Cloud Value Benchmarking Study Quantifies the Benefits of Cloud Adoption

June 2020



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Abstract

Companies must understand the value of a cloud migration to support the business case for making such a move. This whitepaper summarizes the results of an AWS Cloud Economics benchmarking study, focusing on four key value areas: cost savings, staff productivity, operational resilience, and business agility. Business decision makers can use benchmarks to build a cloud migration business case.

Introduction

Quantifying the benefits of cloud migration can help support the business case for making such a move. Using benchmarking data empowers an organization to quickly estimate value based on the experiences of other organizations, to replace or supplement a time-consuming, detailed analysis from the organization itself. Benchmarks also help organizations identify best practices, address shortcomings, communicate performance expectations, and measure progress.

To help companies understand the business value of a cloud migration, this whitepaper summarizes the results of an AWS <u>Cloud Economics</u> benchmarking study by the Omnicom Group. The study measured value in four key value areas: cost savings, staff productivity, operational resilience, and business agility. It was conducted with over 1,000 current AWS customers in the US, with a focus on IT leaders and application owners. To qualify for the survey, respondents needed to have been working full time one year or longer for an organization with 500 or more employees and be personally familiar with the financial and operational metrics associated with an application the organization migrated to AWS at least one year ago. Customers answered a series of questions to measure performance across 15 KPIs. The data was collected between July 15 and August 30, 2019 and utilized 95% confidence intervals.

Below is a summary of the key benefits respondents reported after adopting AWS:

- 27.4% reduction in cost per user
- 67.7% increase in terabytes (TBs) managed per administrator
- **56.7% decrease** in application downtime
- 37.1% reduction in the time-to-market for new products and services

This paper includes metrics from AWS customers to demonstrate specific benefits achieved. Value benchmarking helps business decision makers make more informed decisions about cloud migration, improve their approach, and compare their results.



Customers Realize Benefits in Four Key Areas by Moving IT Infrastructure to the Cloud

Benchmarking is one of the most valuable management tools available to organizations today. Simply put, it is the process of evaluating something against an external standard. As the American Society for Quality puts it:

Benchmarking is defined as the process of measuring products, services, and processes against those of organizations known to be leaders in one or more aspects of their operations. Benchmarking provides necessary insights to help you understand how your organization compares with similar organizations, even if they are in a different business or have a different group of customers.¹

This approach is particularly valuable in the field of cloud adoption. Companies display a wide range of maturity in their journey to the cloud. Those who are just beginning can learn a great deal from those who have gone before.

Public cloud spending continues to grow, rising from \$77 billion a decade ago to an estimated \$411 billion in 2020, according to Technology.org.² The "race to the cloud" is real. However, as with any investment, savvy businesses require a business case with positive return on investment before making a major change to how they operate.

To help organizations quickly quantify the potential benefits of adopting cloud services, Amazon Web Services (AWS) commissioned a blind benchmarking study by the Omnicom Group.

The study measured key performance indicator (KPI) improvements for over 1,000 AWS customers that migrated to the cloud. It focused on four areas of value:

- Cost savings: Decrease IT costs by moving infrastructure to the cloud—including compute, storage, and networking—and eliminating the power, space, cooling, maintenance, and other operational costs associated with onpremises technology.
- **Staff productivity:** Enable employees to shift from tactical to strategic work by reducing time spent by full-time IT employees on system administration tasks.



- **Operational resilience:** Strengthen IT security and increase service availability and reliability, including gaining the elasticity to respond to rapidly changing levels of demand.
- **Business agility:** Increase return on investments due to faster time-to-market, greater product diversity, increased innovation, and faster global expansion. This area also includes the ability of IT to roll out new and updated services faster.

We also present specific examples of how customers from various industries have achieved these benefits.



Benchmarking Results

Cost Savings

Top-Level Improvements

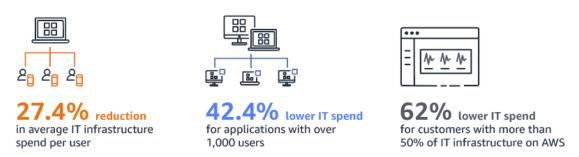


Figure 1 - Illustration of survey data points discussed in the text.

Cost savings are often a high priority when organizations initially consider cloud adoption. On-premises data centers require large investments and incur ongoing cooling, energy, and maintenance costs. Benchmarking data bears out these expectations, with AWS customers achieving a 27.4% reduction in average IT infrastructure spend per user compared to on-premises IT. Driven by economies of scale, larger applications see greater cost reductions, averaging 42.4% lower cost per user for applications with more than 1,000 users.

