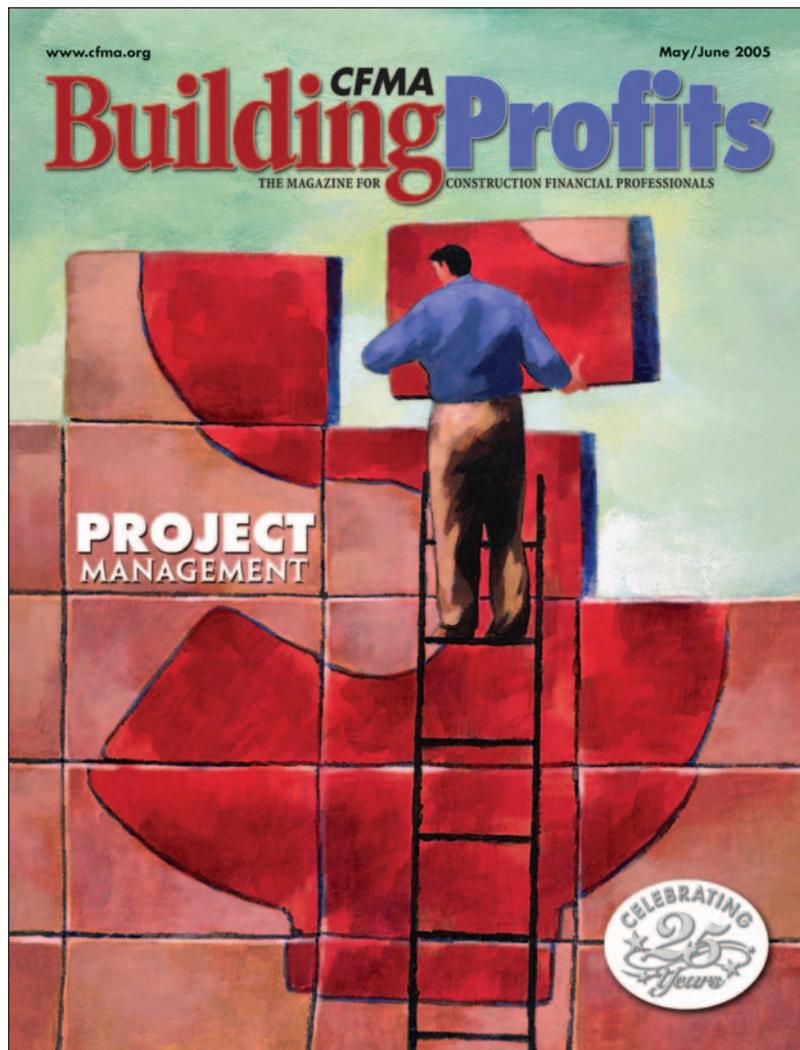


CFMA Building Profits

THE MAGAZINE FOR CONSTRUCTION FINANCIAL PROFESSIONALS

R E P R I N T



MAY-JUNE 2005

CONSTRUCTION FINANCIAL MANAGEMENT ASSOCIATION

The Source & Resource for Construction Financial Professionals

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New Lines of Communication: The Financial Impact of VoIP

VoIP, Voice over IP, IP Telephony, and Internet telephony – all of these terms describe an emerging network technology with significant implications for contractors.

If you haven't already heard about this technology, you will soon. VoIP is everywhere in the business media. There have been many articles about the tremendous success of Vonage – partially because the company survived an early legal dust-up with Verizon, but more importantly because it is taking market share away from the major telecommunications carriers.

The Wall Street Journal reported that more than one million consumer subscribers migrated to Vonage, an 800% increase in the last year. America Online recently announced a new Internet phone service; Time Warner, a sister company that sells residential VoIP, may also enter the commercial VoIP market.

While very few businesses currently send their voice traffic through VoIP carriers, many are considering it, creating enough demand to support multiple carriers. Forrester Research predicts that nearly five million U.S. households will have VoIP phone service by the end of 2006. Where consumers go, businesses are sure to follow.

Interestingly enough, the benefits of VoIP are independent of contractor size. In fact, the smaller the company, the more potential value from the technology. This article answers several common questions about VoIP from a contractor's perspective: **1)** How does VoIP work? **2)** How can contractors save money with VoIP? **3)** What is the payback? **4)** What is the technology's ROI?

How Does VoIP Work?

No one can argue the explosion of the Internet's popularity in the last 10 years. As reported in *USA Today*, there were 38 million Internet users and 3,000 Web sites in 1994. In 2004, 800 million people accessed the Internet and Google, a U.S.-based search engine, indexed 4.2 billion Web pages.

