Business Value
on AWS

Notices

This document is provided for informational purposes only. It represents AWS's current product offerings and practices as of the date of issue of this document, which are subject to change without notice. Customers are responsible for making their own independent assessment of the information in this document and any use of AWS's products or services, each of which is provided "as is" without warranty of any kind, whether express or implied. This document does not create any warranties, representations, contractual commitments, conditions or assurances from AWS, its affiliates, suppliers or licensors. The responsibilities and liabilities of AWS to its customers are controlled by AWS agreements, and this document is not part of, nor does it modify, any agreement between AWS and its customers.

Introduction

The Cloud Value Framework enables organizations to build a comprehensive business case for cloud computing by measuring their progress across four dimensions of value. AWS Cloud Economics developed the Cloud Value Framework by working with more than 100 of our enterprise customers and analyzing over 1,500 public AWS case studies.
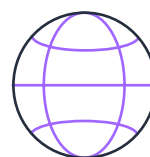
The results show four main areas in which AWS customers are realizing business value by moving to cloud computing:
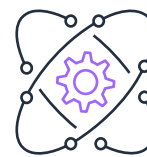
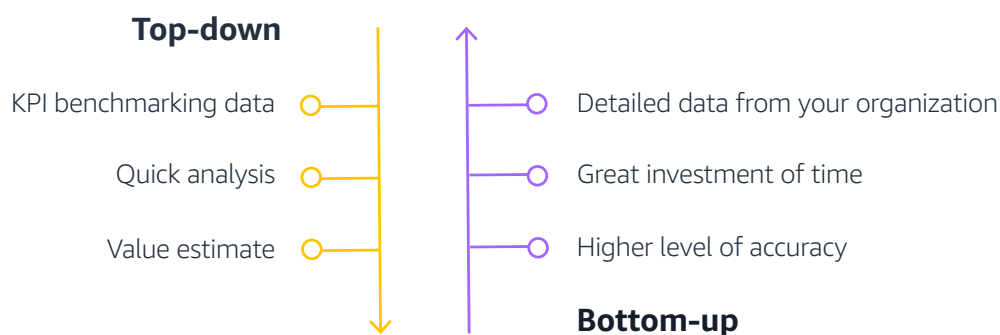1. Cost Savings
2. Staff Productivity
3. Operational Resilience
4. Business Agility

This eBook provides an overview of how the cloud is transforming business and an analysis of the four dimensions of the Cloud Value Framework listed above.

Two main approaches for cloud value analysis:

