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Rochester Institute of Technology
College of Applied Science and Technology

Unified Communications

The search for ROI through tomorrow's business
communication solutions

Vincent Puglia
February 2010

Thesis submitted in partial fulfillment of the requirements for the Master's of Science
Telecommunications Engineering Technology degree

APPROVAL

Date:

Thesis approved by:

Professor Ronald Fulle

Dr. Warren Koontz

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With Sincerest Regards,

Vincent Puglia

ABSTRACT

The traditional workplace is evolving; the way in which businesses communicate today is different than it was in the past and yet is likely to change again in the future. The current state of the economy and globalization has forced every organization to review its future business plans and cut costs everywhere including communications. Organizations are seeking out technology in hopes of finding new ways to reduce their bottom-line communication costs. Today, many enterprise business infrastructures are comprised of separate networks – voice, data, and mobile – yet most of the time these networks never interact. The ability to link business applications from various networks with communications proves to be valuable and is known as convergence. Convergence is defined as the combining of one or more elements into one. Unified Communications is a concept that looks to build on convergence, although it is not a new technology. Unified Communications is the term coined by the communications industry that signifies the comprehensive integration of various communication networks for reasons of increased revenue and reduced costs. Unified Communications will fundamentally transform the way in which people work – from decreased carrier costs to increased response times, the benefits of Unified Communications greatly outweigh the investment. This thesis will analyze the adoption of the Unified Communications paradigm by examining the Unified Communications solutions of tomorrow and prove that establishing a cohesive Unified Communications strategy will indisputably have a return on investment. In doing so, solutions from four Unified Communications vendors (Microsoft, Cisco, IBM, and RIM) will be examined to expose the potential benefits available to any enterprise business. The end result will show

the rate of return for reducing costs and increasing revenue to yield a positive ROI for each vendors' UC solution.

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INTRODUCTION

The current state of the economy and world business has forced every organization to review their future business plans and cut costs everywhere, including communication.

Organizations are seeking out technology in hopes of finding new ways to reduce their bottom line communication costs. In this economic situation, "Unified Communications (UC) is an opportunity which can facilitate both immediate cost reductions and long-term efficiencies in resource utilization."¹ Knowing this, many of the world's communication and software leaders, including Microsoft, Cisco, IBM and RIM, are entering the UC market and releasing solutions to enterprise businesses. One problem still exists – the investment for these UC solutions is not cheap and lacks data proving a return on investment is possible.

This thesis will analyze the adoption of the Unified Communications paradigm by examining the Unified Communications solutions of tomorrow and prove that establishing a cohesive Unified Communications strategy will indisputably have a return on investment.

Throughout this study, the tangible benefits of UC will be explored leading to the discovery of how to translate the needs of any enterprise business into a communication application where the network elements of UC can actually save organizations a lot of money and increase revenue over the short and long term. In addition, the study will clearly show that when UC is deployed with specific process improvements in mind the savings will provide the most positive

¹ Parker, M., and D. Van Doren. "Achieving Cost and Resource Savings with Unified Communications." August 2009.

return on investment (ROI). In the end, the intent is to give the reader a complete analysis of the UC model to prove a tangible return on investment exists for cost justifying the business expense.

STUDY OVERVIEW

This study, “Unified Communications: The search for ROI through tomorrow’s business communication solutions” is structured to provide a complete analysis of the current UC market. Each chapter is designed to address a particular area of interest while continuing to prove that a positive ROI is attainable. This section provides an overview of the study as a whole and is intended to give the reader a basic understanding of the structure:

Chapter 1: Converged Networks

In “Chapter 1: Converged Networks,” background on the concept of a converged network is introduced along with the entire suite of network elements that ultimately make up the UC model. As each of the network elements are discussed in detail, the underlying problem of a fragmented network is exposed.

Chapter 2: Unified Communications

In “Chapter 2: Unified Communications,” the anticipated resolution to the fragmented network issue of a conventional converged network is presented: Unified Communications. The UC model is examined in detail along with its meaning. The concepts are discussed along with the goals and drivers that influence users into adoption.

Chapter 3: The UC Market

In “Chapter 3: The UC Market,” the UC solutions of four vendors (Microsoft, IBM, Cisco, and RIM) will be examined as these are the vehicles for which the benefits will be delivered to enterprise businesses. Each vendor was selected based on their unique strategy, and each vendor assessment will include a brief company history, features of its solutions, advantages, disadvantages, and pricing. These vendor solutions will be used in the ROI analysis.

Chapter 4: Cost Justify the Investment and ROI

In “Chapter 4: Cost Justify the Investment and ROI,” the two proposed benefit categories of UC will be examined. In each benefit category, savings formulas and calculations will be used to ultimately yield the potential ROI.

Chapter 5: The Future of UC

In the final chapter, “Chapter 5: The Future of UC,” concluding thoughts for developing an effective UC strategy and the future of UC will be examined along with any future recommended studies.

PREVIOUS WORK

Much of the research and data presenting UC has focused on the enhancements and functionality it brings to an organization; unfortunately, this type of approach limits the types of interested investors. Real-world investors need to see a return within a set amount of time. It was not until recent efforts did large vendors such as Microsoft, Cisco, IBM, and RIM start conducting extensive real-world case studies to prove UC has a place in the market. It is with these real-world case studies that other customers can realize the true benefits and begin to believe in the UC concept.

MOTIVATION

The UC paradigm is still in its infancy, yet with the abundance of data featuring the benefits of a UC solution, coupled with the new case studies, the UC movement continues to crawl forward as critics believe that investing in a UC solution is not worth the investment or will not produce the kind of return promised. The research work presented in this study brings the multiple views of the various vendors together into a comprehensive framework. In particular, case studies conducted in the market by some of the top vendors will be explored as a competitive analysis is built among features to create credibility as it is used to analyze the ROI potential.

Chapter 1: CONVERGED NETWORKS

The term “convergence” can be used in many industries and has been around for several years, yet its recent hype has made it a topic of interest among many of the world's largest telecommunication and software vendors. The term convergence can be used in the telecommunications industry to define the combining of one or more communication elements into a single platform. Many traditional enterprise infrastructures suffer as their networks are comprised of fragmented communication elements that have the inability to exchange information. A converged network infrastructure looks to combine the various fragmented elements of many different networks in an effort to eliminate redundant communication functionalities and form a more synergistic network infrastructure. The ability to link various applications from different networks with communications proves to be valuable. “There is little doubt amongst most executives that convergence will have a major impact on their organizations over the next five years. Remarkably, 24% feel that convergence is ‘critical’ in achieving the organization’s strategic business goals, and 38% regard it as very important.”² As new applications and business efficiencies emerge, establishing a converged network model will prove to be vital as organizations attempt to tie the various network elements together to work as one.

NETWORK ELEMENTS

A typical enterprise communication infrastructure consists of many different network elements. A network element is considered to be one individual piece of the principle

² Ernest-Jones, T. *Deploy or Delay? Converged Networks in the Enterprise*. The Economist Intelligence Unit, 2004.

framework used by a vast majority of the enterprise businesses to accomplish a specific communication goal. Voice, messaging conferencing, presence and availability, and directories have all become fundamental requirements of an enterprise network. Unfortunately, there exists one common fault among each of the networking elements – their inability to effectively intercommunicate. In other words, the functions and capabilities of a voice network cannot interact or share information between the presence and availability network. This type of intercommunication limitation creates redundancies and inefficiencies in the most basic communication model for any enterprise business. These network elements are the building blocks which most of the business world utilizes for day-to-day interaction; therefore, any inadequacy could lead to lost revenue. The bottom line is that organizations would benefit by creating a communication model where these traditional fragmented network elements would seamlessly interact.

VOICE

The foundation of the voice network was started with the invention of the telephone by Alexander Graham Bell in 1876. Since then the telephone has quickly become a staple in the communications industry and today remains as one of the critical elements for business operations. The traditional telephone voice network consists of numerous circuit switches that make up the Public Switched Telephone Network (PSTN), which are used to make and maintain connections for the duration of a phone call. The PSTN has by far been around for the longest period of time and is considered to be the most reliable.

Today, Voice over IP (VoIP) is an emerging technology that has become a viable alternative in voice communications. In contrast to the traditional PSTN, the VoIP network is connectionless, or, in other words, a physical connection does not exist between the two end points. Rather, the VoIP network uses data packets and network routers to transfer data to and from each end point via the Internet. VoIP allows voice calls to be routed over existing data networks to avoid the need for a separate voice network thus reducing overhead. In contrast, the VoIP communication network is less reliable than the PSTN network and can be susceptible to voice latency and jitter.

Lastly, the mobile network is a wireless voice network solution that uses radio frequency transmissions to transmit voice data. In the past, the mobile network was used for short-range wireless voice transmissions, but in 1973 the first cellular call was made, and today the cellular network is “the fastest growing segment of the communications industry.”³ Mobile networks allow flexibility to contact co-workers and customers while on the road but can have higher costs associated per user than VoIP and PSTN users.

Fragmentation exists within each network element. PSTN, VoIP, and mobile networks are all transporters of voice communication, yet each cannot natively intercommunicate without some sort of conversion gateway. Imagine having the benefits of each network in one device – the reliability of PSTN, the cost and integration of VoIP, and the mobility of the cellular network. Consider the savings, according to a primary research study by Avaya in February

³ Kritzinger, P.S., and L.O. Walters. *Cellular Networks: Past, Present, and Future*. <http://www.acm.org/crossroads/xrds7-2/cellular.html> (accessed December 2009).

2007,"64% of employees carry more than two communications devices and 36% carry three or more devices."⁴

Figure 1 below represents a network diagram consisting of the three voice network elements: PSTN, VoIP, and mobile. The network diagram illustrates that while users on each network can intercommunicate; communicating to another network requires some type of gateway.

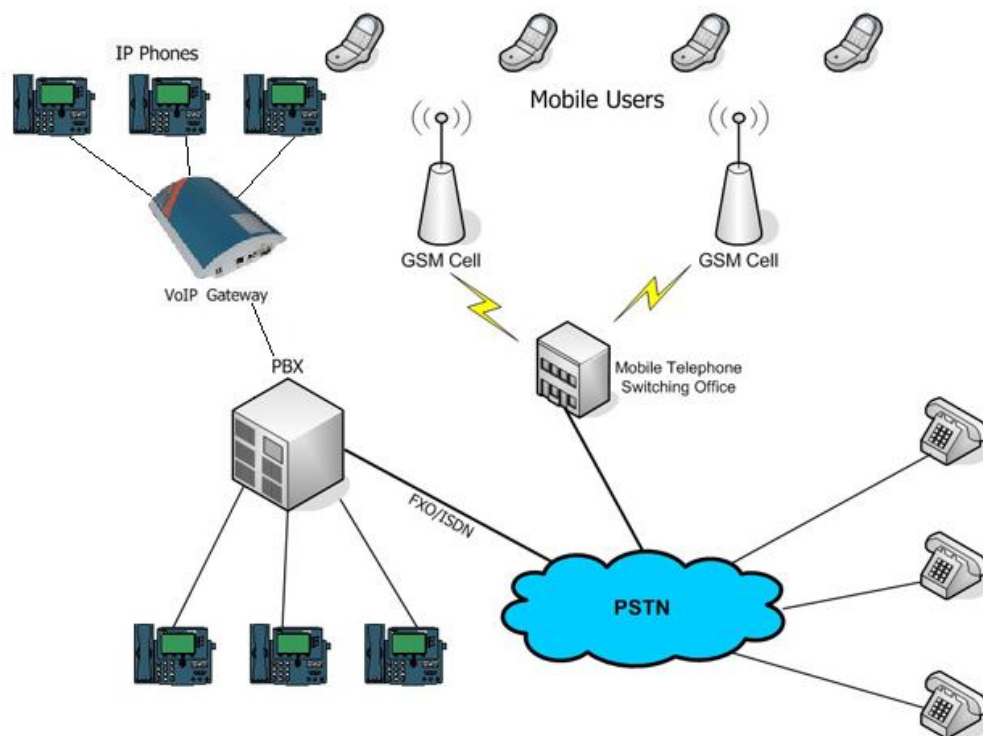


Figure 1: PSTN, VoIP and Mobile Network Diagram

⁴ Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

MESSAGING

Technology has introduced a wide variety of messaging that can be utilized to conduct business through either real- or non-real-time communication including voicemail, email, and instant messaging, yet considering the popularity of their services, each remains an island network. Consider the voicemail messaging component – voicemail boxes allow voice callers to leave an audible message for unavailable users. While voicemail is an effective messaging service, most voicemail users have multiple separate voicemail boxes for business, mobile, and personal. This type of redundancy can lead to inefficiencies and delays in returning important business voicemails. According to a primary research study by Avaya in February 2007, “58% of office workers retrieve important messages late at least once a week because people don’t know the best way to reach them.”⁵

The same dilemma exists with email. Email has become critical in today’s business communication by allowing digital messages to be exchanged, yet users must manage multiple separate accounts for personal and business which can cause delays in response time. According to a primary research study by Avaya in February 2007, “more than half of office workers have missed an important business meeting, a customer inquiry, contract, or new business lead because they weren’t able to email or call.”⁶

⁵ Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

⁶ Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

Lastly, Instant Messaging (IM) first became popular in the early 1990's and was primarily used for social networking communications but now is seen as a valuable collaboration tool and is rapidly becoming a way businesses can real-time inter-communicate within the organization as an alternative to email. The issue arises "when an enterprise has not deployed enterprise-wide IM from software vendors (such as Microsoft and IBM), employees are enrolling their own services (such as MSN, Yahoo, and Google)."⁷ However, the implementation of these outside services can cause major security issues, and unless the entire organization adopts the same third party service, yet another fragmented communication would be created.

CONFERENCING

Conferencing allows for users from multiple locations around the world to collaborate remotely as if they were in one common meeting place. Conferencing first started as a simple audio collaboration among many users but has evolved into web and video conferencing where users can see one another, share applications, documents, and files with the group to enhance the discussions. Again, the issue exists where, if an enterprise has not implemented an enterprise-wide conferencing service, employees will select and use a variety of external services that are not managed internally and can cost the company thousands of dollars in conferencing minutes and fees.

PRESENCE AND AVAILABILITY

Presence and availability is not a communication device; rather, it is an enabler for communication. "Presence helps you determine, in advance, how another colleague can most

⁷ Gregory, P.H. *Unified Communications for Dummies*. Indianapolis: Wiley Publishing, Inc., 2008.

easily and expeditiously be contacted” and “availability helps you indicate how a colleague can contact you, including what sorts of incoming contacts you prefer.”⁸ For instance, if a colleague’s presence reports “In a meeting,” he or she would most likely be unavailable to accept a voice call; whereas if a colleague’s presence reports “Available – Mobile,” then he or she can accept a voice call on his or her mobile device. “Enabling technologies with presence can help workers reach available experts and resolve issues without constant escalation to management, saving both worker and management time.”⁹

CONTACTS AND DIRECTORIES

A good contact list allows a user to quickly locate a number or email address for communication, although in many cases, a user must manage and maintain their contacts through multiple applications or communication devices while none can share data. For instance, a cell phone device may contain many customer contacts, including cell phone numbers or alternative numbers, but those numbers are only accessible via that cell phone device. If that cell phone device was ever inaccessible or lost, those critical numbers would be lost. Synchronizing contacts and directories among applications and communication devices can be critical for efficient business.

⁸ Gregory, P.H. *Unified Communications for Dummies*. Indianapolis: Wiley Publishing, Inc., 2008.