Not surprisingly, a proliferation of devices to manage digital traffic followed the Internet boom. IT experts realized that any analog signal could be digitized with an analog-to-digital converter (ADC), transmitted, and transformed back into an analog format with a digital-to-analog converter (DAC). Voila–VoIP!

Unbeknownst to end users, digital communications saves the telecommunications industry thousands of dollars per year. For decades, telecommunications companies have moved voice calls converted into digital packets around their networks with Internet Protocol (IP) – a very stable and tested technology that disassembles, routes, and reassembles data.

How Can Contractors Save Money with VoIP?

Basically, VoIP sends voice information in digital packets through the Internet, rather than the traditional circuit-committed protocols of the public switched telephone network (PSTN). This is the major cost advantage of VoIP and Internet telephony: Calls travel the PSTN as little as possible, so callers avoid taxes and long-distance tolls.

The lower costs of VoIP break down into three categories:

- 1)** With VoIP, data traffic stays on private networks and the Internet for much longer, reducing data transport costs.
- 2)** With the expansion of this market, upstart companies are challenging the Baby Bells, creating a buyer's market.
- 3)** As Internet traffic, VoIP is still largely untaxed and free of many regulatory charges, allowing calls to travel the Internet for a fraction of traditional phone service costs.

Let's say that a contractor has an office in New York and another in California, and wants to call a supplier in California from the New York office. The VoIP network routes the call to the California office, then uses the public phone service to complete the call to the supplier.

It's All Good

Leveraging the savings inherent in VoIP, some larger



contractors reduce or eliminate long distance charges between offices. Some install IP telephones at each jobsite, which eliminates long distance charges for calls between the office and jobsite, even from one country to another.

Small jobsites with several phone lines could very easily use this technology. And, guess what? When the job is over and the team moves to a new site, the team brings the phone equipment to the next job and connects to the Internet at the new jobsite. No more dealing with the phone company! Once the Internet works, the phone works.

VoIP, along with a conference server, significantly diminishes conference calling costs. Bandwidth and hardware costs increase, but the payback period is relatively short.

What Is the Payback?

Even with equipment, bandwidth, training, and security considerations, VoIP savings usually pay for the technology in a few years. To understand the potential payback, perform a detailed IT audit that lists such existing service costs as: long distance calls, faxing, teleconferences, video conferencing, Internet access, and phone service features like voicemail, call waiting, and caller ID. Then, calculate the service costs, add the savings and implementation costs discussed below, and then compare the total to the savings.

Equipment

Equipment is often a major VoIP cost. Unless contractors plan to install only one VoIP phone on a jobsite through a provider like Vonage, they will require an enterprise phone system.

Such higher-end vendors as Cisco, Siemens, and Avaya are relatively expensive. Depending on the number of upgrades needed, a sophisticated system for 200-300 users could cost several hundred thousand dollars. In addition, many proprietary IP phone sets are almost \$400 each, although providers such as Shoreline and 3Com have very solid systems for much less.

Depending on a contractor's IT infrastructure, upgrades are often necessary to accommodate VoIP networking technology and to provide additional bandwidth. Phil Go, CIO at Barton Malow, a GC headquartered in Southfield, MI, implemented VoIP during an office move. According to Go, "Even if I hadn't been moving to a new building, I would have considered it, but with a new network, it was an easy ROI."

Bandwidth

Unlike traditional telephone systems that operate within

phone company networks, VoIP relies on a contractor's WAN infrastructure. A VoIP system shares bandwidth with such existing business communications assets as e-mail servers, Web-based project management software, and data backups via the Internet.

Not only does VoIP share bandwidth, it often requires more bandwidth than other Internet-based digital technologies. Regular data is barely affected by network congestion, loss, or retransmission, but voice transmissions break up quickly, creating poor reception and dropped calls if bandwidth is inadequate. To ensure a successful VoIP conversion, contractors should evaluate their network bandwidth, especially if they transmit large packets of data like CAD drawings.

Staff Time & Security

Network Managers

It's important to know that changes to a VoIP network can sometimes compromise phone service. Network managers are relatively new to the idea that telephone access is even more important to end users than computer access. Mike Patterson, President of Somix Technologies in Sanford, ME, actively advocates this technology. However, Patterson says, "I have to keep telling my IT staff to test the phone system after every change to the firewall!"

Network managers have a love/hate relationship with VoIP. They love the technology because if implemented correctly, telephones become just like every other network device. But, they dislike it for the same reason.

