Spreading the Word: Messaging and Communications in Higher Education

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Volume 2, 2009

Research Study from the EDUCAUSE Center for Applied Research
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Username: ERS0902
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Spreading the Word: Messaging and Communications in Higher Education
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The mission of the EDUCAUSE Center for Applied Research is to foster better decision making by conducting and disseminating research and analysis about the role and implications of information technology in higher education. ECAR will systematically address many of the challenges brought more sharply into focus by information technologies.

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Foreword

The EDUCAUSE Center for Applied Research (ECAR) was launched on January 1, 2002, to create a body of research and analysis on important issues at the intersection of higher education and information technology (IT). ECAR is fulfilling its mission through a program of symposia and through the publication of biweekly research bulletins, detailed research studies, occasional papers, executive roadmaps, and case studies. These publications are designed to highlight effective practices, lessons learned, and other insights from the practical experience of campus leaders. Since ECAR’s inception, 13 symposia have been held, and more than 400 research publications have been issued.

Messaging and Communications in Higher Education

On October 29, 1967, UCLA’s SDS Sigma 7 host computer transmitted a one-word message to an SDS 940 host computer at the Stanford Research Institute (SRI). The message sent was “lo.” This message had been transmitted over the ARPANET, the packet switching network of the U.S. Department of Defense’s Advanced Research Projects Agency. At 10:30 p.m., Leonard Kleinrock and Charley Kline of UCLA’s Network Measurement Center tried to send a message with the word “login” to SRI’s Augmentation Research Center. SRI programmers had received the letters “lo” when the ARPANET connection crashed. About an hour later, a second attempt at sending the word “login” was successful.

The following year, HAL, the precocious and fictional computer in Stanley Kubrick’s 2001: A Space Odyssey, tells other crew members aboard the spaceship Discovery, “I am putting myself to the fullest possible use, which is all I think that any conscious entity can ever hope to do.” While computers have yet to become sentient, human–machine interactions have become commonplace and complex, and today, more than 1.5 billion humans are transmitting and receiving billions of textual, visual, musical, and vocal messages daily.

It is generally understood that the second wave of the information revolution began with the creation of the ARPANET. With the transmission of messages between computers across networks, it became clear that computers were not only computing machines. They were communicating machines. This was—and remains—a very powerful idea. Kleinrock himself speculated in the earliest days that “we will probably see the spread of ‘computer utilities’ which, like present electric and telephone utilities, will service individual homes and offices across the country.”

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To early Internet pioneers like Kleinrock and J. C. R. Licklider, it soon became obvious that the ARPANET was likely to become a human communication medium with very important advantages over normal U.S. mail and telephone calls. Early net workers discovered that a network message could be written tersely and typed imperfectly without upsetting the applecart. The formality and perfection that most people expect in a typed letter did not become associated with network messages, probably because the network was so much faster, so much more like the telephone.

The rest, of course, is history. The Internet—successor to the ARPANET—has indeed become a mass communication medium of amazing power. It is the connective fabric that links evolving computer utilities and messaging and communications, and it has not only exploded in popularity but has also supplemented and, in many contexts, supplanted both the telephone and the U.S. mail in usage. This history is rich, and the story of messaging and communications told by ECAR Fellow Mark Sheehan captures this unfolding drama as it stands in 2008–2009 in higher education. The story of messaging and communications is especially poignant and important in the context of higher education. First, university information technologists can and should take pride in a story about technologies that were in large measure “invented here.” While the Internet was certainly promoted and funded by visionary leaders in the federal government, it was surely invented, developed, improved, tested, and assimilated by university researchers in university environments. Second, as scholarship is an inherently interdisciplinary and interinstitutional activity, the evolution of messaging and communications is completely interwoven with scholarship, as both have evolved in the past 40 years. Most would argue that scholarly research—particularly scientific research—has changed more in the past 40 years than in the preceding 200 years!

The topic of messaging and communications is not only a touchstone to the past but also a topic that can launch IT practitioners from the relentless demands of today to breathtaking views of tomorrow. One could even say that this is a story that begins with “lo” and ends in “and behold.” Today we are witnessing the full convergence of voice, data, and video on a variety of dazzling platforms. More than one-fifth of all the people in the world communicate via messages across an ever-growing array of communication channels—e-mail, text messaging, cellular networks, social networks, blogs, podcasts, and so forth. Hours of new video content are added to YouTube every minute. In many ways, we swim in a sea of messages—messages that we syndicate and messages that others (human or not!) send to us.

In 2009, to message is to be. As Marshall McLuhan observed, “We become what we behold. We shape our tools and then our tools shape us.”

Mark Sheehan’s study of messaging and communications in higher education builds on a thorough review of the literature of this field, discussions with leaders in our community, an analysis of survey responses from 351 colleges and universities, and interviews with more than 30 IT leaders. Like all ECAR studies, this study of messaging and communications strives to document the state of current practice, including

♦ the robustness of higher education’s communications infrastructure and service,
♦ CIO perceptions of the effectiveness of digital communications in higher education,
♦ the nature of technologies in use and the extent of their deployment,
♦ higher education’s uptake and socialization of rapidly evolving web-enabled handheld devices, and
higher education’s capacity to blend and leverage multiple communication channels to deliver critical messages under emergency conditions.

Many Contributors to the Study

As with all ECAR studies, our ability to produce these analyses depends on contributions of time and expertise from many. Mark Sheehan led the ECAR team that included Judy Pirani, Ron Yanosky, Gail Salaway, Shannon Smith, Bob Albrecht, Susan Foster, and myself. The work of the ECAR fellows is meticulous, and it is checked and rechecked for accuracy. Gregory Dobbin, Bob Carlson, Dixie Cheek, Nancy Hays, Susan Gollnick, Anita Kocourek, Stephen Larghi, and orchestra leader Toby Sitko make up that part of the talented team of EDUCAUSE staff and contractors who translate great research and writing into the tangible resources that make it possible for our readers to gain insights and to make effective cases for action to their stakeholders. Providing tools that promote actionable insight lies at the heart of the ECAR mission.

As is often said, the real team in any ECAR study is the EDUCAUSE community. Our ability to ascertain the state of the practice in any sphere of IT activity in higher education depends on the goodwill of our friends in the community. Literally hundreds of busy CIOs and other senior information professionals share their time and expertise with us. For this study and for three case studies that look at messaging and communications at the Louisiana State University and A&M College (LSU), the University of Louisville (UofL), and the Massachusetts Institute of Technology (MIT), we are particularly grateful to Brian Voss of LSU; Priscilla Hancock and Thomas M. Sawyer of the UofL; and Jerry Grochow, Wilson D’Souza, and Andrew Yu of MIT. Too many members of our community to list here made contributions to this study. Their contributions are deeply appreciated and are acknowledged in Appendix B.

At ECAR and at EDUCAUSE we are constantly reminded that we are amazingly lucky to serve a professional community that is generous, insightful, and kind. To the extent that ECAR and EDUCAUSE live up to the expectations, standards, and example of this community, it is because we are its creation, and one of its reflections.

Lo, and behold.

Richard N. Katz
Boulder, Colorado

Endnotes

The first decade of the new millennium has been a time of transition in communication technologies. The ubiquity of cell phones and the availability of free, institutionally branded, web-based e-mail services gave higher education institutions viable alternatives to managing those components of their student communications infrastructure. Maturation of voice over Internet Protocol (VoIP) gave institutions options for faculty/staff telephony as well, with the financial and logistical advantages of converging two separate communication networks into one. Mobile communications went beyond laptops and Wi-Fi in this decade, manifesting first in explosive student engagement in text messaging and then, more gradually, in the migration of online content and services to web-enabled handheld devices. Finally, catastrophes of various kinds throughout the decade underscored the importance of robust emergency notification technologies and of institution-wide planning to maintain essential communications during a crisis.

ECAR’s study of messaging and communications in higher education was spurred by these transitions and the implications they hold for our community, as both opportunities and obligations. Postings to the EDUCAUSE CIO constituents’ group listserv over the last several years made it clear to us that the issues these changes raise are very much on the minds of higher education IT leaders, as are related issues such as the management of e-mail and other electronic records in light of the 2006 amendments to federal evidence discovery rules.¹

These are interesting times for messaging and communications and, like all interesting times, they abound with challenges and opportunities. This study aims not only to reveal the current state of the practice surrounding these technologies in higher education, but also to share insight into what lies ahead, as seen through the eyes of our respondents.

**Methodology**

Our study of messaging and communications took a multipart approach that consisted of

- a literature review to identify issues and establish research questions;
- consultation with higher education leaders active in communications to identify and validate survey questions;
- a quantitative web-based survey of EDUCAUSE member institutions, which received 351 responses; 81.7% of these identified respondents as a CIO or equivalent;
qualitative interviews with 37 IT leaders; and
- three case studies looking at messaging and communication practices at the Louisiana State University and A&M College, the University of Louisville, and the Massachusetts Institute of Technology.

**Key Findings**

Our study focused on how institutions planned, organized, deployed, and supported messaging and communication technologies, what level of confidence the institution had in them, what their performance was like, and how the institution saw their importance and usage changing in the foreseeable future. The survey questions covered

- respondents’ overall sense of the effectiveness of digital communications at their institutions;
- the robustness of the institution’s communication infrastructure and of selected services carried by it;
- the planning and policy environments associated with messaging and communication technologies;
- the specific technologies deployed for communication purposes, constituents’ level of satisfaction with them, and respondents’ view of future demand for them;
- the state of the institution’s adaptation of existing online services for delivery to web-enabled, handheld mobile communication devices and its development of new ones; and
- the state of the institution’s preparedness to communicate during a crisis.

In the following sections, we summarize and synthesize our main findings.

**Communication Basics**

Respondents to our survey agreed, on the whole, that when their institutions communicate by electronic means, those communications are accurate; they more often disagreed that the communications were timely, reached their intended recipients, and accomplished their communication goals. Currency of the institution’s infrastructure seems to play a role: Early adopters of new messaging and communication technologies were more positive about all these aspects of electronic communication than late adopters, as were institutions where sensitivity to the communication preferences of recipients was greater.

Well over half of respondents agreed or strongly agreed that their messaging and communication infrastructure met the institution’s needs, but a majority said it would not do so in three years.

With the exception of PBX-based landline telephony and institutionally provided student e-mail, respondents on average anticipated an increase in the importance of a host of communication technologies to faculty, staff, and students. If these projections are accurate, institutions will need to prepare to provide and/or support Internet-capable mobile phones, Web 2.0 applications, and both desktop and classroom videoconferencing technologies.

A written policy for e-discovery—to deal with subpoenas and court orders for electronically stored information—was in place at only about half of responding institutions. Where such a policy was in place, respondents were significantly more likely to say that the institution’s process for responding to e-discovery requests met the demands placed upon it, suggesting that the development of such a policy would be beneficial to those who do not yet have one.

