



The Business Value of Mobile Unified Communications in Healthcare

WHITE PAPER

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IDC HEALTH INSIGHTS OPINION

Unified communications (UC) broadly defines a highly integrated communications environment that combines, or unifies, text, voice, video, and data communications in innovative ways to provide process and productivity improvement. It provides for real-time delivery of communications based on the preferred method and location of the recipient and facilitates the incorporation of all information sources pertinent to the communication. The technologies to support UC can include email, telephony, voicemail, instant messaging (IM), video, Web conferencing, and short message service (SMS), which can be brought together in various combinations in real time and coordinated. The benefits of UC are amplified in organizations in which workers are highly mobile and communication between them is both critical and time sensitive.

Key findings from IDC Health Insights' research include:

- The highly collaborative and mobile nature of clinical teams makes UC an essential investment for healthcare organizations today.
- For many hospitals, the implementation of an electronic medical record (EMR) is simply a foundation — a leverage point that has become a driver for the adoption of other technologies, such as UC, that create the synergies needed for real productivity gains and patient care process and workflow improvements.
- Improved communication among team members and between care teams at hand-off points can help mitigate adverse medical events, achieve workflow and process improvements, improve staff utilization and productivity, and reduce patient length of stay and costs through efficiency gains.
- The following significant trends will drive increased UC deployments in healthcare organizations: wireless LAN upgrades and upgrades of existing legacy telephony equipment, both of which are considered important companion technologies, and the widespread adoption of mobile devices by clinicians.

- Although UC is not yet widespread in healthcare provider organizations, early adopters are discovering, and deploying, innovative applications of UC that validate its benefits — applications that are likely to drive significant adoption in the short term. Examples include applications that combine voice, video, data, and text messaging to enable more efficient and more effective communications, improve staff productivity and care quality, and reduce cost.

IN THIS WHITE PAPER

This White Paper is presented by IDC Health Insights and sponsored by Microsoft. The objectives were to:

- Gain insights into the healthcare industry, business, and IT challenges driving clinician adoption of unified communications technologies
- Describe several healthcare use cases for unified communications, including mHealth use cases
- Provide a case study, based on IDC interviews with a Microsoft customer, of an organization that has successfully implemented Microsoft Lync

SITUATION OVERVIEW

What Is Unified Communications?

UC broadly defines a highly integrated communications environment that combines, or unifies, text, voice, video, and data communications in innovative ways to provide process and productivity improvement. It provides for real-time delivery of communications based on the preferred method and location of the recipient and facilitates the incorporation of all information sources pertinent to the communication. The technologies to support UC can include email, telephony, voicemail, IM, video, Web conferencing, and SMS, which can be brought together in various combinations in real time and coordinated. The benefits of UC are amplified in healthcare organizations in which workers are highly mobile and communication between them is both critical and time sensitive.

The terms *unified communications* and *unified messaging* (UM) are sometimes, but incorrectly, used interchangeably. UC refers to the real-time delivery of communications based on the preferred method and location of the recipient, while UM is a component of a UC environment. UM collects messages from several sources (e.g., emails, voicemails, and faxes) and holds the messages for retrieval at a later time via a user-designated (and user-modifiable), preferred delivery method.

The concept of presence is also a fundamental element of UC. Presence provides UC system users with real-time information about where the intended recipients of their communication are located and if they are available. If presence management is correlated to end-user profiles, then presence may also indicate which modality is best to reach the intended recipient. In effect, UC integrates (or "unifies") all the communication modalities that an individual might already be using and helps those systems work together in real time.

What Is Mobile Unified Communications?

UC is moving beyond just combining voice communications and corporate email to including mobile services. Mobile UC merges voice and data utilizing converged mobile devices (CMDs) or smartphones. Key mobile UC features include:

- Single phone number
- Single caller ID
- Single voicemail box
- Click to conference
- Click to call from corporate directory from mobile device
- Internal PBX extension dialing
- Dual-mode phones to leverage WiFi and cellular networks

Increasingly, healthcare organizations are adding mobile services and communication-enabled applications — along with mobile access to content, such as patient data, diagnostic images, and video — to their UC deployments.

What Is the State of UC and Mobile UC Technology in Healthcare Today?