⁹ Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

Chapter 2: UNIFIED COMMUNICATIONS

A paradigm shift can be seen as a new way of looking at an old problem and that is exactly what the UC paradigm shift looks to accomplish to the communications industry. For years, new technology has advanced the way we communicate. Email is replacing standard letters, calendars are replacing day planners, and directories are replacing rolodexes, but users of these technologies are being inundated with messaging overload. It is common for a single employee to carry a cell phone, laptop, and PDA while still having a work and home PC connected to several email and voicemail accounts. These disjointed applications make communications more complex, and it can be quite a task for an employee to manage the communication devices not to mention multiple customers. With technology continuing to advance and new forms of communication arising each day, the complexities of communication may only get worse. UC aims to cohesively tie each of the new emerging technologies together in order to intercommunicate and share information in a way to add value. No longer would an employee be required to conform to the devices that are restricted to a specific task; rather, one device would allow access to all forms of communication. “Unified Communications can be visualized as several roads merging, one at a time, into a single communications system. It’s all about managing multiple means of communications, seamlessly.”¹⁰

¹⁰ Gregory, P.H. *Unified Communications for Dummies*. Indianapolis: Wiley Publishing, Inc., 2008.



Figure 2: The Unified Communications Model

The concept of UC is simple, with the model that inherently takes its shape from a converged network; it combines many existing network components into one platform.

Industry leaders Cisco, Avaya and IBM all have a similar outlook on the term UC:



“Unified Communications is a **comprehensive** IP communications system of voice, video, data, and mobility products and applications.”¹¹

¹¹Cisco Corporation. *Cisco Unified Communications Manager*.
http://www.cisco.com/en/US/prod/collateral/voicesw/ps6788/vcallcon/ps556/ps7240/product_solution_overview0900aecd805e19e7.html (accessed January 2010).



“Unified Communications is about converging features such as our award winning Modular Messaging and one-X Speech application.”¹²



“Unified communications is the integration of disparate communications systems and applications.”¹³

Each definition uses a term that indicates completeness to the communications system, yet UC is much more than that. UC is neither a single product nor is it a technology; rather, it is a concept which allows enhancements of existing network functions by allowing various fragmented network business components to communicate and share information. “Behind the Unified Communications solution is a merging of key technologies. Unified Communications relies on a variety of current and near-future technologies to drive both individual communications media and the unified solution.”¹⁴ It is these key technologies that are driving communications in new directions, but unfortunately it is not always in the same direction. The

¹² IBM Corporation. *IBM: What is Sametime Unified Telephony?*
http://publib.boulder.ibm.com/infocenter/sametime/v8r0/index.jsp?topic=/com.ibm.help.sametime.telphony.doc/sut_adm_what_is_sut_c.html (accessed January 2010).

¹³ *Avaya Unified Communications Boost Employee Productivity and Safety With Freedom of Speech*. April 28, 2008. <http://www.marketwire.com/press-release/Avaya-Unified-Communications-Boost-Employee-Productivity-Safety-With-Freedom-Speech-NASDAQ-NUAN-848874.htm> (accessed December 2009).

¹⁴ Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

goal is to have each of the new and existing technologies working together as one and sharing the benefits each has to offer.

Figure 3 below portrays an enterprise business communication infrastructure which has implemented the UC model as it converges and integrates the many functions needed for day-to-day business into one ecosystem. Contained in this network diagram are several of the network elements discussed in Chapter 1: the UC concept looks to combine each of the fragmented network elements into one synergistic infrastructure. For example, email and phone could communicate to allow a user to hear his or her email messages on the phone while on the road. Simply put, UC is a way to optimize communication components and allow more real-time collaboration between any business communication element from anywhere in the world.

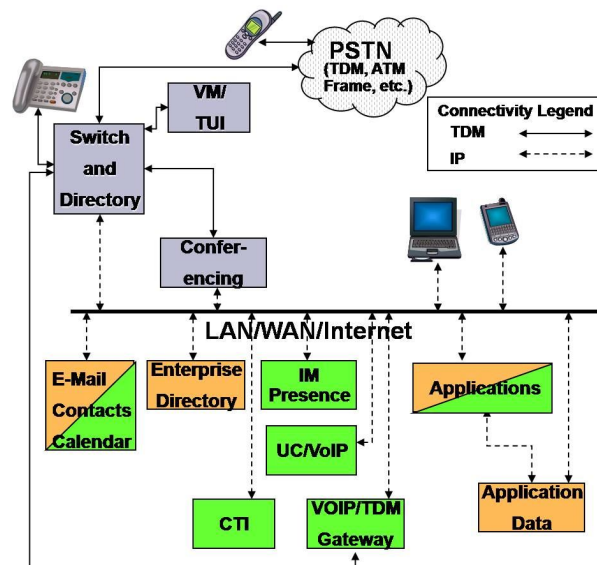


Figure 3: Sample Unified Communication Network Diagram

The purpose of UC is to transform business and give users the tools they need to be successful. A job definitely can be done without the use of UC but the question remains; can you use UC to get the job done better? "It does not matter to most people that voice, email, and text messages travel through multiple networks and incorporate different protocols. Most people just want to make sure that they get notified of important messages and receive important phone calls."¹⁵ UC is about the fulfillment of important business objectives through the use of specific technologies. Unfortunately, sheer functionality of a new model is no longer enough to justify an expense for UC. With increased competition and globalization, businesses are constantly asked to do more with less; thus a tangible ROI is needed before devoting time and money. "Providing quantitative ROI for all aspects of any UC offering has become imperative. To date, ROI for UC has been relatively soft, which needs to change and change quickly"¹⁶ if any type of investment is to be made. The question still remains of what quantifies a ROI and how quickly do users expect to see it.

According to a survey conducted by the Economist Intelligence Unit in 2004, real-world enterprise business customers have specific expectations when it comes to the ROI of a UC deployment. The survey questioned 100+ senior executives on the topic of network convergence. The survey spanned across several functional business segments including Legal, Human Resources, Operations and Productions, and Marketing and Sales, in both the private

¹⁵ Evans, D. "An Introduction to Unified Communications: Challenges and Opportunities." *Aslib Proceedings* 56, no. 5, 2004: 308-314.

¹⁶ Anonymous. "Supplier Survey: Unified Communications." *Customer Inter@action Solutions*, April 2009: 17.

and public sectors. Survey results indicated that the majority of senior executives polled would expect to see a 10-20% reduction in communication costs (figure 4), while the minority would expect to see results of more than 50% in cost savings. The same survey found that the majority of senior executives polled would expect to see a return on investment after implementing a converged network within two years (figure 5), while the minority would expect to see the return on investment within the first year. These numbers suggest that top level managers understand the real savings that implementing a UC solution has to offer and are willing to accept the investment that is needed and have achievable expectations of when to see a return. It is now up to the software vendors to meet these demands with the products they promote.

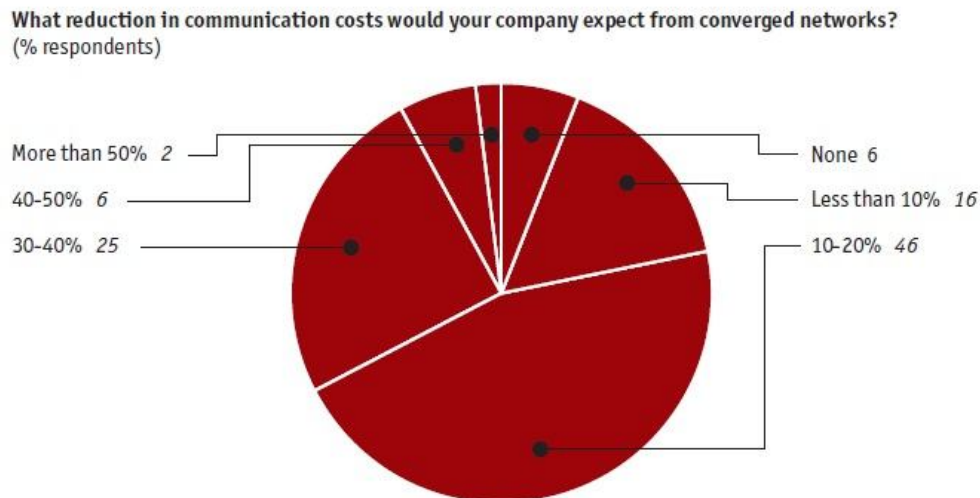


Figure 4: Cost Reduction Expectations

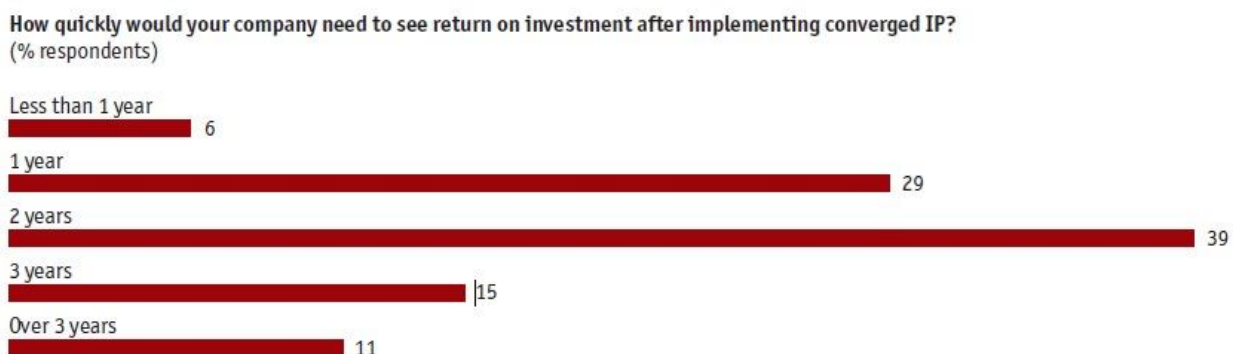


Figure 5: Return on Investment Timeline

UC ADOPTION DRIVERS

The UC paradigm is not a new concept, but just like any business initiative, there always needs to be a bottom line, and it usually revolves around saving money. UC is no different; there needs to be drivers behind the concept before enterprise businesses begin to adopt it. Communications technology has evolved over the years and will continue to evolve as new features arise and benefits discovered. In the beginning, UC applications would allow users to call into their voicemail and listen to their emails, thus eliminating the need to come into the office. Today, some of the industry-dominant vendors are offering a full suite of communication products that include conferencing, presence, directories, and promise to take business communications to the next level, but the drivers to force enterprise businesses to migrate to the UC platform needs to be evident. External drivers can dictate the adoption of a new technology just as much as the benefits and features of the new technology itself. In this case, two external drivers are apparent when enterprise businesses are examining the need for a UC solution: the current state of the economy and the users in the workplace.

THE ECONOMY

Today's current state of the economy is considered by many to be in the worst since the Great Depression; thus many businesses are re-evaluating their expenses, tightening budgets, and cutting unnecessary spending. The UC infrastructure is a good investment that many enterprise businesses have recognized will help them reduce future communication costs in this down economy. Despite being in a weak economy, "in a fast-paced market, companies need to take advantage of the tools available today and need to start deploying them within their work place or risk falling behind competitively."¹⁷ The tools and features of a properly implemented UC solution would benefit any business looking to restructure its communications infrastructure in these weak economic times and prepare to build for the future growth.

USERS

Perhaps now more than ever, recent graduates are entering the workforce with advanced communication skills, and businesses are looking to leverage those skills to create a more efficient business. "Unified communications is now becoming an employee-driven purchase"¹⁸ as businesses attempt to streamline the various communications methods into one simple and efficient model. Still, "it is a product that requires education"¹⁹, which could pose as

¹⁷ Forrester Consulting. "Unified Communications Transform Business Communication." Commissioned study on behalf of Cisco, August 2005.

¹⁸ O'Hanlon, C. *Despite Economy, Unified Communications Still a Technology to Watch*. February 19, 2009. <http://www.channelinsider.com/c/a/Messaging-and-Collaboration/Despite-Economy-Unified-Communications-Still-a-Technology-to-Watch/> (accessed December 2009).

¹⁹ O'Hanlon, C. *Despite Economy, Unified Communications Still a Technology to Watch*. February 19, 2009. <http://www.channelinsider.com/c/a/Messaging-and-Collaboration/Despite-Economy-Unified-Communications-Still-a-Technology-to-Watch/> (accessed December 2009).

an added expense incurred by businesses when planning to roll out a UC solution. The fact still remains that users are driving communication and communication is important to users.

According to a Project Management Institute (PMI) case study done in conjunction with AT&T, "effective communication was a vital element to the success of the project."²⁰ Thus it has established a formal communication plan for the future. Furthermore, Forrester's 2005 Next-Generation Communications study indicated that 27% of workers experience delays in a project on a weekly or daily basis (figure 6 below). In addition, only 3% find that delays in communication seldom happen or have no effect on the timeliness of a project. With the other 97% experiencing some sort of frequent delay, one can see the criticalness of communication when it comes to getting projects done on time.

"How frequently does a project get delayed due to difficulty in reaching key decision-makers when needed?"

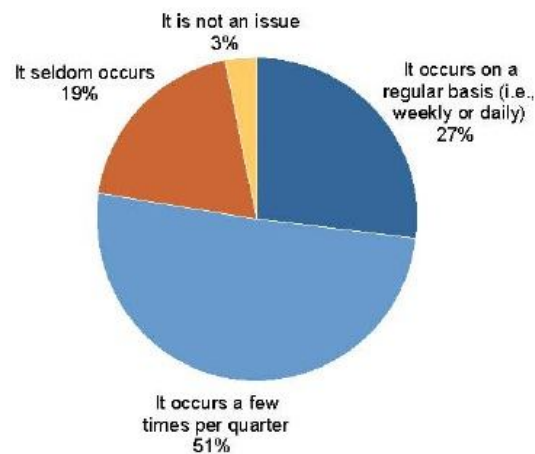


Figure 6: How frequently does a project get delayed due to communication?

²⁰ AT&T, Inc. "AT&T Project Management Center of Excellence: Communications Leader Promotes Project Management Leadership." *PMI.org - Case Study*.
<http://www.pmi.org/PDF/ATT%20Case%20Study-FINAL%2010-23.pdf> (accessed December 2009).

PROPOSED BENEFITS OF UNIFIED COMMUNICATIONS

Benefits are those considered to be tangible improvements to a system as a result of a specific investment. "Any IT investment must accomplish one of two things: reduce costs or increase revenue."²¹ The bottom line benefit essential to a UC investment is a positive ROI. A positive ROI will occur if cost savings of the implemented solution exceed the cost to implement, or if the increased revenue of the implemented solution will exceed the cost to implement. The way in which a properly implemented UC solution can produce a positive ROI benefit can be classified into two categories: reduced costs and increased revenue. For the purposes of this study, these benefits will remain "proposed" until they are proven to be a tangible benefit that contributes to a positive ROI.

REDUCED COSTS

Reducing costs or cost cutting are those benefits that can immediately affect the bottom line savings through strategic attempts of eliminating or reducing existing expenses. Enterprise businesses can achieve greater profits through more efficient use of the expense dollar by eliminating operation costs. The five areas focused on below for proposed cost reduction benefits are intended to reduce the communications costs needed by an enterprise business in an attempt to gain a positive ROI immediately yet be sustained over a long period of time. The proposed reduced cost benefits suggested here are supported using the case study data investigation in Chapter 4.

²¹ Lazar, I. "The ROI of Unified Communications." *Network World*, 2007: 30-36.