**We’ve All Got Mail**

Institutions that stay a little bit ahead of the curve in adopting new messaging and communication technologies seem to have an edge with the groups they serve: They reported greater overall satisfaction with institutional e-mail services among all
constituencies. Students, in particular, seemed sensitive to the currency of the institution’s communication offerings.

Nearly all institutions’ primary e-mail systems for faculty and staff were hosted by the central IT organization. Only 2.3% reported that a commercial provider hosted them. But student e-mail services were much more commonly outsourced, with 19.0% of responding institutions reporting that a commercial provider hosted their primary student system. Momentum for outsourcing of student e-mail is probably just beginning, given our respondents’ prediction that the mean importance for students of institutionally provided e-mail would decrease over the next three years. Nearly half of respondents predicted a reduction in the number of e-mail systems they would host in the next three years, although smaller institutions, on average, predicted less change in this area.

Student use of two alternative communication technologies, text messaging and social networking websites, was expected by half or more of respondents to result in a reduction in students’ use of e-mail in the next three years (see Figure 1-1). Only about a third of respondents thought the third, less interactive alternative that we asked about—RSS feeds—would have such an effect.

Respondents’ e-mail environments are generally not tightly regulated. Paralleling our finding that fewer than half of institutions have written e-discovery policies in place, we found as well that fewer than half of our respondent institutions had e-records management policies in place for faculty/staff e-mail, and only a quarter had both e-discovery and e-records policies in place. Even where e-records management policies were in place for faculty/staff e-mail, fewer than half of respondents said enforcement was consistent.

Telephony 2.0
At most respondent institutions, central IT is the provider of landline telephone service for faculty, staff, and students. Some institutions said they offer telephone service to faculty and staff on an opt-in or (rarely) opt-out basis, but most said they provide it to all faculty and staff. The financial model for faculty/staff telephone service seems sound, with two-thirds of respondents agreeing that the service will be financially sustainable over the

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**Figure 1-1.**
Anticipated Three-Year Increase/Decrease in Student E-Mail Use Resulting from Use of Alternative Communication Technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Decrease</th>
<th>No change</th>
<th>Increase</th>
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<tbody>
<tr>
<td>SMS text messaging</td>
<td>62.5</td>
<td>16.1</td>
<td>21.4</td>
</tr>
<tr>
<td>Social networking websites</td>
<td>50.5</td>
<td>24.1</td>
<td>25.4</td>
</tr>
<tr>
<td>RSS feeds</td>
<td>33.4</td>
<td>43.0</td>
<td>23.6</td>
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next three years. Nevertheless, only 4 in 10 respondents agreed that institutional landline telephone service routinely exceeded user expectations, and nearly half were neutral on that point. Admittedly, routinely exceeding user expectations with a taken-for-granted infrastructure service would be a fairly high standard to meet.

Perhaps our most dramatic telephony finding was the looming shift to IP-based services, a change that has been discussed for a decade or more but has never seemed to reach critical mass. Very few respondents expected any increase in the importance of PBX-based telephone service in the next three years. Most—about three-quarters—seemed instead to expect VoIP to supplant it, at least for faculty and staff telephony. Only about a sixth of respondents overall had completely adopted VoIP for those constituents, but another third had work under way, and only 10% reported no plans to adopt the technology. Institutions with VoIP projects completed or in progress reported better user satisfaction with telephone services than those that did not. Conversion of residential student landline telephone infrastructure to VoIP was much less pervasive, as many institutions have accepted the ubiquity of student cell phones and have chosen to discontinue all or most landline telephone service in their halls of residence.

About 6 in 10 institutions reported that they allow, but do not encourage, the use of consumer VoIP-based long-distance telephone services such as Skype by faculty, staff, and students. Most of the remainder said they either discourage or prohibit it. (Not surprisingly, nearly two-thirds of the latter group said they are late adopters of new electronic messaging and communication technologies.)

**Going Mobile**

In contrast to the momentum we found in VoIP landline telephony, we found the average institution to be somewhat muddled and tentative in its mobile telecommunication strategies. Only about half of respondent institutions reported having a process in place to provide mobile communication services to faculty and staff, mostly by subsidizing or paying outright for services. Even where this kind of financial support was in place, most provided it to fewer than 10% of faculty and 25% of staff. This is an area that may see a great deal of growth, though, because 8 in 10 respondents from the overall survey population told us they expect demand for such financial support to increase or greatly increase over the next three years.

The current frontier for mobile communications in higher education is the delivery of information and services to cell phones and other mobile communication devices. Such devices are in nearly everyone’s hands now, and three-quarters of respondent institutions agreed at some level that their ubiquity will cause the institution to make significant changes to online services in the next three years. Nevertheless, as we will see below, few institutions are now making substantial changes.

Virtually any mobile phone can use text messaging to send and receive messages, and text messaging is in heavy use among students in higher education, at least for casual communications. At present, however, it is not used much for the institution’s official, non-emergency communications. Only one in seven respondent institutions reported using text messaging for communications with students, and even fewer use it with any of the other constituencies we asked about. Only a third of institutions have adapted preexisting online services for delivery via text messaging, and most told us they had done so to a small or very small extent.

Web-enabled handheld mobile communication devices (“handheld devices” hereafter) have not only telephone and text messaging capabilities, but also give their owners e-mail access and web-browsing tools. Two-thirds
of students reportedly own handheld devices that are capable of some sort of interaction with the Internet, but in another recent ECAR study relatively few students told us that they take advantage of that capability, mostly due to cost and convenience factors.

When asked if the handheld device is now an essential tool for the higher education professional, a third of respondents agreed or strongly agreed that it was (see Figure 1-2). When asked if the same would be the case in three years, twice as many agreed, including nearly a quarter who strongly agreed.

Although three years may seem like a long way out, and competing demands are always going to be strong, we believe that higher education is a bit behind the curve in embracing handheld devices. That point comes through most clearly in reports of the institution’s deployment of web services for those devices. Half of respondents said their institutions had adapted no preexisting web-based services for handheld devices, and a third had done so only to a small or very small extent. The numbers are even smaller for the development of new services.

Those who are even slightly ahead in providing services to handheld devices are enhancing their ability to attract and engage a generation of tech-savvy prospective students, faculty, and staff. Those institutions often share a number of characteristics that may be instructive to later adopters. More often than others, they

- reported that mobile communications is specifically identified as an area of importance in their IT strategic plan,
- reported a specific, documented strategy for providing web services to handheld devices,
- agreed that their executive leadership understands the implications of providing such services, and
- described themselves as early adopters of new messaging and communication technologies in general.

“Ready to Ride and Spread the Alarm”

Like modern-day Paul Reveres, central IT and its institutional allies are very clearly taking seriously their role in spreading the word about emergencies and maintaining the flow of communications during a crisis. Formal planning to communicate in time of trouble was common to three-quarters of our
respondent institutions, either through development of a stand-alone crisis communication plan or, more commonly, by including crisis communication planning in their overall emergency response plan. Of those now without a plan, most reported that one is under development. Three-quarters of respondents agreed or strongly agreed that their executive leadership places a high priority on crisis communication planning.

Emergency notification is a key element of crisis communication, and virtually all institutions reported taking a multimodal approach to it. From our list of 11 selected technologies for emergency notification, most respondents reported using between 4 and 7. Testing of each of these communication channels is done at least occasionally by two-thirds of those who adopt them. Most institutions have brought their emergency communication channels together into a more or less coordinated emergency notification system (ENS). Just over 4 in 10 of the institutions we surveyed have acquired a commercial system that pulls their chosen ENS channels together into an integrated system (IENS). At doctoral, master’s, and bachelor’s institutions, where there are greater concentrations of residential students, the IENS is substantially more common than at associate’s institutions.

A valuable measure of the effectiveness of an institution’s ENS or IENS was respondents’ overall confidence that the institution’s emergency notifications would reach their intended recipients (accurate delivery) and that notifications would be received in time for the recipient to take appropriate action (timely delivery). Confidence in accurate and timely delivery is higher where respondents agree that the messaging and communication infrastructure meets the institution’s needs, where a written crisis communication plan is in place, where more ENS channels are in use, where the ENS is tested more frequently, and where an IENS is in place.

Somewhat disturbingly, for a technology whose purpose is to protect faculty, staff, and students from danger of injury or even death, enrollment in an institutional IENS (where enrollment is optional) is far from universal; a majority of respondents said 50% or fewer of their institutional community members had opted in.

Nearly two-thirds of respondents agreed or strongly agreed that their crisis communication procedures would function effectively if campus telephone service was unavailable; nearly half felt the same about unavailability of campus data network service, but only 4 in 10 felt they would do as well in the face of an outage in local mobile telephone service (see Figure 1-3). We assume this is because the mobile telephone network is considered the primary emergency backup for the campus telephone system (and through broadband wireless, perhaps for the campus data network as well). Loss of local grid electrical power would also strain crisis communication procedures, perhaps in part because on-campus electrical generation capacity is not sufficient to meet crisis communication needs, and perhaps because such an outage would have implications for the availability of mobile telephone service.

Several factors appear to improve respondents’ sense of preparedness to communicate in the event of an emergency. Among these are the existence of an institutional crisis communication plan, agreement that executive leadership places high priority on crisis communication, a crisis communication team made up of representatives from diverse campus organizations, a commercial IENS, and a greater degree of organization in the ways the institution appoints and supports the individuals authorized to send emergency notifications.

**Beyond the Horizon**

In “Next-Generation Communications,” the last chapter of this report, we look beyond the messaging and communication
technologies of today toward the transformations ahead. Today’s trend toward convergent technologies is likely to continue. Voicemail, e-mail, text messaging, and social networking applications are all now accessible on handheld devices, but they may not be equally accessible on our desktop or laptop computers. Our office e-mail system’s contact list may sync with that of our handheld device, but our personal e-mail account’s contact list may not; a third, ad hoc contact list in the call log of our mobile phone may be accessible from neither of our e-mail systems and may be lost altogether if we lose the phone. So convergence has a distance yet to go.

The promise of convergence and other emerging technologies is that communication systems will be more aware of their users, not just who and where they are, but what communication resources are available to them from moment to moment and which of them they prefer to use for particular types of communication. This level of intelligence in our communication systems, combined with location-aware global positioning satellite technology already built into our mobile phones, enables a number of science fiction-like scenarios. Systems in buildings that we enter can greet us and, by consulting our electronic calendars, direct us to the location of our next meeting, perhaps even briefing us confidentially through a headset as we walk to the conference room (or classroom). Products or services that we are known to prefer or that are on our electronic shopping lists can advertise themselves to us when we are in proximity to them. In effect, the entire man-made environment can become chatty and helpful.