Top-down

KPI benchmarking data

Quick analysis

Value estimate

Detailed data from your organization

Great investment of time

Higher level of accuracy

Bottom-up

Understanding Cloud Computing

To understand the transformative power of cloud computing, consider how the power-grid revolution modernized manufacturing. Before the development of widespread electrical utilities, companies had to buy and run their own generators for electrical power to operate their machines. This required significant capital expenditure (capex) upfront, as well as ongoing repair, maintenance, and replacement costs. Perhaps most importantly, it made companies less resilient, agile, and productive.
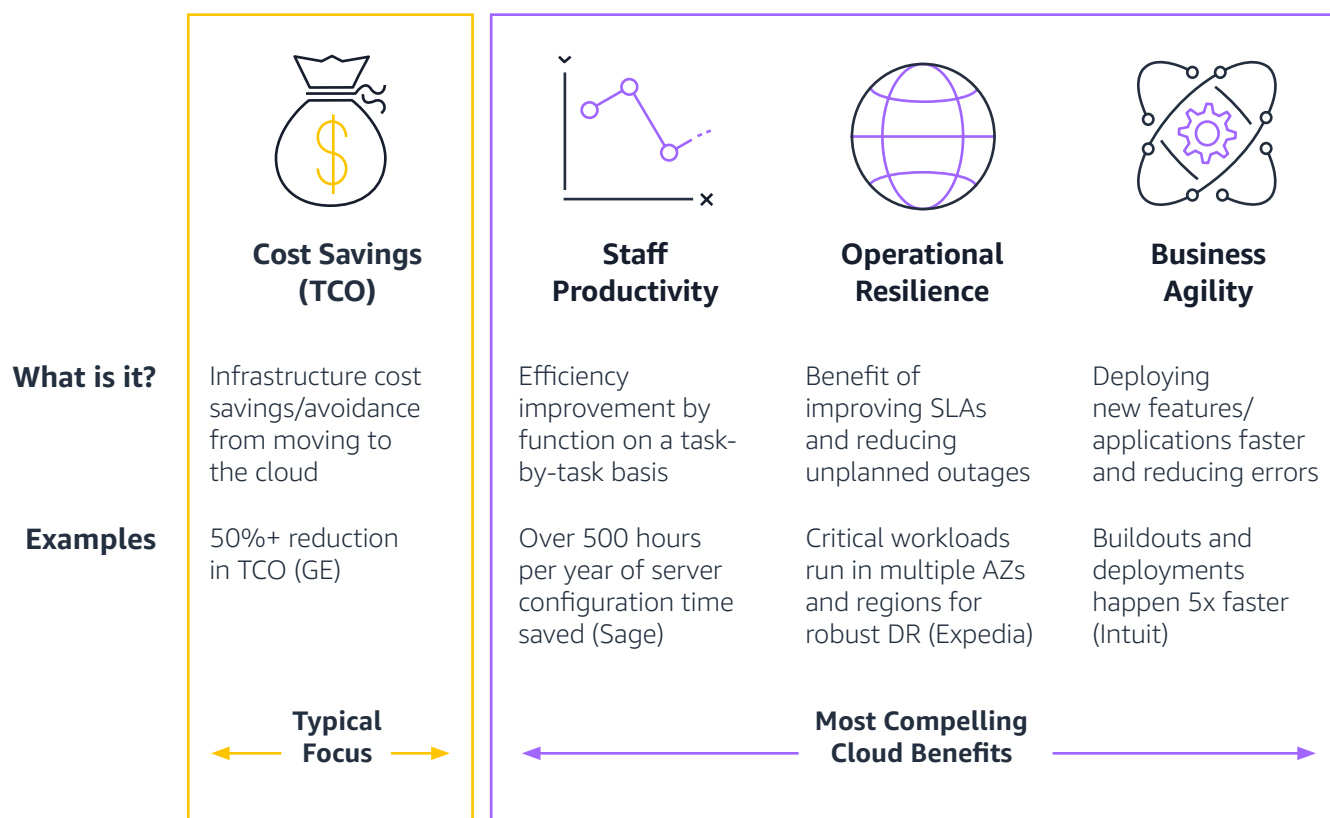
Eventually, utilities began producing electricity centrally and selling it to businesses through the power grid. Not only could businesses reduce costs and capex using utility-provided power, but they could also focus their energy and investment on improving product quality, developing better manufacturing processes, and better serving their customers.

Now, fast-forward to the computing revolution of the 20th century. In the beginning, companies typically purchased, deployed, and managed their own computing resources. As with a power generator, building a data center required large, upfront capex, a lengthy procurement cycle, and the expertise and staff to run it all.

Just as the power grid enabled companies to get electricity from a centralized utility, today, the internet provides a way to access centralized computing resources such as AWS. This allows companies to avoid large, upfront hardware investments and pay only for what they use, as with an electric utility. In addition to reducing costs, these companies also were able to focus their employees on differentiating and value-added work, improve the reliability and security of their electricity, and be more agile and responsive to their customers.

Implementing the Cloud Value Framework

The Cloud Value Framework identifies how migration to AWS creates measurable value beyond cost savings:

	Cost Savings (TCO)	**Staff Productivity**	**Operational Resilience**	**Business Agility**
What is it?	Infrastructure cost savings/avoidance from moving to the cloud	Efficiency improvement by function on a task-by-task basis	Benefit of improving SLAs and reducing unplanned outages	Deploying new features/ applications faster and reducing errors
Examples	50%+ reduction in TCO (GE)	Over 500 hours per year of server configuration time saved (Sage)	Critical workloads run in multiple AZs and regions for robust DR (Expedia)	Buildouts and deployments happen 5x faster (Intuit)
	← **Typical Focus** →	← **Most Compelling Cloud Benefits** →		

In the following sections, we'll provide additional details on each of the four pillars and how they contribute to cloud value.

Cost Savings

When it comes to a traditional data center, capacity planning is typically a major challenge. It requires accurately predicting technology needs and procuring equipment typically 6–9 months before it's operational. Additionally, companies usually provision 20–50 percent over peak requirements to avoid service outages. The Natural Resources Defense Council estimates that average server utilization is only 12–18 percent.[1]

With the cloud, organizations pay only for what they need. During periods of low usage, they use fewer resources; during periods of peak demand, the system scales to deliver the required performance. Supply and demand are closely matched, eliminating the waste inherent in traditional data center models.

