WHITE PAPER

Exploring the true economic value of SAS® Cloud

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Defining the true economic value of cloud

The digital transformation of business applications from on-site to the cloud is well underway. In a recent report, Gartner projects that cloud will make up 14.2% of the total global enterprise IT spending market in 2024, up from 9.1% in 2020.[1] The question, as shown by the rise in multicloud and hybrid cloud strategies, is not whether to move to the cloud; it's which applications to move, which cloud(s) to choose and the economic benefits they provide. In other words, what is the true economic value (TEV) of different cloud options, and how does it affect the business case for organizations undertaking a cloud migration journey?

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SAS defines TEV as the combination of total cost of ownership (TCO) of infrastructure, innovation and agility. This definition recognizes that while many early migrations of applications to the cloud were straightforward cost plays, with companies seeking to lower operating costs and reduce capital expenditure, this is not necessarily the case anymore. Cost may still be the first driver of cloud adoption, but increasingly, business cases are focusing on the transformational benefits of cloud computing. They are looking at the overall business value that the cloud facilitates by increasing innovation and agility; the pathway the cloud provides to more reliable, resilient systems with high application uptime; low-touch implementations that improve time to value; and increased scalability of compute.

When applications are run in the cloud, IT spends less time on troubleshooting, resource provisioning, job queuing and loading data. Therefore, users spend more time on advanced analytics, innovation and advanced use cases. The cloud also lowers barriers to use, so strategic priorities – such as enabling employees to securely access analytics through visual interfaces from anywhere in the world and coding in both SAS® and open source – are possible.

This paper will explore the elements of TEV and illustrate this model at work by showcasing a real-world TEV analysis performed for a SAS customer. The goal was to prove whether or not running SAS Cloud on Azure through a managed application service construct was a smart business decision given the company's limited cloud experience and IT resources.

[1] Gartner Forecasts Worldwide Public Cloud End-User Spending to Grow 18% in 2021.

The pillars of a complete assessment of cloud value

Running analytics applications in the cloud lets companies drive value that has not been previously realized with on-site implementations across three value pillars:

- **Infrastructure enablement** (commonly referred to as the TCO of infrastructure).
- **Accelerated operations**.
- **Business outcomes**.

These three pillars are key elements of a complete value assessment. When organizations focus on just one pillar of value (or one discrete element within a pillar) as the litmus test for when and how to migrate to the cloud, it leads to a suboptimal solution. To understand why it's risky to over- or underemphasize any given pillar, let's take a closer look at the value components each pillar represents for an organization (see Figure 1).

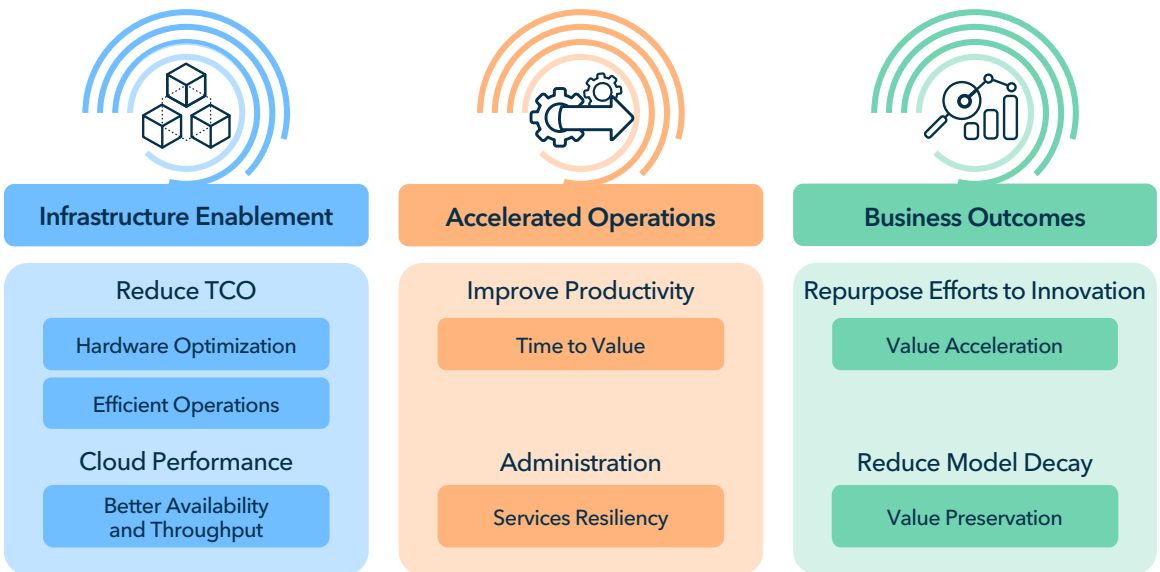

Figure 1: The three pillars explored in this paper on the value of cloud.

