



***Microsoft Software Enables
Progressive Enterprise
Migration to Unified
Communications***

By Arthur Rosenberg, The Unified-View

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Executive Summary

Person-to-person telephone callers have always been handicapped by the inefficiencies of having to know the location and availability of other people in order to make contact, as well as by the limitations of the voice-oriented, hardware-based Telephone User Interface (TUI) for communication management. Because “telephone service,” as an application component of unified communications (UC), must be device and interface independent, software flexibility for user interfaces is the real key to flexible business communication efficiency, including contextual information, such as contact and availability status, address information, message management information (text and voice), message content, information attachments, communication application features, etc.

Applications put the software approach to voice communications in an ideal position to bridge the traditional gap between call management and message management functions. This is what unified communications is all about and where the power of software is bringing new “intelligence,” contact flexibility, and user efficiency to both desktop and mobile business telephone activities.

This paper discusses the two big challenges facing enterprise organizations in planning to move their voice communications to the converged environment of unified communications (UC). The first challenge is for business management to understand how new UC functionality will improve high-value business processes in terms of end user communication productivity and business process performance.

The second challenge is for enterprise IT to migrate selectively and cost effectively from legacy telephony technology silos to an open, integrated UC environment of telephony applications, messaging, and business process applications that will exploit new IP network infrastructures. Microsoft is well positioned to play a strong role in facilitating both this transition of IP telephony applications to UC and its integration with high value business process applications.

Introduction: Unified Communications and “Contextual Call Management”

Unified communications is not just about voice communications, it is about bringing telephony into the world of IP communications and efficient messaging communications. The traditional telephone has always been unnecessarily complex and inefficient for callers initiating time-sensitive business contacts for several reasons, including telephony’s unawareness of a called party’s location and availability, its limited visual interface for reference information, and its lack of continuity from one call to the next (“contextual call management”). This is all beginning to change as IP telephony applications join the Internet communication revolution of unified message management

with the flexibility of wireless network access, a choice of speech and visual user interfaces, and the practical integration of telephone calling with personalized presence and availability management under the umbrella of unified communications (UC).

The future of more efficient business communications under UC and multimodal user interfaces will enable traditional call initiation to be embedded within the context of stored contextual information. Such information includes address books, call logs, messages, database information, online documents, business applications, etc. Rather than requiring the caller to know a specific person's identity, their specific contact locations and numbers, or even remembering to follow up on previous contacts, most of this contextual information will be automatically available. With presence and availability intelligence, UC callers will have the ability to use an alternative method of contact and information exchange that fits their situation, e.g., real-time instant messaging or asynchronous voice or text messaging, rather than waste time attempting a conversational voice connection that is not possible.

To complicate matters for enterprise management, there is also the challenge about how to cost-justify the migration moves to UC. Although VoIP and IP telephony infrastructure is important to UC application efficiencies, it is not the first communication technology that must be upgraded or replaced for UC benefits; UC capabilities can still be enabled through integration with existing PSTN and TDM phone systems. Except for end-of-life or "greenfield" installations, the reality is that TDM telephone systems that still work are not necessarily getting replaced just because of lower costs for support of IP phones.

It is really the combination of improving the performance of specific, high-value business processes for specific groups of end users (e.g., flexible and efficient customer interactions) coupled with the need to gradually update and replace expensive end-of-life technology infrastructures that is driving enterprise UC migration planning. For this reason, it is important for enterprise management to first understand the direction and impact of evolving UC technologies upon key enterprise business processes and people productivity. Then, UC migration planning can be done selectively, intelligently, and strategically.

Defining "Unified Communications" Applications

Part of the confusion surrounding UC has to do with its definition. While UC Strategies.com properly defines UC as being "*Communications integrated to optimize business processes,*" that tells us *why* we want to have all forms of business communications interoperate (such as telephony, voice and text messaging, etc.), but not necessarily *how* to make that all happen. Integrating new and existing communication technologies to simplify making contact with people efficiently across different contexts, communication modalities, networks and device interfaces is where things get complicated.

Because there is no one single, universal way of communicating with people all the time, each of the different modes of business communications that we use today has advantages and disadvantages for both contact initiators and contact recipients. That means that we will *always* need a combination of communication methods in order to

complete a business process task that involves different people, different information content, and different contact environments.