While these examples may seem trivial, there are practical aspects to them as well, for navigation, logistics, knowledge work of many sorts, and—not least—crisis communications. The disparate technologies already exist, and development of master technologies to bind them all together is well under way. The converged delivery instrument—the handheld mobile communication device—is all but perfected. Two things remain to emerge. First, acceptably secure but highly detailed and highly networked profiles for each of us need to be created, and tools must be developed to keep them current with a minimum of effort. And then, to serve as the engine behind this
pervasive, unprecedentedly personalized level of service, a funding model must emerge. The social and economic obstacles will likely be more difficult to overcome than the technical ones, but as anyone who bet against the future of Internet commerce in 1995 will attest, the intersection of popular culture and the marketplace has powers of its own for overcoming obstacles and transforming our lives.

**Conclusion**

Overall, higher education has been conservative in the way it approaches messaging and communication technologies. Much of that conservatism is well placed, given the lengths by which the promise of information technology tends to outpace its delivery. The decibel level of hype about outsourced e-mail, VoIP telephony, and handheld web browsers has been high, and distinguishing early on between what is a fad and what is a new staple technology requires not just good business intelligence but a bit of luck as well.

Relative to the technologies this study addresses, higher education is adapting better in some areas than in others. Our respondents’ adoption of outsourced e-mail services, for example, is proceeding rapidly. Responses to this study’s July/August 2008 quantitative survey indicated that student e-mail was outsourced at 19.0% of institutions and e-mail services for faculty/staff were outsourced at 2.3%. Responses to similar questions in ECAR’s November/December 2008 IT services sourcing survey indicate rapid progress, with 24.7% of respondent institutions then saying student e-mail was outsourced and 4.8% saying the same about faculty/staff e-mail.3

Adoption of VoIP telephony is another area in which higher education is now making good progress, after a long delay during which the technology was still proving itself and only a few pioneering institutions had adopted it. At present, half of respondent institutions have VoIP adoption projects for faculty/staff telephony under way or completed, and another 20% are planning them. VoIP projects for residential student telephony are few, given that student-owned cellular telephones have made residence hall landline telephones nearly obsolete.

Slower, perhaps more deliberate, progress is being made in areas related to mobile communications. Very few institutions are making any non-emergency use of text messaging, despite that technology’s popularity among student-age mobile phone users. While about half of institutions have a process in place to financially support mobile communication service for faculty and staff, the average institution subsidizes or pays outright for those services for only about 8% of faculty and 19% of staff. Nearly 80% of respondents expect demand for this kind of financial support to increase or greatly increase in the next three years.

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Adoption of VoIP telephony is another area in which higher education is now making good progress, after a long delay during which the technology was still proving itself and only a few pioneering institutions had adopted it. At present, half of respondent institutions have VoIP adoption projects for faculty/staff telephony under way or completed, and another 20% are planning them. VoIP projects for residential student telephony are few, given that student-owned cellular telephones have made residence hall landline telephones nearly obsolete.

Slower, perhaps more deliberate, progress is being made in areas related to mobile communications. Very few institutions are making any non-emergency use of text messaging, despite that technology’s popularity among student-age mobile phone users. While about half of institutions have a process in place to financially support mobile communication service for faculty and staff, the average institution subsidizes or pays outright for those services for only about 8% of faculty and 19% of staff. Nearly 80% of respondents expect demand for this kind of financial support to increase or greatly increase in the next three years.

Although many commercial web services and online retailers are rising to the challenge of tailoring the display of their websites to handheld devices, very few higher education institutions are doing so. Only about a third of respondents agreed that web-enabled, handheld mobile communication devices are an essential tool for the higher education professional today. While two-thirds agree that those devices will be essential in three years, we suspect that the recent media coverage received by the rapidly evolving iPhone and by President Obama’s BlackBerry will help accelerate the adoption of those devices within higher education and elsewhere. This may fuel a more rapid increase than our respondents foresaw in the essentialness of those devices to the higher education professional. Very few of our respondent institutions said they had made significant strides toward making web content and services available in formats suitable for those devices, ensuring that their owners will be disappointed if
attempting to use them to learn about and interact with most higher education institutions. The few institutions leading the pack in this effort are likely to gain at least a temporary competitive advantage.

Finally, in the area of crisis communications, driven by strong imperatives to protect faculty, staff, and especially students, most higher education institutions are doing a good job of adopting emergency notification technologies, testing them periodically, and managing their use. If there are laggards in this area, they are not the institutions but rather the immediate beneficiaries of institutional emergency notification—the faculty, staff, and students the systems are intended to serve. Where the emergency notification system is of the opt-in type, 6 in 10 institutions reported that 50% or fewer of those eligible to participate have subscribed, with almost half of those reporting 25% subscription or less.

For most of the messaging and communication technologies we studied, we found that written policies and plans were more common at institutions that reported earlier deployment or adoption. Executive leadership’s understanding of the issues and prioritization of activity involving the technologies also appears to accelerate progress. CIOs who engage executive leadership in developing a vision for digital communications, and who involve the campus in an active, planning-oriented dialogue about them, may stand the best chance of generating forward momentum for their institutions in this fast-growing and rapidly changing segment of their IT service portfolios.

Endnotes
Human nature seems to drive us to exploit any new technology for three purposes: sex, moneymaking, and communication, in roughly that order. Art, including music, deserves a place on the list as well, to the extent that it is distinct from communication. (We like to think it is distinct from sex and moneymaking, though of course it also intersects them in various ways.) And perhaps war should be listed as a fifth item on that list.

The ways in which information technology (IT) has been exploited for sex, moneymaking, art, and war are relatively clear. Examples that spring to mind include online pornography, web-based shopping and advertising, the YouTube explosion of (being charitable) artistic expression, the peer-to-peer sharing of music and video content, and the conduct of raids against insurgent armies by pilotless aircraft. The many applications of IT to messaging and communications are also clear, but the examples are so pervasive and so taken for granted that they may not stand out. Thus, a little context-setting may be in order.

There was a time when computers, networks, and applications—the elements of IT, as we now regard it—had little to do with the generally asynchronous forms of communication that we call messaging and the synchronous, more nearly real-time interactions we call communications. The first computers just crunched numbers, and while the results often needed to be communicated from the computer operators to the programmers who had written the code or to those holding a stake in the results of the computations, that communication did not involve IT. Instead, it was carried out by exchange of green-bar printouts retrieved from bins in the data center lobby, delivered by courier or letter carrier, or discussed in person or by telephone.

But it wasn’t long, once computers became fast enough and plentiful enough to spare cycles for noncomputational tasks, until their value became clear as tools for preparing written communications—both verbal and numerical—via text editors and formatters and, later, word processors. Soon after computer networks became common, in the late 1970s and early ’80s, the future of the computer as a tool for communication of textual information, by way of file transfer and by electronic mail, was assured. The advantages of computer-based communication included its high speed, compared with postal mail, and its low cost to most users, compared with special delivery mail or long-distance telephone calls. As the technologies matured, these advantages became increasingly compelling and, by the mid-1980s, it
became commonplace for faculty, staff, and students to have e-mail accounts and to use them frequently.

The simultaneous—and revolutionary—emergence of the personal computer as a desktop tool wed the advantages of computer/network communications to an efflorescence of applications that made possible the sharing of increasingly complex information among an increasingly broad population of users. The digital revolution put audio and video content of all sorts into computer-friendly formats that could be shared via the network using File Transfer Protocol (FTP). Soon the development of appropriate applications and the buildout of networks with adequate speed and capacity allowed the transmission of information in those formats not just as files exchanged among e-mail and FTP users but also as real-time streams, first equaling the quality and reliability of analog radio, television, and telephony and now, in some cases, surpassing them.

And there we find ourselves now, in the waning days of analog radio and television, with telephone systems that are all but entirely digital—not to mention wireless—and with compact, powerful computers in most of our nation’s homes and many of its briefcases, backpacks, purses, and pockets. The primary purpose of many of these computers is communication, in real time through voice and video applications; near real time through text messaging, instant messaging, and the chat-like functions of social networking applications; and asynchronously through e-mail and various messaging functions of social networking applications.

Communications in Higher Education

Historically, higher education has been an early adopter of digital communication technologies. In the late 1960s, UCLA, Stanford, UC Santa Barbara, and the University of Utah became the first four nodes in the U.S. Department of Defense’s Advanced Research Projects Agency network (ARPANET), effectively pioneering the flow of messages among remotely located computers. ARPANET in 1985 gave rise to the National Science Foundation network (NSFNET), most of whose nodes were higher education research institutions and their government research agency partners. E-mail and file transfer were common NSFNET activities. At a non-U.S. government research agency, the European Organization for Nuclear Research, the World Wide Web was invented in 1991. In 1995, the NSFNET gave rise to the Internet, which quickly grew beyond the higher education community and, as we all know, has made a wide variety of messaging and communication technologies available to virtually anyone on the planet.

In the past decade and a half, higher education has retained its early-adopter status in data communications by, for example, stretching the boundaries of data transmission speeds by setting Internet land speed records. It has also taken a lead in the development of middleware—software tools that enable collaboration and communication by facilitating the integration of disparate network-based services and resources for the accomplishment of shared tasks. As Michael M. Roberts observed in a 2006 EDUCAUSE Review article, “This is an example of an important program priority in which the responsibility for progress lies largely within higher education and its corporate affiliates.”

But in many ways, the emergence of commodity messaging and communication services has left the leading role of higher education—and of the central IT organization in particular—in question. The campus telecommunications organization was once the sole purveyor of campus telephone service. It has now been merged with the central IT organization nearly everywhere and, as this report will show, at most institutions it remains
the sole supplier of faculty/staff telephone services. But thanks to commodity cellular telephone service, central IT has lost most of its hold over the residential student telephone service market. Once the only data network game on campus, central IT now also finds that web-enabled handhelds and broadband wireless devices for laptops have provided new alternatives to the campus network, not just for students but for faculty and staff as well. Cloud-based services such as Google Apps provide alternatives to institutionally supported PC applications and disk storage. And several vendors now provide higher education with institutionally branded e-mail services, which can further lighten central IT’s support load but which, along with the other changes just mentioned, may leave its staff and leadership feeling they have lost some elements of their organizational purpose.

**A Time of Transition**

This ECAR study of messaging and communications has been carefully timed. We are at inflection points in the adoption curves of a number of IT resources, with good examples at hand of software as a service and cloud computing, as discussed above, but also of mobile communications and web access, Web 2.0 communication applications, and integrated emergency notification systems. Early adopters in higher education have invested in each of these resources, but many institutions are still considering them and can benefit from the stories the early adopters have to tell. A year ago, those stories would have been less mature and more speculative. In a year or two, many of them will be old news.

In recent years, text messaging has drawn student-age users of e-mail away from that technology, which many now seem to feel has little value for the kind of personal communications they once employed it for. No doubt the mobility, ubiquity, and “always-on” availability of the cell phone platform has much to do with that, as it enables the immediate gratification of real-time communications in situations where voice communications might be inappropriate. The technology has spawned a quiet revolution in interpersonal communication among those who are comfortable with it.

