



CITO Research

Advancing the craft of technology leadership

Understanding Cloud ROI Factors

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Introduction

The cloud can save you money. That's a statement almost everyone agrees with. But exactly how does that work? CITO Research has been examining the ROI of the cloud for several years. In this paper, we share the insights from our research so far, helping you understand the factors that influence the ROI of the cloud and its implications for your organization.

In calculating cloud ROI, you must consider factors that are relevant to your enterprise application portfolio and computing needs. While this paper is not a step-by-step guide to determining cloud ROI, it is possible to calculate cloud ROI by examining the factors analyzed in this white paper and determining how they apply to your situation.

Cloud ROI =

Return (Revenue from a new app in the cloud)

Investment (Cost of on-premise app development)

Cloud ROI Considerations

Switching from traditional on-premise data centers to a cloud-computing model can produce cost savings for enterprises. The cloud decomposes the traditional hard-wired relationships between application, server, hardware, network, and storage, freeing these resources from their traditional constraints. Cloud providers tend to deploy low-cost commodity hardware, with a layer of software-based management, which allows for many alternative configurations. Because of this, moving to the cloud will generally increase the return on your technology investment. However, it also opens the door to new activities that may not fit into a standard ROI calculation.

For example, let's say that you spend \$100,000 per month on self-hosting an e-commerce site that generates \$110,000 per month. That's a 10% ROI. By outsourcing hosting to a cloud provider, and lowering monthly expenses by \$20,000 per month, that same \$110,000 could still be generated if the application performs at the same level. That's a 37.5% ROI. In addition, it frees up capital to redeploy resources formerly dedicated to maintaining infrastructure to higher-value activities such as research and development. It's up to your organization to determine the value of this new freedom.





It is imperative for your enterprise to obtain an explicit definition of how your intended cloud provider measures productivity or cost on a unit basis

Analysis of cloud ROI should take several broad considerations into account

Units of Measure: A common measure of productivity is cost per unit of computing power. It generally costs less per unit of computing power to run an application in the cloud than it does on premise.

However, many cloud operators define computing power differently. Some look at a virtual machine as an equivalent of a CPU with a certain GHz of processing speed. Others create units that are comprised of the entire “stack” of assets that go into the cloud—networking speed, storage input/output operations per second, memory speed, and processing speed. It is imperative for your enterprise to obtain an explicit definition of how your intended cloud provider measures productivity or cost on a unit basis.

Tradeoffs: Cloud computing reduces the management time and capital costs associated with maintaining on-premise equipment. Assuming an application is “operationally intelligent,” in other words, designed to work around performance variations common in the cloud, this usually translates to a net savings.

However, many applications were not designed to operate in a cloud environment and cannot run properly unless components such as app servers and databases are highly optimized and perform at levels beyond those common in the cloud. These applications may need to be refactored to work in the cloud.

The decision about whether to move that application into the cloud depends on an assessment of its total capital and operating cost, including computing hardware, software, and human resources, weighed against the cloud’s utility **pricing and self-service model combined with the amount of labor necessary to redesign the application.**

Intangibles, Expressed as Time: Cloud computing can create outcomes that are subjectively important but may not have a readily determined monetary value or an easy way of accounting for financial impact; using a weighting scale can make these factors work in an equation.

Intangibles can be expressed in terms of time. This could include time for innovative software design that would formerly have been dedicated to “keeping the lights on.” A qualitative benefit such as “ease of use” may need to be turned into a quantitative expression—how many clicks does it take to accomplish the same task in the cloud vs. on-premise? How long did it take to complete the simplified task?





Investment (Cost) Factors

Moving to the cloud adds new factors for calculating cost or investment—the denominator of the equation. This affects several dimensions of how organizations think about the cost of computing.

Traditional Cost Factors

Economies of Scale
Peak Loads
Capital Expenses
Operational Expenses
Disaster Recovery

Traditional Factors Changed by the Cloud

Expanded use of the cloud transforms the nature of many different forms of cost savings or potential lower investment, which are central to the determination of ROI:

Economies of scale: When you pay a cloud provider, you benefit from economies of scale. The provider houses multiple customers' computing assets in large, highly scalable data centers, providing savings for all of the customers that would otherwise have occurred individually.

Avoiding building for peak loads: Consider what goes into planning a directly owned and operated data center—you must purchase enough equipment and establish enough space and connectivity for that equipment to accommodate peak loads, such as the holiday shopping season or an IPO on Wall Street. The consequences of not doing this are too grave to consider. The disadvantage of overprovisioning is that you almost certainly end up with wasted or redundant capacity.

Reduced data center capital expenses: Cloud ROI calculations should take into account reduced need for data center space and all the costs associated with it.

In the cloud, there are no up-front costs associated with building a data center, such as land acquisition, design, and construction. Cloud providers have already made and are amortizing that investment by acquiring numerous customers and capitalizing on economies of scale. You can avoid building or at least defer expanding your data center using the cloud.