- **Travel Expenses**

- The first point of savings focuses on employee travel. An organization that is experiencing an increased need for collaboration but suffers from a dispersed team, or an organization that is just looking to trim its travel budget, will benefit from implementing UC as it offers a way for team members to communicate without being in the same location. Through the web, audio, and video conferencing features of UC, users from around the world can form a “virtual team” that can actively work on projects together without disrupting business effectiveness and at the same time reduce travel expenses. In addition, the features of UC allow recording options and the ability to post the meeting content to a shared space for later viewing or for members unable to attend.

- **Conferencing Service Fees**

- The next savings point focuses on conferencing service fees. With reduced travel, the need for a reliable conferencing service is critical. Many organizations rely on third-party conferencing services to allow the collaboration necessary to form the virtual teams, but these typically come with a heavy price. The UC model allows for organizations to abandon the pricey third-party conferencing services for an in-house solution. The feature-rich conferencing applications allow users to simultaneously view documents, interact, and share ideas all through voice and video, regardless of their location.

- **Toll Charges**

- Next, toll charges are an area of an organization that can be reduced by implementing UC. In the UC model, most voice communication would travel via a secure IP infrastructure including various sites around the world. Through bypassing the use of the PSTN services for voice communication, organizations can reduce long-distance toll charges that are incurred through daily site-to-site calls. In addition, those savings would extend into conferencing, as UC solutions would be used rather than external services that require long-distance charges. Lastly, the use of the UC Presence feature would allow users to avoid wasted attempts made to unavailable or busy users.

- **Cellular Bills**

- The next area of focus for reducing costs is through cellular bills. Although mobility is a necessity for users on the road, according to a primary research study by Avaya in February 2007, "60% of employee mobile phone calls are made from within an enterprise."²² This creates a large unneeded expense that organizations incur but which could be eliminated. In cases like this, many organizations are utilizing dual-mode cell phones that work with both the cellular networks and wireless Wi-Fi. Thus, when a user initiates a call within the enterprise, the dual-mode cellular device can utilize the cost reduced Wi-Fi infrastructure. In addition, through the use of presence, users can utilize the UC

²² Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

model to dictate whether the intended user can be reached, or even using IM instead of calls would eliminate a tremendous amount of unnecessary cellular costs which would save the organization money.

- **Facility and Carrier Expenses**

- The last area of focus for reducing costs is through facility and carrier expenses, and this area of focus has several ways in which costs can be reduced. First, the internal IT department would no longer need to support various communication networks; rather, the UC model consolidates the communications infrastructure into one simplistic converged network. Second, using the UC solutions would allow more staff to work remotely, thus reducing operation costs for a customary facility (heat, power, security, light, etc). Lastly, as a result of using the IP infrastructure, additional PSTN carrier expenses can be eliminated, as the majority of the communications will use IP. The only PSTN carrier expense would be a backup connection.

INCREASED REVENUE

Increasing revenue, on the other hand, is an inherited benefit of using UC as it enables existing processes to earn more through functional efficiencies. Enterprise businesses can achieve greater profits through improving functionality, improving the user experience, and improving the end results. Historically, UC has been positioned as a significant cost savings investment, but recent evolution through vendor case studies has clearly shown that the

primary driver has shifted to business process efficiency improvements that will return the greatest profit. “While improvements to individual productivity are important, benefits are even more significant, and often more readily measurable, when the UC tools are applied within a team – a workgroup, department, project team, or similar group of individuals working jointly and collaboratively to accomplish a particular goal or to produce a project outcome.”²³

The five areas focused below for proposed increased revenue benefits are intended to increase the enterprise business functionality through the use of communications in an attempt to gain a positive ROI in a near-to-long-term span. The proposed increased revenue benefits suggested here are supported using case study data in Chapter 4.

- **Enterprise efficiency**

- The first point of focus for increased revenue is to increase enterprise efficiency through consolidating and removing legacy-redundant communications systems. Many organizations have a vast array of older legacy communication products scattered throughout the organization. Applying a UC solution to the organization would consolidate these legacy systems into one synergistic communication model. As a result, organizations would be able to remove their outdated communication products for a more centralized solution. In addition, the UC model would save at satellite offices and with remote users, as most of the communication functionality would rely on the IP protocol. No longer would

²³ Parker, M., and D. Van Doren. "Achieving Cost and Resource Savings with Unified Communications." August 2009.

each site be required to host communications equipment such as a PBX or voicemail system. Immediately, organizations would no longer need to support their legacy systems and would avoid any additional licensing fees associated with them.

- **Streamline tasks**

- The second point of focus when increasing revenue through UC is streamlining tasks. This UC benefits general staff efficiency, as users can check all message types regardless of communication device. This seemingly trivial task may only eliminate a few minutes, but users perform these repetitive actions multiple times every day. This is an opportunity for efficiency that can add up to large savings over time. Each time a user checks his or her email and voicemail could be a chance for optimization and streamlining which can translate into more time for other revenue-related tasks.

- **Improve workflow**

- Next, improving workflow is an opportunity for organizations to increase revenue. Improving workflow creates quicker responses, quicker time to market, and less waiting, which can translate into increased revenue. According to a primary research study by Avaya in February 2007, "64% of employees carry more than two communications devices while 36% carry three or more devices."²⁴ If a business customer faced with a critical issue needed to contact

²⁴ Miller, M. "Essential Manager's Guide: Communication Tools for the Effective Worker." *Provided by Avaya.com*. 2008 (accessed December 2009).

someone, he or she could be faced with multiple means of communication yet not know which is the best and most efficient. Again, these seemingly insignificant tasks can add up over time, resulting in reduced wait time and tasks optimized for better performance.

- **Shorten project life cycles**

- The next focus for increasing organization's revenue is shortening project life cycles through UC. As previously stated, communication is key to the success of a project, thus optimizing the processes around a project's communication will shorten the project completion time. "Major savings opportunities include presence and IM tools to find the right resources immediately and to avoid phone calls and messages to persons who are not available."²⁵

- **Improve customer interaction**

- The last focus for increasing revenue in an organization through UC is improved customer interaction. Each of the previous increased revenue benefits will, in turn, improve customer service through reduced response time. For instance, using UC first reduces the number of calls missed through intelligent call routing (find-me, follow-me) and also reduces the response time through streamlining messages to users. Overall, it speeds the entire process – customers no longer have to wait until they are back in the office to access information, listen to

²⁵ Parker, M., and D. Van Doren. "Achieving Cost and Resource Savings with Unified Communications." August 2009.

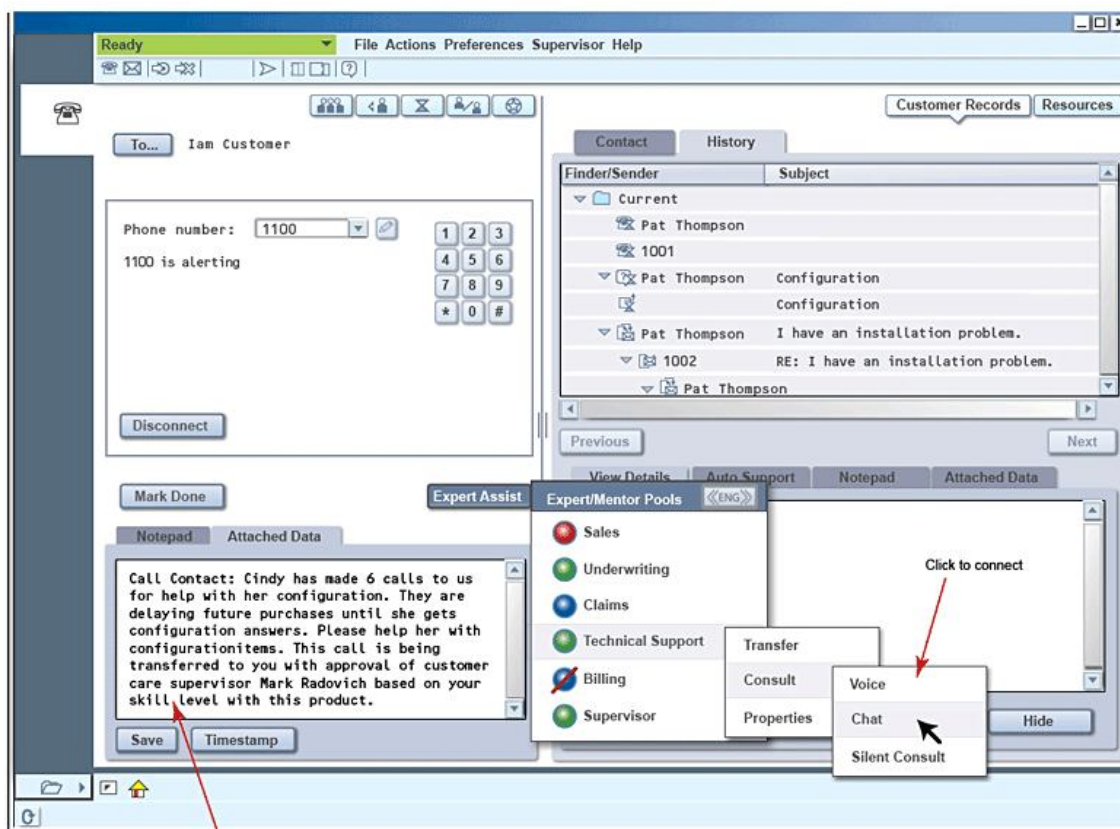
voicemails, and/or read emails. In addition to reduced response times, UC will improve customer management. Previous legacy communication systems had limited call routing capabilities and limited call queue statistics. Through the use of UC, organizations have more available data that can be used to better formulate a customer strategy and quickly adapt current routing rules for rapidly shifting customer demands.

COMMUNICATION ENABLED BUSINESS PROCESSES (CEBP)

Behind the scenes lies another benefit to enterprise businesses that may go unnoticed. A part of the UC paradigm are tools that explicitly integrate into defined processes called Communication Enabled Business Processes (CEBP). CEBP is a concept of applying communications technologies into daily business procedures through tightly integrated software. The concept allows for various software-enabled devices to effectively communicate together in an effort to reduce latency, resolve problems quicker, increase customer satisfaction, and improve overall business efficiency.

Many UC vendors are opening the doors for third party developers to create custom communication applications by providing open-standard tools that tightly integrate with their product. The way in which various CEBP applications communicate can either be driven by users or automated. For instance, figure 7 below illustrates a call center agent desktop application developed by Genesys and embedded with the IBM SUT software. This tool allows for real-time communication functionality to be easily accessed by each agent. In this example, the call center agent can front-line the call, collect information about the issue and then

properly forward the call and his or her notes to an expert. The tool also gives real-time status information on each expert contact, letting the agent know if he or she is available to field the call. This CEBP application allows the user to initiate communication and direct calls to any expert and automatically updates all available experts' status for convenience.



These notes, along with all attached data, are sent to any expert/peer that is asked to participate in the call. For experts, all attached data is rendered in a chat window using their desktop collaboration client (see figure 3).

- Offline
- Available
- In Call*
- Busy

*Experts in a call can still be available via chat.

Figure 7: CEBP - Genesys Call Center Desktop

Chapter 3: THE UC MARKET

Today's UC market has literally hundreds of vendors competing for sales, but "it is important to consider the ways in which these products will evolve into solutions that provide meaningful business advantages."²⁶ Many of today's UC solution vendors are offering a full suite of communication elements that can be integrated and implemented seamlessly into any enterprise business in order to optimize communications and reduce costs. Each vendor is vigorously marketing its solution to the public, but not all UC solutions are the same and one size does not fit all needs. Some focus on specific business functions, whereas others focus on specific business process improvements. Taking the time to review each vendor's features and measuring them against the needs of the business is all a part of a cohesive strategy that will ultimately lead to a positive ROI.

Up to this point, the proposed benefits of a UC implementation to produce a positive ROI have been explored. Now the study will deliver the vehicles that drive the UC features from vendors. The study below includes four vendors from the UC market including Microsoft, IBM, Cisco, and RIM. Each of these vendors has their own UC solution that many of today's enterprise businesses are deploying worldwide. Each vendor was chosen based on its unique strategy to the UC market:

²⁶ Iwatsu America. "Addressing Convergence and IP Telephony in Enterprise Communications." *Iwatsu.com*. 2001.
http://www.iwatsu.com/index.php?option=com_docman&task=doc_download&gid=87&Itemid=72
(accessed December 2009).

- **Microsoft** – software-centric strategy to replace telephony vendors by re-inventing the PBX in software
- **IBM** – building-block strategy by adding value to existing communication systems and allow others to build on their technology
- **Cisco** – network-centric strategy by leveraging UC capabilities through advancing infrastructure capabilities
- **RIM** – mobility strategy that focuses on extending PBX capabilities to remote users

The analysis will provide a brief review of the vendor history along with an introduction to its marketed UC product, its strategies, and pricing. The information provided below should be used in developing a cohesive strategy for future UC deployments.

MICROSOFT

Perhaps one of the most recognizable names in business, Microsoft was founded in 1975 by Bill Gates and Paul Allen to develop and sell BASIC interpreters for the Altair 8800. It wasn't until the mid 1980's that Microsoft became a household name through its Windows operating system product. Today, Microsoft has nearly 100,000 employees worldwide in over 100 countries. The Windows operating system consumes ~90% of the desktop market and has been the catalyst behind Microsoft's ~\$60 billion revenue per year. In addition to Microsoft's widely successful desktop operating system platform, many other successful products have been introduced including Microsoft Office, Exchange (email), and gaming (Xbox). It wasn't until 2006 at "a Strategy Day event held in San Francisco, that Microsoft stated its intention to enter

the emerging unified communications product space with software technology”²⁷ named Office Communications Server (OCS).

OFFICE COMMUNICATIONS SERVER (OCS) 2007 OVERVIEW

The communications model that Microsoft delivers has evolved over the years.

Originally launched as separate entities, the Live Communications Server, Exchange Server, and Office Communicator server would now become a fully integrated communications system known as Office Communications Server (OCS) 2007. Microsoft defines their UC solution as:



“Office Communications Server 2007 delivers streamlined communications for users so they can find and communicate with the right person, right now, from the applications they use most. Without expensive infrastructure and network upgrades, you can deliver streamlined communications, including software-powered VoIP (voice over IP), Web conferencing, and enterprise instant messaging, while maintaining operational control.”²⁸

²⁷ Bennett, R., N. Fish, R. Westover, and T. Bawcutt. "Integrating Telephony with Office Communications Server 2007." *Microsoft.com*. June 2007.

<http://www.microsoft.com/downloads/details.aspx?FamilyID=8cde0c3a-042e-445b-a514-2d12ed5b2ac2&displaylang=en> (accessed January 2010).

²⁸ Microsoft. *Microsoft Office Communications Server - FAQ*.

<http://www.microsoft.com/communicationsserver/en/us/faq.aspx> (accessed January 2010).

The Microsoft OCS solution delivers seamless integration between several of the integral communication elements that make UC so powerful. For instance, a user's presence information is fully integrated using his or her personal calendar to automatically update his or her status when in a scheduled meeting or out of the office (figure 8 below). The Office Communicator client is the application tool that enterprise users install on their desktop to control many of the UC features Microsoft OCS employs including presence controls, instant messaging, voice, desktop sharing, and video.