Web 2.0 applications such as Facebook and MySpace have also captured the imaginations of multiple generations of digital communicators and have changed our notions of community in subtle ways. Other applications such as microblogging (e.g., Twitter) and social tagging (e.g., Digg) allow those who are plugged in to them to communicate in new ways. Really simple syndication (RSS) feeds have become the news channel of choice for many of us, alerting us in near real time to breaking stories and allowing us to bore in on them for detail with a mouse click or a tap on the touchscreen of our mobile devices.

Although most of us were quick to adopt mobile telephony, and text messaging is now taken for granted—among students, at least—the use of handheld mobile communication devices for Internet access is not mature, and many owners of Internet-capable handheld devices still find both financial and technical obstacles to their everyday use. Technology and the marketplace are fast clearing those obstacles away, and we foresee in the near future a miniaturized, personalized Internet appliance in the hands of virtually anyone who wants it.

The commercial sector is rising to the challenge of creating Internet content for mobile devices, but so far we see little progress in that direction within higher education. The problem is largely economic, we surmise. L.L.Bean may see a bump in revenues when it launches a website tailored to mobile devices. A college or university is unlikely to see that effect. More subtle elements of reputation and competitiveness are involved, and it is difficult for the institution to justify investment in the development work that tailored websites require when the payback is so indi-
rect. At many institutions, as we learned in this study, central IT’s response to the challenges of mobile web communications is not part of a formal plan. As a result, what response there is may be of the grudging sort that commonly accompanies unfunded mandates.

The disastrous hurricanes of 2005 and the tragic shooting incidents of 2007 brought the issue of emergency notification into sharp focus in higher education. Mass notification of entire communities had been the stuff of civil defense drills for most of us, but that has changed, perhaps forever, as the nearly unthinkable has entered the collective consciousness of the higher education community. As we discovered, nearly everyone is doing something about communicating in a crisis, but the level of effort is highly variable and is clearly in flux.

Issues of finance, planning, and policy come into play as well in the consideration of where messaging and communications stand in higher education and where they are going. While some legal and regulatory issues related to e-discovery and e-records management have recently been clarified in the context of institutionally owned information systems, today’s options for outsourcing and cloud sourcing have complicated them again. Our investigations into those aspects of messaging and communications, while not detailed, establish a baseline for future investigation.

**Study Objectives and Scope**

Our aim in conducting this study was to assess the status of higher education resources and practices related to a variety of communication functions. These included

- the outsourcing of student e-mail services and the potential for doing so with faculty/staff e-mail;
- the provision of landline telephone services for faculty and staff and the trend away from providing them for residential students;
- the provision (or subsidy) of mobile telephone services for faculty and staff;
- the institution’s efforts toward making web services available to Internet-capable mobile communication devices; and
- the institution’s role in crisis communications, including the technologies it uses to notify its constituents of emergency situations, the robustness of those technologies, and the institution’s preparedness to communicate internally and externally during a crisis.

We wanted to learn from our study population about the overall quality of their institutions’ electronically disseminated official communications, including the accuracy and timeliness of those communications, as well as the success of those communications in reaching their intended recipients and accomplishing their communication goals. We wondered as well about the ability of the institutional messaging and communication infrastructure to meet current needs and anticipated needs three years out.

Another line of inquiry involved campus constituents’ satisfaction with e-mail services, with both PBX-based and VoIP-based landline telephone service, with the institution’s financial support for mobile communication services, and with central IT’s support for web-enabled handheld mobile communication devices. The institution’s progress toward making key institutional web services available to handheld devices was a particular focus. We wanted to determine levels of confidence about the performance of 11 different emergency notification channels and to know how our respondents would assess the actual performance of each under test conditions. And finally, we wondered how the institution’s crisis communication procedures would function if various infrastructure elements became unavailable and how respondents would rate critical aspects of the institution’s preparedness to communicate in the event of an emergency.
Research Approach

Our research proceeded along four major pathways: a literature review, a quantitative web-based survey of IT leaders at higher education institutions among the EDUCAUSE member base, qualitative interviews with IT executives and other staff from selected institutions, and case studies.

The literature review helped identify and clarify issues, suggest hypotheses for testing, and provide supportive secondary evidence. Besides examining articles and studies from journalistic, academic, and IT practitioner sources, we relied on research publications from the Pew Internet & American Life Project, Harris Interactive Public Relations, and the Nielsen Company.

The ECAR research team designed a web-based survey for senior-most IT administrators. A copy can be found at http://www.educause.edu/SurveyInstruments/1004. In mid-July 2008 we sent invitations for the survey to 1,694 EDUCAUSE member institutions in the United States and Canada; we received 351 qualified responses (a 20.7% response rate). Appendix A lists the institutions that responded to this survey.

In addition, we used qualitative interviews to gain deeper insights into findings from the quantitative analysis and to capture ideas and viewpoints we might otherwise have missed. For these interviews, we spoke with 37 individuals, including CIOs and others, involved with messaging and communication practices and resources at 29 higher education institutions. We conducted most interviews by telephone. Appendix B lists the interviewees.

Finally, we took a close look at messaging and communication practices at three higher education institutions and present our findings in the case studies that accompany this report: “Louisiana State University and A&M College: Optimizing Text Messaging and Other Emergency Notification Systems,”5 “The University of Louisville: Fulfilling the Promise of VoIP,”6 and “Massachusetts Institute Technology: Transforming the Campus Experience with the MIT Mobile Web.”7

Classification Schemes

For comparisons, we grouped institutions using categories derived from the 2000 edition of The Carnegie Classification of Institutions of Higher Education,8 developed by the Carnegie Foundation for the Advancement of Teaching. To obtain adequate numbers for statistical and descriptive purposes, we collapsed the Carnegie 2000 classifications as follows:

- Doctoral (DR) institutions group the doctoral-extensive and doctoral-intensive universities together.
- Master’s (MA) institutions group master’s colleges and universities I and II together.
- Baccalaureate (BA) institutions combine the three Carnegie 2000 baccalaureate groups.
- Associate’s (AA) institutions are the same as the Carnegie 2000 associate’s category.
- Other Carnegie institutions include specialized institutions and U.S. higher education system offices.
- Canadian institutions are tracked in a separate, single category.

In November 2005, the Carnegie Foundation for the Advancement of Teaching introduced a new classification scheme employing additional institutional characteristics. We have not provided a crosswalk to this newer scheme, in large part because we suspect that our readers will be more familiar with the older, 2000 taxonomy.

Analysis and Reporting Conventions

We adhered to the following conventions in analyzing the data and reporting the results:

- Some tables and figures presented in this study have fewer than 351 respondents and have been adjusted for missing information.
Sums of percentages in some charts and tables may not add up to 100.0% due to rounding.

We analyzed the data for each online survey question for differences in response patterns among Carnegie classes, private and public institutions, and institutions of varying size. Institution size is determined by the number of full-time equivalent (FTE) enrollments. We also looked for associations between other combinations of variables as appropriate. We noted differences that were both meaningful and statistically significant in the text and/or the supporting figures and tables. Note that a statistically significant relationship between variables does not necessarily indicate a causal relationship.

The Likert scales used in the online survey are footnoted in the tables and figures that show results for those survey questions.

Overview of Respondents
We distributed the messaging and communications survey to the EDUCAUSE institutional representative at each member institution. In most cases this was the CIO; the survey introduction specified that it should be completed by the senior-most IT administrator at the institution or by the senior-most leader of the organization charged with managing each of the technologies the survey addressed.

Of the 351 respondents, 334 were from the United States or its territories and 17 were from Canada. Figure 2-1 compares the distribution of survey responses using the Carnegie class categories described above, alongside EDUCAUSE membership and overall population size in each category. The responding schools mirror the EDUCAUSE membership much more closely than the overall population by Carnegie class. Proportionately, we had the strongest participation from doctoral institutions (24.2% of respondents).

Our survey was completed mainly by respondents holding the title of CIO or equivalent (81.7%), with other IT administrators and managers making up most of the remainder (see Figure 2-2). With, at most, 2.6% of respondents representing non-IT positions, we emphasize that the survey results reflect a CIO and IT management point of view.

The median FTE student enrollment of our survey institutions was 4,522, while the mean, reflecting the weight of the largest responding institutions, was 8,213. Overall, however, smaller institutions made up the bulk of this
survey’s respondent base. Figure 2-3 shows the distribution of respondents by student enrollment. (Excluded from the total are the 10 university system offices that responded.) Institutions of 4,000 or fewer students accounted for 45.2% of respondents, those of more than 15,000 accounted for 18.8%, and those in between made up 36.1%.

Among respondent institutions, 58.1% were publicly controlled and 41.9% were under private control. Control was strongly associated with FTE enrollments, with control more commonly public as enrollments increased.

Several of our survey questions about telephone services required an understanding of the number of residential students respon-
dent institutions had. Figure 2-4 shows the distribution. Nearly 2 in 10 institutions had no residential students at all; these tended to be associate’s institutions. A majority (55.8%) reported 3,000 or fewer residential students. About a quarter (23.9%) had 3,001–10,000, and only 3.2% had more than 10,000.

**Study Organization**

The remainder of this report presents our findings and explores the factors we found to be associated with messaging and communications outcomes.

In Chapter 3, we examine respondent institutions’ use of digital technologies for official communications, the adequacy and sustainability of the infrastructure that supports them, the anticipated increase or decrease in importance of a host of commonly used communication technologies, communicators’ awareness of their constituents’ communication technology preferences, and elements of policy and practice related to the institution’s e-discovery policy environment.

Chapter 4 is devoted to electronic mail and calendaring. In it, we investigate our respondents’ e-mail environments and the practices and policies they use to manage them, and we look briefly at how calendaring is deployed and managed. We examine the rapidly growing practice of outsourcing e-mail services for students (and sometimes for faculty and staff). We look briefly too at technologies that are now supplanting e-mail for some functions, especially among students, and we consider the impacts those alternative technologies might have on institutional communications. We assess the state of unsolicited bulk e-mail (spam) and the institution’s success at managing it. And we look briefly at the institution’s e-records management policies and their enforcement.

In Chapter 5, we discuss telephony and the landline aspects of the current telecommunication revolution. We examine both the faculty/staff and residential student telephone environments, addressing them separately because they are so distinct from one another. The sustainability of faculty/staff landline service comes under our scrutiny, as does respondents’ sense of how the service is perceived by their users. We look at the status of adoption of VoIP technologies as a replacement for legacy, PBX-based telephone systems and at policies regarding PC-based VoIP as a feature-rich alternative to traditional long-distance telephone service.
Chapter 6 delves into the rapidly evolving world of mobile communications, from cellular telephony and text messaging through the use of web-enabled handheld mobile communication devices as an alternative to the PC for delivery of web-based information. Through our respondents’ input, we assess higher education’s readiness to meet the demands and expectations of faculty and staff who are relatively new converts to multimodal mobile communications, as well as the generation of students to whom mobile telephony and text messaging are second nature and for millions of whom mobile web access will become so in the next year or two.

