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The Definitive Guide™ To

Converged Network Management

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Chapter 4: Productivity Advantages of Unified Communications

In years past, cost reduction was a primary driver for integrating services. Convergence was seen as a cost reduction enabler first and foremost. As companies worked to consolidate to a single cable plant, voice and data converged onto one Cat5 or Cat6 wiring infrastructure. Further consolidation to a single wide area network (WAN) circuit infrastructure based on IP has slowly followed. In practice, cost reduction has proven to be a secondary benefit. The real benefit to converged communications is in productivity gains and as an enabler of new business operations. Although process re-engineering itself can be a major effort, convergence further strengthens the competitive edge of increased efficiency and productivity.

This chapter will extend the reach of unified communications beyond cost into specific business areas and interests. It will provide real world examples of how business operations and industry segments can realize tangible productivity gains, and will not only touch on the current convergence of data, voice, and video but also see how they set the stage for other advances coming to the converged network.

Worker productivity will rise and fall with the integration of data, voice, and video communications. This natural ebb and flow is representative of gradual process changes coupled with workers overcoming the learning curve as they adapt work habits to best utilize new tools and resources. It’s important to remember that basic telephone usage is something very natural to working adults. It’s something learned at a fairly young age. In the workplace, changing how people work—how they use the telephone—will have unexpected impacts. For example, a sales team that has been working from individual PC-based contact calling programs such as Act! or Goldmine will encounter a learning and adaptation curve with the enterprise shifts to a company-wide Customer Relationship Management (CRM) system with Sales Force Automation (SFA) features. The work paradigm changes dramatically. This paradigm shift provides the catalyst for a change in corporate culture within the organization.

Convergence is a buzzword that has garnered a lot of play in the past 8 years or so, but convergence means many different things, all of which apply to the enterprise:

- Network convergence is really the first phase of a long evolutionary process. Converging voice and data onto a single infrastructure provides opportunities to reduce operating expenses (OPEX). It reduces billing complexity with service providers. It provides for early workforce consolidation. It sets the stage.
- Service and application convergence is the hot topic of the market today. The idea of a Service Oriented Architecture (SOA), or deploying Software as a Service (SaaS) on the network, sets the stage for radical change in how work gets done. This convergence of data, voice, and video as services, coupled with the convergence of applications as services on the enterprise network, completely changes the basic steps and procedures of performing even some of the most basic work tasks throughout the day.
- Many organizations employ convergence between the telephone set and the desktop PC. Desktop real estate is at a premium for workers in the information economy, and the ability to use a single device on the desktop for all communications activity provides new integration enabling new workflow efficiencies.
- Further evolution in fixed mobile convergence will more tightly couple the telephone, the mobile phone or PDA, and the desktop workstation, providing a convergence that offers device independence with the freedom of mobility and choice of the best available device for communications at a given point in time.

How Service Convergence Drives Productivity and Enables New Business Operational Processes

Service convergence as a productivity enabler has become a root motivator for many companies pursuing unified networks. It's important that organizations not pursue new technologies in unified communications solely for the sake of their novelty. The key for any enterprise is how the convergence of the network supports the established business strategies.

As unified communications technologies develop, companies around the world are discovering innovative business benefits provided by unifying data, voice, and video onto a single service infrastructure. High-level business processes can be heavily impacted by convergence, underscoring the reality that convergence is far more than cost consolidation of multiple, separate networks.

For many enterprises, the question of one network versus several networks remains unaddressed today. Voice and data networks were developed in isolation, each being tuned for the performance requirements of the specific traffic type supported. As separate services, integration between the two wasn't anticipated or planned. VoIP introduced the idea of change, but the complexity of integration and rapidly evolving network capabilities made convergence a costly proposition for many companies. During the earlier years of convergence, organizations focused on the cost without fully understanding the value of business process efficiency and change that could evolve from integrated services.

Today, it's both feasible and practical to integrate business service solutions onto a single network infrastructure. Convergence also enables implementation of business solutions that were just too costly to deploy on non-converged, dedicated voice and data networks.

One example of a service solution that is far more costly to implement in separate dedicated networks is Computer Telephony Integration (CTI) as described in Chapter 2. Call centers were once large, densely populated work centers deploying expensive integration solutions. It was difficult to justify the extreme costs in smaller business operations. Shaving a few seconds off a telephone call provided justification in the high-end call center processing thousand of calls per day, but that integration hasn't always transferred down to smaller business processes. Why not?

Workers in today's information economy agree that there are productivity gains that can be achieved by integrating the telephone and PC workstation. The main hurdle in deploying call center technologies more broadly across the enterprise has been the negative cost ratio. The cost associated with separate networks has, for a number of years, outweighed the business benefits of implementing call center applications. In the fully converged network, many of the complexities of integration are eliminated. This reduces the implementation cost of call center solutions and creates a positive cost ratio. Figure 4.1 illustrates the importance of evaluating the business benefits over the cost ratio.