Reducing IT costs associated with owning and managing infrastructure is often the first thing businesses consider when beginning their cloud journey. While each organization is different, cloud cost savings come in two main varieties. First, organizations can save money by not spending it in the first place, avoiding data-center–related capex and operational expenditure (opex) on hardware, software, networking, facilities operations, and upgrades. Because there are typically no minimum commitments required for cloud services, they can stop or start using a service at any time, further increasing cost efficiency.

To maximize cost savings, it is important to build a culture of cost optimization. This means being able to track and manage cloud costs by tagging resources and using AWS tools such as AWS Cost Explorer and AWS Trusted Advisor to identify opportunities to improve utilization and assign responsibility for managing cloud costs. For more information, see the AWS Cost Optimization webpage.

AWS provides pricing models that help organizations save even more money. Using AWS services such as Amazon Elastic Compute Cloud (Amazon EC2) Reserved Instances, organizations can reserve instances upfront and save as much as 75 percent compared to the on-demand price. Amazon EC2 Spot Instances allow organizations to purchase spare computing capacity at up to 90 percent off the on-demand price. And, the more gigabytes stored in or transferred out of AWS, the lower the cost per gigabyte.

In a February 2018 analysis, IDC estimates that AWS customers have a 51 percent lower cost of operations compared to running on-premises infrastructure.[2] Another study, performed by AWS with 500 select customers in July 2018, shows that AWS customers experience a 14.3 percent reduction in total infrastructure spend after deploying AWS.

Live Nation
AWS Independent Study

AWS customers have achieved the following cost-savings results:

- GE Oil & Gas reduced total cost of ownership for its IT services by 52 percent.[3]

- AdRoll achieved a 75 percent reduction in fixed costs and an 83 percent reduction in operational costs.[4]

- Condé Nast reduced costs by 40 percent and increased operational performance by 30–40 percent.[5]

- Lionsgate saved 50 percent and $1 million over three years.[6]

- Live Nation estimated an 18 percent savings (including 40 percent savings one year after their migration) and 58 percent savings to date.[7]

Staff Productivity

Another way that customers achieve value with AWS is through increased staff productivity. In the data center world, employees spend a lot of time doing work that doesn't differentiate the business. For example, previously, a significant proportion of staff might have been dedicated to procuring, setting up, and maintaining physical servers.

With AWS, these responsibilities are reduced or no longer necessary. Organizations can move away from the day-to-day operational headaches associated with managing IT infrastructure. IT expertise can be put to better use doing strategic, differentiating work, such as developing new and improved applications and delivering a better user experience.

The cloud also lends itself to modern software engineering approaches. These include continuous integration/continuous deployment, microservices architecture, automated testing, and blue/green deployments that test application code in a separate environment before moving it to production. Development and test environments can be provisioned and deprovisioned in seconds to meet the evolving needs of a business. This transformation can significantly reduce time-to-market for applications and services.

IDC reports IT infrastructure staff efficiency improvements averaging 62 percent for organizations adopting AWS. AWS benchmarking shows that, on average, AWS customers are able to manage twice as many virtual machines and 1.8 times as many terabytes of data per staff member compared to using on-premises IT.

The following are examples of AWS customers that have achieved or expect to achieve efficiency improvements:

- NewLog Consulting saved 50 percent in administrative labor tasks.[8]

- Intuit expects to save the 60 percent of IT staff time spent on data proliferation, lack of standards, and security hardening.[9]

- AdRoll saved $3 million in staffing costs and refocused 20 engineers on its core application.[10]

Operational Resilience

Unplanned outages due to security breaches, hardware failures, software glitches, or human error can be very expensive. For example, one IDC study—"DevOps and the Cost of Downtime: Fortune 1000 Best Practice Metrics Quantified"—places the average annual cost of downtime for Fortune 1000 companies at $1.25–$2.5 billion per year. A critical application failure can cost $500,000–$1 million per hour. Using cloud services can increase operational resilience and avoid these high costs of IT disruption. There are four key areas in which AWS helps organizations improve operational resilience: infrastructure, operations, security, and software.