We have always had various communication technology “silos” to provide business communication services to enterprise users, including:

- Telephone real-time conversations,
- Text messaging,
- Voice messaging
- Multi-party voice conferencing
- Video conferencing
- Fax

Each type of communication originated from different hardware-based technologies and it is only now that increased computer power has enabled a shift to software-based application flexibility that allows convergence and greater interoperability to take place. With IP networking, such software applications can also be distributed as off-site services, as well as to personalized software “clients” embedded in user communication devices on the desktop and in mobile handsets. These devices are all becoming “multimodal” to handle the different modes of contact and information exchange that make up the real world of business (and consumer) communications.

However, converging different communication media will also require the consolidation of visual and speech-based user interfaces. This will make it easy and efficient for both contact initiators and contact recipients to seamlessly use different devices and modes of communication, synchronously or asynchronously. This kind of interface flexibility will help minimize the overhead of “human communication latency” and improve business process performance.

As a key element of efficient business communications, we must also include automated business applications that will act as “contact initiators” to deliver time-sensitive information directly to people, without requiring additional people in the contact loop to contribute to communication latency. Such authorized business process applications must be able to notify appropriate individuals about time-critical situations, regardless of the recipient’s business relationship (internal staff, business partner, customer) and regardless of the recipient’s modality of contact accessibility. (See sidebar for practical examples of new UC capabilities.)

Microsoft's Software Approach to Enterprise UC

Given that UC is really not just about voice communications, nor even just about person-to-person contact initiation, Microsoft, as a leading provider of software and user interfaces for operating systems, e-mail and instant messaging, and business applications, is strongly positioned to support the convergence of user communication interfaces at the desktop, browser, and mobile handheld devices. Because UC migration will be evolutionary and different for every enterprise organization, Microsoft's comprehensive and open software approach can provide the flexibility and choice for enterprise organizations to selectively implement UC capabilities that fit specific business process priorities, automated business application integrations, and individual user job responsibilities for communication efficiency.

SIDEBAR 1

A Look Into the UC Future – Some Examples

Unified Communications, or "UC," describes the combination of old and new communication capabilities to improve job performance that is dependent on making contact with people more efficiently and effectively for both conversation and information exchange. This can be done by taking existing communication technologies and eliminating or minimizing their limitations and shortcomings. Not only will this evolutionary approach provide a graceful transition to the future, but it also extends the life existing technology investments.

Crossing the boundaries of telephony and messaging

While telephony has been the primary mode of timely contact for business, the efficiency of messaging has gradually increased its role in business activities. Not only does messaging enable

As stated in their 2006 Annual Report, Microsoft's move into UC is well defined as follows:

*In 2007, we will deliver a wave of new products, services, and technologies that will position us to take advantage of a wide range of high-growth opportunities. One example is ***unified communications, our vision for bringing together telephony, e-mail, instant messaging, mobile devices, and Web conferencing, in order to streamline the way we communicate at work.*** To help make this vision a reality, in June 2006 we created the Unified Communications Group in the Business Division. New enterprise information management tools will help knowledge workers create, find, use, and share business information quickly and effectively. These technologies promise to have a profound impact on productivity, creativity, and collaboration, and we believe they will have a significant impact on our future growth."

Which "ROI" Is Most Important For Migrating to UC?

While cost considerations are important, they are not the only reasons to invest in new technologies for business. This perspective was confirmed by a recent [Saugatuck Technology](#) market research report showing that increasing revenue growth through technology innovation has become the dominant business strategy objective of C-level executives in 2007 by a margin of 5-to-1 over controlling costs.

There are four basic areas of ROI payoff for

communication when people are not available for face-to-face meetings or real-time conversations, but messaging enables people to manage their time more effectively, involve others more efficiently, and even multi-task their communications with other activities.

Only answering machines and voice mail systems initially enabled a caller to change a failed call attempt into a useful, but delayed, voice message. Active message notification and convenient message retrieval from any phone, coupled with the ability to initiate an immediate “call return,” helped reduce the “human communication latency” of asynchronous voice messaging. Now, with UC, the same “transmodal” capability for seamlessly initiating a real-time response to an email text message or an informational attachment will expand the potential for more efficient business communications.