For example, an organization that overemphasizes time to value in the Accelerate Operations pillar without adequately considering efficient operations and service resiliency might build a business case with inaccurate assumptions around the value of governance and the cost of skilled resources needed to self-manage the application and infrastructure. A balanced look across all three pillars (Infrastructure Enablement, Accelerate Operations and Business Outcomes) can save years of wasted effort trying to run models in an environment that requires significant validation, optimization, governance and skilled resources to generate the expected ROI.

An illustration of the TEV pillars at work

SAS helped a commodity management firm dealing in food and feed ingredients assess its TEV of cloud as part of a holistic analytics value assessment. This organization, whose data included credit risk and other data subject to regulations, understood and embraced the value of a hybrid-cloud approach and already had a presence across all major public cloud vendors.

In evaluating the cost of managing an IT infrastructure, it is essential to consider metrics that not only account for the cost to acquire the physical infrastructure and the running cost, but also the manual effort needed to operate the system. Infrastructure management is a significant cost in maintaining an on-site database management system. As a result, most firms look for ways to reduce infrastructure costs while still providing critical support.

Total cost of ownership

Table 1 shows how SAS applied this best practice to the customer's TEV assessment, categorizing infrastructure costs into:

- **Capex (capital expenditure)** – or cost of acquiring physical devices (such as server, storage and network costs).
- **Opex (operational expenditure)** – or the daily running cost for these devices (such as power and cooling, real estate and administration).

In this case, the customer was running their database system on two physical servers with eight cores each with Oracle DB software and 200GB of storage. The TCO for on-site operations was estimated to be more than $307,000 over a three-year period (see Table 1).

On-Site	3 Years
Capex (Hardware Optimization)	$210,000
Opex (Efficient Operations)	$97,000
Total On-Site Cost	**$307,000**

SAS® Cloud on Azure	3 Years	% Reduction
Capex (IaaS Cost)	$56,000	73%
Opex (Efficient Operations)	$84,000	13%
Total Cloud Cost	**$140,000**	**54%**

Table 1: Total cost of ownership calculations.

After migrating this database infrastructure to SAS Cloud on Azure, the customer expects **a 54% reduction in TCO over a period of three years**. With SAS' recent partnership with Microsoft, SAS Cloud has even better pricing, further reducing the infrastructure cost by 13% (from $56,000 to $48,000 for a three-year period).

Uptime and resiliency

Migrating analytics software to the cloud allows significant infrastructure cost savings. It also enables higher performance of IT resources, which reduces unplanned downtime situations. A downtime event results in resource unavailability and lower throughput, which can lead to value loss. For example, this customer had 98% on-site availability (2% downtime – 175 hours or seven days), which led to lost business value of $845,000 over a three-year period. However, SAS Cloud on Azure offers a better cloud performance at 99% standard SLA and 99.5% based on customer requirements, resulting in better availability and throughput. An improvement of 1% availability (from 98% to 99%) reduced the lost business value to $370,000, resulting in a **net cloud uptime benefit of $475,000 to be realized over a three-year period**.

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Annual cost of SAS® Cloud versus self-managed

SAS also worked with the customer to assess the hardware price they would pay to run the solution on their existing Azure tenant and to implement and operate the solution themselves. This "next-best alternative" annual price was compared to the SAS Cloud on Azure offered as a hosted managed service annual price. The SAS Cloud Hosted Managed Service (HMS) option includes enablement services such as:

- Implementation project management.
- Robust compliance processes and documentation.
- Technical account management.
- Architecture optimization.
- Data transfer expertise.
- Proactive patching, monitoring and alerting.
- QA testing (both automated and nonautomated).

The question the customer wanted to answer was not whether the more comprehensive SAS Cloud HMS option would have a higher price; but was the higher price justified and how much value would be derived from the difference?

The SAS Cloud annual price, inclusive of data center and all managed application services mentioned above, was found to be more expensive than the price of only having infrastructure as a service (IaaS). Yet when all the elements of SAS Cloud managed application services are considered, the difference between the self-managed IaaS option and SAS Cloud HMS option shows that the HMS option is a sound investment for a company with few resources. Plus, it's also a sound investment for companies that have the required resources to run the environment themselves.

