



Making the Move to VoIP

Total Cost of Ownership (TCO)

Making the Move to VoIP: Total Cost of Ownership (TCO) Straight Talk about Costs

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Abstract

Savatar, a strategy and technology consulting firm, and XO Communications, a leading provider of telecommunications services for businesses, present findings on the Total Cost of Ownership for Voice over Internet Protocol (VoIP) from the perspective of businesses that are unsure what approach is right for them. This paper examines the strengths and weaknesses of each type of available VoIP service and shows how to evaluate costs using the Total Cost of Ownership (TCO) method. Finally, the paper presents an actual case study of a 35-person insurance company that evaluated a VoIP solution. Costs of four anonymous vendors are compared, and six key questions for evaluating VoIP vendors are provided.

“This paper examines the pros and cons of each type of available VoIP service and shows how to evaluate costs using the Total Cost of Ownership (TCO) method.”

Introduction

Needs of businesses are driving VoIP adoption

Interest in Voice over Internet Protocol (VoIP) is higher than ever. It seems that you can't pick up a major mainstream or trade publication, or read an online news article without seeing the term. “Enterprise VoIP Adoption Soars,” screams one headline. “28 Million Consumers will switch to VoIP,” says another.

Very few of the analysts and pundits have focused on how VoIP will affect the bottom line or how they can evaluate VoIP products and services. At the same time, business owners and managers recognize that they have serious issues with their current phone service.

In a study conducted by Savatar, business owners recited a litany of all-too-familiar telephony problems:

- It's too difficult to make a routine Move/Add/Change (MAC change) to the phone system.
- The current system lacks features critical to business productivity and it costs too much to add them.
- It is difficult to manage the system across multiple office locations and it costs too much to expand them.

These complaints show that businesses are fully aware of the problems with their existing systems, but not so aware of the real and quantifiable benefits of VoIP. A growing number of enterprises have already seen how VoIP can be the technology they need to solve their cost and management problems. However, given all the excitement surrounding VoIP, the decision maker faces a challenge in making an informed choice—you have to start with an understanding of your options.

VoIP comes in different flavors, each with its own strengths and price points. You need a tool to compare them. That tool is the *total cost of ownership (TCO) calculation*—a method that relies on actual costs and ignores buzz.

Cost is a key factor

When asked, “How important are each of the following factors in your decision to switch to a VoIP system: cost, system management, features, and age of your current system?” business owners were very clear. **Over 85 percent said that lowering cost was the most important factor they would consider when contemplating a switch.** Obviously, cost is key and this result inspired the development of the TCO analysis contained in this paper, which provides a framework and a methodology for business decision makers to calculate the bottom line on making the move to VoIP.

“Over 85% of businesses said that lowering cost was the most important factor they would consider when contemplating a switch”

Types of VoIP for Businesses

There are several competing VoIP services available in the market today:

- IP PBX (On-premises)
- Managed IP PBX
- Hosted IP PBX
- Converged Voice and Data service

IP PBX

In the VoIP world, many manufacturers now offer Internet Protocol Private Branch Exchange (IP PBX). They operate much like standard PBXs, which manage the flow of voice traffic between a business and the Public Switched Telephone Network (PSTN). The difference is that an IP PBX carries voice traffic as packets using the Internet Protocol (IP).

Sales of IP PBXs exceed the sales of traditional PBXs and, while there are many advantages with these telephone systems, there are some challenges for businesses to consider. For most businesses, the major reason to implement an IP PBX is for cost savings, but an IP PBX also gives you greatest control over your communications capabilities since the equipment resides at your facilities, and you manage it. There is also a broad suite of features that can enhance your company’s productivity. Some disadvantages include:

- Capital Cost – An IP PBX is a major capital expense. The cost varies by size, capacity and manufacturer, but it can easily run to tens of thousands of dollars. Alternatively, an IP PBX can be leased.
- Obsolescence – Like any other piece of equipment, an IP PBX can become outdated. You can upgrade it, but at additional cost. The leasing option eliminates this problem.
- Management Expenses – The IP PBX is sophisticated hardware requiring specialized skills to manage. If you don’t have that expertise in house, you need to contract with someone who does, and that is another additional cost.