While adoption of UC in the healthcare industry currently lags that in other industries, evidence suggests that both awareness and adoption are on the rise. Two significant trends will continue to drive increased UC deployments in healthcare organizations: WLAN upgrades and upgrades of existing legacy telephony equipment, both of which are considered important complementary technologies. Since the passage of the American Recovery and Reinvestment Act (ARRA) of 2009, there has been a dramatic increase in the adoption of EHR technology by hospitals. Wireless point-of-care access to EHR software has led to the increase in the adoption of WLANs discussed previously. Simultaneously, healthcare providers are actively engaged in either replacing or augmenting their legacy PBX voice networks with IP-based telephony and dual-mode phones.

FUTURE OUTLOOK

Challenges/Opportunities

Despite chronic budgetary constraints, IT investment by healthcare providers will continue to rise as they seek to harness the capabilities of IT to achieve:

- Reductions in patient length of stay
- Improved patient safety and outcomes
- Workflow and process improvements
- Improved utilization and productivity of staff and other resources
- Improved customer service experience

A Growing Role for UC in Healthcare

UC, as an architecture that provides a unified, integrated approach to the communication of voice, data, and images, is a common thread in many evolving solutions in these areas and can be expected to play a key role in achieving these goals. IDC Health Insights sees a growing role for UC in the following broad areas:

- Care team collaboration
- Medical training and education
- Caregiver-to-patient and caregiver-to-caregiver communication
- Integration with business and clinical applications

Care Team Collaboration

Given the mobile nature of healthcare workers and the highly collaborative nature of patient care services, particularly in the inpatient setting, communication between members of the care team is of vital importance.

Several years ago, in a landmark study of business telephone usage conducted by AT&T, researchers found that upwards of 75% of all business calls do not reach the intended party on the first attempt. In hospitals, with their highly mobile workforce, this percentage is even higher, yet communication is essential to effective collaboration. Numerous published workflow studies indicate that nurses often spend more time communicating with other staff than they do at the bedside. A Kaiser-Permanente study found that almost 21% of nursing time is spent in the communications necessary for care coordination. Surprisingly, this is slightly more than the 19% devoted to direct

patient care. Much of this communication occurs via telephone, yet those initiating the calls are frequently unable to reach the party they are trying to contact on the first attempt.

Effective and timely communications between patient care team members can be, very literally, a matter of life and death. The stereotypical image of a clinician carrying multiple communications devices, including cellphones, PDAs, smartphones, or pagers, is, all too often, the reality of a caregiver's workday. The frenetic pace of daily life in a hospital, as well as the frequency of unplanned events and the disruption of planned workflows, is another reality for healthcare professionals. Here, too, timely communications can make the difference in how effectively resources can be redeployed in the face of unanticipated delays and other unexpected events. And although email has become as pervasive in healthcare as it has in other industries, the mobile nature of most clinicians makes email a far less efficient communication method. For most patient-related communication, real-time contact is essential.

The response of the industry has been to provide multiple parallel, but all too often independent, communication pathways. This strategy provides only a marginal improvement in the communication success rate, despite a significant increase in cost, and still does not guarantee a real-time connection.

Conversely, in a UC environment, users can set and update their "presence" status in an ad hoc manner through a variety of desktop or mobile devices. The "presence" status of users can also be automatically linked to their calendar so that their availability becomes a function of their schedule. During periods when users are available, they can specify how they can best be reached so that incoming messages or voice calls are routed to an appropriate device, enterprise extension, external landline, mobile number, or pager. Other users wishing to contact them have multiple options, depending upon the devices available to them. For example, an initial contact could be in the form of an instant message. If necessary, the IM dialogue could be escalated to a voice contact with a simple "click to call," which would be automatically routed directly to the preferred phone number.

This facilitates a user's ability to contact another party on the first attempt, and if the call's recipient has access to the corporate network, the voice dialogue can be augmented with text, data, or video components. Recent advances in wireless point-of-care technology have led to the introduction of devices equipped with digital cameras, which, for example, can allow a caregiver at a patient's bedside to take and transmit a real-time view of a patient to a remote physician, which can be an important aspect of wound care.

On-call lists can also be maintained as a coherent hunt group (based on Active Directory/LDAP), which can facilitate the identification and

contacting of consulting physicians. This is of particular importance to emergency department and inpatient nursing unit personnel, especially during weekends and off-hours. Eliminating the delays associated with the need to call a third party, typically the paging service, to identify and contact the appropriate consultant can have significant implications on the patient's outcome.