UC will enable a text message recipient to respond immediately with a voice call or an instant text message, based upon the status of the sender of the message (“reply”) or of another party (“forward”). So, even if the original messaging contact was not a real-time one, it can quickly be escalated to one. The additional benefit of converging asynchronous messaging and real-time

justifying the implementation of IP-based UC technologies within an enterprise:

1. Reducing internal technology TCO costs, including procurement, support, and administration
2. Reducing costs for user communications services, particularly for mobile devices
3. Increasing individual end user time productivity associated with communication activities
4. Increasing business process performance by providing greater flexibility in making contact with different people more quickly and in different ways

All four ROI areas are of importance to an enterprise organization, but there is a logical priority of business needs controlling what is important for end user job responsibilities, which, in turn, will dictate where and how new UC technology must be applied.

1. Enterprise Technology Cost Reductions

The operational cost savings that may be realized by replacing TDM telephony with IP networks and IP phones will vary for each organization, but can be done selectively to support end user business process needs for UC. The centralization of IP telephony applications, email, and voice messaging servers will help reduce IT support and administration activities. While VoIP trunking may provide toll bypass of the PSTN, and IP-PBXs and desktop IP phones may simplify and reduce the costs of IT support responsibilities, the ROI payback of wireless VoIP should also be evaluated in the context of mobile communications needs within the enterprise environment.

To maximize the cost efficiencies of centralized and integrated UC applications, an “open,” IP network and VoIP infrastructure must eventually be implemented. However, to support a selective evolution to UC, the enterprise market should be looking at the additional ROI that can come from the other three sources of UC value, in order to

telephony and IM contacts is that the context of the original message, including any informational attachments, will be preserved as the basis for more efficient collaborative communications.

Embedding Telephony Within Online Information and Business Applications (“Contextual Call Initiation@”)

One of the most important sources of business communications activity stems from online information that triggers the need to ask questions or discuss the data in more detail. This applies to published documents as well as informational data bases accessed through business applications. In many cases, the information does not show who created the content or who is responsible for answering any questions or comments about the information. Typically, this leads to a lot of time-lost in manual attempts to identify the appropriate person(s) to contact, getting their contact information, and in initiating traditional blind call attempts.

With UC integration with business applications, a user (contact initiator), can “click-to-contact” on the information in question, be given preliminary information about the contact recipient before deciding what mode of contact to employ, email, IM, voice call. The recipient may be identified as

move forward with strategic UC migration planning.

2. Mobile Communication Services Costs

While VoIP network infrastructures and IP telephony applications have made wired voice communications less expensive to use and support, as well as less dependent on traditional carrier-based long distance networks, the rapid adoption of wireless mobile devices by business users, coupled with the globalization of business activities, has made mobile voice communication costs vulnerable to mobile network provider tariffs. New strategies and technology services, based upon VoIP network infrastructures, can be applied to enterprise mobile voice communications to minimize the impact of such uncontrollable usage costs.

More importantly, mobile devices should not be viewed as simply an extension of an office desktop phone or a desktop PC. The dynamic environments of handheld mobile device usage demand multimodal communication flexibility that the office desktop does not. “Mobile presence” and contact availability are really not identical to the office desktop situation, and will therefore require different rules of access. Finally, the cost savings of using Voice over Wi-Fi for mobile devices in a campus/office environment, rather than a wireless carrier service connection, can be extremely significant.

3. Individual End User Time – “Micro-productivity”

We define “micro-productivity” as the timesaving efficiencies realized by individual end users because of new communication capabilities and procedures that improve their personal job performance. By making the transition between all forms of communication “seamless” and easy to use whenever needed, end users can more flexibly and efficiently initiate contacts and respond to others, minimizing the time spent in communicating.

Communication productivity includes not only basic communication functions, but also exploiting

a specific individual or a member of a group that has the responsibility for responding to such contacts. The contact initiator may then decide on whether a voice conversation is necessary or not, and use a “click-to-call” option based on the current availability of the contact recipient.

Unlike “your parent’s voice mail system,” if a person is not available for a voice conversation, a message can be left (voice or text), including any pertinent attachments. The message will be the basis for a return contact that may be “call return,” an Instant Message response, or an email. What is avoided is the huge amount of time wasted in getting phone numbers and then making the traditional “three out of four” failed call attempts.

Embedding Communication Initiation Into Business Processes

With the exception of call centers, telephone activity has always been a communication “silo” that required phone calls to be initiated and received manually, with little or no automated information context, i.e., “person-to-person.” This approach is not only inefficient, but also a major source of error and missed deadlines. With alternate forms of personal contact, time-sensitive communications no longer

contextual information that will make contact initiation more efficient. In particular, the use of “contextual call initiation©” will improve the traditional way we manually placed phone calls. Such contextual information would include a time-sequenced log of contacts with specific individuals (including call attempts with subject information), access to messages that have been received or sent (including attachments), and confirmations of message deliveries.