Managed IP PBX

Managed IP PBX brings all the features of an IP PBX while also shifting ownership and management to the service provider. In this approach, the functions of the IP PBX are managed and maintained by the service provider. The service provider is responsible for owning, managing, and updating the IP PBX system. Typically, the service provider will charge the business an initial project management fee and an ongoing monthly fee for voice and data charges, plus management fees.

The advantages of a Managed IP PBX include a rich feature set, minimal capital costs—a complete phone system doesn't need to be purchased—reduced obsolescence, predictable operating expenses, and outsourced management. On the other hand, there are disadvantages:

- **Capital Cost** – You may incur significant expenses to upgrade your LAN to support VoIP. It is recommended to upgrade but there are PBX manufacturers that offer hybrid solutions that provide all of the capabilities of VoIP while installing digital phones
- **Operating Expense** – While your costs may be predictable, the cost of the management fees will be in addition to your network costs; however, it is important to measure those costs against your current hourly management expenses today to maintain your existing phone system.

Hosted IP PBX

Hosted IP PBX brings many of the features of an IP PBX and managed IP PBX while placing the functions of the IP PBX in the “cloud” where it is managed and maintained by the service provider in their network. The service provider is responsible for all upgrades and management of the hardware and software. Typically, a service provider will charge an initial set-up fee for installation and project management to initiate the service, and an ongoing monthly recurring fee for features, network, and usage. A service provider may also charge a management fee.

The advantages of Hosted IP PBX include a rich end-user and group feature set, lower capital costs—providers may require the customer to purchase the IP handsets separately—reduced obsolescence and a predictable monthly expense as outlined above. The disadvantages are:

- **Capital Cost** to purchase the IP handsets—and you may incur expense for upgrading your LAN to support VoIP.
- **Operating Expenses** will be higher than leveraging your existing hardware and a Converged Voice and Data solution.

Converged Voice and Data

Simpler yet are Converged Voice and Data solutions. This VoIP solution allows a business to work with a service provider to take advantage of VoIP's benefits—without replacing their existing phone system. This approach is desirable when the current phone system is adequate for the time being and the business wants to start benefiting from VoIP, but is not ready to upgrade their system or LAN infrastructure.

“The advantages of a Managed IP PBX include a rich feature set, minimal capital costs, reduced obsolescence, predictable operating expenses, and outsourced management.”

In a converged approach, voice and data are carried over a single data circuit, unlike the separate circuits typically required for voice and data. Because capacity needs continuously fluctuate, Converged Voice and Data solutions dynamically allocate bandwidth on the circuit to adjust for different traffic demands. When voice traffic is low, the circuit allots most of the bandwidth to data traffic. When a call is placed, voice traffic gets priority, and the circuit dynamically allocates more bandwidth to voice to ensure call quality.

Converged Voice and Data is an attractive option with many benefits:

- **No Capital Costs** – You can use your existing phones, key system, or PBX—so there are no upfront charges. This is an ideal solution if you are satisfied with your current phone system and are not looking to implement the full array of VoIP features.
- **Predictable Operating Expense** – Monthly voice and data charges appear on one bill and frequently include a level of local and long distance minutes per month. Charges are calculated on a per-telephone or per-business line basis. Normally, these charges are significantly lower than those for Hosted IP PBX.
- **No Management Expenses** – The VoIP service provider manages a range of IP service features in the network that are accessible by the customer via a self-service portal.

A potential disadvantage with this approach is that you will not be able to take advantage of all of the features associated with Voice over IP initially. Depending on your needs, this may not be a short-term requirement. However, as mentioned previously when describing the Managed IP PBX solution, a business can upgrade their LAN and secure a service provider to supply the IP PBX while benefiting from the converged voice and data technology.

“Converged Voice and Data solutions have very low acquisition costs, usually only a small charge for installing the converged voice / data circuit.”