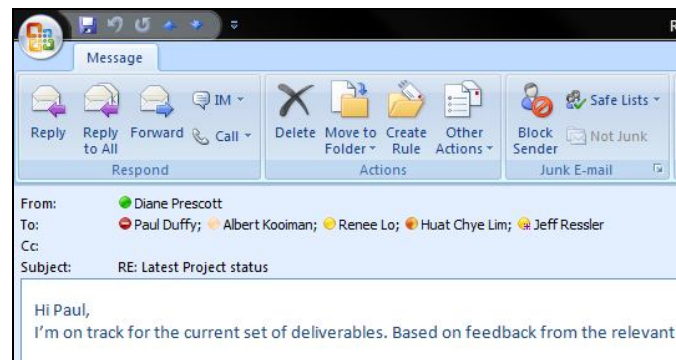


Figure 8: Presence Integration with Email

The Office Communicator client is a powerful tool for enterprise users – it is their connection to the UC network. The Office Communicator client allows users to set their own and view others' presence and availability status. In addition, Microsoft OCS presence integrates seamlessly with the enterprise contact management system, thus allowing users to quickly find contact information such as their office or mobile phone numbers. Figure 9 below illustrates the Office Communicator controls used for presence including your presence status, your location indicator, a note box, your presence button, and contact information.

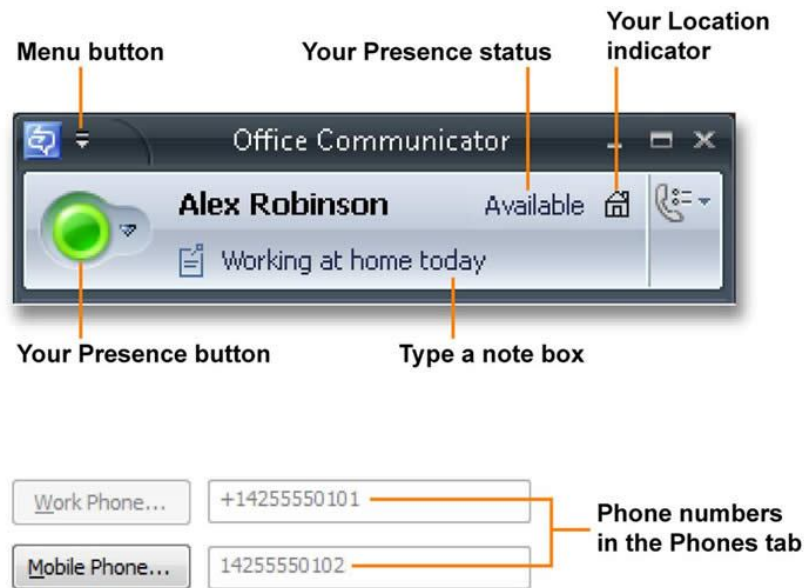


Figure 9: Microsoft OCS Office Communicator

The Office Communicator client is also the vehicle for all instant messaging and voice/video capabilities. Using the Microsoft OCS Office Communicator client, the users can manage their contact list and start/receive real-time instant messaging, voice, and video conversations instantly with single or multiple contacts. For instance, figure 10 below illustrates an instant messaging session started using the Office Communicator with one other contact, whereas figure 11 below illustrates an example for an instant voice or video conversation. When it comes to voice communications, the Office Communicator client is not restricted to other Office Communicator clients. Rather, as the illustration on the left of figure 11 shows, users can communicate with outside communication devices including office phones and mobile devices.

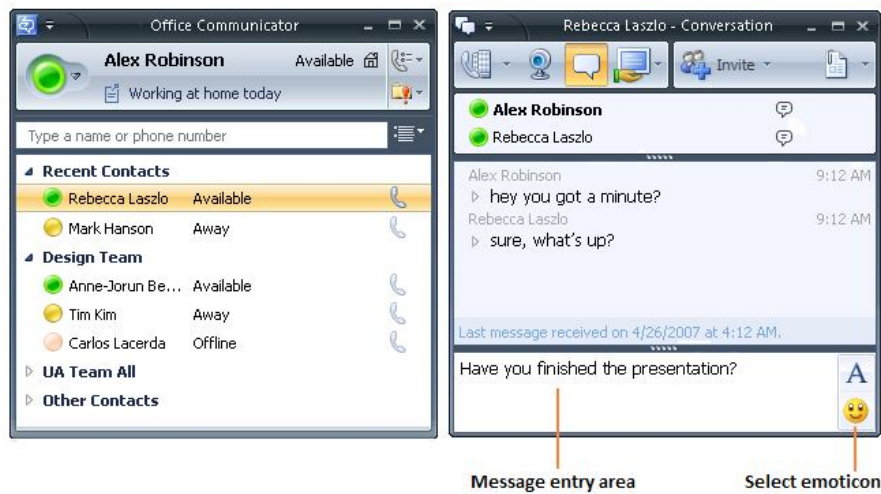


Figure 10: Office Communicator Instant Messaging

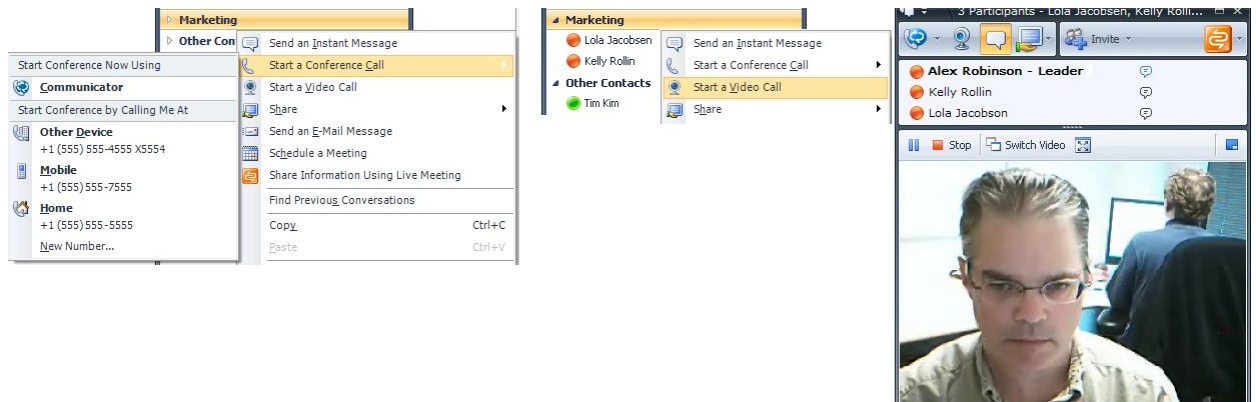


Figure 11: Office Communicator Voice and Video

While the Office Communicator client is great for unscheduled conference conversations, the Microsoft Office Live Meeting application provides audio, video, desktop content sharing, and whiteboard capabilities for real-time collaboration capabilities among multiple users. For example, figure 12 below illustrates the Microsoft Office Live Meeting

application being used for presentation collaboration among multiple users all connected via voice and video.



Figure 12: Microsoft OCS – Live Meeting Conference

STRATEGY

The strategy and approach to the enterprise integration of Microsoft's communication system with OCS has been rooted in software development. The goal has been to simplify and enhance today's communication software to enable more effective collaboration among its users; therefore, the OCS solution is built as a software-based suite and not hardware. Third-party gateways enable the OCS solution to communicate to a variety of PBXs and central office providers while continuing to provide software enhancements. Microsoft can leverage its existing operating system and enterprise e-mail market in the successful migration of their UC solution.

ADVANTAGES

- Offers a full suite of UC capabilities
- Interoperability to all PBXs through gateways
- The name Microsoft – recognizable and trusted
- Built in security (encryption, redundancy, and failover)
- Open SDK for custom-built applications

CHALLENGES

- Limited by strictly software – no internal developments in hardware
- Complex installation process

Primary Competition:

- IBM SUT
- Cisco Unified Communications
- Avaya One-X
- Jabber XCP
- Mitel UC
- Shortel UC
- NEC UniVerge 360
- Siemens OpenScape Enterprise
- Nortel UC Application Suite

PRICING

Solution Element	\$/User/Year
Presence/IM	\$14
Conferencing	\$61
Mobility/Telephony	
CEBP	Included
Total	\$75

Note: Pricing provided directly by vendors as part of a presentation delivered at Voice Con in Orlando 2009. Refer to Appendix A for more information about vendor pricing.

CISCO

Today the name Cisco in the communications industry is synonymous with networking, as it has become the worldwide leader for security, voice, wireless LAN, home, and business networking. Cisco was started in 1984 by a group of computer scientists from Stanford University and is now a staple in millions of home and business-based networking solutions across the globe. With yearly revenue topping \$36 billion in 2009, the Cisco suite of products has become a reliable solution that enterprise businesses can trust with their communications network. It wasn't until early 2006 that Cisco announced the release of its new Unified Communications system "aimed at streamlining business processes and helping drive productivity."²⁹

CISCO UNIFIED COMMUNICATIONS OVERVIEW

Cisco is considered one of the pioneers of the IP communications industry as it was one of the first, providing services since 1997, and "today, more than 85 percent of Fortune 500 companies use Cisco Unified Communications."³⁰ Like many of the other vendors, Cisco Unified Communications is not a single product but rather a family of products that are fully integrated including Cisco MeetingPlace, Cisco Unified Personal Communicator, Cisco Unified Mobile

²⁹ TMCnet.com. *Cisco Unified Communications Changes Everything?* March 5, 2006. <http://blog.tmcnet.com/blog/tom-keating/voip/cisco-unified-communications-changes-everything.asp> (accessed January 2010).

³⁰ Cisco. *Why Choose Cisco*. http://www.cisco.com/en/US/products/sw/voicesw/products_category_purchase_considerations.html (accessed January 2010).

Communicator, and a full suite of Cisco IP-enabled hardware. Cisco describes their UC solution as:



"Cisco Unified Communications combines all forms of business communications into a single, unified solution that enables your organization to move with greater speed and agility. It empowers people to communicate more effectively, improves business processes, and helps businesses achieve better profitability."³¹

The Cisco Unified Personal Communicator is the application tool that connects users to access presence controls, IM, and voice capabilities. Each user can install the application tool on his or her desktop or laptop to intercommunicate with other users. Through the use of presence, Cisco Unified Communicator users have the ability to check a contact's availability before communication with his or her, thus "removing the real-time communications bottleneck that often inhibits business-to-business communications."³² Users of the Personal Communicator have the ability to set their presence status to a variety of states including available, away, on the phone, in a meeting, etc. In addition to presence, the Personal

³¹ Cisco. *Voice and Unified Communications*.

<http://www.cisco.com/en/US/products/sw/voicesw/index.html#~learn-more> (accessed January 2010).

³² Cisco. "Interdomain Federation — Enable Business-to-Business Exchange of Cisco and Microsoft Presence and IM." *Cisco.com*. 2009.

http://www.cisco.com/en/US/prod/collateral/voicesw/ps6788/vcallcon/ps6837/solution_overview_c22-514646.pdf (accessed January 2010).

Communicator has IM, video, voice, and desktop/document sharing capabilities all through a single interface. As figure 13 below illustrates, users can contact any of their stored contacts or access the company directory to contact any enterprise user.

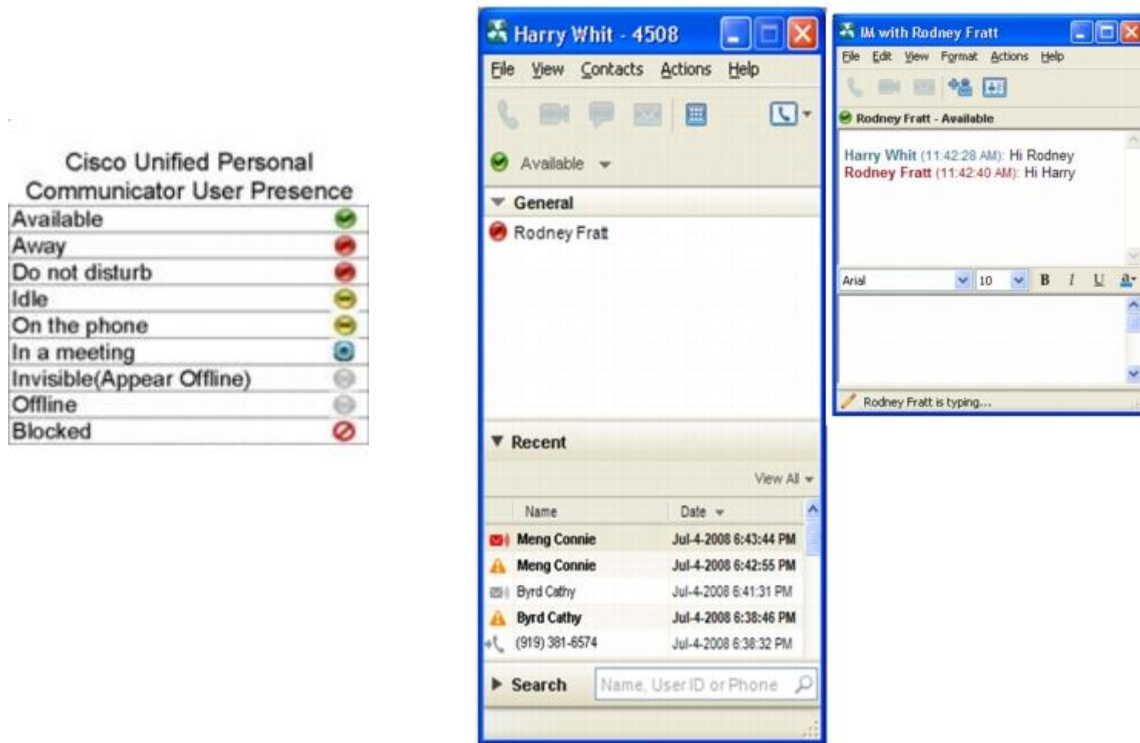


Figure 13: Cisco Presence and IM

For mobile users, Cisco introduced the Unified Mobile Communicator to its family of UC products. The capabilities of the Unified Mobile Communicator are very similar to those of the Personal Communicator except users are not bound to their desktop or laptop; instead much of the same information is accessible via their phone. As shown in figure 14 below, the interface for the Unified Mobile Communicator does not appear to be advanced, yet it provides mobile users many capabilities that enable them to be more efficient. Aside from the usual presence and voicemail capabilities, Unified Mobile Communicator allows users to place calls from the

mobile phone but appear as if they were in the office (single number access); thus, users can save on mobile calling costs by placing calls through the corporate telephony infrastructure rather than the mobile network. In addition, the Unified Mobile Communicator has the ability to move calls between other Cisco Unified IP phones without interruption. For instance, if a user wants to start a call with a customer from within his or her office but has to leave for another customer appointment, the user can transfer the call to his or her mobile device without the customer ever knowing. Lastly, the Unified Mobile Communicator gives the user complete access to the Cisco audio conferencing service without problems. The one-click conferencing feature allows any mobile user to access a Cisco conference at any time.



Figure 14: Cisco Unified Mobile Communicator

The Unified MeetingPlace is Cisco's conferencing solution that enables users to effectively create a virtual teaming space for instant interaction and collaboration through voice, instance messaging, and video communications. As shown in figure 15 below, users can share documents and collaborate in a real-time. The intuitive interface makes for an easy meeting setup, attendance, meeting management, and sharing among all users without the

hassle of a large download. Conference moderators are given complete control over voice, video, and web controls including the ability to mute all or certain lines. This on-premise conferencing service allows the delivery of on-demand conferencing that is not only feature rich but saves money.