In Chapter 7 we examine the technologies our respondents use for crisis communications in general and for emergency notification in particular, and we assess our respondents’ confidence in them and their actual performance under test conditions. We explore some of the policies, practices, and priorities that make up the crisis communication environment and take a careful look at the robustness of crisis communication processes.

Chapter 8 gives our view of the future of messaging and communications. It focuses in particular on unified communications and the principle of “presence,” which liberates communications from reliance on a particular network or device. We look at the way presence aggregates information about the individual’s location, the communication resources available there, and the individual’s preferences and how it ensures that communication occurs reliably and with a maximum of flexibility.

For a summary and synthetic overview of the study findings and recommendations, see the executive summary in Chapter 1.

Endnotes
3

Communications and the Institution

*Self-expression must pass into communication for its fulfillment.*

—Pearl S. Buck

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**Key Findings**

- Most respondents agree that the institution’s electronically disseminated official information is accurate and timely; fewer are convinced that it reaches its intended recipients and accomplishes its communication goals.
- Bachelor’s institution respondents are the only Carnegie class to project “no change” in the importance of institutionally provided e-mail services for their faculty and staff over the next three years; all others project an increase. Only associate’s institution respondents project an increase in importance for students.
- Respondents who evaluate most positively institutional communicators’ understanding of the communication preferences of their constituents also report that their institutions’ communications are most successful.
- Where agreement is stronger that the institution’s messaging and communication infrastructure now meets the institution’s needs and will meet them over the next three years, respondents report that campus communicators and central IT have a better understanding of the communication preferences of their constituents.
- Higher percentages of respondents report the existence of a written e-discovery policy where the CIO, the institution’s general counsel, or a mix of other officers coordinate the e-discovery function; where the president, provost, or business officer coordinates e-discovery, or where no functional office has that responsibility, percentages of respondents reporting a written e-discovery policy are significantly lower.

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Few of the activities of a higher education institution function independently of communications. Instruction involves communication of various kinds and in several directions, research must be communicated to receive validation and to achieve relevance,¹ and of course any higher education administrator will recognize communication as an indispensable tool for administrative duties. Student socialization, one of the less heralded roles of face-to-face higher education, is, of course, all communication at its core.² In each of these contexts, communication is increasingly based on networked digital technologies.

In this chapter we examine several characteristics of the respondent institutions’
official communications, the infrastructure that supports them, the anticipated growth or decline in importance of a number of key communication technologies, communicators’ awareness of their constituents’ communication technology preferences, and communication-related aspects of the institution’s e-discovery policy environment.

**Successful Electronic Communications**

In the 21st century, it is the rare higher education institution that makes no use of electronic messaging and communication technologies to communicate official information. In fact, 96.0% of respondents to our survey were able to answer all four of our questions about the success of such communications; only one institution declined to answer all four of them.

**Electronically Disseminated Official Information**

As Figure 3-1 shows, mean agreement that the institution’s electronically disseminated official information is accurate, is timely, reaches its intended recipients, and accomplishes its communication goals ranges from a respectable high of 4.19 on our 5-point agreement scale (somewhat better than “agree”) for the accuracy of the information, to a more lackluster 3.43 (between “neutral” and “agree”) for the information’s accomplishment of its communication goals. In general, the institution has progressively less control over the outcomes represented from left to right in this chart, which may help explain the corresponding decline in mean agreement.

Mean agreement about each of the four characteristics is significantly positively associated with the others. Responses about information reaching its intended recipients is particularly strongly associated with responses about that information’s accomplishing its communication goals. The weakest associations (although still significant) are for the accuracy of the information analyzed against agreement about its reaching intended recipients and accomplishing its communication goals.

**Pace of Adoption**

As seen in Figure 3-2, early adopters of new electronic messaging and communication technologies were relatively rare among
our survey population. Only 11.2% identified themselves as such, while a majority said they were mainstream adopters and nearly a third said they were late adopters of those technologies.

Early and mainstream adopters were significantly more positive (expressing agreement or strong agreement) about the success of all four characteristics of their institutions’ electronically disseminated official communications than late adopters (see Table 3-1). The difference in mean agreement between those groups was greatest for agreement that electronically disseminated official communications accomplish their communication goals (0.63 points) and least for agreement that those communications are accurate (0.36 points).

Of the four characteristics, the accuracy of electronically disseminated official information depends least upon technologies, which may explain the comparatively low difference between early and later adopters of new ones. The timeliness with which that information is delivered and the sense of confidence respondents have in its ability to find its way to the correct recipient are more dependent upon technological factors such as the robustness of the institution’s voice and data networks and the applications that ride on them; the greater differences in mean agreement between early and late adopters probably reflect that.

For the last item, electronically disseminated official information meeting its communication goals, any significant difference in means would seem to rely on a mix of technological factors mediated by central IT, and human factors largely controlled by other campus entities. If that is the case, the substantial difference in mean agreement here between early/mainstream adopters and late adopters may suggest greater synergies between technologists and administrators where the pace of adoption of new electronic messaging and communication technologies is brisker.

**The Role of Infrastructure**

As we point out in various contexts in this report, our survey respondents’ sense that their institutions’ messaging and communication infrastructure met institutional needs was useful in differentiating among responses to other questions. In general, positive agreement (“agree” or “strongly agree”) about the adequacy of the technical underpinnings for messaging and communications tended to go hand in hand with more positive opinions about the institution’s communication-related services and practices.

Among the survey population, agreement that communication infrastructure met current needs and would meet future needs was distributed bimodally, with most respondents...
either agreeing or disagreeing at some level and relatively few saying they were neutral (see Figure 3-3). As one might anticipate, agreement about the adequacy of the current infrastructure was substantially more positive ("agree" or "strongly agree") than about that infrastructure's ability to meet the institution's needs over the next three years. Our interpretation is that at least a plurality of respondents, the 45.7% who strongly disagreed or disagreed about future adequacy, anticipate the need to modify the messaging and communication infrastructure in the relatively near term to meet evolving demands.

Agreement that current infrastructure meets the institution's needs was positively associated with agreement about its adequacy three years out. The 194 respondents who agreed at some level that current infrastructure was adequate (28.9%) as those who disagreed at some level that current infrastructure was adequate (56.2%) as often as those who disagree at some level that current infrastructure was adequate (28.9%).

Not surprisingly, the state of the current infrastructure was significantly associated with respondents' assessment of three of the characteristics of official electronic

<table>
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<th>Pace of Adoption of New Technologies</th>
<th>Electronically disseminated official information:</th>
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<tr>
<td></td>
<td>Is accurate</td>
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<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
</tr>
<tr>
<td>Early adopter</td>
<td>4.33</td>
<td>39</td>
</tr>
<tr>
<td>Mainstream adopter</td>
<td>4.29</td>
<td>194</td>
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<tr>
<td>Late adopter</td>
<td>3.97</td>
<td>114</td>
</tr>
<tr>
<td>Total</td>
<td>4.19</td>
<td>347</td>
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|                                     | Is timely                                     |  |
|                                     | Mean*                                         | N | Std. Deviation |
| Early adopter                       | 4.05                                          | 39 | 0.826         |
| Mainstream adopter                 | 4.05                                          | 194| 0.638         |
| Late adopter                        | 3.48                                          | 114| 0.914         |
| Total                               | 3.86                                          | 347| 0.803         |

|                                     | Reaches intended recipients                   |  |
|                                     | Mean*                                         | N | Std. Deviation |
| Early adopter                       | 3.85                                          | 39 | 0.844         |
| Mainstream adopter                 | 3.74                                          | 189| 0.775         |
| Late adopter                        | 3.33                                          | 112| 0.924         |
| Total                               | 3.61                                          | 340| 0.856         |

|                                     | Accomplishes its communication goals          |  |
|                                     | Mean*                                         | N | Std. Deviation |
| Early adopter                       | 3.64                                          | 39 | 0.873         |
| Mainstream adopter                 | 3.64                                          | 186| 0.841         |
| Late adopter                        | 3.01                                          | 111| 0.968         |
| Total                               | 3.43                                          | 336| 0.934         |

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
communications presented in Figure 3-1. Agreement that that information is timely, reaches its intended recipients, and accomplishes its communication goals was significantly greater among those who responded positively (“agree” or “strongly agree”) that the institution’s current communication infrastructure meets the institution’s needs than among those who were neutral or negative (“strongly disagree” or “disagree”).

As mentioned in our discussion of Table 3-1, technology and, by extension, infrastructure, are highly important to both the timeliness of electronic communications and their successfully reaching their intended recipients. The comparatively great difference in mean agreement about the success of electronically disseminated official information in meeting its communication goals between those who agree that their current messaging and communication infrastructure meets the institution’s needs than those who were neutral or negative (“strongly disagree” or “disagree”).

As mentioned in our discussion of Table 3-1, technology and, by extension, infrastructure, are highly important to both the timeliness of electronic communications and their successfully reaching their intended recipients. The comparatively great difference in mean agreement about the success of electronically disseminated official information in meeting its communication goals between those who agree that their current messaging and communication infrastructure meets the institution’s needs than those who do not suggests a strong role for infrastructure in that more complex arena as well.

Among institutions that considered themselves early adopters of electronic technologies for messaging and communications, agreement that current infrastructure meets the institution’s needs and will do so in three years was about a point higher on our 5-point agreement scale than among those who identified themselves as later adopters.

We found no significant association between perceptions about either the current or the future adequacy of infrastructure and our usual demographics, including Carnegie class, institution size (FTE students), or public/private control.

**The Changing Technology Spectrum**

As digital technologies allow both convergence and diversification in communication technologies, higher education IT organizations find it necessary to support an increasingly complex array of applications and services. To get an idea of which technologies our respondents thought would take on greater importance in the future, we supplied a list of 16 communication-related items and asked respondents to predict their importance for faculty, for staff, and for students in the next three years. Those applications were

- PBX-based landline telephony,
- institutionally provided e-mail services,
- mobile telephones without Internet capability,
- VoIP-based landline telephony,
- conference/classroom videoconferencing,
- virtual environments,
- RSS feeds,
- desktop videoconferencing,
- outsourced e-mail services,
- wikis,
- blogs,
- social networking websites,
- SMS text messaging,
- mobile telephones with Internet capability,
- campus portal, and
- learning management systems.

**Anticipated Change in Three Years**

Respondents tended to see the importance of most of our listed technologies increasing over the next three years, especially for students. The few for which a mean decrease in importance was forecast were PBX telephony and mobile phones without Internet capability (for all three constituencies) and institutionally provided e-mail services (for students only) (see Figure 3-4). Respondents anticipated a mean increase in importance of institutionally provided e-mail for faculty and staff and of all other listed applications and services for all three constituencies.