Calculating Total Cost of Ownership

The appropriate way to evaluate competing systems, both VoIP and traditional, is to calculate and compare the total cost of ownership (TCO) of each solution. The concept of TCO is not new; it has been used by information technology professionals for years to compare the economic consequences of a major equipment purchase. They use TCO to sum up all costs: purchase, use, maintenance, one-time, and recurring over a set period of time. A VoIP system's TCO equals the sum of its three cost components: Acquisition Costs + Monthly Recurring Costs + Annual Maintenance Costs.

Acquisition Costs

An acquisition cost is any cost paid up front. For VoIP, acquisition costs are more than just equipment purchases. They include system installation and employee training, and may include a cost associated with terminating an existing vendor contract. Remember that with VoIP, voice and data are carried over the same connection so there are usually charges related to the provisioning of that connection. Simply put, ask your prospective VoIP provider, “How much will I need to pay up front to make a switch to VoIP?”

- IP PBX acquisition costs include the cost of the IP PBX and other necessary equipment like routers, switches, phones, cabling and power supplies—while an IP PBX solution can be bought or leased, our example will assume that the system is purchased. There will also be costs for shipping, installing and configuring the equipment. There might be an additional charge for the software that runs the IP PBX.
- Managed IP PBX acquisition costs may have installation or project management fees, and the requirement to upgrade the LAN.
- Hosted IP PBX acquisition costs include activation fees, installation fees, some on premise equipment (usually devices related to Quality of Service or LAN upgrades), along with the cost of new IP phones.
- Converged Voice and Data solutions may have the lowest acquisition costs—usually only a small charge for installing the converged voice/data circuit.

Monthly Recurring Costs

With VoIP, monthly recurring costs cover both voice and data services and can take different forms. Some service providers charge per minute usage fees for local and long distance calls, along with a fixed monthly cost for data. Others bundle these charges together into a single monthly fee that offers unlimited data access and typically a flat-rated voice package that includes a block of local and long distance voice minutes for shared use by everyone in your company.

If you have more than one business location, voice charges are typically waived for calls between your offices because the calls are never transferred to the Public Switched Telephony Network (PSTN), but rather are carried across the service provider's VoIP network. Calls from one office to another are sometimes referred to as "on net" or Virtual Private Network (VPN) calls. Regardless of how the service provider constructs the charges, ask your prospective VoIP provider, "How much will I have to pay every month for my voice and data service?"

- **IP PBX** – Often, businesses will purchase an IP PBX and the vendor—typically a value added reseller or system integrator—is responsible for all management and maintenance of the IP PBX and any other equipment that resides in your office. You may elect to train your staff or you can outsource to the vendor and incur either a monthly recurring management charge or non-recurring hourly charges for services. The TCO calculations in this paper assume a monthly recurring management fee. Most IP PBX solutions include a fixed charge for the data circuit, which is billed by the service provider in their monthly charge. As previously mentioned, voice charges are typically priced in either service bundles or per-minute charges for local and long distance service.
- **Managed IP PBX** – The monthly recurring voice and data charges are simple. Normally, the service provider will line item these charges and include a managed services fee for the management, maintenance, and possibly the monitoring of the IP PBX. The charge for the management service is typically based on the number of "seats" installed at the given location.
- **Hosted IP PBX** – The monthly recurring voice charges for Hosted IP PBX are simpler. The service provider normally will charge a fixed monthly cost per telephone set. This fixed cost includes a flat-rated bundle of minutes for local, long distance, and/or local toll calls, and all fees related to system management and maintenance. There is also a monthly charge for the cost of the data circuit. As stated earlier, some service providers will bundle the IP handsets as part of the monthly recurring fee; however, in this TCO calculation, the equipment was considered a capital expense.

"A VoIP system's TCO equals the sum of its three cost components: Acquisition Costs + Monthly Recurring Costs + Annual Maintenance Costs."

- **Converged Voice and Data** – Typically the service provider will offer a flat-rated bundle price for local and long distance service that includes a large block of calling minutes. Charges are calculated based on the number of lines required to meet the needs of the business. There is also a monthly charge for the converged voice/data circuit.