Advanced systems can interface with network security, which allows IT managers to easily create and delete phone system permissions simultaneously with network access. But, as with everything that travels the Internet, VoIP is vulnerable to hackers. Two vulnerabilities are in the news right now: digital interception (the theft of sensitive information, such as banking account numbers) and denial-of-service attacks (a steady deluge of bits and bytes that overloads a network or server).

Telecommuters & Remote Staff

If your company has already recognized the cost benefits of telecommuting, then this technology is a home run. A number of equipment manufacturers and software companies sell phone sets and software for PCs. This "soft phone" approach means that voicemail access and other internal phone features are available wherever there is an Internet connection.

Managers, especially those with remote or traveling workers, see a payoff. Because VoIP can direct calls to any phone, managers can connect with road-warriors as needed. In a survey of 100 IT professionals, Sage Research found that mobility functions provide some employee populations with an additional 3.9 hours per employee, per week. Assuming a 50-week year, that's 195 hours of saved time – almost 5 weeks.

Siemens has a telenetworking product that allows users to bring their office phone set home. Cisco's AVVID line of IP telephony gear is probably the remote-use leader, but there are many options.

Additional Savings

Not only is IP traffic less costly to send through carriers and/or carry on a private network, it also is akin to other network traffic and subject to the same innovative PC-like economies of scale.

Exhibit 1: The ROI of VoIP	
Savings, Year 1	
Long Distance Charges (phone, fax, teleconferences)	\$6,000
Taxes/Fees	\$1,200
Total Savings, Year 1:	\$7,200
Investment, Year 1	
Implementation Hardware (Host router + 3 office routers)	(\$20,000)
Implementation Fees (labor, consulting fees, etc.)	(\$10,000)
Total Investment:	(\$30,000)
<p>Payback = 4+ years $[\text{Investment}/\text{Savings}] * 100$</p> <p>ROI over 5 years = 20% $[(\text{Savings} * 5 - \text{Investment})/\text{Savings}] * 100$</p>	

Reconfiguration Costs

With VoIP, contractors reduce the cost of phone system changes. With traditional phone systems, moving a staff person across the hall in your office can require physically changing the wires in the switch room, and changing the switched location on the phone system.

With new IP technology, picking up your telephone and moving it to another office and plugging it into the computer network is just like doing that with a PC or laptop – the switch finds the device and moves voice traffic to it automatically. Gone forever are telephone technicians “punching down” copper cables in the phone closet at \$75 an hour.

Jobsite Setup

The savings continue to accrue when VoIP is on the jobsite. In *ENR*, Tom Garrett, CIO of Brasfield & Gorrie, a GC in Birmingham, AL, shares his experience: “We’ve also been able to push out VoIP to jobsites, and that’s a big win. We were spending \$10,000-30,000 for a single purchase of a phone system for 10-20 people. So now we are not putting in a phone system; we plug in through the computer.”

Conference Calls

WebEx, Raindance, and most major carriers provide conference call services at \$.10-.20/minute per leg of the call. VoIP reduces these costs to almost nothing when contractors engage vendors who include conference bridging in the base package.

However, some businesses do not want to “bet their business communication” on this type of service. And, without adequate bandwidth and credible vendors, quality can definitely be a problem. But, large to medium-size construction companies with multiple offices have successfully used voice-enabled routers integrated with sophisticated phone systems for years. With some smart planning, IP voice traffic isn't a “bet the company” decision – it's a cost-dampening tool.

What Is the Technology's ROI?

Exhibit 1 estimates the probable costs and ROI to implement VoIP between three regional offices. This does not take into account the cost of money, depreciation, or such costs as older phone switches, which often require additional hardware investments to accommodate IP traffic.

Because business processes, existing infrastructure, and technology needs differ, contractors also need to assess these potential effects of VoIP:



- Service and maintenance fees
- Productivity savings
- Network management costs
- Staff requirements
- Scalability

Most high-end equipment vendors such as Cisco and Avaya have ROI tools to help justify site-to-site VoIP, as well as IP phones and switches. Push vendors hard on the numbers and only include “hard” costs in the analysis.

Conclusion

VoIP has matured enough as a technology to be an obvious choice for contractors. Once contractors address bandwidth and security issues, this technology is easily implemented within existing business networks.

Because of the many cost benefits – from saving on inter-office calling, to jobsite phone service, to reduced maintenance –

VoIP can benefit any construction company willing to make the commitment. Answer the phone. VoIP is calling! **BP**

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