. More infrastructure means more people costs, footprint costs, and cooling costs.

Figure 3. Flash Storage Benefits



Source: Enterprise Strategy Group

The Rest of the Data Center Achieves Higher Utilization Levels

Think of all the elements in a data path as an assembly line. Before flash, storage was always the slowest section of that line. The hosts and network were perpetually waiting for storage to respond to incoming data requests.

With flash, that problem goes away. The server achieves many thousands of additional transactions per second. Multiple systems are no longer in a chronic “wait state.” One application on one socket or node, running under one software license, can handle more transactions because fast storage now fuels it.

Performance-debugging Costs Disappear

With flash, storage admins can stop spending so much time debugging performance issues. Traditionally, many enterprises had to retain two or three storage admins whose full-time jobs centered on fixing performance problems. With flash arrays in place, those admins can turn their efforts away from routine maintenance and toward application deployment, architectural refinement, or other higher-value tasks.

CapEx Costs Decrease

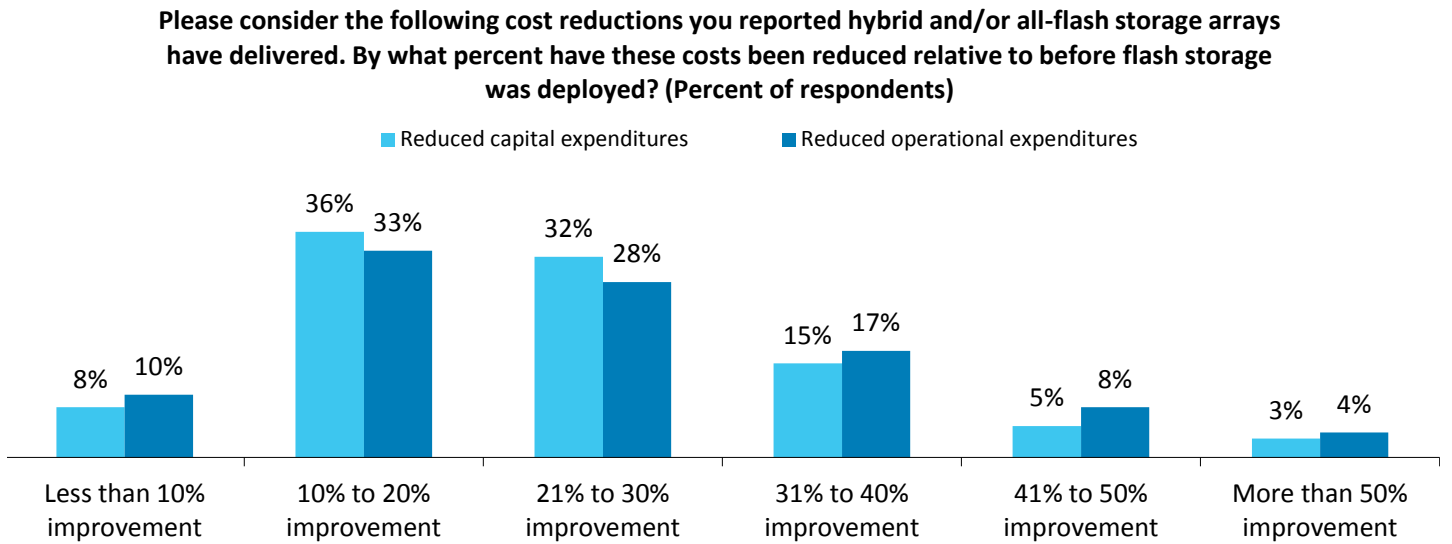
It may seem counterintuitive, given common perceptions about flash’s premium price, but organizations using flash report it has helped them lower CapEx costs.

Consider the significant progress the industry has made in improving data deduplication and in-line compression. Those advancements are now allowing organizations to fit, say, 10 TB of data onto 1 TB of raw capacity. Even workloads less suited to storage efficiency technologies, such as structured databases, can usually achieve a two or three times efficiency multiplier with All-Flash storage. The bottom line is that increasing storage efficiency reduces the need to buy as much raw capacity and hardware.