Annual Maintenance Costs

Annual maintenance costs have been a given in hardware and software purchases for years. Companies often charge 10-20 percent of the purchase cost of these products each year to guarantee technical support and product updates. The situation is no different with VoIP. Ask your VoIP vendor, “How much will I need to pay at the end of each contract year to maintain my voice and data service?”

- **IP PBX** vendors handle these costs a bit differently. Some will charge a single fee that is a percentage of the purchase price of the IP PBX. Others will charge a fixed annual fee for each piece of equipment under management. Some offer different levels of support at different fee levels. They may charge one price for telephone-only support during regular business hours, or they may offer a higher price for premium support that includes technicians coming on site within two hours, seven days a week, to fix any problem that arises.
- **Managed IP PBX** may bundle the maintenance cost in the management fee or offer it as a separate line item.
- **Hosted IP PBX** has no annual maintenance costs. You may, however, purchase maintenance for the IP handsets.
- **Converged Voice and Data** has annual maintenance costs similar to that of traditional voice and data service, as the equipment is the same or similar.

A TCO Case Study for VoIP

Let’s take a look at how these VoIP options might stack up for a typical business.

Savatar was involved in the purchase of a VoIP solution for an insurance company, based in a large metropolitan area on the east coast. This 35-employee company was using different providers for local and long distance voice services and a third provider for T1 access to the Internet. They had a ten-year-old PBX that provided basic voice mail and calling features. They did not manage the PBX in house; they contracted with another vendor for this service. We calculated the TCO over a three-year period.

In switching to a new VoIP system, the company wanted to reduce its overall voice and data costs, reduce the number of vendors providing these services, and avoid hiring dedicated staff to manage the new infrastructure.

We quickly whittled down a list of ten vendors to four, based on their responsiveness and product knowledge. All were recognized names in the telecommunications industry, but we will call them A, B C, and D:

- **Vendor A**, an IP PBX solution (including voice and data services)
- **Vendor B**, a Hosted IP PBX solution (including voice and data services)
- **Vendor C**, a Managed IP PBX Solution (including IP PBX, voice and data services)
- **Vendor D**, a Converged Voice and Data Solution

All the vendors worked with us to supply the numbers we needed to calculate the TCO of their product offerings, as illustrated in **Table 1**. From a TCO point of view, the answer is clear:

Table 1

TCO Comparison					
	Vendor A IP PBX	Vendor B Hosted IP PBX	Vendor C Managed IP PBX	Vendor D Converged Voice & Data	Traditional Voice/Data Service
Acquisition Costs					
Phones	\$10,928	\$	\$	\$	\$
Equipment	\$13,000	\$	\$	\$	\$
Installation, Configuration, Training	\$3,864	\$2,000	\$1,999	\$115	\$300
Subtotal	\$27,792	\$2,000	\$1,999	\$115	\$300
Monthly Recurring Costs					
Data Circuit	\$555	\$625	\$	\$515	\$700
Usage Charges	\$175	\$160	\$195	\$185	\$1,774
Service Contract	\$	\$1,000	\$1,800	\$	\$
Management Fee	\$473	\$	Included	\$447	\$
Subtotal	\$1,203	\$1,785	\$1,995	\$1,147	\$2,474
Annual Maintenance Costs					
Maintenance and On Site Support	\$1,675	\$	Included	\$1,890	\$1,500
Subtotal	\$1,890	\$	\$	\$1,890	\$1,500
Total Cost of Ownership					
TCO	\$76,125	\$66,260	\$73,819	\$47,077	\$93,873
Cost/Month/User	\$60.42	\$52.59	\$58.59	\$37.36	\$74.50

- The best TCO is Vendor B if your current IP PBX is at the end of its useful life. However, this is only 10% less than Vendor C and the choice ultimately depends on the business owner's comfort level.
- Vendor C's Managed IP PBX and Vendor B's Hosted IP PBX, although a higher TCO than the Converged Voice and Data solution, do provide security of management, reducing the risk of obsolescence by converting a traditional capital expense into an operating expense.
- The Converged Voice and Data solution from Vendor D had the lowest TCO by far—a quarter to a third of all the other options. It is important to note that the TCO model did not include any costs associated with replacing or upgrading the PBX, which is 10 years old.