Typically, as companies mature and increase their usage of AWS, they discover more opportunities to optimize cost and deepen their ability to build and manage cloud-ready architecture. Those with more than half their infrastructure on AWS report 62% lower costs than those with a smaller footprint.

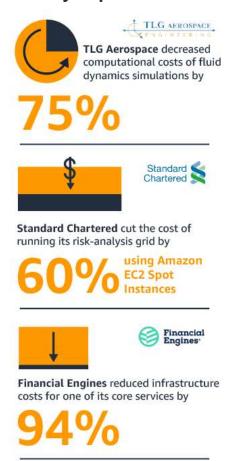
One of the ways that customers further take advantage of cost savings is by using options such as Amazon Elastic Compute Cloud (Amazon EC2) Reserved Instances, Spot Instances, and Savings Plans, which provide organizations with significant cost savings opportunities—up to 75% off for Reserved Instances, 90% off for Spot Instances, and 72% off for Savings Plans.³

AWS also makes many innovative services available at a fraction of the price of onpremises versions. Managed services such as Amazon Aurora and Amazon Redshift enable organizations to run enterprise-grade solutions at one-tenth the cost of comparable on-premises solutions. Once the cloud becomes the norm in an



organization, it can grow its user base and capabilities with only small, incremental increases in cost due to the efficiency of cloud infrastructure.

Industry experiences with cost savings



General Electric is reducing its data centers from 34 to four by migrating their IT infrastructure to AWS.

TLG Aerospace decreased the computational costs of fluid dynamics simulations by 75%. The world's largest manufacturer of glass, AGC, reduced costs by 40% by moving foundational systems to AWS.

Many organizations cut IT expenses by spinning down servers when not in use. This approach has allowed the <u>Centers for Medicare and Medicaid</u> <u>Services</u> to triple the number of servers it uses vs onpremises—without increasing costs.

Standard Chartered, a leading worldwide provider of corporate finance and investment banking, cut the cost of running its risk-analysis grid by 60% using Amazon EC2 Spot Instances. Financial Engines, one of the largest independent investment advisors in the United States, reduced infrastructure costs for one of its core services by 94%, or about \$110,000 annually.

Figure 2 - Illustration of customer metrics and benefits discussed in the text.



Staff Productivity

Top-Level Improvements

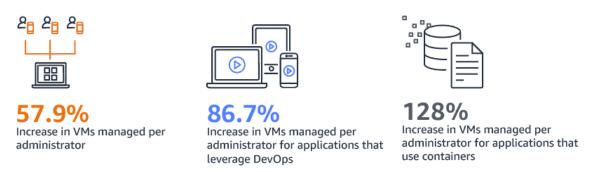


Figure 3 - Illustration of survey data points discussed in the text.

These benchmarks refer to the efficiency improvements experienced by full-time IT employees using AWS versus on-premises technology. Moving to the cloud enables organizations to shift from tactical to strategic tasks and dramatically scale their efforts. Organizations can manage more virtual machines (VMs) and greater volumes of data using the same or reduced staffing levels.

While moving to the cloud improves productivity, adapting applications for the cloud further improves productivity gains. Respondents reported much higher staff productivity improvements for rearchitected, replatformed, or refactored applications than those applications that were not (VMs managed per administrator improvement of 147.7% vs 57.9%, and terabytes managed per administrator improvement of 153.5% vs 67.7%.

Modernizing development and operations also improves the average return on cloud investment, among other benefits. Agile development makes feature delivery more predictable and reduces testing requirements. Organizations that adopt Agile development more than double the number of VMs managed by their administrators. Applications leveraging DevOps require less maintenance and increase VMs managed per admin by 86.7% and terabytes managed per admin by 129.1%. For applications that use containers, VMs managed per admin rose to 128% and terabytes managed per admin rose to 164.3%.



The key takeaway from all these benchmarks is that companies achieve the best results when rethinking operations, processes, and architecture to take maximum advantage of cloud services. Therefore, while a "lift and shift" approach will yield productivity improvements, a more comprehensive transformation program yields significantly more value.

Industry experiences with staff productivity



<u>Ebury</u> migrated to AWS and dramatically demonstrated this increase in productivity, more than doubling its client base and annual revenues—yet continued to use the same number of IT professionals it had when its infrastructure was on premises.

<u>Unilever</u> can now focus on innovation rather than infrastructure and, as a result, launches new products 75% faster. At <u>GE Appliances</u>, the IT team spends more time on strategic work such as developing code, which helps the company shift from a reactive to a proactive stance in rolling out new application features.