Medical Training and Education

In-service education is fundamental to the professional development and licensure maintenance requirements of healthcare professionals at every level of training. Published estimates vary as to the rate at which medical knowledge is increasing, but whether one believes the estimates that it doubles every 18 months as some have estimated or every 5–7 years as others have estimated, experts agree that ongoing education for healthcare professionals of every discipline has never been more important. Technologies that facilitate the dissemination of that knowledge are fundamental to achieving improvements in the quality of patient care. Technology-enabled remote learning provides a means to bring high-quality, low-cost in-service education to healthcare professionals no matter where in the world they may be located.

UC-enabled functions, such as Web-based presentations, real-time videoconferencing, live and recorded videoconferencing with mixed media, and various types of two-way interactive sessions, enhance the learning experience and expand the reach and quality of in-service medical education programming.

Caregiver-to-Patient and Caregiver-to-Caregiver Communication

The healthcare industry is struggling both to satisfy dramatic increases globally in the demand for healthcare services and to control the escalating costs of healthcare services. The factors are many — increased economic affluence, increased life expectancy, and a higher incidence of chronic disease conditions that consume a disproportionate share of healthcare costs. For many clinical disciplines, educational programs are not producing enough trained professionals to keep up with this demand. And in many countries, these disparities are further exacerbated by imbalances in supply and demand between urban and rural regions. Technology-enabled remote care delivery processes (collectively referred to as telemedicine), as well as technology-enabled remote consultations between treating physicians and remote experts, are seen as an important tool for leveraging scarce resources. Videoconferencing is an essential component for many forms of telemedicine. It can facilitate examination, diagnosis, and treatment of a patient by a specialist connected over a videoconference link to a caregiver present with the patient in a remote location that combines the live video with other media, which might include patient medical record data.

Remote patient monitoring, a subset of telemedicine, is another emerging model of care delivery. Although not yet widely deployed, remote patient monitoring holds the promise of improving the quality and simultaneously reducing the cost of managing many chronic diseases. Diabetes is a prime example. The treatment of diabetes — and its related impact on other aspects of patient health — represents a significant portion of total health costs. For example, in the United States alone, 20.8 million people, or 7% of the total population, have diabetes. The treatment of diabetes-related complications accounts for about 55% of the nearly \$100 billion associated with diabetes management, the remainder being direct treatment expenses. Although confirmed diabetics make up only about 11% of the population over the age of 65, elderly diabetics consume 40% of skilled nursing days, 29% of home-health visits, 26% of emergency room visits, and 21% of office consultations. Diabetics of all ages have a 1.5 times greater risk of being hospitalized and remain in the hospital an average of 2.8 days longer than nondiabetics with the same conditions (source: American Diabetes Association).

Timely intervention is the key to effective diabetes management from both outcome and cost perspectives. Intervention can be facilitated by remotely monitoring the glucose levels of diabetics in the course of their daily lives. Should the patient's level exceed a threshold value, automated communication of that information to the patient's case manager, coupled with timely communication by a caregiver to the patient, can result in improved management of the patient's condition, potentially avoiding a visit to the physician's office or the local hospital emergency room. For example, business rules could be established that trigger follow-up actions that are dependent on the level of urgency: from scheduling a screening appointment (nonurgent) to a real instant message or time-sensitive outbound call to the first available specialist. If UC-enabled through "presence," the calling process would be able to determine, in real time, which caregiver is available, a key differentiator to blind outbound calls that might simply result in one or more rounds of voicemail/phone tag.

Communications technology not only can "enable" improved clinical processes but also can facilitate routine business communications between patients and caregivers. Healthcare is just beginning to embrace the principles of customer service that other industries have already adopted. Patients and their families have become accustomed to the benefits of online banking, stock trading, and shopping and are demanding similar ubiquitous and asynchronous access to their healthcare providers to schedule appointments, obtain test results, renew prescriptions, and even consult with their physician electronically rather than tolerate a seemingly endless string of telephone calls. Providers, mindful of the increasingly competitive environment, are seeking ways to meet these demands, improve customer service, and enhance customer loyalty.