Because wireless mobility provides individual end users with faster contact accessibility beyond the wired desktop, it has become a key driver for UC flexibility. However, the value of UC capabilities will vary for individual users or user groups, depending upon several factors, including:

- Whether their needs are primarily as *contact initiators, recipients, or both*,
- Whether they are at a *desktop, are mobile, or using a public kiosk*
- Whether they are in their office, on campus, or working in a remote location (including from home teleworking.).

Furthermore, because business users are increasingly becoming both desktop and mobile device users, UC interfaces must be consistent and effective across both modes of contact activity.

One new UC communication technology that is being enabled by new SIP standards for IP telephony applications is presence/availability management, which allows contact initiators to be aware of the real-time accessibility of contact recipients before making a call attempt. This is particularly important when end users exploit personalized mobile devices whenever they are away from their desks.

Although micro-productivity benefits individual end users personally, the time saved may or may not necessarily always directly benefit an enterprise business process. However, if the associated business process is also completed faster or better, then the enterprise may get direct benefits

have to be initiated completely manually, nor necessarily as real-time voice contacts. For many business processes, information notifications can trigger people to take actions or more efficiently initiate timely person-to-person calls.

For example, a salesperson entering a sales order will set the stage for a work flow process that will include being notified when the order will be shipped, confirming shipment, and delivery. In addition, if there are any delays or other order information that should be immediately discussed person-to-person, the salesperson could be notified with a reminder message, containing necessary context information, access to presence status, and the option to “click-to-call” the appropriate customer contact, without having to remember or search for contact information or switching communication devices.

The role of “intelligent” presence management – not just for IM

The “new technology kid on the block” for making real-time communications more convenient and efficient is presence and availability management. Although this capability was first successfully introduced with consumer instant messaging (IM), it has been extended through IP telephony applications to include

that can fall to the bottom line from a business performance perspective. While such business process benefits associated with communication efficiencies are hard to quantify, the results are significant, and will require looking at all the individuals who are key to a business process, as well as the value of each such process.

4. Business Process Efficiency – “Macro-productivity”

When a business process involving several people can be completed in a shorter period of time because of better communication technologies, the enterprise can benefit directly from that time savings and we have called that kind of group productivity “macro-productivity.” This is where micro-productivity benefits to individual users can be compounded into greater value for an enterprise business process.

A good example of macro-productivity is to be found in customer care applications, where live assistance is required, but a customer-facing “agent” must rely on the expertise or authority of another person to resolve a caller’s problem. Under the label of “first call/contact resolution,” the agent can make real-time contact immediately with anyone in the organization (or even outside the organization) who is both available at that moment in time and best qualified to resolve the customer’s problem.

This faster contact with a third party will result in a better “experience” for the customer and greater customer satisfaction for future revenues and/ or prevention of potential losses to the enterprise. Studies have shown that customers who run into typical problems with a product or service, but have those problems resolved immediately, become appreciative and more “loyal” for future business.

The real enterprise benefit from greater communication flexibility and efficiency will come from the ability to complete a time-sensitive task that will involve several people, either inside or outside of an enterprise organization. They can be customers, business partner organizations,

“telephony presence” by the leading IP-PBX vendors for internal contacts. This enables a caller (contact initiator) to first ascertain whether a callee (contact recipient) is indeed near their phone and that they are not busy on the phone *before* wasting any time attempting to place a voice call.

If the recipient is busy on the phone, IM can then be used as an alternate means of real-time communication that won't disrupt a voice conversation. If a voice call conversation is really necessary, IM can be used to schedule a suitable time for both parties. In the worst case, the contact initiator will simply leave a voice or text message.

Although presence management standards are still evolving to enable SIP-based “federation” of presence information between enterprise organizations and across private and public networks, the technology is available today for practical internal enterprise use.

Federation of presence across vendors and services will further extend end-to-end contact efficiency between enterprises and with customers.

information providers, etc., all of whom may be contact initiators and/or recipients and accessible in different ways at different times. The enterprise business process will benefit directly from the reduction of any “human communication latency” to get operational results.

Of course, the value of UC contact efficiencies to an enterprise business process will vary; depending upon the role the business process plays in either generating new revenue or preventing some financial loss. For this reason, migration planning to support business process improvements will dictate priority-based UC implementations.