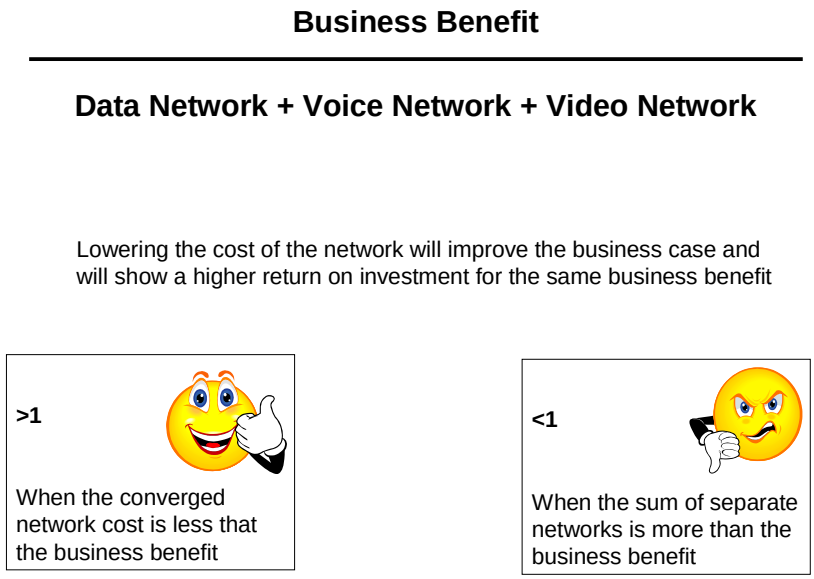

Figure 4.1: Business benefits and cost ratio evaluation.

What we find are some vital areas of business benefit. Convergence can deliver both financial and operational benefits derived from the integration of applications and services, while enabling improved productivity. For many organizations, these benefits appear in business facets that weren't fully considered in the past. Although this chapter is primarily focused on productivity gains, let's briefly touch on these business facet benefits as a reminder that convergence delivers a broad range of gains to the enterprise. They all need to be considered in the deployment and management of the converged service network.

Management and Utilization of Property

Service network convergence can enable property modifications that provide better working facilities for employees while reducing the enterprise needs for real estate ownership. Given distribution of work within an enterprise, the converged network can provide collaboration tools and a work environment that eliminates the requirement for all employees to work in a large, centrally located facility. Different work functions can be distributed to locations, taking advantage of tax benefits and other financial drivers. For many companies, placing the employees closer to the customer geographically provides an added value.

Cost Reduction and Management

Network consolidation leads to more efficient use of technical staff, leading to further cost reduction. Housing of technology resources, such as network server farms, and reducing the number of vendors or leasing requirements bring further reduction in costs. Additionally, a single, consolidated network provides greater clarity and visibility of future costs as the enterprise plans technology enhancements to support a unified business strategy.

Enterprise Agility

Enterprise agility is difficult to measure and quantify. One competitive factor that has been widely recognized by many companies is that Internet technologies have allowed small, entrepreneurial, nimble companies to compete against large enterprises effectively. Making the large enterprise a nimble, agile business through convergence enables quicker response to new opportunities in the market. Leveraging the property and asset management values, large enterprises can quickly move resources where they are needed or where favorable tax and labor rates prevail. Adaptation to change is simpler and less costly with a fully integrated network.

Staff Productivity

The converged network, integrating data, voice, and video services, allows employees a wider range of information media and network accessibility options. Tools such as unified messaging, voice, and video conferencing, and Web-based productivity tools create an environment for employees to more effectively accomplish business goals.

New applications can be deployed more quickly in a unified network. Interoperability concerns are reduced or eliminated. Data, voice, and video applications no longer have to be developed and tested on separate networks, then cobbled together to create new service applications.

To enhance productivity, the enterprise needs to improve employee flexibility and mobility while ensuring secure access to corporate information resources. Some examples include:

- Campus roaming
- Itinerant workers who routinely work out of different corporate offices
- Mobile telephone users—Cellular users today and VoIP users through fixed mobile convergence tomorrow
- Relocations and moves of departments and within departments

The convergence of data and voice allows employees to be as fully productive outside the office as they are when they're in the office at their desk. VoIP, unified messaging solutions, and call center technologies can all be used today to support the increasingly mobile enterprise workforce. Teleworkers, sales people, and consultants who spend much of their productive work time away from the office still require access to corporate services and information resources. One added value with VoIP services in the converged network is the accessibility for workers in transitory locations such as hotels and airports.

As we look at the productivity advantages of unified communications, there are a number of other transitional events that help the enterprise determine whether to adopt convergence as part of the overall business strategy. For many organizations, these events act not as catalysts on their own but as accelerators to convergence adoption. In many cases, they can bring quicker benefits, both financial and via productivity, to the enterprise.

The Non-PC Workstation Environment

For many enterprises, particularly those whose core business is not based solely on information technology, there is a need to provide real-time data in a variety of different environments. Manufacturing environments may be too dirty to deploy PCs. Refineries, chemical facilities, and the shipping industry often present hazardous environments. Remote locations can present special security requirements. In addition, PCs may just be too expensive. In many cases, there is a need to provide a cheaper end user device. A converged network may be able to utilize a single handset device to provide both voice and data services in a cost-effective manner, reducing the equipment exposed to risk.

Evaluating the Call Center Strategy

In organizations with existing call centers, agent turnover is a universal concern. Alternate facilities might be considered for reduction in operating expenses (OPEX). Optimizing technologies onto a single platform can offer both cost savings and productivity increases. The converged call center can bring crisp and dynamic management to call flow balance between multiple call centers to ensure peak agent utilization.

Implementing efficient call transfer technologies in the unified service network facilitates movement of both voice and CRM data across any customer "touch point" within the enterprise.