Figure 15: Cisco MeetingPlace

In addition to Cisco's extensive suite of software UC products, it has a large selection of IP-enabled hardware products that makes integration seamless and easy, including:

- Cisco Unified Communications Manager – IP telephony call processing system.
- Cisco Unified Survivable Remote Site Telephony – IP call processing redundancy for remote branch offices and remote workers.
- Cisco Unified IP Series Phones – provide high-quality voice, video, and application collaboration through one appliance interface to enhance the user experience.

STRATEGY

Cisco's vision to the enterprise integration of Unified Communications is "to change the way people work, live, play and learn"³³ through the use of its products. Cisco has been on the forefront of many IP networking innovations, and the next phase of unified communications is no different. Cisco's strategy for the UC market is based on networking and leverages its majority IP networking market share, together with their extensive IP knowledge in the successful and seamless migration of its UC solution to its existing customer base.

ADVANTAGES

- Offers a full suite of UC capabilities
- Intelligent IP network infrastructure
- Modular scalability for each piece of UC element
- Market leader in networking and gateway products
- QoS built into hardware

Primary Competition:

- IBM SUT
- Microsoft OCS
- Avaya One-X
- Jabber XCP
- Mitel UC
- Shortel UC
- NEC UniVerge 360
- Siemens OpenScape Enterprise
- Nortel UC Application Suite

³³ Cisco. *Corporate Overview - fact sheet*. <http://newsroom.cisco.com/dlls/corpinfo/factsheet.html> (accessed January 2010).

PRICING

Solution Element	\$/User/Year
Presence/IM	\$3
Conferencing	\$65
Mobility/Telephony	\$15
CEBP	\$11
Total	\$75

Note: Pricing provided directly by vendors as part of a presentation delivered at Voice Con in Orlando 2009. Refer to Appendix A for more information about vendor pricing.

IBM

While the beginning of International Business Machines (IBM) dates into the 1880's, it wasn't until 1911 that it became incorporated making it one of the oldest technology companies in the world. Most widely known for its computer hardware and software for personal and business use, IBM also offers consulting and infrastructure services to enterprise businesses. IBM has been behind many of the world's technology evolution transformations including "Deep Blue," the world's first supercomputer designed to play chess and which was able to beat the reigning world chess champion. Today, IBM is a \$103 billion company with nearly 400,000 employees worldwide, making it one of the largest and most profitable companies in the world. While IBM is the veteran in the technology industry, it is the relative rookie when it comes to UC as it delivered their Sametime Unified Telephony solution after many of the featured vendors. Nevertheless, IBM's solution is feature rich and boasts the same benefits as other established vendors.

SAMETIME UNIFIED TELEPHONY (SUT) OVERVIEW

The movement by IBM to deliver real-time communications services is known as Unified Communications and Collaboration (IBM UC²). The IBM UC² vision is to make it easy for users to find, reach, and collaborate with others through a unified user experience. The primary driver behind this strategy is implemented by means of the IBM Lotus SUT software. IBM describes their UC solution as:



“IBM SUT is designed to make it easy to access and manage telephone communications from inside the Lotus Sametime or Lotus Notes client. The SUT offering extends the value of Lotus Sametime software as a platform for communications by providing a rich, unified communication and collaboration experience to users, allowing them to seamlessly and simply integrate voice, video, and telephony capabilities.”³⁴

Similar to many of the other UC vendors, IBM SUT deploys a user interface client, Lotus Sametime Connect, which users can install to access many of the UC features offered, including presence, IM, voice, and video. Figure 16 below illustrates an example of the IBM Lotus Sametime Connect client. As shown in the illustration, with the IBM Lotus Sametime Connect client installed, users can access their contact list and quickly view a contact’s presence. In this example, the user has his or her contact list segmented by business groups (i.e., mortgage team), thus enabling the user to quickly find an available contact within the specified business group if a question arises. In addition, the Sametime Connect client allows users to set their presence and update their preferred contact method.

³⁴ Dialogic. *Dialogic Media Gateways for IBM Lotus Sametime Unified Telephony*. <http://www.dialogic.com/solutions/uc/ibm.htm> (accessed January 2010).

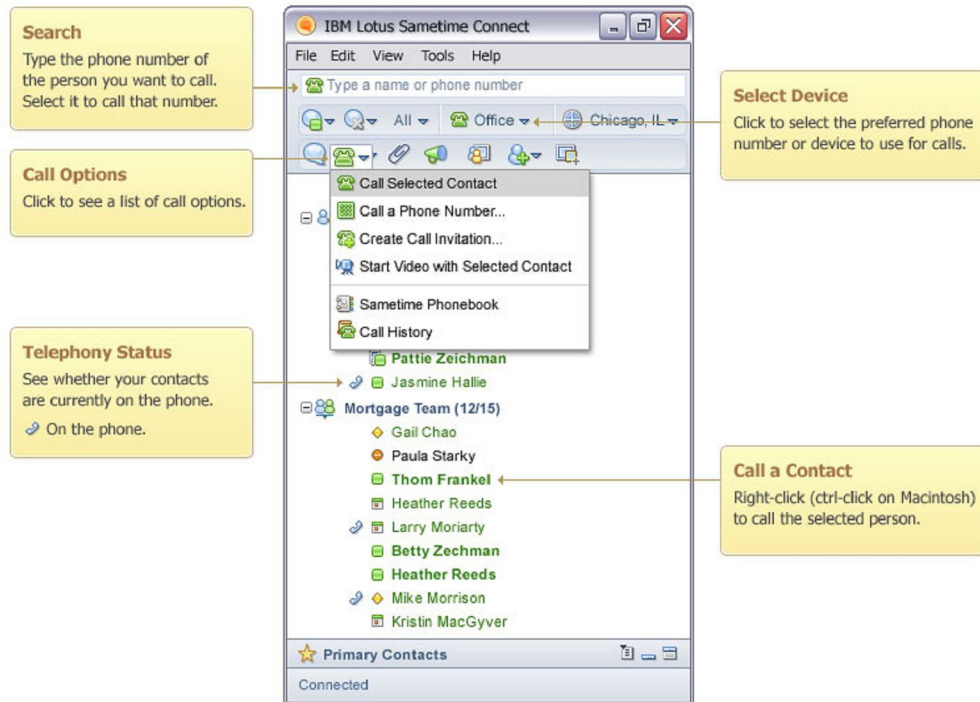


Figure 16: IBM Lotus Sametime Connect

In addition to presence, the IBM Lotus Sametime Connect client can be used as a soft phone to make and receive telephony voice calls. Starting a call with the IBM Lotus Sametime Connect client is extremely intuitive: users simply click-to-call any of the contacts in their list or search the company directory for the contact. The user's preferred contact information is used in making the outbound call, whether it is a Sametime Connect-to-Sametime Connect call, Sametime Connect-to-mobile phone, or any other preferred telephony device. Figure 17 below illustrates an example voice call being made by the IBM Lotus Sametime Connect client. While connected, the IBM Lotus Sametime Connect client provides users with many of the features

they are accustomed to when using a standard telephone including muting, caller-on-hold, transfers, and conferencing all accessible via the Sametime Connect interface.

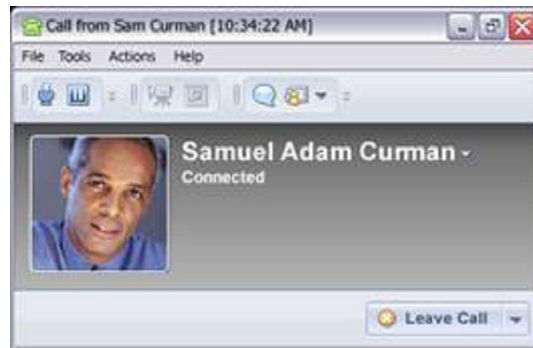


Figure 17: IBM Lotus Sametime Connect Voice Call

The IBM SUT software extends beyond the desktop and can be used on a variety of smart phones for Sametime mobility. Mobile or remote users can access the same features as an office worker through the SUT mobility software including presence controls, contact directory information, IM, and click-to-call phone and conferencing capabilities. The IBM SUT mobility software is available for a variety of business smart phones including the Apple iPhone and the RIM BlackBerry device (figure 18).



Figure 18: IBM SUT Mobile Software

The IBM SUT software also gives its users conferencing capabilities through its online meeting place. With the IBM SUT software, users no longer have to reserve a conference ahead of time; rather, the SUT software allows for *ad hoc* conferencing anytime. Like the IBM Sametime connect software, the IBM SUT meeting software is extremely intuitive yet feature rich. As shown in figure 19 below, users have a meeting panel that displays video, participant information (including presence), a library of sharable content, and a discussion board. Moderators have sophisticated user interface options to control the telephony including muting users, recording conference calls, and granting user controls. In addition, the IBM SUT intelligence software allows all participants to visually see who is speaking in order to avoid any confusion. Lastly, the IBM SUT meeting software is available via a browser-based software; therefore, no large downloads are needed for participating in online meetings.



Figure 19: IBM Lotus Sametime Online Meetings

STRATEGY

The IBM UC² strategy differs from other strategies as it attempts to unify the user experience while leveraging the existing IT and telephony infrastructure. The IBM SUT software is not replacement software; rather, it is considered an add-on enhancement that builds upon and adds additional value to an existing communications network. This type of approach is beneficial to the decentralized companies that utilize disparate, mixed, multi-vendor communication solutions in a variety of locations, divisions, or business segments. The IBM SUT software is designed to easily integrate with these mixed fragmented communication networks while implementing a complete unified communications system to leverage existing technology to continuously improve the overall business process through collaboration. “The IBM UC

solution provides the essential software, service, hardware, and strategic alliances that enterprises need to connect people to applications, data, and to one another—virtually anytime, anywhere.”³⁵

ADVANTAGES

- Offers a full suite of UC capabilities yet modular for various enterprise needs
- Open and extensible platform allowing integration with multiple voice communication partners
- Most experience with technology innovation

CHALLENGES

- Relatively new in the UC space

Primary Competition:

- IBM SUT
- Microsoft OCS
- Avaya One-X
- Jabber XCP
- Mitel UC
- Shortel UC
- NEC UniVerge 360
- Siemens OpenScape Enterprise
- Nortel UC Application Suite

³⁵ Page, T., and J. Reser. "Understanding IBM Lotus Sametime Unified Telephony." *IBM.com*. November 2008. <http://www.ibm.com/developerworks/lotus/documentation/sametime/d-ls-understandingsut/index.html#download> (accessed January 2010).

PRICING

Solution Element	\$/User/Year
Presence/IM	\$51
Conferencing	
Mobility/Telephony	
CEBP	Included
Total	\$51

Note: Pricing provided directly by vendors as part of a presentation delivered at Voice Con in Orlando 2009. Refer to Appendix A for more information about vendor pricing.

RESEARCH IN MOTION (RIM)

The name Research in Motion (RIM) may not be the most widely known among the other communications vendors, but its award-winning product, the BlackBerry, is one of the most widely used mobile devices among enterprise businesses. Founded in 1984, RIM was named one of *Fortune* magazine's fastest growing companies. Today, RIM is a publically traded company that has approximately 12,000 employees worldwide and earned approximately \$11 billion in 2009. The popular BlackBerry device owns 40% market share and brings e-mail, calendars, contact directories, and voice capabilities to thousands of mobile users. In 2007, RIM announced its BlackBerry Mobile Voice System (MVS) at the Wireless Enterprise Symposium, which was designed to extend the communication capabilities of mobile users.

BLACKBERRY MOBILE VOICE SYSTEM (MVS) OVERVIEW

The BlackBerry Mobile Voice System (MVS) allows users to have enterprise voice and data on a single BlackBerry device, thus removing the disconnect users experience when on the road or working remotely. The BlackBerry MVS solution differs from other vendors' solutions as it completely focuses on mobility. Other UC features such as presence and IM are not offered in the MVS solution. RIM describes its own MVS solution as:



“BlackBerry MVS mobilizes PBX systems, bringing office phone features to BlackBerry smart phones. BlackBerry MVS is designed to unify fixed and mobile voice communications to provide one business phone number, one caller ID, one voice mailbox, and office phone features through BlackBerry smart phones”³⁶

Many enterprise businesses already equip their mobile users with BlackBerry devices, but the BlackBerry MVS solution is designed to leverage the existing communications infrastructure, including the existing PBX system, for a much more feature-rich solution. In doing so, businesses can still take advantage of many of the in-house call reporting features the PBX offers. The BlackBerry MVS solution, along with the BlackBerry smart phones, utilizes two enterprise servers to connect mobile users to the enterprise network (figure 20 below). These additional enterprise servers act as a level of security between the mobile network and the enterprise network, authorizing a user’s mobile BlackBerry device access to the enterprise network. In addition, the enterprise servers act as the control behind many of the UC features introduced in the MVS solution including call routing, voicemail access, and call moving/transfers.

³⁶ RIM - Blackberry. *BlackBerry Mobile Voice System*.
http://na.blackberry.com/eng/services/blackberry_mvs/ (accessed January 2010).

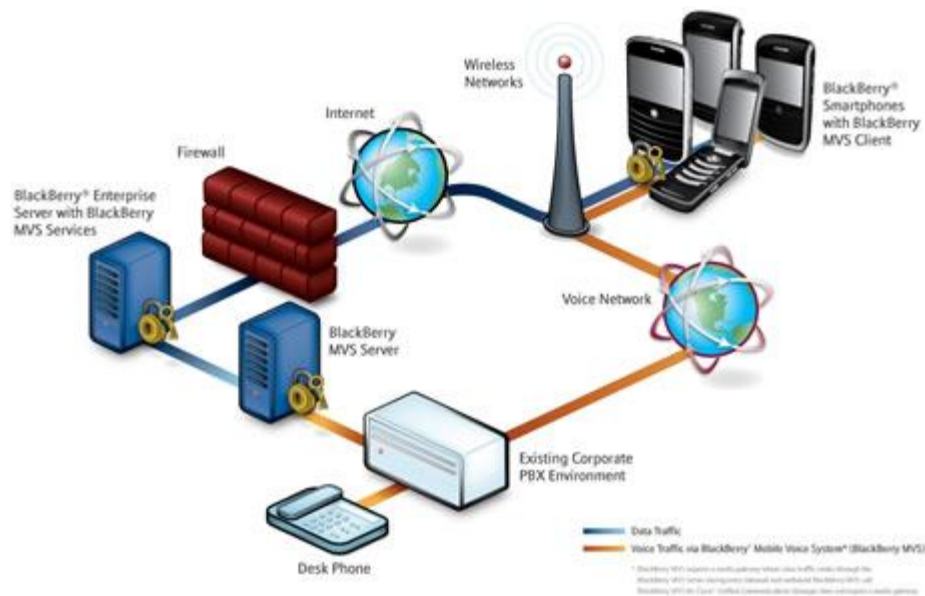


Figure 20: RIM BlackBerry MVS architecture

No longer are users bound to their desks. The BlackBerry MVS solution promotes effective productivity through mobility as its users have the same access to information whether in the office or on the road. In doing so, the BlackBerry MVS software features call routing capabilities, which allows users to distribute one phone number to customers that will reach them wherever they are. This seamless communication path allows increased user accessibility and a decreased chance of missing calls. In addition, the MVS software allows BlackBerry users to make calls to customers and appear as if they originated from the user's office desk phone, thus simplifying the process not only for the user but the customer as well.



Figure 21: RIM BlackBerry MVS incoming call

In addition, the BlackBerry MVS solution eliminates the need for multiple voicemail systems for desk and mobile networks. Instead, the BlackBerry MVS solution employs a single voicemail box for all communication devices, thus enabling the user to only have to check one voicemail box rather than multiple boxes.