This is because the SAS Cloud Hosted Managed Services offering delivers exceptional value to customers, including:

- **Productivity savings** – by eliminating multivendor coordination through a single service level agreement.
- **Reduced costs and inefficiencies** – by reducing troubleshooting time and effort.
- **Reduced risk of downtime** – because SAS managed services experts have the best skills and experience to manage and resolve SAS issues.
- I**mproved solution availability** – because the SAS Cloud guarantees a 99% uptime for customers.
- **Higher solution efficiency and scalability** – to meet future business needs.

Each line item (see Figure 2) was validated with the customer, including the required services, salaries and resource assumptions. The line items covering program/project management, technical account manager, QA testing and maintenance, architects and technical communication also include the cost of SAS application administrators.

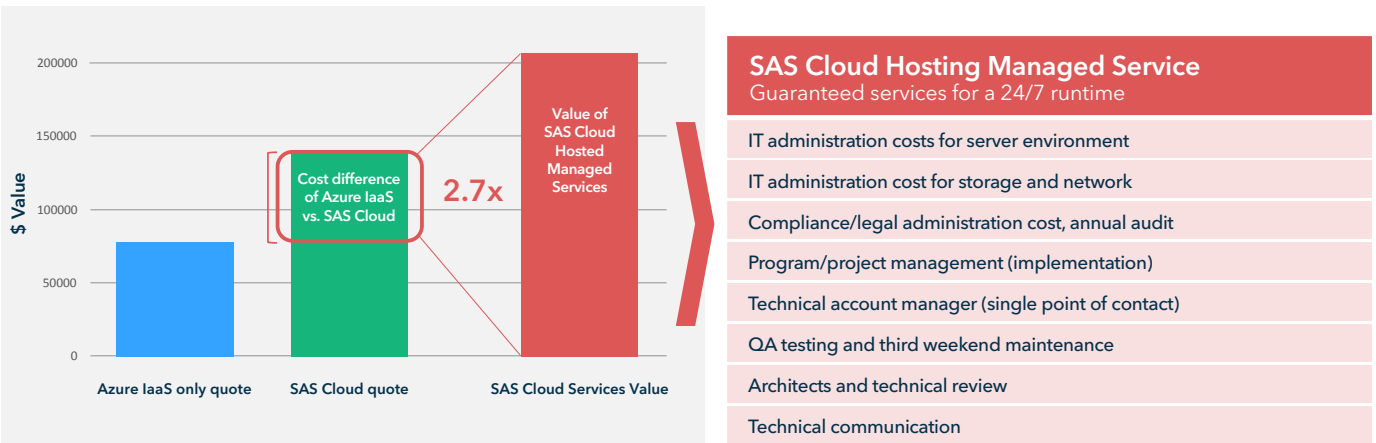

Figure 2: Line items in the analysis validated with the customer.

Note that this analysis includes items that are not quantified; however, they are nonnegotiable in a cloud implementation, such as robust compliance and security procedures that are built into the SAS Cloud.

SAS, along with the customer, assigned a cost to each of the line items in Figure 2 to measure the potential value of these managed services. It was found that the **cumulative value was 2.7 times the price differential between the SAS Cloud HMS option and the option where the client only pays for the cloud infrastructure costs**. Also note that this value does not include the opportunity cost of having resources work on maintaining the SAS solution rather than working on other value-added tasks, or the cost of hiring and managing additional resources to do the work.

Breaking down the cost components that go into managed application services pricing for the SAS Cloud offering more than justifies the difference between a public cloud IaaS implementation self-managed by the client's own resources and a SAS Cloud managed application services implementation. **It confirms our hypothesis that SAS Cloud on Azure through a managed application service construct is a smarter business decision for customers than self-managing the solution internally**. SAS has scale, automation, expertise and intellectual property from thousands of projects to provide this service more efficiently than anyone else.

Productivity gains

Prior to SAS Cloud, IT spent significant effort (up to 70%) on model deployment and model management. Using SAS Cloud removed these tasks from IT and delivered automation that resulted in a 50% reduction in time spent on such tasks for data scientists. This reduced effort affected not only SAS users, but also open-source data scientists who now find it easier to compare multiple open-source and SAS models on the same integrated platform, and deploy champion models into production with the click of a button.