Integration with Business and Clinical Applications

The highly interdependent nature of hospital processes frequently requires that resources in one area respond in a timely manner to an event that has occurred in another. The need for such communications is often triggered by the attributes of a transaction processed by one of the hospital's applications. Integrating UC into these applications enables the required follow-up actions to be communicated automatically, without delay, at minimum cost and with a high degree of certainty that the communication is delivered to someone who can act on it in a timely manner.

Examples of such transactions include:

- Availability of critical diagnostic results
- Communication of "panic values"
- Patient transportation requests
- Resupply notifications
- Emergency blood draws
- Schedule changes
- Mass notifications
- Consultation requests
- Discharge facilitation

In each of these examples, and many more like them, UC can enhance process quality and improve productivity by automatically initiating the communication based on predefined business rules. Further, by exploiting the "presence" capabilities and business rules inherent in UC, hospitals can structure these communications processes so that the user who initiated the communication can reach the intended party or an appropriate alternate in real time rather than simply leaving a message.

CUSTOMER PROFILE: BELFAST HEALTH AND SOCIAL CARE TRUST

In Northern Ireland, the National Health Service is referred to as the Health and Social Care in Northern Ireland (HSCNI). In addition to providing healthcare services, HSCNI offers social services such as home care services, family and children's services, day care services, and social work services. Belfast Health and Social Care Trust (BHST) is one of five HSCNI Trusts in Northern Ireland, and with an annual budget of approximately £1 billion (approximately \$1.6 billion) and 20,000 staff, it is one of the largest Trusts in the United Kingdom.

BHSCT delivers integrated health and social care to 340,000 people in Belfast, as well as regional specialist services to all of Northern Ireland.

Before deploying Microsoft Lync, BHSCT was running 6 large legacy PBX or VoIP exchanges across 6 acute hospitals and many more smaller branch exchanges with between 8 and 20 users in 150 buildings across Belfast. Managing the different exchanges was a difficult and expensive task. In particular, the costs of moves, adds, and changes (MACs), which can be substantial across such a dynamic environment, were a significant concern. Consolidating to a single infrastructure not only would reduce costs but also would enable BHSCT to improve the telco and support services it offered.

The real challenge was that BHSCT was trying to unify different aging technologies, which were never going to scale, especially as the equipment became less reliable with age. For these reasons, the BHSCT ICT department reviewed its assets with the goal of consolidating to a single IP infrastructure. The objectives for deploying a new UC system were:

- Enable people to communicate more effectively regardless of where they are located
- Improve how people communicate with each other by consolidating their messaging streams and offering presence, instant messaging, and data communications, which are critical to BHSCT
- Standardize the level of support and reduce the costs for MACs across the participating hospitals and community care settings
- Reduce total cost of ownership by consolidating legacy PBX and VoIP exchanges and reducing multiple ISDN lines

BHSCT selected Microsoft Lync over the incumbent vendor offering for its UC technology, namely integrated presence, instant messaging, and videoconferencing, and for the range of communication services included as part of the overall Lync package. BHSCT staff were already familiar with the Microsoft user interface. In contrast, in the incumbent vendor offering, each of these UC capabilities was an added feature for which BHSCT would have to pay and may not be well integrated with the overall UC solution.

Integration was an important consideration for BHSCT's CTO, Paul Duffy. "The natural integration that Lync offers with other Office products was really a compelling thing for us," he said. The integration with existing desktop tools and the familiar user experience were advantages in user adoption. This reduced the training and expedited user adoption, important considerations when one is focused on delivering a service to more than 10,000 staff. Lync is integrated with

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Microsoft Outlook, which is a major advantage since users are very familiar with the user interface and are not afraid to try new ways of communicating using features they have used before, such as presence and instant messaging.

Rolling out Microsoft Lync

BHSCT has a small, dedicated IT team of fewer than 10 staff managing the Lync rollout that can deploy approximately 200 to 300 phones per week. The IT team consists of internal project managers as well as deployment, development, integration, support, and training staff, and some of the IT suppliers have also become involved. BHSCT started with a small pilot group of 100 users and then expanded it to 1,000 users. Pilot participants provided feedback, prior to deployment, on how features worked so that the features could be replicated — where appropriate — in Lync. This approach allowed BHSCT to ensure that established communication workflows would not be disrupted and to discuss additional training so that issues could be resolved and a suitable rollout plan could be put in place for the specific needs of the healthcare environment.