In most cases, mean anticipated increase in importance was very similar for all three constituencies. Exceptions included future importance of institutionally provided e-mail and VoIP telephony for students, both of which were considerably lower than for faculty and staff. Also bucking the overall trend were outsourced e-mail services, whose mean predicted increase in importance was considerably less for faculty and staff than for students, and learning management systems, whose mean predicted increase in importance for staff was considerably less than for faculty and students. Differences between staff and students in mean predicted increase

![Figure 3-4. Anticipated Change in Importance, in Three Years, of Communication Applications (N = 351)](image)

*Scale: 1 = greatly decrease, 2 = decrease, 3 = no change, 4 = increase, 5 = greatly increase*
in importance of virtual environments and social networking sites were considerable; the means there for faculty were intermediate.

Overall, these results suggest a distinction between the technologies that are thought to be of greater future importance for “digital native” students and for faculty who, like it or not, must interact most closely with them, and the technologies that staff and faculty rely on for their day-to-day professional activities. For example, there certainly is no strong indication that respondents expected Web 2.0 technologies to become deeply imbedded in staff work routines in the next three years.

The Future of E-Mail and Telephony

Of all our demographic data, only Carnegie class was significantly associated with anticipated change in the importance of communication technologies in the next three years, and then with only three technologies.

As Table 3-2 shows, institutionally provided e-mail services are likely to increase in importance for faculty and staff at most institutions, at least for the next few years, but at bachelor’s institutions, those services are less likely to gain importance. Considering all faculty and staff, mean change in the importance of institutionally provided e-mail was around 3.20, between “no change” and “increase” on our 5-point scale. Among Carnegie classes, for both faculty and staff, the smallest mean change (about 2.95, just below “no change”) was projected by respondents from bachelor’s institutions and the greatest (3.52) by those from associate’s institutions. Master’s and doctoral institution means were intermediate.

For students other than those at associate’s institutions, institutionally provided e-mail is clearly expected to decline in importance in the same time frame. Again referring to Table 3-2, we see that anticipated change in importance of institutionally provided e-mail projected for students was uniformly much less positive, with a total mean of 2.56, about halfway between “no change” and “decrease.” The greatest decrease (2.29) was projected for doctoral institutions and the least change (3.07) for associate’s institutions. Means for master’s and bachelor’s institutions were intermediate but still showed a substantial decrease in importance of institutionally provided e-mail for students, at about 2.55.

Projected changes in the importance of two other technologies for students were associated with Carnegie class: the importance of PBX-based landline telephony and the importance of mobile telephones with Internet capability. For students at all institutions, the mean projected change in the importance of PBX-based telephones was a decrease. For doctoral, master’s, and bachelor’s institutions, respondents predicted nearly equal, solid mean decreases; associate’s institutions, however, projected a mean change in the importance closer to “no change” than to “decrease.”

Table 3-2. Change in Importance of Institutionally Provided E-Mail Service, by Carnegie Class

<table>
<thead>
<tr>
<th>Carnegie Class</th>
<th>Change in Importance of Institutionally Provided E-Mail Services for:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Faculty</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>DR</td>
<td>3.18</td>
</tr>
<tr>
<td>MA</td>
<td>3.23</td>
</tr>
<tr>
<td>BA</td>
<td>2.94</td>
</tr>
<tr>
<td>AA</td>
<td>3.52</td>
</tr>
<tr>
<td>Total</td>
<td>3.20</td>
</tr>
</tbody>
</table>

*Scale: 1 = greatly decrease, 2 = decrease, 3 = no change, 4 = increase, 5 = greatly increase
With respect to Internet-enabled mobile phones, overall mean anticipated change was a strong increase. At doctoral, master’s, and bachelor’s institutions, the importance of these devices was projected to increase most strongly. Associate’s institutions also projected an increase, but a substantially smaller one than for any other Carnegie class.

Both of these student telephony-related findings suggest that doctoral institutions are the most likely to see their students responding to changes in those technologies, in terms both of abandoning the older institutional PBX technologies (or having those technologies abandoned for them by residence hall management) and of adopting cutting-edge personal data communication technologies.

**Understanding Communication Preferences**

It has become axiomatic in the past few years that e-mail is considered by students to be an old-fashioned form of communication and, like postal mail service, is best reserved for official correspondence. Mobile telephony, SMS text messaging, instant messaging, and social networking channels such as Facebook, Twitter, and the like appear to be the preferred means of interpersonal communication among digital natives, whether students, faculty, or staff. The 2008 ECAR study of undergraduate students and technology reports that the Net Generation of students, as well as many older students, “actively use multiple modes of IT to communicate, socialize, and stay connected with others ... [and] choose mobile technologies.” How aware, then, are higher education institutions of their constituents’ communication preferences?

**Communicators and Enablers of Communication**

We asked about the awareness of two groups of communicators: the official communicators—those who determine which official information is disseminated to various constituencies; and the institution’s central IT service organization—those who most often provide the infrastructure and services by which official information makes its way to its intended recipients. Figure 3-5 shows that a plurality of respondents agree that official communicators understand their constituents’ communication preferences, and a majority agree that central IT does so. (Recall that more than 80% of respondents were CIOs.) Very few respondents strongly agreed that official communicators (3.5%) or central IT (6.1%) understood their constituents’ communication preferences.

Mean agreement that official communicators understood their constituents’ communication preferences was considerably weaker (mean 3.12; S.D. 0.981) than agreement that central IT did so (mean 3.51; S.D. 0.846).

Responses to these two questions are strongly positively associated with each other. As shown in Table 3-3, in institutional cultures where respondents say official communicators understand their constituents’ preferences, they also tend to report that central IT is also more cognizant of them. Of course, we don’t know if one of these circumstances drives the other or if they are both driven by an unidentified third influence, but it does appear that they often work together.

We found significant associations between agreement about official communicators’ and central IT’s understanding of communication preferences and the characteristics of electronically disseminated official information (listed in Figure 3-1), with the exception of the accuracy of that information. This suggests that the institutions that best understand the communication preferences of their constituents believe they communicate the most successfully. The association is strongest between agreement about official communicators’ understanding of constituents’ preferences and agreement that electronically disseminated official information
accomplishes its communication goals. The associations between official communicators’ understanding and the timeliness of official information and its reaching its intended recipients are weaker but still significant. The same patterns hold for the associations between central IT’s understanding of preferences and the characteristics of electronically disseminated official information, although in general the associations are a little weaker. This suggests that central IT’s understanding of its constituents’ communication preferences plays a smaller role in the success of electronically disseminated information than does official communicators’ understanding of those preferences.

Table 3-3. Central IT Understands Constituents’ Communication Preferences, by Official Communicators Understand Constituents’ Communication Preferences

<table>
<thead>
<tr>
<th>Official communicators understand their constituents’ preferences.</th>
<th>Central IT understands the communication preferences of its constituents.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Strongly disagree or disagree</td>
<td>2.96</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.41</td>
</tr>
<tr>
<td>Agree or strongly agree</td>
<td>3.97</td>
</tr>
<tr>
<td>Total</td>
<td>3.51</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Figure 3-5. Understanding of Constituents’ Communication Preferences

Pace of Adoption and Adequacy of Infrastructure

We have already noted the tendency for earlier adopters of communications technology to be more positive about their institutions’ success in disseminating official information. We also discovered that early and mainstream adopters are more positive about institutional understanding of constituents’ communications preferences than late adopters. Institutions that rate themselves as early or mainstream technology adopters reported levels of mean agreement about understanding constituents’ communication preferences of 3.41 for official communicators and 3.71 for central IT. Both figures
are between “neutral” and “agree” on our 5-point scale. At a statistically significant level, among late adopters mean agreement is noticeably weaker, at 2.68 (well below “neutral”) for official communicators and 3.19 (above “neutral”) for central IT.

A respondent’s sense that the current messaging and communications infrastructure meets the institution’s needs and that it will meet them in three years also goes hand in hand with a sense that campus communicators and central IT understand constituents’ communication preferences. Where agreement is positive (“agree” or “strongly agree”) that infrastructure is adequate to meet the institution’s needs now, agreement that both campus communicators and central IT understand the communication preferences of their constituents is about seven-tenths of a point more positive on our 5-point scale. Where agreement is positive that infrastructure will be adequate to meet the institution’s needs over the next three years, agreement that both campus communicators and central IT understand the communication preferences of their constituents is only about half a point more positive. Again, it is difficult to determine which of these factors drives the other or whether a third factor or set of factors drives them both. All we can say with certainty is that these two factors are related in some way.

**E-Discovery and Institutional Communications**

The last decades’ proliferation of digital technologies and the avid adoption of those technologies in higher education have brought many benefits. Along with these, however, have come heightened concerns about individual privacy and the confidentiality of information that is digitally transmitted and stored. Amendments to the Federal Rules of Civil Procedure in 2006 made a wide variety of digital information fair game for legal discovery requests and provided some guidelines for institutions about their management of electronic records. In this study our investigation of the privacy issue focuses on e-discovery, the process by which various authorities may lawfully request access to an institution’s records of telephone calls, voicemail, e-mail, and mobile communication sessions and the stored contents of devices such as servers, desktop and laptop PCs, and cellular telephones.

**The Policy Environment**

Only about 4 in 10 respondents (43.1%) said their institutions had a written policy to deal with e-discovery requests such as subpoenas and court orders (see Table 3-4). Another 46.0% of respondents said their institutions did not have such a policy. The remaining 10.9% said they did not know whether the institution had such a policy—a surprisingly high number, given the potential impact on the institution of such requests.

Having a policy in place to deal with e-discovery requests is more common among large, public, and doctoral institutions. Of all Carnegie classes, doctoral institutions were substantially the most likely to say they had policies in place for dealing with e-discovery requests (see Table 3-5). Master’s institutions were only slightly more likely than bachelor’s or associate’s institutions to have such policies in place.

Larger institutions were more likely than smaller ones to have such policies in place. Institutions with more than 15,000 FTE students were more than twice as likely (71.7%) to report having such a policy as institutions with 1–2,000 students (28.8%). And public institutions were more likely (57.1%) than private ones (36.9%) to report having such policies in place.

**Process and Coordination**

Four in 10 respondents reported that the office of the general counsel had responsibility for coordinating e-discovery requests at their
institution (see Table 3-6). Nearly 2 in 10 reported that no single functional office had that responsibility.

Doctoral institutions and those with larger FTE student populations most frequently reported that the office of the general counsel is responsible for coordinating e-discovery requests. The CIO is the second most frequently cited officer at doctoral and master’s institutions, and at institutions with more than 15,000 students. At bachelor’s and associate’s institutions and at institutions with 15,000 students or fewer, responsibility for coordinating e-discovery requests is vested in diverse offices.