“It Takes Two to Tango” – UC for Contact Initiators and Contact Recipients

A research study report¹ published by the Association for Computing Machinery in 2006 showed that asynchronous email messaging has become as important as the telephone for maintaining business relations and interactions between business users in different locations. While traditional telephony satisfies the need for real-time conversation, email conveniently supports both person-to-person asynchronous messaging and information exchange via attachments or links to online information on the web. By combining email and voice mail under unified messaging (UM), they each can supplement each other’s advantages to provide mix-and-match flexibility for the dynamic needs of both message originators and recipients.

Now, Instant Messaging is making text messaging real-time and a gateway for both information exchange and “click-to-call” telephony. Through the benefits of UC, multimodal endpoint devices, and SIP-based presence management, users of asynchronous email and voice messaging can dynamically escalate to real-time chat and voice connections.

Such communication flexibility improves both micro and macro-productivity because it reduces the time expended in initiating contacts and in escalating the modality of contacts between contact initiators and recipients (“transmodal communications”). It is particularly useful when the users are communicating from different environments and with different device capabilities.

Desktop vs. Mobile UC

The multimodal and “transmodal” capabilities of UC are very dependent on the communication devices that are available to individual end users, as well as their environments. Even with new, multimodal mobile or desktop “smartphones,” the final choice of contact modality will be dependent on the status of both the contact initiator as well as the contact recipient.

Mobile users will benefit more from UC flexibility because of their dynamically changing environments, both as contact initiators and as contact recipients. Studies have shown that as much as 40% of enterprise user cell phone calls originate and terminate within an office environment. “Mobile” users include users roaming about a campus environment as will occur in vertical market environments such as healthcare, education, retail, etc., as well as when traveling away from the office. Mobile situations that will benefit from the flexibility of UC presence information include:

- Away from a desktop, walking around the office, campus
- Sitting down in a meeting, silence required when

SIDEBAR 2

What’s Wrong With What We Have Now?

The Desktop Telephone

- Telephone User Interface (TUI) is limited to a touchtone number pad and a few special function buttons for input, small screens for limited output displays,
- Wired desktop phones and phone numbers are a

¹ V.R. McKinney and M.M. Whiteside, “Maintaining Distributed Relationships” – March 2006/Vol. 49, No.3 Communications of the ACM

communicating

- Driving a car – requires hands-free, eyes-free communications
- In a noisy or public space, where speech will be difficult or inappropriate for others to hear

Presence management, coupled with availability management and modality management, will enable UC to support real-time contacts between end users who have different interface needs, as well as different end point device types. For this reason, true UC capabilities will require flexible integration between text messaging (email, IM, SMS), voice messaging (voicemail), and voice/video conferencing, “federated” across both enterprise systems and public services.

UC Productivity Metrics

Because UC will involve the seamless interoperability of all forms of communications in the context of a business process, it will not be enough to track such activity as separate modalities for a single end user, but it will also be necessary to track such activity as elements of a business process task involving other end users as contact initiators or contact recipients. An example for tracking UC performance is the incident “trouble ticket,” initiated by a user/customer, which ties all support activities and contact events together in an elapsed time sequence report.

A productivity benefit of mobile messaging that needs metrics is the ability to retrieve and respond to messages during periods of travel “dead time” away from a desktop. That is one reason why mobile communications can generate increased end-user time productivity that could be lost. With increased use of mobile devices, users can also be accessible for immediate notification contacts and greater business process performance.

Contact activity events need to be collected, analyzed, and reported across all modalities of communications and types of endpoint devices involved in key business processes. Unifying the collection and reporting of UC activities in order to quantify communication productivity for both individual micro-productivity and group macro-productivity are objectives for business process metrics. Microsoft is in a position to support these through its unified messaging and IM/presence applications, its operating systems expertise, and now its new involvement with software-powered voice communications.

place, not a person

- Telephone contact availability is based upon a “blind” call attempt, which may result in time wasted because of “busy” or “no answer,” and leaving voice messages.
- Information attachments to a voice mail message are limited to fax that must be redirected to a fax machine or a printer
- Multi-party call conferencing is awkward to set up, especially on an ad hoc basis
- Caller ID display does not identify the purpose of the call (No “subject”) or urgency for call screening purposes
- Unstructured voice conversations are not always the most efficient way to communicate and not always necessary for exchanging one-way information
- TDM telephony is dependent upon separate voice networks that make it difficult to integrate with and manage in the same way as

The Challenges of Migrating to UC – “Different Strokes for Different Folks!”