Time and effort

Equally important, typical effort spent by data scientists, risk analysts, business analysts and citizen data scientists in data preparation and analytics was reduced by 60%-80%, thanks to the AI, machine learning and other automation features of SAS Cloud. The result was an average productivity benefit of **$3 million to $3.3 million per year (approximately $17 million over five years)**. This time saved was used to fuel value acceleration. For example, time was redirected to additional advanced analytics use cases, which are now being delivered by the same team over the same time period.

Overall business outcomes

Next, during the installation and customization of the customer's SAS Cloud on Azure solution, SAS ran a value review to investigate the business outcomes of the SAS solution. It was identified that SAS Cloud can affect multiple areas through advanced analytics such as retention/churn modeling, share of crop prediction, propensity to trade, customer journey, forecast accuracy and net promoter scores. Given the available data, three business metrics were chosen to compute value generated – increase in revenue due to higher trade counts, quantity per trade and improved productivity of the customer services team.

SAS was able to improve performance in these business areas through customer landscape visibility, clustering, segmentation and predictive modeling, trader dashboard through CRM enablement, customer intelligence, supply chain optimization and trading floor analytics. It was observed that even a conservative 2.5%-5% improvement in these areas resulted in **$1.1 million to $2.3 million in revenue upside** in the first year for three of the top-selling commodities. Additionally, the customer service team's productivity improvement resulted in $200,000 in the first year, with $620,000 in gains expected over a three-year period. **When projected over three years, the total business benefit was more than $24 million with a present value of $19 million**.

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The enhanced availability and throughput, guaranteed resiliency, scalability and improved features of SAS Cloud increased the productivity of the data engineers, data scientists and IT. The impact of business metrics resulted from both:

- **Value acceleration** – achieved when efficiency gains were diverted to bring innovative use cases to life faster.
- **Value preservation** – where model drift was reduced by easier and more frequent model refresh cycles, enabled by the modern SAS Cloud on Azure infrastructure.

Key takeaways

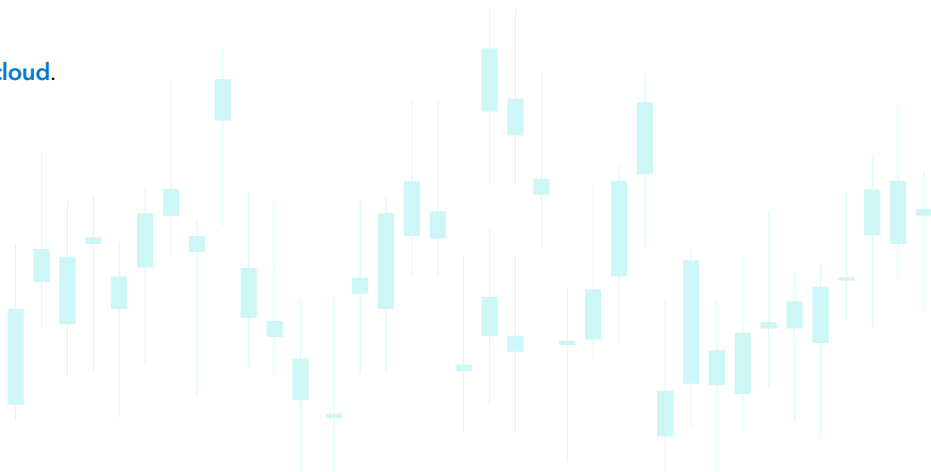
CIOs and business stakeholders who are seriously considering moving analytical workloads to a cloud environment should start planning early, as well as invest in a detailed TEV analysis of various options. This planning should not only consider the road map and architecture of on-site versus a hybrid and multicloud end state, but should also encompass the economic benefits in moving analytics workloads to that proposed end-state environment. Instead of only assessing infrastructure benefits, the analysis should also consider:

- Time to value.
- Holistic administration services offered by the provider.
- Value acceleration and value preservation driven by productivity gains.
- Automated model deployment and model management, which reduces dependence on IT and embraces open-source models.

As illustrated in this paper, SAS Cloud on Azure provides exceptional TEV using a future-proof platform that takes the complexity and risk out of the equation for the customer. This is achieved through a managed application services construct powered by SAS® Viya® features that support easy, open-source integration and automated model management and deployment.

Learn more

To learn more about SAS Cloud, please visit **sas.com/cloud**.



For more information, please visit sas.com/cloud.