This multi-channel call center approach lets the enterprise humanize business relationships with customers, eases access to critical information resources, and makes agents more productive by reducing handling times. These factors all lead to increased customer satisfaction. For sales channels, increased customer satisfaction can lead to cross-sell and/or up-sell opportunities, increasing the bottom line revenue potential.

Business Process Optimization

Enterprises constantly tune and optimize business processes for increased productivity. Remote collaboration tools can reduce time lost to travel. Video conferencing can eliminate travel time for internal company meetings. With converged services, giving every employee universal access to necessary resources, the enterprise can deliver a consistent user experience.

Productivity in Resource Management

The overhead associated with adds, moves, and changes is a significant burden. It costs time and money, and for many organizations, this ongoing administration OPEX is far more costly than the initial capital expenditure (CAPEX). Convergence reduces OPEX by creating efficiency in the administration process.

Facilities managers who oversee a combination of office space and services such as voice and data in large enterprises often use what is referred to as "swing space." Swing space is extra capacity to allow for the ongoing movement of individuals or groups of employees through constant organizational changes. It's essentially a buffer. For many large enterprises, swing space may comprise as much as 5 to 10 percent of the building.

For many companies, the need for swing space was driven by the inability for real-time adds, moves, and changes in the traditional business PBX platform. Moving a telephone user in the legacy PBX world required time and effort to reconfigure wiring and implement programmatic changes.

In the converged network, administrative intervention can be eliminated, enabling real-time reconfiguration of data, voice, and video services. Network cabling requirements have been cut in half, using the unified IP cabling plant.

WiFi technologies coupled with VoIP softphones may completely eliminate the need for cabling to the individual desk. Other fixed space assets, such as conference rooms, can become viable temporary work spaces during reorganization or to support special projects with significantly reduced administrative overhead to support adds, moves, and changes.

Focusing on Employee Productivity

Email, voicemail, fax, and other messaging tools have provided increased ability to communicate both within the enterprise and with business partners and customers. These tools have also created inefficiencies. Some studies indicate that employees spend an average of 2½ hours each day either reading and responding to email or listening to voicemail messages. To increase productivity, communications need to be managed more efficiently.

The converged network provides a number of benefits to the organization. Perhaps the most significant is the ability to quickly integrate and deploy a wide range of services and applications. These service and applications can help streamline administrative tasks, letting employees focus on business goals, customer care, and revenue generation. The following three sections offer examples of application services that increase productivity in the converged data, voice, and video network.

Unified Messaging

Unified messaging platforms can give users immediate, integrated access to voice, email, and fax messages from any workstation in the enterprise, whether it's a VoIP phone or a PC. The time reduction in using a phone for voicemail versus a PC for email can be significant. Unified messaging is a natural lead-in to device convergence, enabling any device on the corporate network to act as the workstation of choice at any point in time. Traveling employees can access all messages from a single device, speeding response times.

Personal Communications Assistants

Enterprise employees have many different contact points:

- Desk phones—In some cases, in multiple offices
- Mobile phones—In many cases, multiple mobile phones
- Home office phone
- Email—To PC workstations and to handheld devices or mobile phones
- Video collaboration tools
- Instant messaging tools—Both inside the enterprise and with outside contacts

It's becoming increasingly difficult to know which number to call or how to contact any one individual at any point in the work day. Multiple phone numbers lead to counterproductive "phone tag," or worse, "voicemail tag." Missed calls and multiple voicemail messages present a resource drain on productivity. Communications assistant tools in a converged network can provide information about presence and availability to help workers prioritize who can contact them and via what communications devices. Critical calls, or contacts, can be automatically routed to multiple devices to ensure efficient communications. Another advantage of these personal communications assistants is the ability to set up conference calls on demand, increasing collaboration efficiency both inside and outside the enterprise.

IP Video Solutions

The fully integrated network doesn't just converge data and voice; it brings videoconferencing power in a cost-effective, ubiquitous way. Many organizations see the power of videoconferencing as a means to reduce travel expenses. Beyond the travel cost, video can save time and provide a rich user experience in communications.

In a converged network, the enterprise can provide both video on demand and videoconferencing capability to every desktop. Many organizations today are very laptop- or notebook-computer–oriented. Today's systems often come equipped with a video camera (or Webcam) built in. For companies needing to invest in Webcam technologies, high-quality cameras have become low-cost commodities and can easily be bought in volume for less than $50 apiece.

Video provides an array of business communications tools that are quickly becoming a normal part of the day for many organizations. Distance learning via video allows employees around the world to continue learning without the headache of travel to a centralized training facility or classroom. Crucial business information, board meeting updates, product announcements, even staff meetings, can all be viewed in either broadcast or interactive modes depending on the tools used for video. For teleworkers and remote staff, IP video provides face-to-face communications in real time, maintaining strong working relationships with coworkers in other remote locations and in corporate offices.

Web-Centric Businesses

For Web-centric businesses, or those tightly coupled to information technologies, the evolution of voice to next-generation voice and video services holds great potential. Although some of the content in this section may not apply directly to the enterprise implementation of unified communications today, it certainly paints a clear picture of where integrated voice and video technologies are quickly headed.