First, AWS provides a highly resilient infrastructure to protect against hardware failures, natural disasters, and power outages. Each AWS Availability Zone is redundantly connected to multiple Tier-1 network providers, virtually eliminating the possibility of network outages. Every compute instance is served by two independent power sources, each with utility, UPS, and backup-generator power. These approaches are standard with AWS but would be costly and complex to implement in an on-premises data center.

Second, from an operations perspective, AWS enables organizations to automate error-prone human elements with tools such as AWS CloudFormation and AWS Service Catalog, which enable highly repeatable deployment of proven configurations. It provides system-wide visibility into utilization, performance, and operational metrics to identify and address issues quickly, helping reduce the complexity of operations while improving the ability to meet service-level agreements (SLAs) and keep the business running smoothly.

Third, AWS supports high levels of security. Security is job zero for AWS. It's the most important thing we do. Protecting against ever-evolving threats requires constant vigilance, and the cost of a breach can be significant. AWS continuously applies best-of-breed protections to our global infrastructure. AWS automation and tools help to mitigate security risks such as denial-of-service attacks. With AWS Identity and Access Management (AWS IAM), organizations can securely control access to AWS services and resources, eliminating threats created by rogue servers or unauthorized users. With more than 30 certifications and accreditations, AWS provides a foundation for building compliance-ready applications and services.

Finally, AWS provides mechanisms for reducing the likelihood of software issues that could cause outages. Automation of the continuous integration/continuous delivery workflow can be accomplished using services like AWS CodeDeploy and AWS CodePipeline. For ultimate peace of mind, AWS Managed Services automates common activities such as change requests, monitoring, patch management, security, and backup services and provides full-lifecycle services to provision, run, and support infrastructure.

IDC found a 94 percent reduction in unplanned downtime for AWS customers versus their previous on-premises implementations. Further, AWS research shows that AWS customers experience an average reduction in monthly incidents per app of 43.4 percent, in critical P1/P0 incidents of 48.7 percent and reduction in security incidents of 36.1 percent. The benefit of reduced incident volumes is further compounded, as mean time to resolution also drops by 27.7 percent after adopting AWS.

AWS customers have achieved these resilience gains:

"We believe [AWS] enables us to operate more securely in the public cloud than we can in our own data centers."

— *Rob Alexander, Chief Information Officer, Capital One*

- MedStar rebuilt its patient engagement portal on AWS and reduced downtime from 120 minutes per month to less than five.[11]

- Trainline migrated all workloads to AWS to reduce downtime by 60 percent, achieving annual savings of £1.2 million.[12]

- Travelstart reduced downtime by 25 percent and has grown into emerging markets while reducing operational costs by 43 percent.[13]

- Live Nation increased availability from three 9s to five 9s.[14]

- Convertale increased system availability to 99.965 percent, compared to 98 percent on its on-premises setup.[15]

Business Agility

The traditional IT model places constraints on innovation. If a team wants to develop a new application or service, it needs to provision resources to do so. This requires additional time and money, slows time to market, and cuts into innovation budgets. The cost of failure is another potential roadblock. For example, if a company using an on-premises infrastructure tries and fails to launch a new product, it still must support the hardware it purchased to run the project.

With the cloud, developers can instantly provision resources and begin writing code. They don't have to wait to get the budget to deploy a full infrastructure stack just to prototype something new because the cloud supports a rapid, agile approach to IT that drives competitive advantage. They can even avoid costs by shutting down instances if and when they are no longer needed.

In a talk at the AWS Summit Series, Morningstar Chief Technology Officer Mitchell Shue highlighted the broader business benefits of the cloud, saying,

"We're super excited about cost efficiencies, but we're even more excited about creating a frictionless developer experience that spurs innovation and increases productivity."[16]

In other words, cost savings are just the beginning of business value.

Simply put, adopting AWS helps businesses move faster, whether that means getting innovative products to market before competitors, taking advantage of fresh opportunities, quickly expanding to new geographies, accelerating M&A, or increasing the pace of experimentation. In a digital economy, IT is the enabler of all these capabilities.

In a cloud environment, the risk of trying new things is greatly reduced. For example, if an organization can try 20 ideas on inexpensive cloud development and test infrastructure (which can be deployed in minutes on AWS), deploy 10 of them to production, and keep only two of them over the long term, it can do so with only a fraction of the waste that would be incurred attempting to do so with an inflexible on-premises environment. When an initiative takes flight, scaling up infrastructure to meet demand becomes a simple exercise. IDC estimates that using AWS can result in 25 percent higher developer productivity and enable the delivery of 3x as many features compared to on-premises environments.