Rollout began on a hospital-by-hospital basis starting with the major acute hospitals. The initial steps involved scoping end-user requirements and understanding how healthcare users could adopt Lync to fulfill day-to-day tasks more easily. This was followed by an education process explaining the new UC capabilities that Lync provides and training users on the new solution where necessary. BHSCT found that rolling out Lync was the easiest part of the project. "A lot of work needs to go into scoping and planning the project and educating staff about the benefits of the new UC system. Execution and rollout is fairly straightforward if you are well prepared," explained Duffy. "Change management, however, is by far the hardest part. Early communication, user engagement, training, and practical examples of how users can benefit from Lync help drive adoption and functionality utilization. Once the users get it, they generally love it!"

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General training is now a light-touch engagement, with follow-up training provided for those who require it. The ICT department communicated to employees in the health services that Lync is more than a replacement of their traditional phone system. It also offers additional collaborative tools that are integrated with their current desktop environment. However, for some users, the "compelling event" of replacing their phones was the impetus they needed to think of new ways of using the UC technology.

Benefits: Lower Telecommunication Costs and Faster Clinical Decision Making

The immediate benefit of upgrading BHSCT's UC system is a reduction in telecommunication costs. BHSCT estimates that it will save £1 million (approximately \$1.6 million) over the duration of the contract across the entire enterprise by:

- Reducing the number of inbound and outbound bearer circuits and the maintenance and support costs associated with the eliminated circuits
- Reducing the need for further cabling by maximizing the current cabling infrastructure, eliminating telco costs with regard to MACs and providing end users with the capability of logging on to any phone in any location
- Lowering maintenance costs by reducing the number of PBXs from six to one
- Maximizing the existing IP data network to reduce the number of ISDN lines that need to be maintained

From a clinical perspective, the savings are measured in reducing the time it takes to make a clinical decision with input from colleagues. Duffy commented, "In healthcare, it's all about the decision. Within a clinical environment, using Lync and its various communication and collaboration features will help speed up the decision-making process." By using Lync, clinicians can send instant messages, initiate on-demand videoconferencing with one another, and share their desktops so that they collaboratively review the same clinical information or patient's electronic health record. These on-demand communication capabilities eliminate the need for in-person meetings with all of their inherent scheduling challenges.

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Best Practices: Lessons Learned from the Field

BHSCT identified several best practices while deploying UC and Lync:

- If Lync is to be a major platform, then design it from the outset with the capacity and capability to support the entire organization.
- Take time to scope the rollout of the project. While scoping takes time, it is an opportunity to engage with users, to discuss the benefits of the new system, and to solicit concerns so that they can be addressed before the system is rolled out to end users.

- It is extremely important to carry out detailed planning before implementation, taking into account users' expectations. Any learning and issues from the pilot should be fully considered as part of subsequent rollouts.
- Understand how your existing system is currently used, and be prepared to retrain and challenge users to work differently or ensure Lync is configured to replicate those features.
- Enthusiastic and knowledgeable staff who can act as advocates and encourage others to adopt the new feature set are important in the change process. When Lync is properly deployed, the extra functionality that it offers should appeal to users who see it only as a replacement phone system.
- Involve clinicians to obtain an understanding of existing clinical and nursing communication processes, and challenge current practices that are not optimal to help clinicians realize that the features and benefits of Lync can enable them to find better ways of working with their colleagues.
- Change management can be challenging for IT and end users. If possible, choose those areas within the business where adoption will be easiest and will provide the most benefit to staff before moving into the more specialized areas of the organization where one might expect more resistance to new technology adoption.

What's on the Horizon for BHSC and Lync?

The videoconferencing feature of Lync is very important to BHSC because it enables real-time face-to-face communication between healthcare providers. Once they are comfortable using this capability and begin to realize the benefits of such communication, they will find more opportunities to use videoconferencing.

For certain conditions — such as mental health, diabetes, or diet management — video chat may be the preferred channel for clinicians and patients. BHSC envisions using Lync to facilitate communication between physicians and patients who have been discharged from the hospital or who have managed conditions that would benefit from frequent, but brief, health coaching.