The industry is also seeing an ongoing decline in the per-terabyte cost of flash. Arrays that just a few years ago were viewed as costly aren’t anymore. Thanks to this shift, flash storage has been able to move beyond “niche” status to become a foundational, cost-effective data center technology, particularly among *Transformed* companies.

ESG’s findings validated this assertion (see Figure 4). Organizations using flash storage report an average 24% reduction in storage infrastructure CapEx. These organizations support the workloads that demand high performance by buying only as much flash capacity as they require rather than buying four or eight times as much spinning disk, and then short-stroking those HDDs to boost IOPS to a sufficient level.

Figure 4. Reduction in Storage CapEx and OpEx Due to Flash



Source: Enterprise Strategy Group

Decision-making Becomes Easier, Faster, and More Accurate

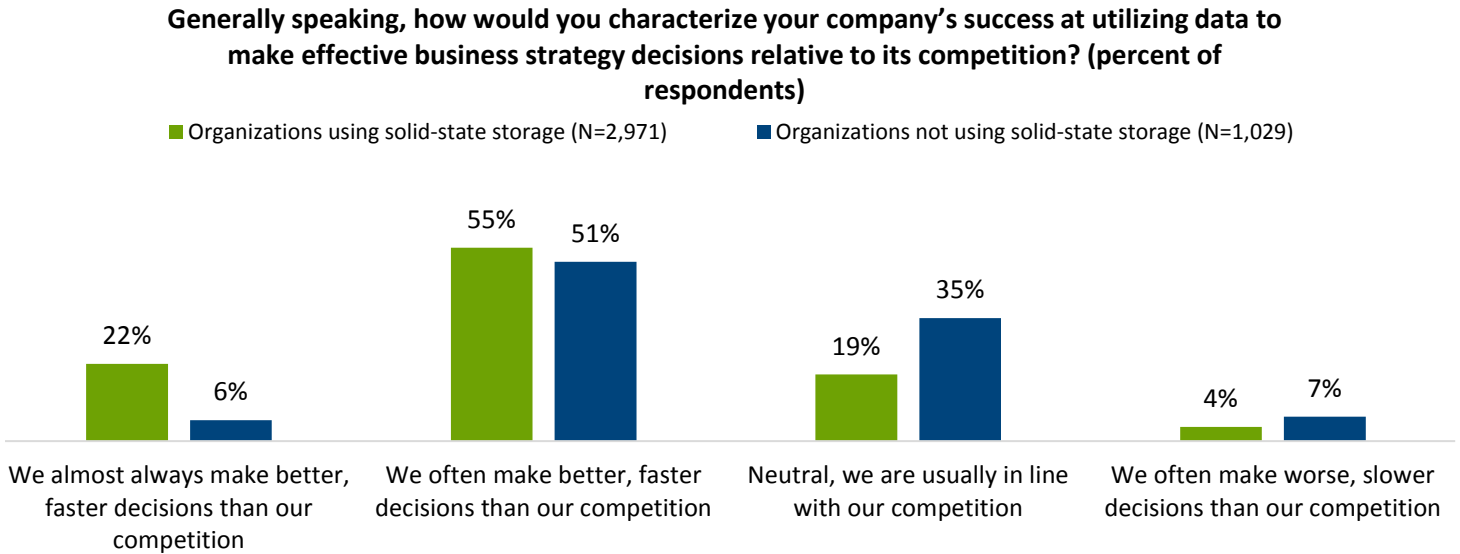
Some of today’s most performance-hungry applications are the ones supporting big data analytics. Such applications process immense amounts of data in real or near-real time; their operating requirements match flash’s performance characteristics very well. Of course, the intent of big data analytics is to allow stakeholders to make intelligent business decisions.

Consider that with OLTP workloads supported by flash, database queries simultaneously cost less to run and are more effective. Flash is often the best choice for a transactional database because of its speed. In years past, database administrators (DBAs) had to spend considerable effort ensuring that every query they wrote was as precise as possible: each query had to uncover exactly, and only, what the stakeholders needed to know. But even with queries optimized to perfection, it sometimes took them too long to run for the results to be fresh and useful.

Queries made to flash-supported workloads don’t take hours to run. Results are ready in moments. Therefore, not only can DBAs run many more queries, but they can also stop devoting so much time to perfecting every query’s structure.

