

Annex 1

Computing the Total Cost of Ownership in Cloud Adoption

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1 What is Total Cost of Ownership?

Investing in the right systems, assets, and infrastructure is critical to the success of any organization. A critical factor in determining the true value of a product or service is the ‘Total Cost of Ownership (TCO). TCO encompasses all expenses associated with acquiring, implementing, operating, maintaining, and disposing of an asset.

Evaluating the total cost of ownership, which encompasses expenses beyond the initial purchase, enables an organization to make informed decisions about tool investments and maximize ‘Return on Investment (ROI).

2 What is TCO in Cloud Adoption?

The total cost of ownership in cloud adoption refers to the financial estimation that helps an organization assess the complete cost of adopting and operating cloud-based services compared to traditional on-premises solutions. It includes direct costs, such as subscription fees, as well as indirect costs such as maintenance, support, and operational expenses.

3 Calculation of TCO in Cloud Adoption

3.1 Step 1: Calculate the Current IT Infrastructure Costs

Understanding the actual cost of the current IT infrastructure is the first step. It involves calculating the direct and indirect costs of running and maintaining the current system as well as estimating the current workloads, including servers, databases, storage, and network bandwidth.

Following aspects can be considered when performing the calculation.

a. Hardware and Infrastructure Cost

Identify the cost of the hardware that powers the existing on-premises solutions. This includes physical servers, supplies, spare parts, etc.

b. Datacenter Cost

The cost incurred to power the data center and to meet the current cooling, power, and space requirements

c. Software Cost

Calculation on the current software usage, including the number of licenses and related cost.

d. Personnel Cost

The personnel involved in system, network, and database administration and the cost associated with salaries.

e. Disaster Recovery Cost

If a disaster recovery system is in place, the cost associated with maintaining and managing the DR site.

f. Maintenance Cost

The cost of servicing, operating, and maintaining the system, including the cost of both in-house and outsourced maintenance.

g. System Upgrade Cost

The cost associated with upgrading the system, if the need arises.

h. Security Cost

The total cost of securing the current system, from the cost of physical security to firewalls and security experts. On-premises data centers require several layers of security, most of which is handled via software. Network security threats need to be managed with firewalls and tools for intrusion detection, prevention and vulnerability.

i. Hidden Costs

The cost associated with downtimes to review log files to determine the server downtime frequency, loss of hours, and the operational cost implication of such hours.

3.2 Step 2: Calculate the Intangible Costs of Current IT Infrastructure

On-premises solutions includes a range of intangible (or hidden) costs that organizations need to carefully evaluate during cloud TCO calculation. These costs include;

- a. **Downtime:** Once on-premises environments suffer outages, productivity and output can come to a halt. Downtime is often one of the significant intangible costs of on-premises solutions.
- b. **Slow Speed:** Just as important as downtime are slow speeds, another common issue with on-premises computing.

- c. **Waste of Employee Time:** In an on-premises environment, IT staff often lose productivity due to troubleshooting and issue fixing, which can take a longer time, depending on the severity of the problem. Even diagnosing the difficulty can have IT teams running in search of answers. Patching software to maintain security is another time consuming activity. These time consuming tasks, prevent IT teams from contributing to more strategic initiatives. In cloud computing, many of these tasks are the responsibility of the CSP or software-as-a-service (SaaS) application provider.

3.3 Step 2: Estimate the Cost of the Cloud Solution

This step involves calculating the cost of operating the applications in the cloud. Understanding the major cost areas in the cloud is key in optimizing the cloud cost and ensuring a lower TCO.

Major cost areas to consider are;

1. Migration costs
2. Monthly cost of the selected cloud service
3. Cost of consultation and training

Migration Costs

Moving on-premises applications and data to the cloud is a key step when switching to the cloud. Current applications may require modification to function properly in the cloud environment.

Government organizations can opt to either of the following methods to move on-premises applications to cloud.

1. Re-hosting applications without making any changes to their architecture
2. Re-factoring or running applications on a cloud provider's infrastructure
3. Revising the application, i.e. modifying or extending the existing code base
4. Rebuilding or re-architecting the entire application for the cloud
5. Replacing the application with commercial software delivered as a service

Each of the above methods has its own cost implications and Government organizations need to determine the costs associated with the chosen method.

In addition to application migration costs, it is important to estimate data transfer costs associated with moving the applications.

Monthly Cloud Cost

The monthly cloud cost depends on the workload of the organization, the specific cloud services consumed and the method of purchase. The most crucial aspect is to estimate the potential monthly cloud bill based on the organization's workload.

Major cloud platforms provide pricing calculators that make it easier to estimate the monthly cloud bill. For example, the AWS pricing calculator¹, allows to estimate the infrastructure cost based on the retinue of AWS products and selected services.

Two of the major factors that will affect the size of your cloud bill are;

1. Type of cloud services consumed
2. Cloud consumption model

Cost of Consultation and Training

If the organization lacks the expertise required for the migration process, factor in the cost of hiring consultants for training should be accounted during the cost estimation process.

3.4 Step 3: Calculate the intangible benefits of the cloud

Whilst evaluating the financial aspects of on-premises vs. cloud solution, it is equally important to consider the opportunity costs such as innovation, elasticity of not adopting a cloud solution.

¹ <https://calculator.aws/#/>