Unlike single-purpose applications, UC is comprised of a set of different communication application technologies and functions that must be dynamically interoperable, integrated with business applications, both device and network independent, and, above all, personalized for individual end user needs. Because there may be different technologies in use in different enterprise locations because of mergers and acquisitions, each location may have to be integrated or replaced differently. Fortunately, not everyone in a large enterprise organization will need UC capabilities at the same time or with the same priority of implementation.

All this means that, although the end objective is to have consistent and interoperable communication capabilities across the enterprise as a whole, the migration steps will be different for different locations, for different work groups, and even for different individuals. For this reason, UC technology implementation planning is a long-range process, which should be governed by the following considerations:

1. Business process priorities
2. Key individual/group needs associated with those business processes, wherever they may be located
3. Current communication capabilities and operational costs
4. Budgetary considerations
5. IT support capabilities

Enterprise UC migrations will not be identical and will require planning and homework to identify business process priorities. For this reason, enterprise management should be looking for initial UC solutions that are the easiest to implement, cost effective, and will also support an “open” migration path to full UC capabilities.

Where Does Microsoft Fit Into Enterprise UC Migrations?

The scope of UC covers several different communication technologies ranging from wired and wireless network infrastructures to application servers to endpoint devices and their software (operating systems and application clients). Microsoft is targeting the desktop user interface as a logical starting point for converging communication interfaces because the desktop is also where business process

data applications.

- No integration with calendar and contact availability information
- Many features that are obsolete in light of new mobility and messaging capabilities
- TDM telephony has traditionally been too hardware dependent, which slows down innovation, reduces flexibility, and increases costs

Legacy Enterprise Voice Mail

- Can only be accessed directly by outside callers to leave a message after a failed call attempt (“Busy,” “No Answer”), no direct mailbox access to leave a voice message
- Little flexibility for callers to escape “voice mail jail”
- Mailbox-to-mailbox voice messaging limited to users on same system or to intra-enterprise voice mail

applications and other business tools also interface with the user. Familiar, easy-to-use visual interfaces, as well as speech options for phone callers, will be important for converging UC communication functions, such as personalized call and message management, within the context of both desktop and mobile applications.

“Information work” will always require sitting down with a large screen and a comfortable keyboard to handle complex application interfaces and human multitasking. Business contacts will therefore continue to take place from desktop to desktop, between a desktop and a mobile device, or between different kinds of mobile devices, depending upon the kind of business environments involved and the nature of information that must be referenced.

Microsoft UC At The Desktop

Desktop interfaces for business applications and messaging are very similar and Microsoft is aiming at making the same thing happen for IP voice communication interfaces with its Office Communicator client and its Office Communications Server. Given that they have a strong position in the enterprise markets for email, Instant Messaging/Presence, and business applications, they are in a good position to facilitate message management integration with voice call management applications under the umbrella of federated presence. Indeed, most of the major enterprise telephony providers have announced their intent to interwork with Microsoft’s new messaging technologies and desktop user interfaces.

The migration to UC will see IP telephony applications capitalizing on the desktop screens for initiating “click-to-find-a-person,” “click-to-call” and “click-to-conference” for contacting people using unified directories, personal online address books, “one number” contacts, and “federated” telephony presence. Voice messaging will continue its convergence with email, as well as with IM, to form “unified messaging” (UM) by exploiting the flexible efficiencies of screen and keyboard interfaces (“Visual Voicemail”), in addition to speech recognition interfaces, for message management. The integration of UM facilities with IP telephony applications will be a major step towards the efficiencies of “contextual” call initiation (e.g., implicit “call return” information for replying to messages).

networks – no voice message exchange between public consumer services

- User interfaces limited to complex TUI approach, which requires memorizing error-prone touchtone commands and using time-consuming voice menus. Message management very inefficient without visual interface
- Voice mail systems must be individually installed on premise with TDM telephone systems, preventing the centralization of such technology for lower costs and support requirements
- No cross-messaging between email and voice mail
- End user limitations for voice message storage and retention, support required for mailbox management and password creation

Microsoft and Mobile UC

Not only is wireless networking shifting from public cellular services to fixed mobile connectivity (FMC) and campus-based Wi-Fi, but the mobile devices are all becoming multimodal “smartphones,” rather than just for voice conversations. Text messaging and web-based information access in various forms can be supported on these mobile handheld devices and the race is on to design a variety of such multimodal devices to be:

- Flexible for all UC contacts (with both visual and speech interface options),
- Simple to use,
- Consistent with the desktop user interface experience, and
- Interoperable with desktop communications.