Presence and availability information are crucial, but they're also not well understood by the enterprise business world today. That is changing as society evolves. The established leadership in enterprise business today is comprised of people from the Baby Boomer Generation, but in the high-tech market, GenXers have stepped into many leadership roles. The next-generation workforce is coming from what is now being called the Millennial Generation. For many users, particularly younger users who have known Internet technologies their entire lives, tools such as instant messaging are vital communications tools. Adults often learn and adapt to new technologies from their children.

> 🕮 For an interesting perspective on the generation of children that has grown up with a computer mouse in hand, check out *Homo Zappiens - Growing Up in a Digital Age* by Wim Veen and Ben Vrakking.

In the world of instant messaging (IM), presence and availability provide key pieces of information for the enterprise. These concepts are a follow-on to the simple IM buddy list. Although presence and availability are the key buzzwords used in the unified communications space today, relevance and context are basic concepts behind them both. The buddy list provides a window into online contacts' availability, simply showing that they are online, available, busy, at lunch, on the phone, or some other simplistic status indicator.

The real unified communications vision is far, far broader than the concept of relevance. Today, communications assistants (that is, software tools) offer the ability to give users control over who contacts them—when, where, and how. In short, users can define the context they are working in and control how they are contacted. This idea is a piece of the future, but only one piece.

Service integration is crucial—voice, data, and video converged on a single set of tools. Collaboration tools today are many and varied, but most currently lack extensive video services coupled with widespread application sharing. That's a collaboration component developers are just beginning to fully understand.

Fixed mobile convergence (FMC) presents another piece of the puzzle, and it's sorely lacking today. In its earliest stages, FMC is to many the ability to pass a phone call from the mobile network to a locally managed WiFi. That's really nothing more than arbitraging the cost of mobile minute airtime. It's an achievable technology that simply needs the right protocols to make it work. If the market demand existed today, this view of FMC would be fairly easily accomplished. Every technology piece needed exists in some form today.

As unified communications evolves, FMC will enable the initiation of a call from a PC in a home office in the morning. The converged network can make this a multimedia call with video and application sharing. When the time comes to leave the home office and drive in to the corporate facilities, the voice stream can be handed off to a mobile handset on a home WiFi network. As you get in the car and drive away, the call will seamlessly hand off to the mobile carrier. Upon arrival at the office, it will be handed over to the corporate WiFi network. And when you arrive in your office cubicle, you'll be able to hand the call back off to the phone on your desk, a softphone on your PC, or even to re-engage a full video collaboration client on the desktop to rejoin the collaboration call. That's the unified communications path for FMC. It's more than just the network. The network, or networks, is still nothing more than a transport mechanism.

Presence, availability, and relevance technologies today are barely the tip of the iceberg. Barely a toddler in terms of what the mature model will become. Today, you can share presence with your buddy list with your contacts but that doesn't begin to describe the enterprise value of convergence.

Integrating Voice with Sales, Service, and Support

Combine data, voice, and video with relevance, collaboration and FMC advances and think about how these services bundle together. Imagine an enterprise customer service team that is beyond relevant. A customer can call their sales rep, but the relevant enterprise will have every employee's presence and availability information. Integrate the CRM system to enable advanced customer choice. The customer doesn't have to simply leave voicemail because they can't reach their designated account rep. Why not let the customer choose whether to leave voicemail or ring through the next relevant member of an account team who is available automatically? With converged systems, you not only pass the call but can easily send all the pertinent customer information as well.

Call Centers—Localized, Distributed, Offshore

Now consider the ramifications of all this enterprise relevance, presence, and availability capability tied into the call center philosophy. Why not make the entire enterprise a business relevant call center. You can know where every employee is, and their availability. You also know what tools they have available to communicate in the moment. "Voicemail jail" disappears from the landscape. Nobody ever needs to leave a voicemail message for their account rep except by choice.

This evolution of convergence will redefine the "easy-to-do-business-with" enterprise! The relevant enterprise. But at the core, it's not relevance. It's not presence. It's not availability. It's responsiveness. It enables nimble adaptation to the tactical needs of day-to-day business—business communications at the speed of thought.

When you think of the global telephone network, one of the features that has made it so valuable for worldwide business is its ubiquitous presence. The telephone is everywhere. Why not leverage convergence and unified communications technologies for the ubiquitous enterprise. The enterprise that is always on, always accessible, always responsive. That is where the next generation of communications convergence is headed. Integrating data, voice, and video today is the enabling foundation.

IVR Systems

As Chapter 2 noted, interactive voice response (IVR) systems are computerized systems that let callers choose options from a voice menu. With advances in voice recognition technologies, you'll not only see new IVR applications, you will begin to see costs drop significantly. Simple IVR solutions let the caller speak simple answers such as "yes," "no," or numbers in response to the prompts, but they continue to grow in sophistication.

IVR systems today can also "read out" complex and dynamic information such as email messages, news reports, weather information, and faxes using complex Text-To-Speech (TTS) conversion tools. These TTS systems use human voices creating speech in very small fragments that are assembled to create very lifelike voice.

Although IVR systems have been used to create service solutions such as airline ticket booking, banking by phone, balance inquiry, and so forth, in the converged network, they present a new set of services for internal use. They allow employees out of the office to call in and have email messages or fax messages read back as part of a unified solution. IVR technologies enhance the ability of any employee from any location to receive and respond to important business calls and email messages.