TCO Comparison

It is useful to look at the TCO numbers on **Table 1** from a slightly different angle. The numbers on this table are for a 35-person company over three years and include all voice and data costs for the company. If we take the TCO number, divide by the number of employees and divide again by the number of months in the contract, we can come up with a total cost for voice and data per employee per month.

In this case, it works out to about \$60.42 per employee per month for the IP PBX, \$74.50 for traditional voice and data service, \$52.59 for the Hosted IP PBX, and \$37.36 for the Converged Voice and Data service, and \$58.59 for managed IP PBX.

The system management of a Converged Voice and Data solution is superior to traditional voice and data service, where changing an extension requires a call to the phone company, a cost for making the change, and a day or two wait until the provider actually does the move. With Converged Voice and Data, the same move would take about 30 seconds, at no charge, using a web browser application.

Is there a trade-off? IP PBX, Hosted IP PBX, and Managed IP PBX do offer a richer feature set than Converged Voice and Data services. However, more features may not necessarily be what your business wants or needs. As a first step, businesses want what Converged Voice and Data solutions provide: lower costs and easier system management. However, where a new or replacement PBX is inevitable, the choice comes down to the capital spend of a new IP PBX or the operating expense of Managed IP PBX or Hosted PBX.

Acquisition Costs

The IP PBX and Hosted IP PBX solutions required the purchase of new phones. Vendors A and B carried similar name-brand VoIP telephones at slightly different prices. The Converged Voice and Data solution from Vendor D could use the existing phones. Vendor C bundles the new IP PBX, phones voice and data and delivers the service at a production operating expense.

There were other acquisition costs for Vendors A and B.

- **Vendor A's** acquisition costs included a name brand IP PBX and a number of other pieces of equipment for the company's new voice and data infrastructure. The total equipment cost including shipping the equipment to the company site was \$13,000. Additionally, Vendor A would charge \$3,864 for installation and configuration of the equipment.
- **Vendor B's** acquisition costs included installation, activation of service and end-user training for an additional \$2,000.
- **Vendor C's** acquisition cost may include a project management fee to coordinate the installation of

the hardware and network services.

- **Vendor D's** acquisition costs were just \$115.

Monthly Recurring Costs

Each vendor would provide a data circuit to carry the company's voice and data traffic. Vendor A's price was \$555 per month; Vendor B's, \$625 per month; Vendor D's, \$515 per month. Vendor C provided a bundled price of network, IP PBX and management and only separated out the Long Distance usage at \$175 per month. In each case, the company would be required to sign a three-year contract.

- **Vendor A's** charges for voice usage were \$175 per month for a bundle of local and long distance service minutes.
- **Vendor B's** charges were \$160 to cover all telephones, voice calling, and system management.
- **Vendor C** charges a monthly recurring charge of \$195. Additionally, the service provider will charge for the management of the system.
- **Vendor D's** monthly recurring costs weren't based on the number of employees, but rather the number of concurrent system users expressed in line counts. The charge worked out to be around \$185 per month.

Since the company did not want to hire or train staff to manage the new system, we asked each vendor for a cost to handle that job. Vendor A offered complete management services for about \$473 per month. Vendor B's and C's management costs were already built into their service contract price. Vendor D's management services were \$447 per month.

Annual Maintenance Costs

To keep their new IP PBX up to date and have on-site support on call, the company would need to purchase a maintenance contract from Vendor A. The cost was \$1,890 per year, or \$5,670 over three years. Vendors B, C and D had no separate annual maintenance charges.

Traditional Voice/Data Service

As a final check, we approached the local phone company to cost out a replacement traditional voice and data service. The phone company recommended a package of Centrex voice service, plus T1 dedicated Internet access.

The acquisition costs were very low, \$300 with no new phones required. Monthly recurring costs included about \$700 per month for the data circuit, 3.9¢ per minute for all local, long distance and local toll calls, and a charge of \$1,774 per month for the service pack of calling features. Using an average of 330 voice minutes per user per month, we came up with total monthly recurring cost of about \$2,816 per month, or \$101,385 for the three-year contract term. There were no annual maintenance costs.