Other features of the BlackBerry MVS solution include the ability to move calls to and from the desk phone during a call. For instance, as figure 22 below illustrates, if an incoming call arrives on the BlackBerry device, the MVS software can seamlessly move the call to the user's desk phone without the caller knowing. The same procedure can be done if a call arrives on the user's desk phone; using the MVS solution, the user can seamlessly move the call to his or her BlackBerry device for mobility.



Figure 22: BlackBerry MVS - Move call to smart phone

STRATEGY

The critical piece to the success of the MVS solution is already in place in many enterprise businesses today: the BlackBerry device. RIM can leverage the fact that many enterprise users are already equipped with a BlackBerry device in adopting their mobile UC solution. The MVS solution delivers a true in-house convergence between the existing communications network to a wireless/mobile network while preserving much of the existing communications investments. This strategy not only increases productivity and user effectiveness but also eliminates the need for enterprise businesses to remove any previous large investments (i.e., PBX and voicemail systems).

ADVANTAGES

- Enterprise communications extension/add-on
- Interoperates with many existing communications infrastructures
- Users can toggle between desk and mobile phone seamlessly

CHALLENGES

- Not a complete solution - only offers mobility

Primary Competition:

- IBM SUT
- Microsoft OCS
- Avaya One-X

PRICING

Solution Element	\$/User/Year
Presence/IM	
Conferencing	
Mobility/Telephony	\$22
CEBP	
Total	\$22

Note: Pricing provided directly by vendors as part of a presentation delivered at Voice Con in Orlando 2009. Refer to Appendix A for more information about vendor pricing.

Chapter 4: COST-JUSTIFY THE INVESTMENT AND ROI

Today, enterprise businesses are asking more than, “Will there be a return on investment?” when making important investment decisions. Instead the question will be, “How long before there is a positive return on investment?” Unfortunately, the current state of the economy creates a lack of investing among enterprise businesses due to uncertainty in the marketplace, creating a challenge for vendors to increase interest in their products. The risk associated with any of today’s investments needs to be minimal, and the proof of a positive return needs to be widely apparent. According to an *Information Week* research survey on “Reasons not to deploy Unified Communications,” the top answer was “difficult to measure or prove ROI” The two proposed benefits of UC, reduced costs and increased revenue, attempt to overcome an investor’s fears of a UC investment, but the proof still remains. In this section, the study will examine the proposed benefits and analyze the potential savings to cost justify the investment and prove ROI.

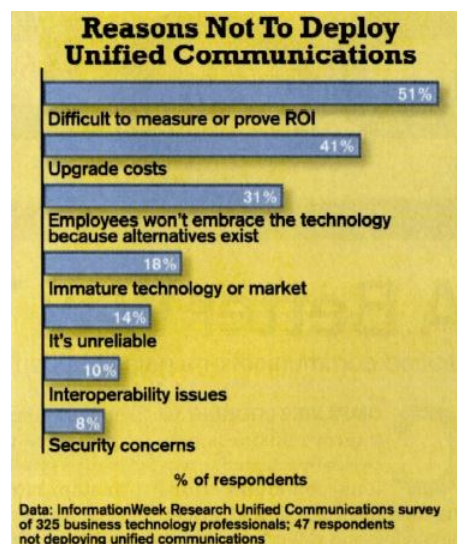


Figure 23: Reasons Not to Deploy UC

CALCULATING ROI PROCEDURES AND ASSUMPTIONS

Determining ROI is the most important calculation an enterprise business needs to make to ensure the investment decision contains a viable benefit. Unfortunately, as research shows, enterprise businesses are having difficulty demonstrating a clear ROI when deciding to implement a UC solution. This is in part due to some of the non-tangible benefits a UC solution

brings to an enterprise business such as increases in efficiency and productivity. To add to the complexity, not every business benefits the same: the increases in productivity and efficiency for a mortgage company may not equate to the same increase in revenue as a technology company. As a result, the benefit calculations used in this study are based on a variety of assumptions that facilitate a monetary savings estimate for determining ROI.

The study below examines two categories of benefits from UC: Reduced Costs and Increased Revenue. Each benefit proposes a variety of methods in which any enterprise business can benefit from a UC solution. The reduced cost benefits are based on tangible savings that an enterprise business may experience if a UC solution is introduced and utilized correctly. Much of the data used in the calculations are supported with industry averages and therefore will remain as an estimate. A more accurate figure would be available for an enterprise business if the savings formula were utilized with real numbers by a specific company. For each formula, the estimated enterprise savings are based on the lower end of the benefit, meaning these would be the minimum potential savings an enterprise business could expect, not the maximum. For purposes of this study, the total reduced costs calculation assumes that the enterprise business will experience all of the benefits discussed to produce a yearly savings amount. In a real-world scenario, an enterprise business may not experience each savings benefit depending on the focus of their operation.

The increased revenue benefits category is based on non-tangible benefits that an enterprise business can experience through increased productivity and/or increased efficiency. Each increased revenue benefit proposed by UC must answer the question, how many minutes

can each user save per day by communicating more effectively? Each minute saved doing routine tasks could have been spent more efficiently on other more critical tasks. The difficulty arises as one minute saved for one company may increase revenue more than for another company, although calculating ROI requires that each benefit needs to be reduced to the common denominator: money. Therefore, for purposes of this study, each of the revenue-increasing benefits will be derived from a variety of real-world vendor case studies. Each case study will be summarized along with the benefit achieved. In the cases where a time savings estimate was present, the estimated time saved will be converted into a financial value. In doing so, this study assumes that the value of one's time is equal to his or her hourly salary rate – for this study, each employee will have the same hourly federal minimum wage (\$7.25) when used to calculate ROI (Refer to Appendix B for further breakdown). The remaining non-tangible benefits that cannot be converted will still be explored but excluded from the ROI calculation. In the end, the increased revenue total will be an average derived from each case study's increased revenue estimate in conjunction with the simulated company. Again, these increased revenue estimates are based on assumptions but can be used by any enterprise business to gauge expectations for a UC solution.

REDUCED COSTS

The reduced cost category will explore five benefits: travel expenses, conferencing service fees, cellular bills and toll charges, facility expenses, and carrier expenses. These estimates are based on the simulated company created for vendor pricing in Chapter 3 (also referenced in Appendix A).

Travel Expenses

The following savings formula can be used to calculate the estimated amount an enterprise business would save if a portion of its business travel was reduced:

Estimated Travel Expense Savings Per Year = # of traveling employees x Average trips per year/travelling employee x Average cost per trip x Estimated Trip Reduction using UC

Number of traveling employees

According to the U.S. Travel Association travel facts and statistics, one in five U.S. adults is expected to travel for business in the next six months. Assuming that number holds true for this simulated company, this 20% will be the primary source of regular travel throughout the year:

200

Average trips per year per travelling employee

According to the U.S. Travel Association travel facts and statistics, the majority of business travels will expense 3.9 trips (~1 per quarter)³⁷:

3.9

Average cost per trip

Based on the 2008 and 2009 American Express Business travel release, the average cost per trip for an employee is \$1,480 which includes airfare, car rental, hotel, dining, and airport parking³⁸:

\$1,480

Estimated Trip Reduction Using UC

Assuming by implementing a UC solution, the enterprise business can save 1 trip per 2 employees (12.5%) not having to travel:

12.5%

Estimated Travel Expense Savings Per Year = \$144,300

³⁷ U.S. Travel Association. *Travel Facts and Statistics*. 2009. <http://www.ustravel.org/news/press-kit/travel-facts-and-statistics> (accessed January 2010).

³⁸ American Express. "2010 Global Business Travel Forecast." *AmericanExpress.com*. September 30, 2009. http://home3.americanexpress.com/corp/pc/2009/f2010_print.asp (accessed January 2010).

Conferencing Service Fees

The following savings formula can be used to calculate the estimated amount an enterprise business would save if it eliminated the conferencing service fees by switching from a third-party conferencing source to an in-house UC solution:

Estimated Conferencing Service Fee Savings Per Year = Usage charges per user per month x Conference users in busy hour x 12 months

Usage charges per user per month

Averaging four of the more popular third party web conferencing applications:

GoToMeeting.com = \$49.00 per month

Dimdim.com = \$25.00 per month

Adobe Connect Pro = \$45.00 per month

Zoho Meeting = \$35.00 per month

\$38.50

Conference users in busy hour

Based on the pricing assumptions for vendor considerations, there will be 150 conferencing users in the busy hour:

150

Estimated Conferencing Service Fee Savings Per Year = \$5,775

Cellular Bills and Toll Charges

The following savings formula can be used to calculate the estimated amount an enterprise business would save if a portion of its toll charge and cellular bill was reduced through a UC implementation:

Estimated Toll Charge and Cellular Bill Savings Per Year = (Average Long Distance Minutes per month x Average Long Distance Charge Per Minute x Estimated Reduction) + (Average cellular usage per month x Estimated Reduction x # of Mobile users) x 12 months

Average Long Distance Minutes per month

100% of employees will have (4) one-hour meetings per month (240 minutes average per user per month)

**480,000
minutes**

Average Long Distance Charge per month

Assumption based on the average price per minute for three major carriers (excludes subscription, service, and tax fees):

**6.9¢ per
minute**

AT&T Long Distance = 10¢ per minute³⁹

Quest Long Distance = 5¢ per minute⁴⁰

Verizon Long Distance = 5.7¢ per minute⁴¹

Estimated reduction

Estimating that each employee can reduce long-distance calling 30 minutes per month (one half-hour meeting) by replacing with VoIP-to-VoIP calling, Instant Messaging, or Intelligent VoIP-to-TDM routing:

12.5%

³⁹ AT&T. *Compare AT&T Calling Plans*. <http://www.shop.att.com/plancomparison.jsp> (accessed January 2010).

⁴⁰ Qwest. *Residential: Long Distance Rates*. http://www.qwest.com/residential/ld/index_oor.html (accessed January 2010).

⁴¹ Verizon. *FlexDistance Calling Plan*.

http://www22.verizon.com/longdistance/business_east/plan_flexdistance_east.jsp (accessed January 2010).

(Cellular Bills and Toll Charges continued...)

Average cellular usage per month

Based on the average unlimited voice and smart-phone data plan offered by the leading providers, the average cost per cell phone per month would be:

\$99

Verizon Wireless Unlimited = \$99.00 ⁴²

AT&T Wireless Nation Unlimited = \$99.00 ⁴³

Estimated reduction

Many wireless carriers allow an unlimited number of minutes to a designated number; thus, users can set their designated numbers to the UC solutions and makes outbound calls from there. In doing so, each enterprise user's cell phone plan from "unlimited voice and smart-phone data" to a plan with reduced minutes and a set amount of designated numbers can reduce each account by:

15%

Verizon Wireless Unlimited = \$89 (\$59 talk + \$30 data) ⁴⁴

Number of Mobile Users

Based on the pricing assumptions for vendor considerations, there will be 400 mobile users:

400

Estimated Toll Charge and Cellular Bill Savings Per Year = \$120,960

⁴² Verizon. *Individual Plans*.

<http://www.verizonwireless.com/b2c/splash/plansingleline.jsp?lid=//global//plans//individual> (accessed January 2010).

⁴³ AT&T Wireless. *Nation Unlimited Calling Plan*. http://www.wireless.att.com/cell-phone-service/cell-phone-plan-details/?q_sku=sku3830293&q_planCategory=cat1370011 (accessed January 2010).

⁴⁴ Verizon. *Individual Plans*.

<http://www.verizonwireless.com/b2c/splash/plansingleline.jsp?lid=//global//plans//individual> (accessed January 2010).

Facility Expenses

The following savings formula can be used to calculate the estimated amount an enterprise business would save if a portion of its facility expense was reduced from a UC implementation:

Estimated Facility Savings Per Year = Average Square Foot Usage per Employee x Average cost per Square Foot per year x # of potential teleworking employees

Average Square Foot Usage per Employee

According to OfficeFinder.com, the square foot usage per employee is⁴⁵:

220ft

Average cost per Square Foot per year (lease)

According to the Grubb & Ellis 2010 Metro Office Rental Rates for a Class A building, the price per square foot ranges from \$70.12 in New York City to \$14.00 in Kalispell, MT, with the average being approximately:

\$25/ft

Number of potential teleworking employees

The amount of employees who would be able to work from a remote location without the use of a facility is estimated to be 1%:

20

Estimated Facility Savings Per Year = \$110,000

⁴⁵ OfficeFinder. *Office Space Calculator*. <http://www.officefinder.com/officespacecalc.html> (accessed January 2010).

Carrier Expenses

The following savings formula can be used to calculate the estimated amount an enterprise business would save if a portion of its carrier expense was reduced through a UC implementation:

Estimated Carrier Expense Savings Per Year = Estimated Cost Per Trunk per Year x Estimated Number of Trunks Reduced

Estimated cost per trunk per month

The average monthly cost for an analog trunk is approximately \$30. Each of the 24 remote branches will utilize 1 analog trunk per 8 users. Each remote site has approximately 50 employees therefore 6-7 trunks per site will be needed. Estimated total cost per year for all sites is: \$5,040

\$65,040

In addition, the on-going support and maintenance for PBX hardware and software, including phone moving, adding, or changing an employee phone line, is approximately \$50 per user per year. The estimated total cost per year for all sites for PBX maintenance is: \$60,000

Number of trunks reduced

Assuming that each site was able reduce the number of analog trunks needed to four by converting to VoIP, then utilize a UC TDM-to-IP gateway for the trunks instead of a PBX, the enterprise business is estimated to save at least:

Estimated Carrier Expense Savings Per Year = \$45,528

REDUCED COSTS SUMMARY

Figure 24 below summarizes the five reduced costs benefits and the yearly savings potential. Based on the assumptions, the most effective savings in this scenario came from the reduced travel, whereas the least potential came from conferencing fees. The total yearly reduced costs estimation assumes the simulated company will take full advantage of the UC implementation and therefore reap each of the five reduced cost rewards totaling a yearly savings of **\$426,563**.

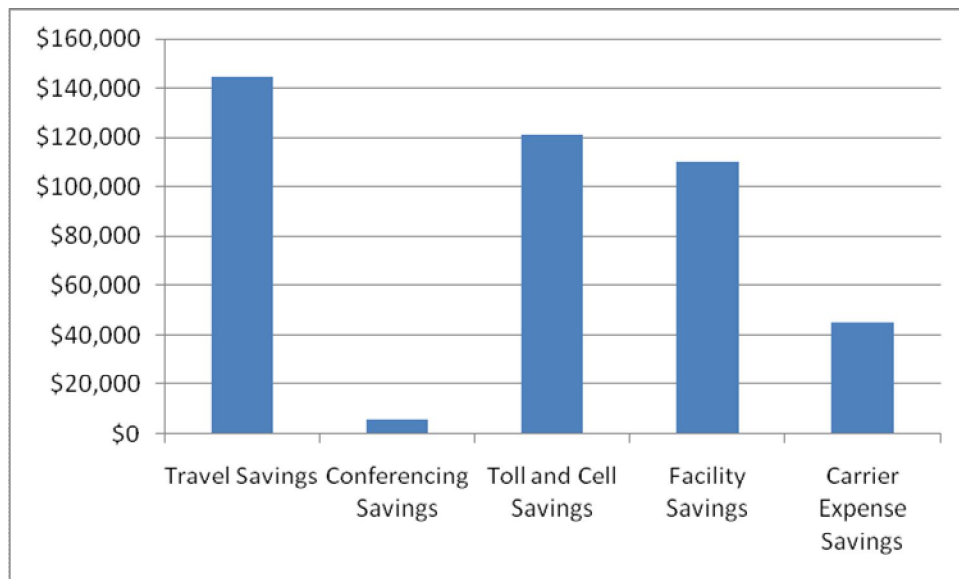


Figure 24: Reduced Costs Summary Graph

INCREASED REVENUE

Five benefits are explored in the increased revenue category: improve enterprise efficiency, streamline tasks, improve workflow, shorten project life cycles, and improve customer interaction. Ten case studies from various vendors have been reviewed with the benefits highlighted (grey boxes) and converted where possible into a tangible dollar saved per employee (green boxes). Refer to Appendix B for all formulas used in calculating increased revenue.