Computer Telephony Integration

Chapter 2 also reviewed how Computer Telephony Integration (CTI) can facilitate interaction between the telephone system and enterprise computer systems. The converged network integrates data and voice onto a single IP infrastructure, drastically reducing the cost and complexity of CTI.

In the converged service network, caller information, screen pops, call control tools, and outbound calling features are integrated into the VoIP system more tightly than was possible when integrating legacy voice and data network services. Call transfer, call hold, and conference calling features often become one-click operations.

In Internet services today, the idea of click-to-call gets a lot of attention. On the Internet, it's a nice idea that's forming. In the enterprise converged network with CTI, it's a reality today. The converged network of unified communications tools makes CTI features readily accessible by business operations groups that previously couldn't implement these efficiencies.

Application Integration with CRM and ERP Systems

Enterprise Resource Planning (ERP) driven, Web-centered collaboration in business-to-business (B2B) interaction has grown significantly in recent years as business partners found ways to leverage Web services in Internet technologies. ERP systems are often implemented during process re-engineering within enterprise businesses to help break down the legacy "silo" mentality that compartmentalized large companies into smaller fiefdoms, often struggling internally within the organization. ERP systems dissolve many barriers by unifying all data resources and business processes under a single umbrella solution. This unified approach facilitates, and even encourages, collaboration between different business work groups.

Although ERP systems frequently began as supply chain monitoring tools in the manufacturing sector, today they're widespread across every business environment. Today's ERP systems support manufacturing, supply chain management, customer relationship management (CRM), sales force automation, human resources, and more. All of these components of ERP require unfettered access to voice services and data resources. As with CTI, the convergence to a single network infrastructure for data, voice, and video reduces the cost and complexity for implementing ERP systems.

For many organizations, the ERP system represents what Bill Gates has referred to as the *Digital Nervous System* of the enterprise. ERP systems can be very tightly coupled as a service on the converged enterprise network. Communications tools, integrated with process management and monitoring, provide a level of integration that speeds countless business operations, reducing costs and increasing efficiency within the company.

Customer Relations and CRM

CRM is used to describe a wide array of business capabilities, methodologies, and technologies that support how an enterprise manages day-to-day relationships with customers. CRM systems bring reliability and consistency to customer interactions, enriching the customer experience and increasing customer satisfaction overall.

As a corporate strategy, CRM is often implemented to create and maintain lasting customer relationships. As Chapter 2 noted, CRM is often a cultural shift for organizations, moving to a holistic view of managing the entire lifetime of the customer relationship.

CRM systems are typically implemented within the marketing, sales, and customer service groups who have the most frequent and direct customer contact. One success key to CRM in the converged network is simply the ability to capture every single touch point and every customer interaction that occurs, regardless of what group within the enterprise is involved.

CRM's focal points are to create a customer-based culture of end-to-end service. Convergence integrates data and voice services to effectively capture this information for continuous analysis and improvement. Figure 4.2 revisits a process flow introduced earlier in this guide. CRM may be viewed as analogous to ERP for many enterprises. What the CRM system enables is capturing every piece of information the organization has about every interaction with every customer, throughout the life of the customer relationship. This information repository becomes enterprise metadata; that is data about your enterprise business that can be analyzed and leveraged to further streamline and improve customer service processes.

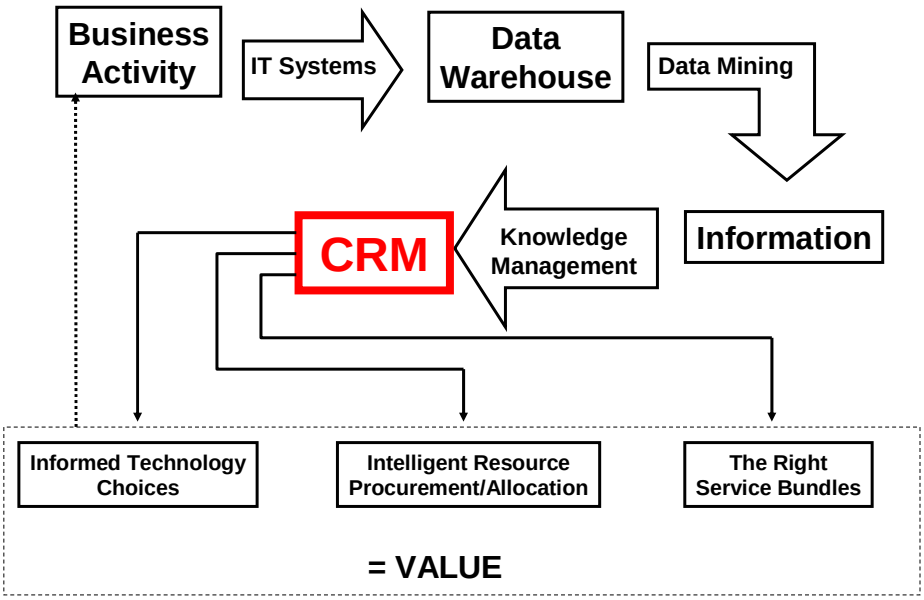

Figure 4.2: Building value with CRM.

To fully use the strength of the converged network, you need to capture every business activity into an IT system—every one. This data warehouse of information becomes the repository of what happened at every step of the way in the business flow. This information can be mined and processed against customer interaction data from the CRM system. This entire process of knowledge management gives business leaders fully developed information about the enterprise so that they can make informed technology choices for the future, intelligently procure and allocate resources within the enterprise, and develop the right new product and service offerings to increase revenue by filling customer needs, both present and future. That's the value of CRM.