The office responsible for coordinating e-discovery requests is significantly associated with the existence of an institutional e-discovery policy (see Figure 3-6). Predictably, where no office has that responsibility, only 2 in 10 institutions reported having a policy in place (well below the 56.4% among those institutions identifying a responsible functional office). Where the office of the president,

| Table 3-4. Institutions with E-Discovery Policy (N = 348) |
| Institution has a written policy in place to deal with e-discovery requests such as subpoenas and court orders. | Percentage of Institutions |
| No | 46.0% |
| Yes | 43.1% |
| Don’t know | 10.9% |

| Table 3-5. Institutions with an E-Discovery Policy, by Carnegie Class |
| Carnegie Class | Percentage of Institutions |
| DR (N = 81) | 71.6% |
| MA (N = 88) | 43.2% |
| BA (N = 59) | 39.0% |
| AA (N = 40) | 40.0% |
| Other (N = 27) | 29.6% |
| Canada (N = 15) | 46.7% |

| Table 3-6. Functional Office with Responsibility for Coordinating E-Discovery Requests (N = 331) |
| Functional Office | Percentage of Institutions |
| Office of the general counsel | 40.5% |
| No single functional office has this responsibility | 18.1% |
| Chief information officer | 14.8% |
| University business officer | 10.0% |
| President or chancellor’s office | 8.2% |
| Public affairs/university relations | 2.1% |
| Office of the provost | 1.2% |
| University auditor | 0.6% |
| University library | 0.6% |
| Other | 3.9% |
provost, or chief business officer has responsibility, reports of an extant policy are nearly twice as numerous (37.0%) but still fall short of a majority. This may suggest that the authority those offices typically have makes codification of e-discovery policy less necessary.

Higher percentages of respondents (between 58.3% and 66.7%) reported the existence of an e-discovery policy where the CIO, the institution’s general counsel, or a mix of other officers is responsible. The CIO and general counsel, at least, are likely to be executives who deal frequently with institutional policy, and these positions are typically low enough in the institutional hierarchy that the people who occupy them benefit from the authority a written policy confers. Because the “public affairs + auditor + library + other” group is so diverse, and because sample size there is so small (21), we are somewhat less confident that the percentage shown for that group is representative of higher education in general and so are hesitant to speculate about what it might mean.

As to the robustness of the institution’s process for responding to e-discovery requests, a majority of respondents (58.9%) agreed or strongly agreed that it met the demands placed upon it. Mean agreement was 3.49 (N = 287/S.D. 0.848) on our 5-point agreement scale, or halfway between “neutral” and “agree.”

Among the 260 respondents who answered both questions, mean agreement that the institution’s process for responding to e-discovery requests met the demands placed upon it was higher where the institution had a written policy in place to deal with e-discovery requests (see Table 3-7). The difference between those with and those without a policy was only 0.38 on our 5-point agreement scale, but the difference was statistically significant, suggesting that the existence of a policy makes the unpleasant task of dealing with e-discovery requests at least a bit easier.

**Summary and Implications**

Communication is key to nearly everything, of course, and higher education is no exception. Most institutions rely on the telephone, e-mail, Web 2.0, and other services that the central IT organization provides. Respondents to our survey generally agreed that official institutional information distributed by electronic means was accurate, but they were less sanguine about those communications’
other aspects: timeliness, reaching intended recipients, and accomplishing communication goals. Where the institution’s pace of adoption of new messaging and communication technologies was slowest, respondents gave lower marks to all aspects of electronically disseminated official information.

Well over half of respondents agreed or strongly agreed that their messaging and communication infrastructure met the institution’s needs, but improvements and upgrades are clearly in the cards, because fewer than 45% said current infrastructure would meet those needs in three years. Early adopters of new technologies had more confidence, on average, than mainstream or late adopters that messaging and communication infrastructure met current needs and would meet the institution’s needs in three years.

With the exception of PBX-based landline telephony, institutionally provided student e-mail, and ordinary cell phones, respondents on average anticipated an increase in the importance of communication technologies for faculty, staff, and students. The average respondent said the importance for students of VoIP-based landline telephony will increase a little less than for faculty and staff, the importance for faculty and staff of outsourced e-mail services will increase a bit more slowly, and the importance of learning management systems for staff will also lag. Other findings suggest that institutions will do well to prepare to provide and/or support mobile communication options, Web 2.0 applications, and both desktop and classroom videoconferencing technologies.

Sensitivity to the communication preferences of faculty, staff, and students emerges as a differentiating factor among our study findings and may be an area in which respondents will want to improve their performance. Respondents felt that, in general, central IT was more sensitive to its constituents’ communication preferences than those at the institution who determine which official information is disseminated to various constituencies. Where official communicators were more sensitive, the trend was for central IT to also be more sensitive, suggesting that sensitivity may be an aspect of the institution’s culture. Where the sensitivity of both official communicators and central IT was greater, respondents were more likely

- to agree that electronically disseminated official information was timely, reached its intended recipients, and met its communication goals;
- to be mainstream or early adopters of new technologies; and
- to say that their messaging and communication infrastructure meets institutional needs and will do so in three years.

A written policy for e-discovery—to deal with subpoenas and court orders for electronically stored information—was in place at about half of responding institutions. Surprisingly, nearly 2 in 10 respondent institutions had assigned coordination of such requests to no single functional campus

<table>
<thead>
<tr>
<th>Institution has a written policy in place.</th>
<th>Institution’s process for responding to e-discovery requests meets the demands placed upon it.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>No</td>
<td>3.30</td>
</tr>
<tr>
<td>Yes</td>
<td>3.68</td>
</tr>
<tr>
<td>Total</td>
<td>3.50</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
office. Where coordination was more formal, the institution’s general counsel was most often in charge and the institution was more than twice as likely to have an e-discovery policy in place. Where such a policy was in place, respondents were significantly more likely to say that the institution’s process for responding to e-discovery requests met the demands placed upon it, suggesting that the development of such a policy would be beneficial to those who do not yet have one.

Endnotes


It’s a safe bet that nothing has done more than e-mail to advance the cause of keyboard literacy. The generation that embraced the telephone as a cheap, easy, and very welcome alternative to sitting down and penning or typing a letter has given way to a generation that finds the virtues of e-mail ample reward for learning to touch-type. Those virtues have remained persuasive since 1981 when BITNET (NorthNet in Canada) introduced interinstitutional e-mail as a commodity or near-commodity service. Prior to that time, e-mail had been available for several years, but communications occurred almost entirely between users with accounts on a given host computer and had limited value as a replacement for telephony or letter writing. An exception was the University of Illinois’s (and later Control Data Corporation’s) PLATO system, which provided a pioneering version of interinstitutional e-mail to its users in the late 1970s and early 1980s.
The Internet developed in parallel with BITNET and rapidly eclipsed it as, in August 1982, the Internet Engineering Task Force published a historic Request for Comment describing Simple Mail Transfer Protocol (SMTP). More than 25 years later, most e-mail systems are still based on that protocol.

Alternatives to e-mail are provided by communication channels such as instant messaging (IM), web syndication services such as really simple syndication (RSS) feeds, short message service (SMS) text messaging, and social networking channels such as Facebook, Twitter, and others. Text messaging and social networking channels are very popular, especially among students, but e-mail remains the primary means of text-based electronic communication among higher education faculty and staff, and between them and the student population.

This chapter looks at practices, policies, and predictions related to higher education’s use of this pervasive technology.

### Getting Institutional E-Mail Right

Our respondents offered their own assessments of their institutions’ success at providing e-mail services to faculty, staff, and students. For each of those constituencies, we asked for the respondent’s level of agreement with the statement, “Overall, [the constituency] at our institution [is] satisfied with the e-mail services we provide them.” Mean agreement with the statement was highest for staff (4.02 on our 5-point scale) and faculty (3.82) and lowest for students (3.48). Figure 4-1 shows the details.

These satisfaction ratings probably reflect the varying demands the different constituencies place upon institutional e-mail systems. Students—digital natives, for the most part—may expect more of the institution’s e-mail system in terms of system response time, reliability and availability, storage capacity, ease of use, interface features, and so forth. These are all factors that our qualitative interviewees pointed to as reasons to outsource student e-mail. Today’s students may also be impatient with e-mail policies that are stricter than those of the commercial providers they have used outside the institution. Faculty, although most are digital immigrants rather than natives, probably share most of these expectations and may also place heavy demands on the system as they collaborate with off-campus entities in time-critical enterprises such as the preparation and submission of grant proposals and manuscripts. Staff may be more of a “captive audience,” may expect fewer features, and may put fewer demands on the mail system.

The link between constituents’ satisfaction with e-mail services and the institution’s more general success at electronic communication becomes clear immediately when e-mail satisfaction is analyzed against respondents’ agreement that electronically disseminated official information is timely, reaches its intended recipients, and accomplishes its...
communication goals (see Table 4-1). This association holds for faculty and students; however, it does not for staff. This may be because staff satisfaction with institutional e-mail is generally so high that it loses value as a differentiator in this analysis.

For all three constituencies, agreement about satisfaction with institutional e-mail services is positively and strongly associated with agreement that the institution’s messaging and communication infrastructure is adequate to meet the institution’s current and three-year future needs. This helps confirm our sense that a robust infrastructure is a key ingredient of a successful institutional e-mail service. And it appears that adding a dash of empathy to the recipe is also helpful; we found that agreement about student satisfaction with institutional e-mail services is positively associated with agreement that both official communicators and central IT understand communication preferences of their constituents. Faculty and staff satisfaction with institutional e-mail is significantly positively associated only with agreement that central IT understands communication preferences, suggesting that the technology environment, more than the information environment, is a differentiator in those constituents’ satisfaction with e-mail services.

Among early adopters of electronic messaging and communication technologies, agreement that students, faculty, and staff are satisfied with institutional e-mail services is higher than among mainstream or late adopters (see Table 4-2). Students’ reported mean satisfaction is low compared with the other constituencies where the pace of adoption is “mainstream” or “late,” suggesting a greater sensitivity to technical currency among that group. For all paces of adoption, agreement about staff members’ mean satisfaction is just a bit higher than for students and faculty, hinting again that that group may be, in general, the least demanding of the three.

The Faculty/Staff E-Mail Environment

As we discuss later, the student e-mail environment is rapidly being outsourced. The faculty/staff e-mail environment, on the other hand, remains very much within the purview of the central IT organization, with most hosting commercially developed e-mail systems.
Among our respondent institutions, 92.8% required faculty to have institutional e-mail accounts and 92.2% required staff to have them. About 98% of the institutions that require one require both. Among our demographics, faculty were required to have institutional e-mail accounts a little more often at smaller institutions and privately controlled institutions; there was no corresponding finding for staff. More than 9 in 10 institutions with 1–8,000 students reported requiring faculty to have institutional e-mail accounts, as opposed to roughly 8 in 10 larger institutions (see Table 4-3).

Among privately controlled institutions, 97.9% require faculty to have institutional accounts, whereas 89.9% of private institutions do so. This at least hints at consistency with the somewhat more laissez-faire policies that ECAR studies often report for public institutions.