ESSENTIAL GUIDANCE

UC and the technologies that enable it are quickly becoming vital components of healthcare organizations' IT infrastructure. Healthcare organizations must consider the impact of rolling out new UC technologies not only on administrative and clinical staff but also on telecom and IT staff, as well as their existing telecom infrastructure:

- **Transition telecom to IT.** The first challenge will be migrating telecom staff and functions to the IT department. Certain processes, such as help desk functions, should be integrated; telecom help should be combined with the IT help desk function, although handled by staff with the appropriate skill set. Healthcare organizations need to establish and maintain a business focus, a step that is often, unfortunately, skipped by many organizations. A senior-level individual should be assigned to the task of managing enterprise communications and collaborative tools to improve not only business processes but also clinical processes.
- **Expose "boring applications" that drive healthcare organization.** Before seeking a new UC solution portfolio, healthcare organizations must understand how both administrative and clinical staff currently communicate with each other. For example, they need to identify the heavy phone users and ask why they use this channel over other channels. The same is true for email, instant messaging, and mobile phone users.
- **Identify inefficient processes that have a high human latency factor.** Healthcare organizations should seek to identify communications processes that are highly inefficient, such as those for which the first attempt success rates are lowest, the time required to successfully complete the contact is greatest, and the response delays are the longest and the consequences of those delays pose the greatest potential patient risks or represent significant avoidable costs. Healthcare organizations should involve the user community in identifying these processes. Engaging end users to help identify "broken" processes will help garner support for staff participation in pilot projects and help achieve a "quick win." Both actions will encourage the requisite process change required for rolling out UC technology more widely.
- **Engage physician and nurse champions for clinical communication processes.** Healthcare organizations need to identify clinical leaders who are well respected among their peers not only for their clinical expertise but also for their thought leadership on matters where IT intersects with medicine. These clinical leaders will be instrumental in identifying clinical communication processes that would benefit from applying UC technologies and encouraging their peers to adopt new strategies to entrenched, but broken, processes.

- **Assess current IT infrastructure, telecom equipment, and service provider contracts.** Key considerations include investment protection, vendor standardization or multivendor environment, and use of common IT standards (e.g., SIP, XML). Healthcare organizations simply cannot afford "rip and replace" strategies. Consequently, and where practicable, they should extend existing infrastructure. Most organizations start with identity to lay the foundation for email and calendaring, and then mobile messaging. With these core UC applications in place, healthcare organizations can add presence and instant messaging. Unified messaging capabilities coordinate the aggregation and dissemination of messages to staff according to their preferred channel (e.g., email, fax, phone). Lastly, conferencing and VoIP are deployed to complete the UC stack. It should be noted that once identity is established, deployment of the UC components can occur in any order, depending upon the organization's unique business and system requirements.
- **Educate the user community about how UC can positively impact communications.** An informed user community will often use technology to solve its own challenges in ways that may surprise the "experts" but that can be very much effective. Several of the organizations interviewed as part of our research reported that the more successful pilot projects were those in which users described to IT how they envisioned the technology could be used to solve their communication challenges. Healthcare organizations should identify case studies highlighting innovative UC applications at other provider organizations. Once the various UC components are in place, end-user teams can often devise their own communication processes and, through viral, internal marketing of the solution, encourage other colleagues to adopt the solution for their own purposes.
- **Require vendors to provide customer case studies and other empirical studies.** As with any other major IT investment, healthcare organizations are encouraged to ask vendors to provide objective studies that show how their solution will provide business and clinical value. In addition, clinicians respect empirical data and will respond favorably to peer-reviewed studies that demonstrate the clinical efficacy of using UC in clinical settings.

PARTING THOUGHTS

The healthcare working environment is fast paced and communication intensive. UC deployment will drive many process improvements in healthcare — most notably, improving patient safety and patient outcomes while reducing costs through productivity and efficiency gains. The potential benefits of UC deployment are many and far broader than merely those associated with UM. Although healthcare

providers are early in the UC adoption cycle, a confluence of factors, including the relentless drive to improve operational efficiency and care quality, along with increased adoption of EMR and mobile devices by clinicians, wireless networks, and IP telephony technologies, can be expected to raise both awareness of and investment in UC technologies by healthcare providers over the next several years.

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- Maximize the business value of their technology investments
- Minimize technology risk through accurate planning
- Benchmark themselves against industry peers
- Adopt industry best practices for business/technology alignment
- Make more informed technology decisions and drive technology-enabled business innovation

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