Where the rubber meets the road, at customer interaction, you use a variety of communications tools—data, voice, and increasingly video. The converged network simplifies the ability to let employees focus on customers, while leveraging the strength of the technologies to automate capturing the business intelligence information that will help the enterprise evolve.

CRM systems today provide comprehensive order history tracking, click-to-email, click-to-call, and analysis reporting tools that arm employees with comprehensive CRM tools to manage larger sets of customers more efficiently than could ever be achieved in the legacy voice and data networks.

Vertical Market Business Drivers for Change

Although there are numerous small drivers within each vertical segment of the market, one key driver across all sectors is the hyper-connected nature of workers. Workers today are information professionals regardless of the business sector they work in. Everyone in the work force is an information professional. Everyone is connected. Many workers are hyper-connected.

Workers use email, office phones, mobile phones, pagers, Blackberries, smart phones, home computers, and laptops—in short, they are almost always online. In this hyper-connected state, workers have also achieved a virtual *Masters degree in multitasking*.

Using today's communications tools, workers manage more projects, cultivate more customers, and complete more work than ever before. This hyper-connected, all-inclusive toolset also means that work and personal life blur. Customers today often involve personal relationships as the work day becomes an artificial constraint for business in many areas. People work from home or from wherever they are at the point in time they're needed. Convergence technologies and the unified communications evolution not only leverage this ability but also bring business tools that help employees ensure that business and personal lives don't blur entirely.

Convergence isn't just VoIP. Convergence of data, voice, and video today are the foundational elements for unifying all communications technologies. The power of convergence doesn't lie in VoIP. The power of convergence lies in integrating voice and data services of all kinds with business applications in the enterprise, tightly coupling services and applications to support business strategies.

An Example of Convergence Beyond VoIP

Voice isn't always VoIP. The real value of convergence is the broader unified communications that embraces all data voice and video technologies. There is a new startup company today that can provide a single “virtual” number that works on a mobile user’s existing mobile phone. Users can both dial out from and receive calls on their virtual number, so they can easily separate their business calls from their personal calls, for example.

Not only can a mobile user have two mobile numbers on a single phone, but the virtual number can be selected from almost anywhere that the user desires. In this way, professionals who conduct business in multiple regions can use their virtual number to give the impression of a local presence because callers can see that they are reaching or being reached by a local number. This virtual number is another telephone number. It can be assigned to your cell phone. The mobile phone can support two numbers, with CallerID working on both. The virtual number can be anywhere. Consider foreign students attending college in the U.S. Recent reports say there are 674,000 students with active VISAs at present. They could have a phone number on their cell phone in England, Japan, India, and Australia. From home—their real home where family live. Two huge benefits brought about by this development are the ability to leverage international long distance arbitrage to obtain the cheapest per minute cost to call home. But this also means that mom can call back and reach her student with a local phone call.

Foreign students are just an example. How many workers travel to other parts of the world from their home to work? Some parts of the U.S. are heavily populated with migrant workers in agriculture. Many professionals in the medical field come to the U.S. from the Philippines. How many people have corporate offices in their home country and another part of the world? What about a consultant in Idaho who wants a Washington DC number to work on contracts with the federal government. Local presence, via a local phone number, is easily accomplished. And Caller ID follows that number. Place a call from the UK number, and that is what the person receiving the call will see on their display.

Beyond that there is another aspect of aliasing existing telephone numbers. Let me give a personal example for aliasing. I have phone numbers for home, home office, office, personal cell phone (Treo), business cell phone (Blackberry), and a couple of others that I use daily. With telephone aliasing technology, I can make them all appear on my cell phone, just like the virtual number described a moment ago. I can make and receive calls with the full presence of my telephone number. If I call on work business, I can place the call from my business number and that is what the called party will see on their display. In short, the identity of my telephone number is extended to my mobile phone, complete with Caller ID information. I know I keep mentioning Caller ID, but it's important.

Let's look at a broader vision. Consider professional services workers—consultants, doctors, and lawyers—as examples. Consultants and lawyers make their living on billable hours. There is a law firm in Silicon Valley that has privately estimated that they lose $1.5 million dollars a year in billable time from attorneys talking on their cell phones while they are driving. If those attorneys had virtual numbers with an account code, that time could be tracked, and billed, driving billable time back into corporate revenue stream. Consultants may provide a block of hours or billable service to special clients. Many provide a dedicated phone number for the client to reach them any time. What a perfect fit! A virtual telephone number, dedicated to a client with account code tracking for billing built right in.

Doctors have different constraints. When a doctor calls a patient with test results, the Health Insurance Portability and Accountability Act (HIPAA) regulations forbid patient test results being left in a voicemail message. The medical professional has to speak with the patient. Doctors don't call patients from their cell phones because they don't want patients calling them back there. If you get a call from your doctor's cell phone, you're likely to let it go to voicemail as an unfamiliar number anyway. But if you see the medical center number on Caller ID, you know they're calling with test results. Everyone is assured the privacy and confidentiality of patient information, but through Caller ID, you leverage the telephone network for better efficiency.