User experience with the desktop UC interfaces will lead to creating similar capabilities for mobile users, where a variety of device form factors and application software clients will impact user interfaces. Recognizing that mobility is a major driver for UC need, and that consistency with desktop interfaces is key to end user acceptance of mobilized applications, Microsoft has focused on its new Windows Mobile 6 Operating System to maintain compatibility with its desktop software on a wide variety of “smartphone” devices.

In addition, because “eye-free, hands-free” mobility requires the benefits of speech interfaces for both messaging and telephony applications, Microsoft supports its Exchange Server 2007 unified messaging, Outlook, and calendaring applications with speech recognition and text-to-speech user interfaces for mobility. This will facilitate enterprise application mobilization and making wireless mobility more “corporate liable” for localized Voice over Wi-Fi campus environments. Because speech interfaces are needed for “mobilized” applications, Microsoft Office Communications Server 2007 will have built in IVR capabilities that will support traditional and future interface needs.

Legacy Enterprise Email

- There is no real-time message notification when away from the desktop PC.
- Email doesn't deliver text messages to telephones.
- Email doesn't have a telephone interface to accept a voice message reply to email messages.
- Email can't respond to a text message with a real-time call back.
- Email addresses were not suited to touchtone input.
- Instant Message status and response to an email message were not available from email systems.
- No mobility support
- Limited web access

UC Migration: Where Do You Start?

It all depends!

In order to prepare for either new, “greenfield” installations, as well as for migrating replacements of current communication technologies, the enterprise organization must start at the top by identifying critical business processes, the key people involved with those processes, and the communication inefficiencies that contribute the most “human communication latency” affecting business process performance. Although business management may be generally aware of such problems, it may be necessary to research individual end user groups to find out exactly who has what communication problems that UC and mobile technology can fix. This is where presence management software technology will not only be a key factor in improving the efficiency of time-critical business contacts, but can be a practical first step for converging all UC application software interfaces.

Once the people with high-priority communication problems are identified, then it will be appropriate to research the most cost-effective implementation of solutions that UC technology can provide. Pilot testing such solutions will be very critical in order to learn what really works best for individual groups and business processes. The solutions may be available through upgrading or replacing existing technologies, or by providing additional capabilities through new premise-based technologies or hosted services, e.g., from application providers and mobile communication carriers.

Summary and Recommendations

The world of business communications and information access is changing dramatically and adapting to the new opportunities for improving business performance will prove disruptive to all enterprise organizations. Whether the situation involves a new business installation (“greenfield”) or a replacement of existing “end-of-life” technologies, the challenge will be similar – planning for new and unfamiliar UC capabilities.

Regardless of when implementation has to take place, and regardless of the fact that the industry is still developing integrated UC technologies, what is critical is that both enterprise business management and technology management start planning for change with the coming migration of telephony applications to UC.

1. Put someone in charge who can represent business process priorities, which should be the primary source for UC implementation planning priorities
2. Provide secondary planning responsibility for correlating business requirements and technology evaluations
3. Identify high-value business processes and expected productivity benefit
4. Identify key end user communication needs associated with priority business processes
5. Prioritize selective UC technology implementations based upon business priority needs and key individual needs, including replacing end-of-life legacy telephony systems or implementing new “greenfield” installations. Start with easiest to implement and least disruptive UC software capabilities such as presence management capabilities, unified messaging, and mobile communication

capabilities as a strategic first step that will selectively cover both people and application contact needs

6. Identify TDM telephony integrations for all new UC elements
7. Evaluate current data network capacities and coordinate new IP network infrastructure upgrades with business process and UC application implementation requirements and priorities.
8. Plan and implement “pilot” application usage for above to help quantify user support needs and operational ROIs. Use hosted or managed services where possible for such trials, to minimize the commitments and resources while gaining usage experience.
9. Identify potential providers of UC capabilities, including current providers of services and CPE technologies. Review offerings for “future-proofed” implementation
10. Reorganize IT to support above
11. Plan end user education, training
12. Plan to evaluate operational usage with UC metrics
13. Plan next wave of UC applications and pilot groups, using advanced UC features and capabilities