Reduced data center operational expense: Cloud providers also save you the cost of operating a data center. Paying energy bills, IT staff, and security personnel to maintain the center all go away when you transfer those responsibilities to the cloud. Again, the economies of scale that come from shared premises mean that operating costs borne by the cloud provider are amortized across a large customer base.

You can avoid building or at least defer expanding your data center using the cloud





Reduced disaster recovery risk: You can also significantly reduce risk by using the cloud for disaster recovery, which is a new challenge. Cloud providers have made the investment in multiple, redundant data centers and backup policies that protect their customers. If the unthinkable happens, all of your eggs won't be in one basket. Additionally, you can further reduce risks by retaining more than one cloud provider for your most critical applications and services. Nevertheless, ownership considerations may come into play that would not be an issue in standard disaster-recovery scenarios and should be discussed with your cloud provider: Who owns content synchronization and failover responsibility? Who determines recovery time objective (RTO) and recovery point objective (RPO)?

New Cost Factors

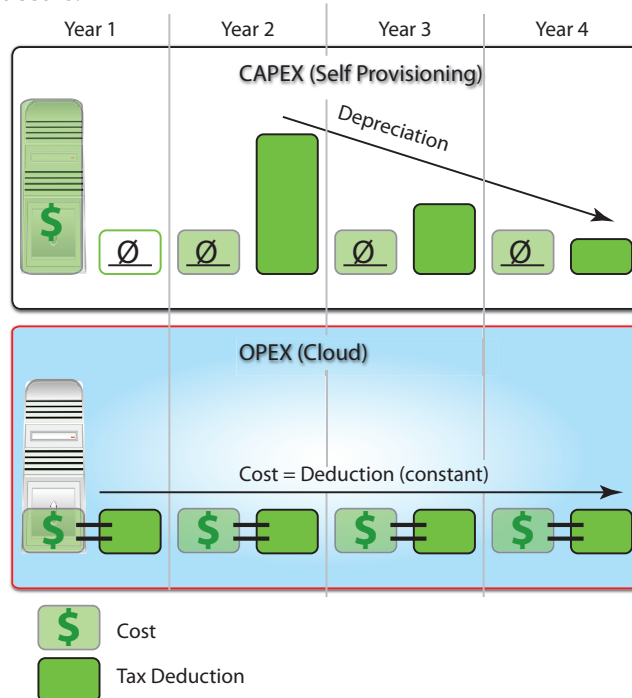
- Pay for what you use
- Move from CapEx to OpEx
- Computing Transparency
- Automation
- Vendor Lock-in
- Scalability
- Resource Efficiency

New Factors Introduced by the Cloud

Cloud computing introduces new factors into the ROI equation that require thinking outside the box of capital acquisition, licensing of software, and depreciation:

Paying only for what you use: Switching to the cloud means you only pay for what you use, and you can scale up and down as needed.

Moving from CapEx to OpEx: When switching to a pay-as-you-go model, many companies find that savings accrue from changing their financial accounting for computing assets from capital expenditures (CapEx) to operating expenditures (OpEx). With CapEx, the full cost of an asset is levied right away, but the expense of the asset is depreciated over time. With OpEx, the expense can be deducted in full in the year it occurs.





Cloud software will run the same in each cloud, meaning the customers have choices and avoid lock-in

New levels of transparency into cost and computing resource use: Through a cloud provider's interface, you can see exactly how many CPUs are being used to support each application, what that power is costing you, and how well your application makes use of those resources. That means you can better manage your existing applications, as well as make decisions about rolling out new applications with much greater confidence than before.

Increased control and automation: When your enterprise switches to the cloud, you can instantly gain benefits from greater control and precision over your resources. When your application needs more computing power, direct application programming interfaces (APIs) can seamlessly automate the assignment of that power by implementing rules you have set.

OpenStack and the Open Cloud

In one respect, cloud technology is exactly like all previous generations of technology: if you are not careful, you may end up locked into a particular vendor and lose options. The first generation of the cloud has been dominated by Amazon Web Services, a proprietary cloud implementation controlled by one company. OpenStack, the open-cloud initiative co-founded by Rackspace, created cloud infrastructure software created and distributed as open source. The largest service providers in the world, companies like IBM, HP, Dell, and others have all committed to building clouds using OpenStack. While these vendors will compete on levels of service and other aspects, the cloud software will run the same in each cloud, meaning the customers have choices and avoid lock-in.

Avoiding vendor lock-in: The open cloud (see sidebar) can also increase your choices of vendors for any number of services, reducing the risks associated with vendor lock-in and propelling maximum savings potential, as well as driving returns.

Scale quickly. A prime cost benefit of the cloud's economy of scale lies in customers' ability to scale up and down quickly, across a number of investments. If your company acquires or sells a division or another company, typically it inherits the contract obligations of that company, which include hardware, software, data centers, and support contracts for all of the above. With more companies joining the cloud, an acquisition or divestiture doesn't carry that burden. You can add or delete redundant services associated with the acquired or sold asset, generally with fewer obligations than with traditional, on-premise computing resources.