Beyond North America, these technologies mean that global boundaries don't matter. If I do business in six countries, I expect I'll be able to get virtual telephone numbers in every country at some point. All on my mobile phone. All at once. Whether the underlying network is VoIP, PSTN, or cellular is irrelevant to the user. Convergence eliminates the technology and simply makes it a voice service.

Business Sales and the Web, or Net-Enabled Business

Earlier, it was pointed out that the real challenge of convergence is in supporting the enterprise business strategies. The fundamental goal isn't to implement convergence. It isn't to shift to VoIP. The real objective is solving business problems. In a recent article entitled "VoIP Outside of the Box—A New Way of Thinking," *Telephony World* editor Don Panek had this to say:

> *Business owners and executives today are not sitting around board room tables discussing their existing phone systems, services, or expenses. They're not thinking about VoIP or Telephony and what it can do for their bottom lines. They're discussing real business problems and looking for real solutions to those problems.*

His closing drove the point home yet again:

> *I think the time has come to stop talking about VoIP and Telephony and start talking about applications and solutions. Solving problems. And at the end of the day after the order has been signed, we can then mention that all the phone calls will be free or virtually free! And how is that done? Well the solution has VoIP built in!*

Communications technologies manufacturers, vendors, and developers often get sidetracked into the idea of how their products can interoperate…how they can build a platform. Customers don't care about a platform, and don't care what vendors are doing beneath the hood. Customers care about their business problems and solutions to those business problems.

For business sales, Web-enabled businesses and the hyper-connected workers of today, access to corporate business resources and instant, easy communications are vital to success. Convergence of network voice and data services provides a first step. Integration with ERP and CRM systems takes convergence further along the road to productivity enhancement and business success.

Product and Services Sales

Convergence to the fully integrated network provides access across the enterprise to a full set of business tools. Business sales, whether products or services, all have a time interval—a sales cycle. Outside this sales cycle, business information travels at the speed of light, or electrons on the wire. Converged services in the hyper-connected, always-on business provide differentiators that didn't previously exist, in part because the converged business is a nimble business able to respond quickly to market demands. Some examples of how this always-on enterprise can leverage the converged data, voice, and video services of the future include:

- All markets are up for grabs—The marketing paradigm changes dramatically. The always-on enterprise leverages communications tools to reframe the discussion and win customers while the less-empowered competitor is left behind.
- Difference not differentiation—The converged enterprise minimizes the behavioral changes in customers by embracing change within the enterprise. This can give your customers a tangible set of reasons to love your products and services.
- Don't disappoint—By leveraging reliable new technologies, you ensure that everything works and the organization can react instantly to a situation.

- Make your marketing sociable—The enterprise can't control the customer conversation, but can leverage best-in-breed convergence technologies and refined business processes to build genuine relationships with established and potential customers rather than white-noise relationships. CRM becomes not a buzzword, not a catch phrase, but a corporate culture of nurturing the business.
- Interaction requires iteration—It's not enough to listen and respond to customers. Business success requires a long-term, sustainable dialogue that convergence technologies support. Meaningful long-term connections with customers come from community, co-operation, and co-creation—all collaborative efforts that the integration of services and applications enhance.
- Don't forget to sell—Engagement is great but it doesn't pay the bills. Remember that every touch point throughout the customer relationship cycle is an opportunity to up-sell, cross-sell, or lose business. Selling is responding to the customers. It's about making it easy to do business with you. Convergence technologies integrate all your corporate intellectual capital into a suite of services and applications that make you easy to do business with.

Financial Services

Beyond the basics of efficiency and productivity, there is another set of drivers in the financial services sector that are tied to regulatory compliance. Whether it's the Sarbanes-Oxley Act (SOX), the Gramm-Leach-Bliley Act (GLBA), ISO-17799, or IT Infrastructure Library (ITIL), there is a set of practices that are ever widening across business sectors. The financial services sector has always been tied to close auditing and scrutiny.

Beyond audit or compliance considerations, the financial services sector is perhaps the closest sector to a pure information economy. In financial services, the ledgers and paper trails of old have become a stream of information on the network. The paper is gone and finance is all about moving information quickly, accurately, and securely.

Convergence of data, voice, and video onto a single infrastructure will, for many financial institutions, provide a consolidated approach to monitoring and management, simplifying the entire data capture, warehousing, and analysis process for regulatory compliance. Figure 4.2 showed the importance of CRM in the business flow, but that same chart provides an overview of touch points in the flow that eases compliance reporting and documentation for companies involved in financial services.

For financial services businesses, the reduction in cost of call center technologies may play a key role in redefining the financial services business. Deploying call center methodologies in smaller volumes now affordable with convergence can drive measurable gains in productivity down into smaller workgroups.

Health Care

Like financial services, the health care environment brings a unique set of compliance requirements related to HIPPA. This legislation established standards for transactions in the healthcare sector, but also established requirements for the security and privacy of patient health data.

Converged services again provide a single infrastructure to secure and bring into compliance. The complexity of HIPAA has spawned numerous supporting, consulting service markets. Network consolidation can allow health care providers to take a single, unified approach to HIPAA compliance, thereby focusing on their core business—health care.

Beyond compliance, the converged network brings the model of CRM to patient care in the health care environment. This integration of voice and data services means that doctors, physician's assistants, nurses, and other health care professionals can leverage advances such as screen pop CTI and click-to-call technologies to better serve patient needs.