Being able to run lots of time-sensitive queries gives an organization an edge. Respondents characterized how successful they are at making good decisions relative to their competition (see Figure 5), and it appears that the organizations using flash storage essentially have made their in-house business intelligence (BI) analysts “smarter.” *Organizations using flash were more than three and a half times as likely to report making better, faster, data-driven decisions than their competitors could.*

Figure 5. Data-driven Decisions



Source: Enterprise Strategy Group

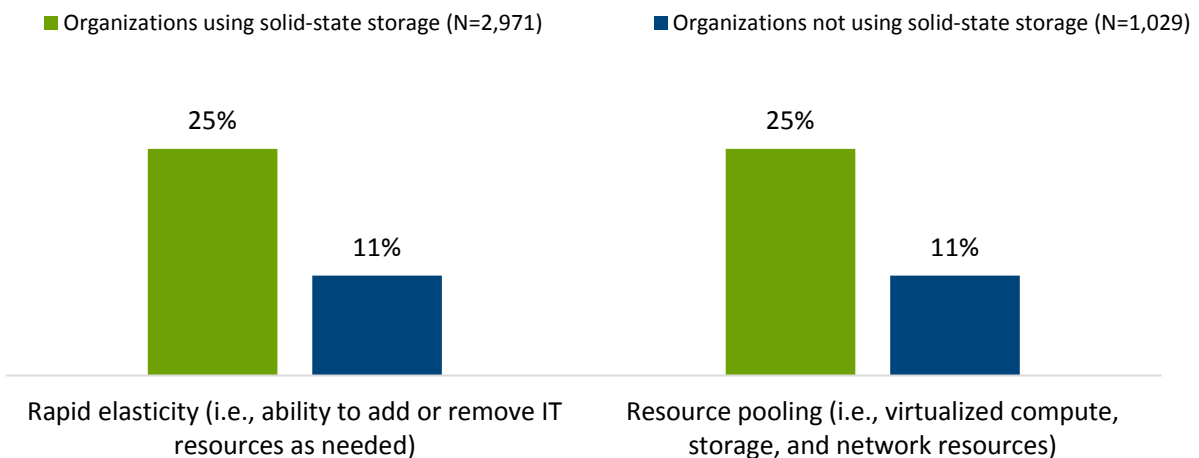
Helping Organizations Ramp-up Private Cloud Initiatives and Application Agility

ESG’s research also revealed an interesting correlation between flash use and private cloud advancement (see Figure 6). When respondents were asked how much progress they’ve made enabling rapid resource elasticity and virtually pooling compute, network, and storage resources, those using flash were more than twice as likely to report excellent progress.

Such capabilities are key tenets of operating a private cloud environment, so a clear, quantifiable connection is apparent between the use of flash storage and the ability to operate a cloud IT environment onsite. Similarly (and probably tied to private cloud advancement), flash storage users are nearly two times more likely than respondents in organizations not using flash to report that most application deployments happen ahead of schedule.

Figure 6. Private Cloud Progress

Percent of organizations that have made "excellent progress" on enabling rapid elasticity (i.e., ability to add or remove IT resources as needed) and resource pooling (i.e., virtualized compute, storage, and network resources)



Source: Enterprise Strategy Group

The Bigger Truth

Flash storage as a modern infrastructure choice can bring several meaningful outcomes to organizations. It reduces data center OpEx *and* CapEx through its next-generation storage efficiency capabilities and its consistently declining drive costs. Flash dramatically improves application performance, which adds new power to resource-intensive digital initiatives such as big data analytics. Flash also plays a meaningful role in helping organizations run a data center environment that is agile and similar to cloud IT.

Any organization looking for improvements in those areas should evaluate their present flash storage usage and perhaps look for opportunities to expand utilization.

After all, *Transformed* companies are almost unanimously leveraging flash. And by doing so, they are saving money, making better decisions, staying on schedule with their deployments and strategic initiatives—and ultimately staying ahead of the competitive curve.

Given those compelling benefits, what are you waiting for? Read the full global study and begin your IT Transformation maturity assessment.

[Read the Full Report](#)[Launch Assessment](#)

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