Other Considerations

There are other factors that augment TCO analysis that should be considered when analyzing VoIP service providers. Two of the most important are VoIP network performance and solution scalability. A third factor is your business' current environment and future plans.

VoIP Network Performance

Any VoIP solution is only as reliable as the network that carries your voice and data traffic. As we mentioned earlier, services providers who offer business class VoIP services carry voice and data packets over a managed network to ensure service quality.

Any provider offering such a network can and should provide information on the network's performance including security, redundancy, and reliability. When selecting a VoIP service provider, poor network performance is a knockout criterion. There is simply no point in working with a vendor who offers a large TCO advantage but has a track record of poor network performance. Ask your potential service provider, "How long has your network been carrying converged voice and data traffic?"

Solution Scalability

There are two dimensions to consider when evaluating the scalability of a VoIP solution: adding users to the system, and adding features to the system.

A VoIP solution with a 30 percent TCO advantage for a 40-person company may not maintain that advantage as the company grows to 70 employees. For IP PBX, you should be especially careful in this respect. Ask your prospective service provider, "How will my costs scale as I add new users to the system?"

When it comes to adding new features, be sure that a prospective vendor can supply them in a cost effective way. It is equally important to know that a vendor has an evolutionary product path in place to ensure an easy transition to a more sophisticated or larger system as a business grows. Ask the prospective service provider, "What happens when I outgrow this new system? Can your system grow as my business grows?"

Your Current Environment and Future Plans

Other factors can significantly impact your business' decisions with respect to VoIP solutions. For example, maybe your PBX has reached its end of life and you need a new solution, regardless. Or, maybe your business is just starting up and you have no PBX. In these situations, the benefits of Converged Voice and Data aren't as great for your business compared to a business with a fully functioning PBX. Consider also your future plans for growth. The benefits of IP PBXs and Hosted PBXs increase in distributed environments. IP PBXs and Hosted PBXs help distributed businesses communicate more effectively and cost efficiently—they also pave a clear path for continued growth. On the reverse, businesses that are contracting or centralizing

their operations have different issues to deal with. The age and type of PBX will significantly impact the decisions your business makes. For companies with these types of complex issues, it is important to ensure that a prospective vendor can meet your needs now and in the future, as your business transforms.

Experienced Service from XO

You don't have to blaze your own trail into the VoIP frontier. You can work with a service provider with proven VoIP capabilities: with the right products, the expertise, and the business sense to help you succeed. With more than a billion dollars in annualized revenue, XO Communications is a proven provider of IP bundled services. XO operates an 18,000 route mile nationwide network that connects more than 70 metropolitan markets across the United States and operates 9,100 route miles of local fiber. XO has been delivering services with VoIP technology for more than ten years and offers a proven track record of handling more than 43 billion minutes of VoIP traffic a year. And, the XO VoIP product portfolio offers an array of premise or network-based solutions to meet your company's business needs.

XO Communications can help you migrate to VoIP services simply, flexibly, and cost effectively. The basic VoIP bundle, XO IP Flex, is a Converged Voice and Data solution that enables you to extend the useful life of those assets while enabling you to take advantage of the productivity and economic gains of VoIP today and provides service to over one million business VoIP subscribers.

XO's Managed IP PBX solution provides a fully managed PBX at a predictable monthly fee that can be customized to meet the requirements of your business.

XO's Enterprise Cloud Communications helps businesses with locations across the US integrate complex voice and IT environments, centralize voice applications and provide productivity benefits to their employees.



About XO Communications

XO Communications is a leading nationwide provider of advanced broadband communications services and solutions for businesses, enterprises, government, carriers and service providers. Its customers include more than half of the Fortune 500, in addition to leading cable companies, carriers, content providers and mobile network operators. Utilizing its unique combination of high-capacity nationwide and metro networks and broadband wireless capabilities, XO Communications offers customers a broad range of managed voice, data and IP services with proven performance, scalability and value in more than 85 metropolitan markets across the United States. For more information, visit www.xo.com.

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