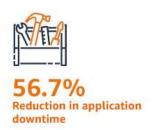
<u>Graze</u> migrated from Amazon EC2 to various AWS managed services and didn't have a single support request in the first six months. Previously, IT staff worked late at least once or twice a week to get support. And <u>Kellogg Company</u> reduced server deployment time from eight weeks to an hour.

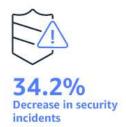
Figure 4 - Illustration of customer metrics and benefits discussed in the text.



Operational Resilience

Top-Level Improvements







24.1% Reduction in overall incidents (31.8% reduction in P1/P0 incidents)

Figure 5 - Illustration of survey data points discussed in the text.

These improvements enable IT departments to deliver business-critical services when users and processes need them. They drive engaging customer experiences, support an efficient workplace, and keep data safe to build customer trust and meet compliance requirements.

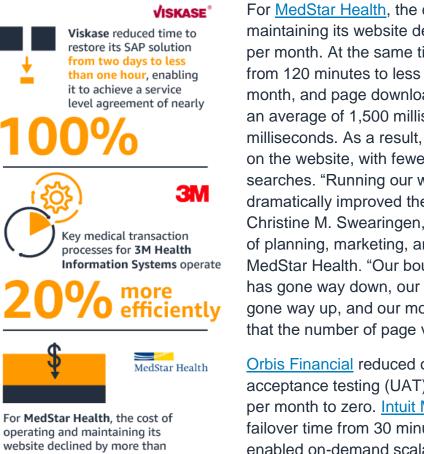
AWS customers see significant increases in operational resilience. On average, customers reduce incidents by 24.1%—highlighted by a 31.8% drop in P1/P0 incidents—and cut security incidents by 34.2%. They also see mean time to resolution (MTTR) reduced by 39.3%, meaning that when incidents do occur, the application becomes available faster. These contribute to an overall 56.7% reduction in application downtime.

Organizations using AWS on a larger scale further increase the availability, resilience, and security of their applications due to the resilience and security of cloud infrastructure. For example, applications with more than 1,000 users achieved a 42.8% decrease in the number of critical incidents.

Industry experiences with operational resilience

In looking at individual use cases where organizations improved operational resilience by migrating to AWS, <u>Viskase</u> reduced time to restore its SAP solution from two days to less than one hour, enabling it to achieve a service level agreement of nearly 100%. Key medical transaction processes for <u>3M Health Information Systems</u> operate 20% more efficiently on AWS, compared to their performance on the prior cloud provider—with no code modifications.





For MedStar Health, the cost of operating and maintaining its website declined by more than 40% per month. At the same time, downtime decreased from 120 minutes to less than 5 minutes per month, and page download times decreased from an average of 1,500 milliseconds to 120 milliseconds. As a result, patients spend more time on the website, with fewer people abandoning their searches. "Running our website on AWS has dramatically improved the user experience," says Christine M. Swearingen, executive vice president of planning, marketing, and community relations at MedStar Health. "Our bounce rate on the website has gone way down, our time on the page has gone way up, and our most recent numbers show that the number of page views is increasing."

Orbis Financial reduced outages in its user acceptance testing (UAT) infrastructure from 10 per month to zero. Intuit Mint reduced database failover time from 30 minutes to one minute and enabled on-demand scalability to support website traffic increases of 200%.

Figure 6 - Illustration of customer metrics and benefits discussed in the text.

<u>Graze</u> increased its portal cache hit rate to 99%. Another manufacturer, <u>Vestel Elektronik</u>, reduced application latency for European end users of its Smart TV portal by 20%. <u>GE Appliances</u> decreased incident remediation time from three days to 80 minutes.



Business Agility

Top-Level Improvements

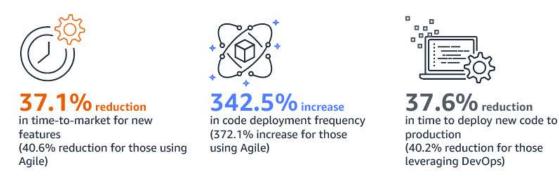


Figure 7 - Illustration of survey data points discussed in the text.

Business agility gains were universal among customers in the study, regardless of investment level, time on AWS, number of users, and AWS footprint. Customers saw a 37.1% reduction in time-to-market for new features, a 342.5% increase in code deployment frequency, and a 37.6% reduction in the time it takes to deploy new code.