Manufacturing

For manufacturing, the advantages of convergence may seem hidden. The manufacturing sector doesn't appear at first to be tied to network services the way purer information-driven companies might be. But in manufacturing, there are several key areas where convergence brings real value to the integration of data, voice, and video.

Perhaps the most tangible value in convergence lies in the broad spectrum of supply chain management and the vendor/supplier relationships that make up an integral part of the manufacturing process. Inventory control data systems can easily prompt via an enterprise ERP system to contact a supplier and ensure inventory restocking is timely. The integration of data and voice in the converged network has for many manufacturing businesses proven the key to success in following the precepts of "just in time" component delivery.

Summary

In a recent paper entitled "Voice and Video over IP: Leveraging Network Convergence for Collaboration," Melanie Turek, Senior Vice President & Founding Partner at Nemertes Research, had this to say:

> For several years, the big question with Voice over IP (VoIP) was whether it actually worked, and if so, whether it worked well enough for corporate ears. Well, the answer is in: Yes! As long as the network is architected properly, VoIP is definitely ready for enterprise use, and convergence projects are running strong in the vast majority of organizations.
>
> Better still, while voice typically is the first application implemented on a converged IP backbone, Nemertes is starting to see IT executives explore new applications—such as video, unified communications, and other collaborative tools—that can also leverage the IP network. The benefits can be great, including cost savings and increased productivity in the virtual workplace.

> As they deploy these and other technologies, companies are starting to recognize the need for network optimization, enhanced management tools and tight security. And although most IT executives don't spend a lot of time worrying about specific standards, they like what standards get them—easy integration and interoperability among vendors and networks, both of which are important when it comes to communications technologies. As SIP grows more robust and more common, companies will have more vendor options open to them—and they'll start to take advantage of the benefits convergence brings: Integration, interoperability, and the ability to stay agile in an increasingly global world.

Most companies that have already deployed VoIP, when queried, identify plans to extend converged voice service to teleworkers. Although today the focus is predominantly voice service, other collaborative applications, such as voice conference services, desktop videoconferencing, and Web conferencing/collaboration are expected to follow quickly.

Many organizations are already running some kind of video over IP. Business managers show increasing interest in leveraging the technology for more than just voice communications. Many enterprises are running trials and developing applications using video to address business needs in their emerging converged network environment.

General industry predictions are for significant growth in both desktop and room-to-room video deployments in 2007 and 2008. IP networking and advances in broadband technologies have made video an affordable and practical business tool. Although desktop videoconferencing is viewed as a relatively new technology for almost everyone, the barrier to entry is very low. Business managers and strategists see video as one tool in a larger suite of collaborative applications, and show their interest in using it where no video exists today.

According to a report by Nemertes, video is one of the leading drivers for converged networks (28 percent of participants in Nemertes' latest benchmark name video as a key driver). That's very important because of the large number of enterprise business employees who either work remotely from their direct managers or are geographically dispersed in remote offices. Some broad industry projections show that teleworkers have increased as much as 800 percent in number over the past 5 years. As companies become more global in nature, and more widely dispersed, the value of real-time communications over converged networks becomes apparent.

Citing Nemertes again, in a Convergence benchmarking study, participants were asked to rate on a 1-to-5 scale (where 1=unimportant; 2=somewhat important; 3=important; 4=very important; 5=vital) how important the following drivers were in approaching convergence:

- Growing revenue
- Boosting employee productivity
- Gaining competitive advantage
- Reducing costs
- Meet regulatory/legal requirements

Results showed, not unexpectedly, that growing revenue is the foremost business driver across all surveyed organizations with a mean score of 4.38 out of 5. Second in importance was meeting regulatory and legal requirements, with a 4.07. Cost reduction placed third in the survey with a 4.02 mean score. Gaining competitive advantage scored 3.84. Of these five categories, boosting employee productivity came in with the lowest rating at 3.8. When you compare these strategic business drivers with IT services and network convergence projects, it becomes apparent that demonstrating benefits at the top line (revenue) increase the adoption rate of convergence. Cost reduction is also important, but gains in productivity are still seen as a soft cost and are very difficult to quantify. Given the difficulty in proving these benefits, it's not surprising that improving employee productivity is the lowest importance of the business drivers in Nemertes' survey on convergence.

Organizations that have gone through the evolution of adopting convergence technologies have identified several lessons learned:

- When methodically implemented, the converged service network can lower OPEX and increase employee productivity.
- The converged service network typically creates a scalable infrastructure capable of supporting new business applications in a dynamic environment.
- To achieve cost savings and productivity benefits, a holistic view of business services and applications is required. It's critical to look at the full picture and not just focus on either cost savings or employee productivity.
- The full converged network can provide greater visibility into granular cost controls.
- Industry studies have shown that 80 percent to 85 percent of the enterprises that have already implemented a converged network determine that the quality, resiliency, and scalability that these technologies provide either meet or exceed their expectations.

Convergence of data, voice, and video is a viable technology. It's available in the market and can be implemented today. Through integration of unified data, voice, and video onto a single IP-based infrastructure, organizations can lower their total cost of ownership (TCO). They can lower expenses for equipment and maintenance, reduce administrative costs, and lower carrier charges. The converged services network can also increase productivity and enterprise communications capabilities by facilitating employee mobility and providing a solid foundation for the deployment of advanced, feature-rich services and solutions.

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