Baylor Health Care System – RIM BlackBerry

Baylor Health Care System is one of the largest nonprofit care organizations with over 15,000 employees spread over North America. The objective was to increase productivity and reduce costs through efficient resource allocations. Baylor Health Care System found through using the RIM BlackBerry solution that it was able to build a custom application enabling it to remotely manage critical business systems. Baylor Health Care Systems found that it was able to ***improve workflow*** and ***streamline tasks*** through the new system as it had built a change management tool directly into the application, thus getting the approval forms delivered wirelessly to the correct decision makers. Baylor Health Care Systems estimates it reduced its approval process from 5 days to 15 hours for each request.

**87%
reduction in
response**

First Community Bank - Cisco Unified Communications

First Community Bank is a financial services provider located in Albuquerque, New Mexico, with 900+ employees in more than 64 branches. The objective was to quickly facilitate integrating new branches throughout the area. Using Cisco Unified Communications, First Community Bank was able to increase enterprise efficiency and save \$400,000 in PBX system costs for 24 new branches and reduce the time needed for technicians to visit branches for PBX changes, saving \$100,000 each year.

\$400,000 PBX systems

\$100,000 PBX tech fees

Estimated Enterprise Efficiency = \$500,000

Global Crossings – Microsoft OCS

Global Crossings is an international telecommunications service provider based in Florham Park, New Jersey, with 5,000+ employees worldwide. The objective for Global Crossings was to implement a communications system that leveraged its existing infrastructure while increasing efficiency among its employees. With the Microsoft OCS, Global Crossings was able to improve workflow and estimates it was able to save its employees 20 minutes per day through more efficient communications including presence, quicker directory searches, and instant messaging.

Saved 20 minutes per day

Estimated Improved Workflow Per Employee = \$627.85

Heinz – RIM BlackBerry

Heinz is an international food company spread over 50 countries and is most widely known for its ketchup. The objective for Heinz was to expedite the store audit quality process, as the existing paper system had a large lag between when the data was gathered and when it was analyzed. Heinz found through the RIM BlackBerry solution they were able to develop a wireless auditing system that improved workflow and saved two hours per day by not having to manually key in data. As a result, Heinz was able to increase the number of audits per year by 10-20%.

**120 minutes
per day saved**

Estimated Improved Workflow Per Employee = \$5,220

Microsoft IT – Microsoft OCS

Microsoft decided to implement a company-wide UC solution and conduct a business value evaluation to measure efficiency and productivity. As part of the solution, Microsoft IT delivered IM, presence, conferencing, and voice to their 100,000+ employees and measured the impact. Microsoft IT found that by using Microsoft OCS, it was able to ***improve workflow*** and save 28 minutes per day per employee through Microsoft OCS and increase sales proposals by 6.5%.

**28 minutes
per day saved**

Estimated Improved Workflow Per Employee = \$879.42

The National Workers' Housing Fund Institute (Infonavit) – Microsoft OCS

Infonavit is a federal housing assistance company throughout Mexico

designed to assist the Mexican workforce purchase homes. Infonavit has approximately 4,000 employees spread over 80 remote offices throughout

Mexico. The objective for Infonavit was to implement a communications solution that would allow its decentralized workforce to easily communicate and collaborate. Infonavit found through using Microsoft OCS, they were able to **improve workflow** and **streamline tasks** as Infonavit employees could now get email, voice, and messaging on a single device. Infonavit estimates that with the new UC solution, it will be able to save 30 minutes per day.

**30 minutes
per day saved**

Estimated Improved Workflow Per Employee = \$924.50

Reeds Jewelers – Microsoft OCS

Reeds Jewelers is a retailer based in Wilmington, North Carolina, with 67 retail stores throughout the United States and 600+ employees.

The objective for Reeds Jewelers was to implement a communications system that helped its employees be more efficient and improve system

uptime. Reeds Jewelers found that by using Microsoft OCS they were able to improve **enterprise efficiency** through reduced communication system troubleshooting by 80% (from two hours a day to two hours per week), and infrastructure costs by 90%.

**80% time
savings
troubleshooting
communications
system**

Estimated Improved Enterprise Efficiency Per Employee = \$50,000*

*Based on 5 full-time support employees

Thiess – Cisco Unified Communications

Thiess is an international mining, construction, and services contractor based in Queensland, Australia and has locations throughout the world with 15,000+ employees. Thiess found that the last few minutes leading up to a deal deadline are the most critical and could ultimately lead to either winning or losing the deal. Therefore, the objective was to increase communications among the global community and increase productivity. Thiess found that through Cisco Unified Communications it was able improve customer interaction and improve workflow by locating and collaborating with the right decision makers quicker and easier through presence and IM. Thiess estimates that it was able to reduce turnaround 97% (from two days to 30 minutes) and positions them to win more deals.

**97%
reduction in
turn-around
time**

Voith IT Solutions – Cisco Unified Communications

Voith IT Solutions is a manufacturing company based out of Austria and has locations throughout the world with 37,000 employees worldwide. Voith IT Solutions is one of the world's largest paper producing machines in the world. The objective is to reduce costs, increase collaboration among global community, and accelerate time to market. Voith IT solutions found that while using Cisco Unified Communications, it was able to increase enterprise efficiency through managing communication services much easier. Voith IT Solutions was able to reduce the number of man-hours used to manage communication services by 83% (from 3 people to 0.5). In addition, Voith IT Solutions was able to reduce

**83%
reduction in
needed
support**

**25% cycle
time
reduction**

project life cycle for the time to design a custom-made printing machine by 25% (from 24 months to 18 months) through improved collaboration.

Estimated Improved Workflow = \$75,000

Reduced Project Life Cycle Savings Estimation per 12 projects = \$45,420

Warner Pacific Insurance Service – Cisco Unified Communications

Warner Pacific Insurance Services is an insurance provider in Westlake

Village, California, with +100 employees including approximately 70 teleworkers. The objective was to reduce communication costs while

**\$84,000 LAN
line removal**

embracing future growth. Through Cisco Unified Communications, Warner

Pacific Insurance servers was able to increase **enterprise efficiency** and

**\$48,000 PBX
maintenance**

convert all teleworkers to mobility, saving \$84,000 per year in home LAN lines

and \$48,000 per year in PBX maintenance.

Estimated Enterprise Efficiency = \$132,000

REVENUE SUMMARY

The ten case studies from the various vendors provide a practical outlook to what real-world buyers are doing with UC. UC is more than a cost-cutting mechanism; rather it is an opportunity to equip their workforce with the tools to work more efficiently and produce better results. Figure 25 below is a summary of each the ten case studies, separated into benefit categories. For purposes of this study, in the “Improved Workflow” category, the estimated time savings per employee was converted into estimated money saved and then applied to the simulated company profile. For instance, in cases where the savings benefited the entire company (Global Crossing, Microsoft IT and Infonavit), the estimated savings were multiplied by 2000 employees (100%), whereas the savings which benefited only mobile users (Heinz) were multiplied by 400 employees (20%). The end result was an average savings of 25.5 minutes per day per employee which is estimated to save the simulated company over **\$1.7 million**. From the five related case studies, the “Project Cycle Time and Enterprise Efficiency” category yields an average savings of over **\$160 thousand**. Lastly, the two case studies experienced a reduction in response time by an average **85% savings**.

VENDOR CASE STUDY SUMMARY		
IMPROVED WORKFLOW		
Case Study	Savings Per Employee	Simulated Company
Global Crossings	\$627.85 or 20 mins/day	\$1,255,700 per year
Heinz (400 mobile users)	\$5,220 or 120 mins/day	\$2,088,000 per year
Microsoft IT	\$879.42 or 28 mins/day	\$1,758,850 per year
Infonavit	\$924.50 or 30 mins/day	\$1,849,000 per year
AVERAGE IMPROVED WORKFLOW SAVINGS = \$1,737,887 or 25.5 MINS/DAY/EMPLOYEE		
PROJECT CYCLE TIME AND ENTERPRISE EFFICIENCY		
Case Study	Estimated Savings	
First Community Bank	\$500,000	
Voith IT Solutions	\$45,420 Project Cycle Time \$75,000 Enterprise Efficiency	
Reeds Jewelers	\$50,000	
Warner Pacific Insurance Service	\$132,000	
AVERAGE PROJECT CYCLE TIME AND ENTERPRISE EFFICIENCY SAVINGS = \$160,484		
REDUCTION IN RESPONSE TIME (ENTERPRISE EFFICIENCY)		
Case Study	Estimated Reduction in Response Time	
Baylor Health Care System	87% Reduction in response time	
Voith IT Solutions	83% Reduction in response time	
AVERAGE 85% REDUCTION IN RESPONSE TIME		

Figure 25: Vendor Case Study Summary

THE RETURN ON INVESTMENT

The ROI is the bottom line figure that enterprise businesses can use to determine the value of any potential investment. In this study, two ROI numbers will be factored to prove the importance of implanting UC with a purpose: ROI for reduced costs and ROI for increased revenue. The formula being used for calculating ROI is:

$$\text{Return On Investment} = (\text{Total Estimated Savings} / \text{Total Estimated Investment}) \times 100$$

Before actually calculating the ROI, the estimated total cost of ownership (TCO) needs to be calculated. In doing so, the estimated vendor pricing will be used from Chapter 3 (figure 26 summary below) along with the additional estimated costs associated with implementing UC (services, hardware, and devices) to calculate the estimated vendor licensing pricing.

TOTAL COST OF OWNERSHIP SUMMARY				
	Microsoft	Cisco	IBM	RIM (mobile only)
UC Licensing Price/Employee/Year	\$75	\$75	\$51	\$22
Price Per 2000 Employees	\$150,000	\$150,000	\$102,000	\$8,800
Estimated Services	\$404,000	\$404,000	\$404,000	\$80,800
Estimated Hardware	\$108,000	\$108,000	\$108,000	\$21,600
Estimated Devices	\$788,000	\$788,000	\$788,000	\$157,600
TOTAL	\$1,450,000	\$1,450,000	\$1,402,000	\$268,800

Figure 26: Total Cost of Ownership Summary

Note: Refer to Appendix C for itemized break down pricing estimations.

REDUCED COSTS ROI

Using the ROI formula, the total estimated reduced costs savings were \$426,563 for Microsoft, Cisco, and IBM and \$230,960 for Mobile only savings (RIM). The total cost of ownership for each of the four vendors, the average ROI, yielded an average 70% return by simply reducing expenses through UC. It was estimated that by using this return rate, the investment would see a positive ROI between years 4 and 5 – and between years 1 and 2 for Mobile only savings (RIM).

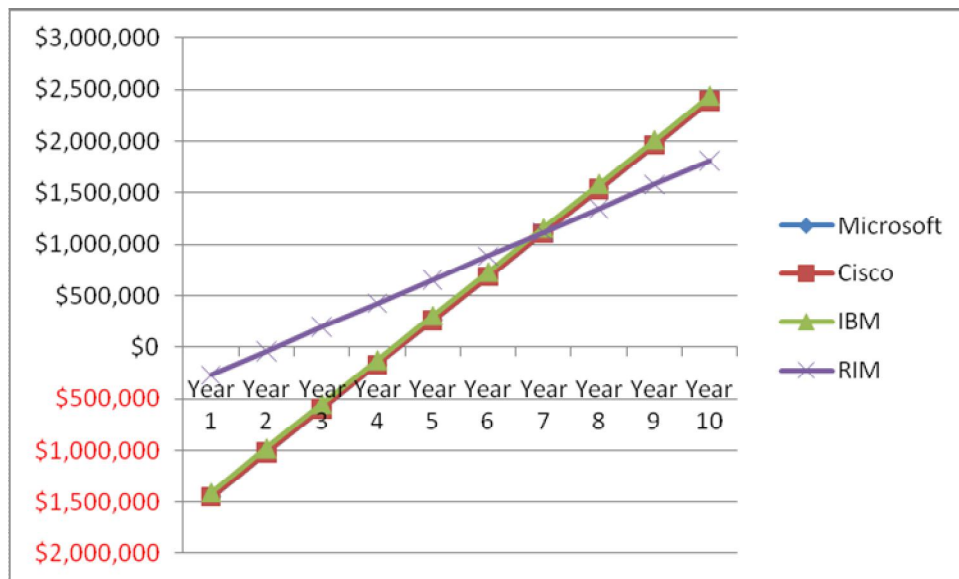


Figure 27: ROI for Reduced Costs

INCREASED REVENUE ROI

Again using the ROI formula, the total estimated increased revenue for time saved was \$1,737,887 for Microsoft, Cisco, and IBM and \$2,088,000 for Mobile only savings (RIM). The total cost of ownership for each of the four vendors, the average ROI, yielded an average 121% return by simply saving 25.5 minutes per day. It was estimated by using this return rate, the investment would see a positive ROI between years 1 and 2.

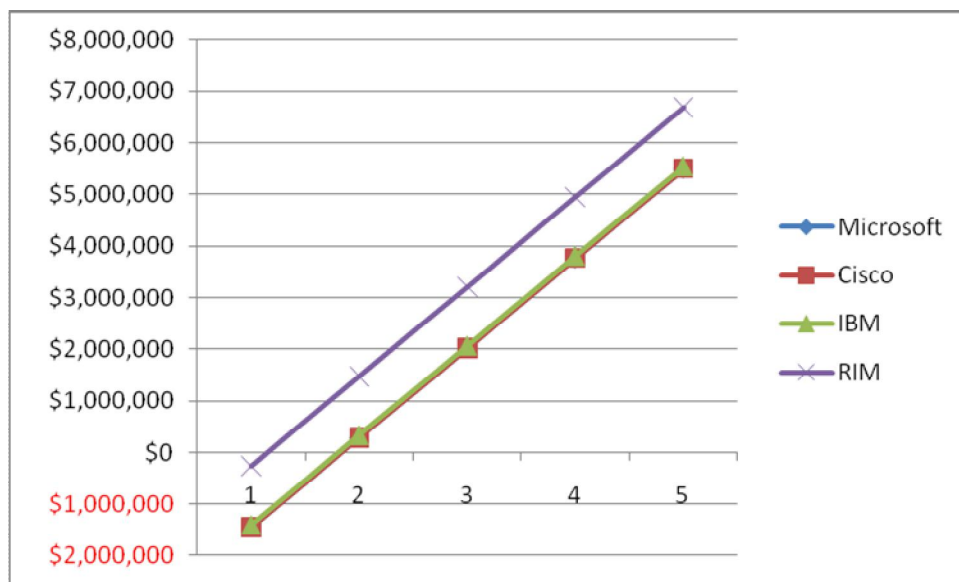


Figure 28: ROI for Increased Revenue

USING METCALFE'S LAW TO DEVELOP A UC STRATEGY

Developing a strategy for implementing UC is not easy. UC is still in the early years of its adoption phase; therefore, a best-known method (or best-known practices) does not exist at this time. Robert Metcalfe's law states that the value or power of a telecommunications network increases in proportion to the square of the number of nodes on the network. Thus, as the network grows, so does the value. In other words, a communications network is more valuable when more people can be called. Metcalfe's law holds true for UC-- the true value of a UC solution can only be best realized when it is utilized by the majority of employees within the enterprise business especially spread across remote locations. As the ROI calculations have proven, a significant savings occurs when travel and toll costs are reduced through UC; however, to maximize the return the UC strategy needs to be organized so that the majority of its users can take advantage of these benefits and avoid creating silos of features among groups who do not share resources. For example, an enterprise business where employees collaborate among various sites throughout the world would not maximize the benefits from a UC solution delivered to only the main headquarters. A study done by the Momentum Research Group indicated that if "organizations deployed applications technology only, they may see a slight improvement in productivity, up to 4%" and may even see a decrease in productivity. On the other hand, "if organizations deploy technology taking into consideration people and processes, there is a 10 – 12 times greater improvement in productivity than with applications alone."⁴⁶

⁴⁶ Neville, J., and B. Kelly. *A Framework for Deploying Unified Communications*. Duxbury, September 2008.