Organizations that use Agile and DevOps on an AWS-hosted application see even higher gains. These include a 40.6% reduction in time-to-market for new features, a 372.1% increase in code deployment frequency for those using agile development, and a 40.2% reduction in the time it takes to deploy new code for those leveraging DevOps.

Reducing code deployment time and increasing frequency are related naturally tend to reduce time-to-market for new features and services, which in turn can enhance customer and employee satisfaction. Because smaller, faster deployments are the essence of Agile and DevOps, organizations using these approaches experience greater gains in business agility.

For many organizations, business agility is the primary goal of cloud adoption. Reduced costs enable businesses to invest more on innovation. Staff productivity improvements allow IT and development professionals to focus on strategic activities. Operational resilience ensures that services are available when needed, driving rapid delivery to improve customer and employee satisfaction.



Industry experiences with business agility



Fraud.net, a fraud detection service, provides a prime example of the business agility that AWS enables. The firm relies on AWS to power an innovative application that saves customers about \$1 million a week. The National Bank of Canada reduced post-trade analysis from weeks to hours and datamanipulation processes from days to 1 minute.

Managers at <u>Ferrara Candy</u> can generate reports

on warehouse performance in minutes instead of weeks. At MediaTek, software development cycles accelerated by 50%.

The healthcare DevOps team at <u>3M Health</u> <u>Information Systems</u> decreased server provisioning time from more than 10 weeks to just minutes, while increasing code deployment frequency from once every six weeks to once a week. It also expects to deploy application updates multiple times a day. All these innovations have led to an organizational shift. "We are fully supporting our continuous integration and deployment pipelines by relying on AWS, and that has really boosted our development efficiency,"

says Rick Austin, manager of Advanced Technology at 3M Health Information Systems.

Figure 8 - Illustration of customer metrics and benefits discussed in the text.



Using Benchmarking Data to Build a Top-Down Business Case

There are two ways to build a cloud migration business case. One is a traditional "bottom-up" approach that requires collecting detailed internal data, building a model using complex calculations, and investing a significant amount of time in the process.

The "top-down" approach uses external benchmarks based on KPI improvements that similar organizations achieved by migrating to the cloud. This approach requires less data-gathering and is typically much faster at providing a value estimate. A top-down business case can either replace or provide credibility to a bottom-up business case.

For example, to calculate potential cost savings, the bottom-up method requires IT to document its entire server and virtual machine inventory and then measure the utilization of compute resources and the data usage associated with each VM. Each VM and physical server is mapped to AWS to calculate the TCO differential. This process of building a business case can take 6 to 12 weeks or more and require many hours from resources across the organization.

Conversely, the top-down method uses benchmarks and calculations to provide a value estimate quickly. The concept behind this method is similar to how research analysts use earnings and revenue valuation multiples to determine the market value of companies.



Conclusion

In addition to using these benchmarks to build a business case, you can use them in other ways throughout your organization. For example, the metrics presented here strongly indicate that the benefits of cloud adoption are not evenly distributed. Organizations adapting their operations, IT, and development approaches to take maximum advantage of the cloud often see benefits that are double the average or greater. Similarly, organizations that look beyond a lift-and-shift approach to re-architect applications see significantly higher benefits. As indicated by higher improvements in KPIs for larger applications, as customers grow to rely on AWS for some of their largest and most critical applications, they see bigger benefits. These benchmarks have significant strategic implications not just for *whether* to adopt cloud technology, but *how*.

Benchmarking also provides relevant KPIs that enable you to measure your organization against average and top-performing peers. If you are underperforming benchmarks, this could point to areas for potential improvement. For example, if you see little improvement in the number of VMs managed per administrator after moving a large application to the cloud, you may need to look more closely at your IT processes and application architecture. Benchmarks show what other similar organizations have achieved and point to best practices that can drive additional improvement. Before migration, benchmarks can form the basis of performance targets and expectations.

As you plan your move to the cloud, the benchmarks presented here can help shape your business case and strategy, providing a valuable supplement to the traditional bottom-up data collection and analysis. While each journey is different, the clear takeaway is that organizations achieve significant benefit after migrating to AWS.



Further Reading

Learn more about Cloud Economics

Document Revisions

| Date | Description |
|-----------|-------------------|
| June 2020 | First publication |

Notes

- ¹ American Society for Quality, "What Is Benchmarking?" https://asq.org/quality-resources/benchmarking
- ² Technology.org, "Exciting Cloud Computing Predictions for 2020." https://www.technology.org/2019/12/29/exciting-cloud-computing-predictions-for-2020/
- ³ https://aws.amazon.com/ec2/pricing/