Increase Resource Efficiency: By moving to an outsourced cloud provider, your non-computing resources (people!) also become more efficient. Enterprises can:

- ▶ **Reassign employees formerly dedicated to low-level IT tasks**, such as supporting hardware updates and administering servers, and offer them more challenging work.
- ▶ **Start a new business or a new line of business.** You may be able to do so without investing in any additional staff or computing resources.
- ▶ **Eliminate employees** who were formerly required to support on-premise computing services and data centers, affording a new range of flexibility for investments.

Return Factors

Now we examine the numerator of the ROI equation, the return on investment.

Traditional Return Factors

"Curiosity tax"
Experimentation
Risk
Capital Preservation

Traditional Return Factors Changed By the Cloud

Cloud computing repeals the "curiosity tax" imposed by the need for expensive infrastructure to support innovation. The cloud enables you to run experiments internally or in the marketplace. The ability to shut down the resources associated with an idea that tests poorly means less risk when funding new ideas. Companies can be much more fearless in their innovation. The flexibility to preserve capital when needed is critical in an uncertain economy.

New Factors Introduced by the Cloud

New factors connected with returns on investment include:

New Return Factors

Agility
Green Advantage
Innovation
Independence from IT
Business Process Design

Better agility, faster time to market: If your marketing department used to take three months to launch an online campaign using in-house IT and now takes a week, that's a significant advantage. You're getting better ROI from your marketing team, because they produce more projects in a given timeframe. On the other hand, how do you measure success of a marketing campaign—does it have a direct revenue impact? Could other lines of business benefit? Assigning a numerical value to this benefit could help it become a more useful factor in making cloud-related decisions.

Gain green advantage: The tremendous efficiency of the cloud's economies of scale, derived from meticulously organizing space and services in shared data centers, means it takes less energy to run and cool those data centers. Not only does this lower costs; it boosts the credibility of your company's green efforts.





Huge waves of productivity opened up when enterprises moved from mainframes to desktop computing

Cloud computing instigates organizational change, not just IT change

At what price, innovation? One of the greatest advantages of moving to the cloud is also the most difficult to quantify. What is the cost of innovation? It's much cheaper to experiment when you don't have to make a long-term commitment.

Reduced dependence on IT: Cloud computing means products can move from a back-of-the-napkin sketch to the marketplace in far less time. Because of the ease of assigning and moving assets to support new endeavors, it also means that more people can create those solutions—everyday business users can get to work right away, provisioning and using computing assets as needed without the need for IT intervention.

Redesign business processes: The revolutionary promise of cloud computing is akin to that of every previous advance in computing. Huge waves of productivity opened up when enterprises moved from mainframes (a few of the “best and brightest” working on arcane calculations in an isolated room) to desktop computing (everyone can contribute to organizational value through computing). Cloud computing bursts the hierarchical operating model once again. Now, you can deploy smart people on innovation, not infrastructure. In a world where computing power scarcity is no longer a critical limiting factor, the return on your investment could extend far past savings for IT into redesigned business processes that are only being imagined now.

The Cloud as Business Transformer

The cloud enables a transformation of your organization and the way you do business—not just computing power consumption. The benefits are great, but so are the challenges. It is a fallacy to suggest that moving to the cloud is as simple as transferring IT costs from one place to another.

Most applications were built with the assumption that they would run on traditional client/server architecture inside a corporate firewall. Some applications may need to be radically altered in order to function in the cloud, representing an initial cost that must be justified by expected returns down the road.

Often, cloud computing instigates organizational change, not just IT change. A review of organizational interdependencies and dynamics is advisable before taking the plunge. Procurement and security protocols may need to be reviewed and changed before proceeding. For example, in the cloud, computing power can be purchased on a whim with a credit card and may not be part of the purchasing workflow, unless policy is written to accommodate this possibility. Departments





The speed of the cloud must be matched by the speed of your organization

can create their own resources in the cloud without IT supervision. If your organization transfers risk to a vendor with whom you do not have a master services agreement, you could be placing terms of liability for sensitive data back on your shoulders.

Cloud computing is one of several factors playing into the changing role of the IT department. IT needs to take an active role in developing a “service catalog” that includes in- and outsourced services, reflecting the flexibility and reduced timescales that cloud computing enables.

In other words, the speed of the cloud must be matched by the speed of your organization.

Conclusion

Cloud computing can create significant return on investment, affording energy, licensing, and administrative cost savings for many applications enterprises run today, as well as providing the flexibility to invent new applications. By leveraging economies of scale, it frees up capital and personnel to innovate new ideas quickly, with limited financial penalties. But moving to the cloud is not a decision to be made lightly, or without a trusted advisor. As with any worthwhile investment, cloud computing has an organizational impact that must be carefully considered, not only for IT, but for the entire business. Moving to the cloud is a transformational investment, in every sense of the word—but it’s a move that many of today’s organizations find compelling.

CITO Research

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