The cost of failure is also reduced in the cloud. When initiatives fail, as they so often do, that failure is far less costly because organizations can quickly, easily shut down instances.

AWS research supports these findings, showing that AWS customers save an average of 2.5 months in time to market when launching new applications on AWS while also offering 26.4 percent more new features, updates, and fixes per release. Applications moved to AWS receive significantly higher user satisfaction scores on a 10-point scale, rising from 7.0 to 8.8 for employees and from 6.8 to 8.8 for customers.

AWS customers have achieved transformative benefits to business agility:

- McDonald's launched its Home Delivery Platform on AWS with a microservices architecture, allowing it to scale to 20,000 orders per second with less than 100-millisecond latency.[17]

- Bristol-Myers Squibb gained the ability to run simulations 98 percent faster, reducing the cost of clinical trials and improving conditions for patients.[18]

- Unilever can launch new projects 75 percent faster.[19]

- Dow Jones increased its product development velocity by 30 percent.[20]

- Lionsgate used AWS to reduce the time required to deploy infrastructure from weeks to days or hours.[21]

"Speed is time, speed is money. Our projects no longer last years, they last months. Which means that we can deliver new features, new services, new products to our customers much faster than we had before."

— *Alan Williams, Enterprise Architect, Autodesk*

"Our developers are able to start small Amazon EC2 instances to do proofs of concepts. The successful ones are then rolled into production and merged with larger instances. This wasn't feasible under the model of purchasing new servers for conceptual ideas."

— *Adrian Payne, Manager of Online Services, Indianapolis Motor Speedway*

"With traditional infrastructure, it can take weeks to get a server procured, delivered, and running. With the AWS Cloud, we can provision resources as we need them."

— *Denise Taylor, Chief Information Officer, Anschutz Entertainment Group*

Conclusion

We began our discussion of cloud value by highlighting the importance of measuring the impact of cloud initiatives across the four key dimensions of value. Equally important is the need to communicate how and where cloud wins are delivering value to the business.

Here are the best practices we recommend for communicating cloud value to your organization, based on helping thousands of enterprises migrate successfully:

Start early
Start business-case procedures early in the decision-making process

Involve stakeholders
Enlist the right stakeholders (from finance, procurement, IT, engineering, business ops) and build the case in multiple iterations

Assign value
Present the overall business impact (not just TCO) by assigning value to hard-to-quantify parameters such as business agility

Footnotes

1   https://www.nrdc.org/sites/default/files/data-center-efficiency-assessment-IP.pdf

2   https://pages.awscloud.com/Global_IDC_Enterprise_Whitepaper.html

3   https://aws.amazon.com/solutions/case-studies/ge-oil-gas

4   https://aws.amazon.com/solutions/case-studies/adroll-tco

5   https://aws.amazon.com/solutions/case-studies/conde-nast

6   https://aws.amazon.com/solutions/case-studies/lionsgate

7   https://aws.amazon.com/enterprise/executive-insights/content/how-live-nation-realized-business-value-with-aws

8   https://aws.amazon.com/solutions/case-studies/newlog-consulting

9   https://aws.amazon.com/solutions/case-studies/intuit-cloud-migration

10   https://aws.amazon.com/solutions/case-studies/adroll

11   https://aws.amazon.com/solutions/case-studies/medstar-health

12   https://aws.amazon.com/solutions/case-studies/trainline

13   https://aws.amazon.com/solutions/case-studies/travelstart

14   https://aws.amazon.com/enterprise/executive-insights/content/how-live-nation-realized-business-value-with-aws

15   https://aws.amazon.com/solutions/case-studies/convertale

16   https://www.youtube.com/watch?v=vhNvhJGOhSw&ab_channel=AmazonWebServices

17   https://aws.amazon.com/solutions/case-studies/mcdonalds-home-delivery

18   https://aws.amazon.com/solutions/case-studies/bristol-myers-squibb

19   https://aws.amazon.com/solutions/case-studies/unilever

20   https://aws.amazon.com/solutions/case-studies/dow-jones

21   https://aws.amazon.com/solutions/case-studies/lionsgate