Therefore, to maximize Metcalf's law of the network value, the enterprise business must develop a cohesive UC strategy with the users in mind.

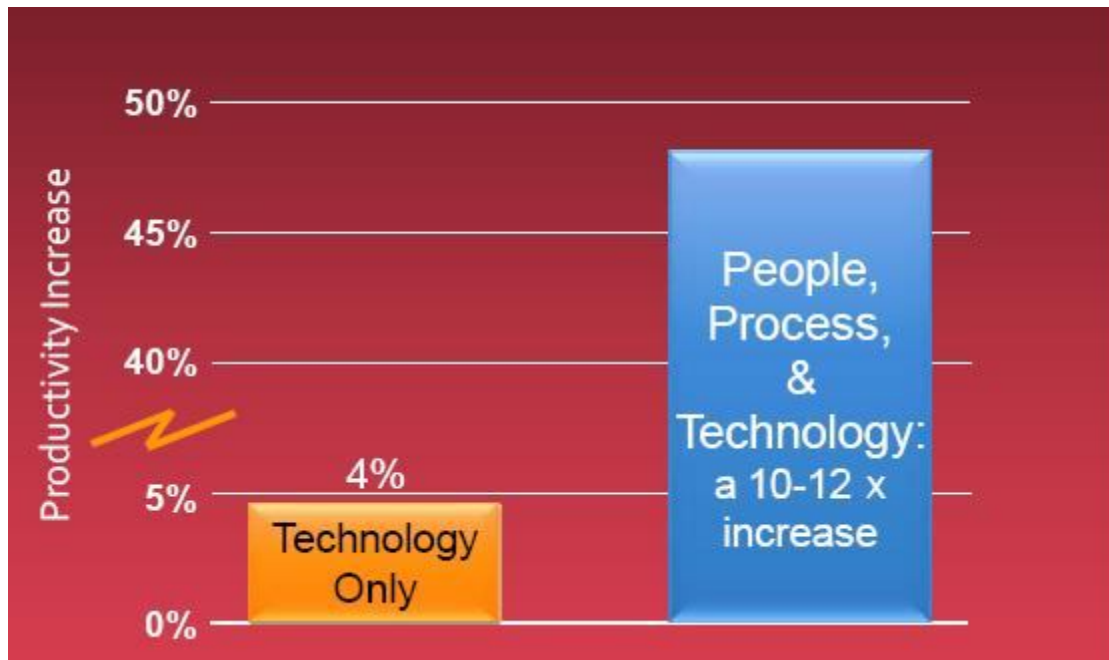


Figure 29: Productivity Increase

CASES AGAINST UC AND ROI (CHALLENGES)

As more organizations continue to adopt the UC model into their communications infrastructure, they continuously see the value and return on their investment. Yet every new innovation comes with its fair share of challenges, and unfortunately the UC paradigm shift is no different. Many enterprise businesses do not see the value and doubt the benefits of UC, which will stifle progress. The truth is, until those challenges are answered, UC will not be a widely accepted movement, and some enterprise businesses will hesitate to transition. Below

are some of the more common cases against the acceptance of UC in the enterprise business along with facts in response to supporting UC.

Case #1: Leaving well-enough alone

Many organizations use the “if it is not broken, then don’t fix it” philosophy, and, therefore, do not see the value of investing into any communications equipment. This is especially a hard sell since many enterprise businesses have recently spent thousands of dollars on existing communications equipment including PBX, voicemail, and email systems and they do not see the additional value of implementing a UC model into their communications infrastructure if the existing model meets its needs.

While the current infrastructure of an enterprise communications system has much of what is needed, it has limited capabilities. The corporate composition is changing - enterprise businesses are growing globally with a decentralized organizational structure. More than ever, communication infrastructures need to support collaboration and mobility with high reliability and low costs. As proven, the UC model can add valuable capabilities to increase efficiency and productivity while saving a significant amount of revenue. In addition, many of the UC vendors interoperate with many legacy systems, thus leveraging the benefits and capabilities of both new and older technology.

Case #2: Additional Training needed

Organizations are typically equipped with a team that supports telephony communications and a team that supports data, but UC bridges the gap between telephony and

IT experts. Each speak their own language, thus additional training is needed to support the new solution. In addition, the users will need to be trained in order to adopt the new technology and incorporate it into their daily work routine.

The concept of convergence does merge voice and data, but the skills and experience of those separate teams will still prove to be valuable with UC. UC presents an opportunity for cross-training between the traditional telephony and data teams in order to maximize their skills while supporting the new solution. The users of the new solution would need to be trained to maximize the overall value and return on investment, but the vendor's goal is to make the interface of its solutions intuitive to the point where users should be able to learn the technology quicker.

Case #3: UC increases interruptions and decreases productivity

Modern communication technology has increased the variety of ways and ease by which an employee can interrupt or be interrupted. Many organizations feel the UC model only adds to the interruptions through e-mail, IM, and voice features. As a result, employees divert their attention to interruptions, thereby diminishing efficiency and productivity. Organizations fear that with these distractions, the value of any UC model is significantly reduced.

Modern communication does increase accessibility for every employee. Employees are now one click away from being interrupted by a customer or colleague, but despite interruptions the work must go on. The art of the interruption has always been a part of business, but the tools and capabilities are there to ensure the all messages (critical and non-critical) get delivered to the intended recipient not mediate the increased interruptions. The UC

model features Presence capabilities, which if used correctly can help deter unimportant interruptions through availability indicators. The goal of presence is to discourage those looking for information to interrupt the recipient when busy.

Case #4: UC technologies lack maturity, security, and/or reliability

Enterprise businesses that depend heavily on communications fear that the network elements of a UC solution (such as VoIP) lack the maturity and reliability of a PSTN solution. The voice quality for a VoIP solution is not where it needs to be in comparison to a PSTN solution. It is common for a data packet (containing voice) to be lost or delayed, which in a real-time communication scenario can cause issues. In addition, the voice traffic of a UC solution would be sent over the Internet, where enforcing security is difficult to impossible against viruses and malicious attacks.

Undoubtedly, the vast existence of the PSTN network does give it an advantage of maturity, which helps increase reliability and security, but the VoIP network is not far behind providing a guaranteed Quality of Service (QoS). Many vendors have built-in security features to fend off malicious attacks and prevent virus outbreaks. In addition, encrypting voice packets increases security and deters unwanted eavesdropping. For redundancy, many UC networks are introducing failover and redundancy capabilities which protect against server outages. At the same time, each solution is easily scalable to promote growth in the global environment. New HD-audio codec's and IP hardware (such as Cisco's UC IP phones) are built for data connections and continuously enhancing the audio quality.

Chapter 5: THE FUTURE OF UC

The reality is that the way we communicate is constantly changing, and this is just the beginning. The UC model is still in its early adoption phase yet is growing rapidly and setting the stage for the future of communications. In a September 2009, in a UC survey conducted by *CIO* magazine, over 400 organizations involved with technology purchases were questioned about their future plans with UC. According to the survey, 32% of those questioned already have some type of UC solution in place, whereas nearly 35% plan on implementing a UC solution within the next five years (figure 30 below). The remaining organizations either did not plan on implementing (20%) or were not sure (12%). "For the high-growth scenario, the worldwide Total Gross or UC-capable market for Unified Communications was \$9.52 billion in 2007, based on end-user revenue, growing to \$15.9 billion by 2012."⁴⁷ Therefore, this creates over a \$3.3 billion opportunity for UC vendors over the next 5 years to market their solutions to the customers of tomorrow.

Is your organization currently using or planning to implement unified communications solutions (e.g., a set of products providing the same user interface and experience across various types of devices and media)?	Percent
Currently using/running	32.2%
Planning to implement within one year	19.6%
Planning to implement within 1-3 years	11.1%
Planning to implement within 3-5 years	4.1%
No plans to implement	20.1%
Not sure	12.8%

Figure 30: Future Planning of UC

⁴⁷ Pleasant, B. "Unified Communications Market 2007-2012 Executive Summary." *UCStrategies.com*. http://www.ucstrategies.com/uploadedFiles/UC_Research/UC_Analysis/Blair's%20UC%20Market%20Survey%20executive%20summary%20TOC.pdf (accessed January 2010).

From this point forward, communication infrastructures will continue to converge, become smarter and more efficient. The network of communications elements will continue to rapidly grow, as critical applications will integrate more tightly with the communications infrastructure. Mobility will break the barriers of the common workspace, and online collaboration will replace the in-person conferences. Real-time communication will slowly replace e-mail, just as e-mail is phasing out standard mail, and behind all the change will be the vendors and their products pushing the envelope as globalization creates a world without boundaries. The entire workforce will be available anywhere, at any time.

RECOMMENDATIONS FOR FURTHER STUDIES

This study only touched on a small piece of a larger design. UC is an immense concept that incorporates a vast array of technology and creates opportunity for future studies. Below are several ideas that arose while researching:

Social Impact: As the workforce becomes more mobile, enterprise businesses are expecting employees to be more available; therefore, the line between work and personal are being blurred almost to a point that employees no longer have a personal life. To what degree does the UC paradigm impact the social lives of those who use it?

Market Research: There are hundreds of UC vendors competing for the market. The industry names mentioned in this study may be the most recognized but may not be the best. Building on this research and investigating the solutions of tomorrow beyond these names will allow future researchers to find the next big feature to be adopted by enterprise businesses.

Predicted vs. Actual: UC is still a new technology in its infancy. There are no best-known methods available, and up to this point ROI is a best guess estimate based on limited case studies and anticipated savings. Building on this research, five to ten years from now the UC topic could be investigated again and benefits that were originally offered could be compared to those that are offered at that time. Did all the predictions and estimates come true?

CONCLUSION

The way in which we communicate is changing for the better. Globalization and the recent state of the economy have forced many enterprise businesses to re-evaluate the way they do business. Enterprise businesses are seeking alternatives to current costly expenses. UC is an opportunity to invest in a solution that will have a positive ROI for many years. UC is a concept that integrates a variety of communication applications into a single platform including email, IM, voice, and conferencing. In summary, UC provides:

- A way to integrate all communication elements into one platform
- Basic essential communication tools for enterprise business including voice, audio conferencing, presence, and IM
- Advanced communication features including communication enabled business processes, intelligent routing, mobility, and video conferencing
- Improved employee productivity and enterprise business efficiency

While the UC paradigm is still in the early stages of development, the UC solutions of tomorrow will transform the way we do business while saving time and money. This thesis was designed to analyze the adoption of the Unified Communications paradigm by examining the Unified Communications solutions of tomorrow and prove that establishing a cohesive Unified Communications strategy will indisputably have a return on investment. In doing so, the

proposed benefits (reduced costs and increased revenue) were converted to show the potential gains an enterprise business can achieve while using UC. In the end, the bottom line question that most enterprise businesses request is answered—UC will have ROI. Specifically, with respect to the reduced costs which UC will save—the bottom line expenses on an enterprise business—a return rate of 70% was estimated along with a positive ROI between the fourth and fifth year. On the other hand, the increased revenue benefit has much more potential, with an estimated return rate of 121% and a positive ROI between the first and second year, thus proving a positive ROI is clearly evident.

Appendix A: Vendor Pricing Considerations

UM per user pricing information obtained from UniComm Consulting as part of a presentation delivered at Voice Con, Orlando 2009

Configuration criteria for pricing:

- 2,000 employee enterprise
 - 500 in Headquarters
 - 300 in 2 Regions
 - 1,200 in 24 branch offices
- All employees get Presence and IM
- All employees are enabled with conferencing – 150 employees in busy hour
- 20% of employees are mobile enabled

Prices based on:

- List prices
- Software licenses – per user and/or server licenses
- Three-year maintenance

Appendix B: Increased Revenue Time-to-Money Formulas

**Time Savings Estimates per employee = Minimum compensation per employee per hour x
Estimated Hours per year saved**

Example (Global Crossings):

Average compensation per employee per hour = **\$7.25 per hour (Federal Minimum Wage)**

Estimated Hours Saved = (Average minutes saved per day x 260 working days per year)/60
minutes per hour = (20 minutes x 260)/60 = **86.6 hours per year saved**

Time Savings Estimates per Employee = 86.6 hours saved x \$7.25 per hour = **\$627.85**

**Reduced Project Life Cycle Savings Estimation per 12 projects = 12 x % Reduction in project
completion time x Minimum annual compensation per employee**

Example (Voith IT Solutions):

Percentage of reduced project competition time = **25%**

Minimum annual compensation per employee (\$7.25 x 40 hours per week x 52 weeks)=
\$15,080

Reduced Project Life Cycle Savings Estimation per 12 projects = 12 project per year x .25
reduction x \$30,000 per year = **\$45,240**

Appendix C: Itemized break down for TCO considerations

The following itemized break down for “2007 VoIP” in figure 31 was used to create TCO considerations for Hardware (UM/VM Servers and PSTN/PBX Gateways), Services (Installation, Software and hardware maintenance), and Devices (IP Display phone, User IP Phone License, Softphone License, IP PBX License, and IP PBX Servers).

	2007 VoIP	2007 PC-based	2010 Forecast
IP Display Phone	\$190	\$140	\$102
User IP Phone License	\$110	\$90	\$60
Softphone License	\$50	\$16	INCL
IP PBX License	\$18	\$4	\$3
IP PBX Servers (2)	\$26	\$26	\$19
VM/UM User/Svr Lic's	\$93	\$ 30	\$20
VM/UM Servers (2)	\$26	\$ 26	\$19
PSTN/PBX Gateways	\$28	\$35	\$20
Installation	\$102	\$60	\$70
Tot. Acquisition Price	\$643	\$427	\$313
Annual Maintenance			
Software	\$83	\$35	\$27
Hardware	\$17	\$17	\$14
Subtotal Maint/Year	\$100	\$52	\$41
Three Year Average	\$314	\$194	\$145

Figure 31: Per User Pricing

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ACRONYM LIST

Best Known Methods (BKM)
Communication Enabled Business Processes (CEBP)
Enterprise Resource Planning (ERP)
Instant Messaging (IM)
Internet Protocol (IP)
Project Management Institute (PMI)
Public Switched Telephone Network (PSTN)
Return on Investment (ROI)
Total Cost of Ownership (TCO)
Unified Communications (UC)
Voice over IP (VoIP)