Only five institutions reported that their institution had no “primary” system for faculty/staff e-mail. As Table 4-4 shows, among the multitudes that did report such a system, 96.8% said that central IT hosted it. A commercial provider did the hosting for 2.3%. Other sources made

### Table 4-1. Characteristics of Electronically Disseminated Official Information, by Overall Student and Faculty Satisfaction with E-Mail Services

<table>
<thead>
<tr>
<th></th>
<th>Electronically disseminated official information:</th>
<th>Faculty are satisfied with institutional e-mail services:</th>
<th>Electronically disseminated official information:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is timely</td>
<td></td>
<td>Is timely</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.58</td>
<td>60</td>
<td>0.850</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.75</td>
<td>75</td>
<td>0.856</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>4.03</td>
<td>191</td>
<td>0.684</td>
</tr>
<tr>
<td>Total</td>
<td>3.88</td>
<td>326</td>
<td>0.777</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.26</td>
<td>57</td>
<td>0.973</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.52</td>
<td>73</td>
<td>0.852</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.78</td>
<td>190</td>
<td>0.772</td>
</tr>
<tr>
<td>Total</td>
<td>3.63</td>
<td>320</td>
<td>0.850</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
<td>Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.05</td>
<td>58</td>
<td>1.016</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.37</td>
<td>70</td>
<td>0.705</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.59</td>
<td>189</td>
<td>0.910</td>
</tr>
<tr>
<td>Total</td>
<td>3.44</td>
<td>317</td>
<td>0.911</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree*
This supports our impression that the motivations pushing institutions toward outsourced e-mail for students are generally independent of the institution’s motivations to do so for faculty/staff e-mail. Our qualitative interviews suggested a few reasons why institutions bifurcate their

Table 4-2. Overall Satisfaction with Institutional E-Mail Services, by Pace of Adoption of New Electronic Messaging and Communication Technologies

<table>
<thead>
<tr>
<th>Pace of Adoption of New Electronic Messaging and Communication Technologies</th>
<th>Overall, constituency is satisfied with institutional e-mail services.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Early adopter</td>
<td>4.00</td>
</tr>
<tr>
<td>Mainstream adopter</td>
<td>3.55</td>
</tr>
<tr>
<td>Late adopter</td>
<td>3.11</td>
</tr>
<tr>
<td>Total</td>
<td>3.47</td>
</tr>
<tr>
<td></td>
<td>Faculty</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Early adopter</td>
<td>3.97</td>
</tr>
<tr>
<td>Mainstream adopter</td>
<td>3.93</td>
</tr>
<tr>
<td>Late adopter</td>
<td>3.57</td>
</tr>
<tr>
<td>Total</td>
<td>3.82</td>
</tr>
<tr>
<td></td>
<td>Staff</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Early adopter</td>
<td>4.21</td>
</tr>
<tr>
<td>Mainstream adopter</td>
<td>4.12</td>
</tr>
<tr>
<td>Late adopter</td>
<td>3.77</td>
</tr>
<tr>
<td>Total</td>
<td>4.02</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Table 4-3. Required Faculty E-Mail Accounts, by Institution Size (FTE Students)

<table>
<thead>
<tr>
<th>Institution Size (FTE Students)</th>
<th>Percentage of Institutions Requiring Faculty to Have Institutional E-Mail Accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2,000 (N = 81)</td>
<td>95.1%</td>
</tr>
<tr>
<td>2,001–4,000 (N = 73)</td>
<td>98.6%</td>
</tr>
<tr>
<td>4,001–8,000 (N = 71)</td>
<td>97.2%</td>
</tr>
<tr>
<td>8,001–15,000 (N = 50)</td>
<td>82.0%</td>
</tr>
<tr>
<td>More than 15,000 (N = 63)</td>
<td>85.7%</td>
</tr>
</tbody>
</table>

Table 4-4. Host for Primary Faculty/Staff E-Mail System (N = 346)

<table>
<thead>
<tr>
<th>Host</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The central IT organization</td>
<td>96.8%</td>
</tr>
<tr>
<td>A commercial provider</td>
<td>2.3%</td>
</tr>
<tr>
<td>Another academic institution</td>
<td>0.6%</td>
</tr>
<tr>
<td>Another organization at the institution (school, college, center)</td>
<td>0.3%</td>
</tr>
</tbody>
</table>
e-mail systems, outsourcing student e-mail but keeping faculty and staff e-mail in-house. One motivator is the desire to provide greater e-mail integration to the enterprise in order to enhance faculty and staff members’ productivity. Chuck Chulwick, vice president, learning and technology services, Raritan Valley Community College, explained, “We want to enable our faculty and staff to use SharePoint to generate e-mails and task lists, to use forms, or to get access from an Outlook client. Although not impossible, those things would be more difficult if we outsourced e-mail.”

A second factor is the faculty and staff’s perceived comfort with their current e-mail systems. “They are real comfortable with it,” stated Douglass Gray, chief technology officer, Chesapeake College. “Outsourcing faculty/staff e-mail would enable us to tackle other, more important projects, but I would have to sell my faculty on the concept, which means it has to be reliable and easy.”

Issues concerning faculty and staff members’ privacy and security and the off-site storage of e-mail messages surfaced frequently during our interviews. For example, Dave Tindall, Seattle Pacific University’s assistant vice president for technology services, investigated outsourcing his institution’s faculty/staff e-mail, but for now the institution has decided to keep it within internal control and responsibility. “There is a lot institutional data and information maintained in faculty/staff e-mail, and to track that data is important,” Tindall told us. On the other hand, Oberlin College has outsourced its single institutional e-mail service to Google, a move that affected students, faculty, and staff. John E. Bucher, chief technology officer, rejected the idea that faculty/staff e-mail had different privacy requirements than student e-mail. He supported his position with the example of a potential e-mail exchange of federally protected demographic or financial information between faculty or staff and students. “To make the case that one group of people on campus has more sensitive data than the other,” Bucher said, “I don’t see it.”

Finally, a few of our interviewees said they wanted to test the waters by outsourcing their student e-mail first. “Outsourcing student e-mail will be a learning process for all of us,” states Steven Sather, associate CIO, Princeton University. “If we feel comfortable with their experiences and with the prospect of storing institutional data off campus, we may outsource our faculty and staff e-mail systems, too.”

Eight in 10 respondent institutions reported that their primary faculty/staff e-mail systems were developed by commercial providers (see Table 4-5).

We found that about 1 e-mail system in 10 was developed by an open-source provider such as Zimbra. Only 7.8% of primary faculty/staff e-mail systems were developed in-house.

### Sourcing Student E-Mail Services

Although alternatives to institutionally provided e-mail were available earlier and were adopted by a few institutions, 2008 saw the beginning of a significant migra-

<table>
<thead>
<tr>
<th>Developer</th>
<th>Percentage of Institutions</th>
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<tbody>
<tr>
<td>Commercial provider</td>
<td>79.4%</td>
</tr>
<tr>
<td>Open-source provider</td>
<td>9.6%</td>
</tr>
<tr>
<td>In-house</td>
<td>7.8%</td>
</tr>
<tr>
<td>Another institution</td>
<td>2.9%</td>
</tr>
<tr>
<td>Other</td>
<td>0.3%</td>
</tr>
</tbody>
</table>
tion of student e-mail service provision to commercial entities such as Microsoft and Google. These providers have aggressively sought higher education’s participation in partnerships that give institutionally branded e-mail accounts to students at little or no cost to the institution and that, presumably, gain the provider mind-share with a demographic of present or future value.

As we will see, though, when our survey was in the field, the preponderance of institutions reported that they still host their own student e-mail services. More recent data from Campus Computing 2008 suggest that the pace of adoption of outsourced e-mail services is accelerating, not only for student e-mail but for faculty/staff e-mail as well. Indeed, in the 18 qualitative interviews we conducted that discussed outsourcing student e-mail services, 11 participants had either outsourced or considered outsourcing those services. For their comments, see the sidebar “Views from Qualitative Research: Pros and Cons of Outsourcing E-Mail.”

Institutional e-mail accounts are required for students at 89.3% of respondent institutions, overall. Where an account is required for students, it is usually also required for both faculty and staff. Among our respondent institutions, 82.6% require all three.

Unlike the requirement that faculty have institutional e-mail accounts, the requirement for students does not vary much by institution size. It does vary by Carnegie class, however, as the faculty requirement did not. As Table 4-6 shows, the requirement is most common among bachelor’s institutions and a little less common for master’s and doctoral institutions. Associate’s institutions are by far the least likely to require institutional e-mail accounts for students; however, our qualitative research suggests that may be changing. For example, at Glendale Community College, Director of Information Technology KC Hundere reports that institutional e-mail “has always been considered a classroom resource. It has been a place for academic conversations

Views from Qualitative Research: Pros and Cons of Outsourcing E-Mail

IT leaders voiced very strong opinions—both pro and con—about outsourcing student e-mail services, providing a checklist of considerations for those contemplating a similar strategy.

Pros:

- More strategic allocation of resources. “From my perspective, I view e-mail as a commodity, and the less I can pay for it, the more money I have to spend on things that are strategic,” said Brian Voss, vice chancellor for information technology and CIO, Louisiana State University and A&M College. Theresa Rowe, CIO, Oakland University, agreed. “My mission here is research and education,” she stated. “E-mail and communications are more commodity services. If we can manage them at a lower price, then that is great.”

- Resources. Whether it is a strategic service or not, outsourcing e-mail can save the institution money. When John E. Bucher, chief technology officer, Oberlin College, evaluated new e-mail solutions, outsourcing emerged as the most cost-effective option. “The cost to internally provide the expected level of e-mail services was higher than in the past, especially to offer much storage space,” Bucher said. “Adding Web 2.0 applications on top of the e-mail services pushed the cost even higher.”

- Lower e-mail management costs. In the same vein, some IT leaders looked for outsourcing to specifically reduce their e-mail management costs. For example, Bucher noted, “While I often have the capital to purchase new hardware and software, I don’t always have the staff to assign to the project.”

Cont’d
Familiarity and use. One driver behind the University of Denver’s switch to Gmail was the fact that “40% of students currently forward their DU mail to a Gmail account,” according to Ken Stafford, vice chancellor of technology. “I see outsourcing student e-mail as a good way of providing each student with a single DU e-mail address for life.” In that vein, Minot State University students proactively asked their IT organization to evaluate outsourced e-mail solutions. At Oberlin, Bucher discovered that many faculty and staff already used Gmail and found that this familiarity has eased the institution’s switchover to the Google service and reinforced IT’s decision to outsource its institutional e-mail system.

More features. Enhanced features, such as Web 2.0 capabilities, calendaring, and disk storage, were identified as outsourcing drivers. For example, although Seattle Pacific University did not, in the end, go with an outsourced solution, in its analysis it seriously considered that option as a way of addressing campus concerns about providing sufficient disk storage to meet student demands. Stafford added that, “DU could not cost-effectively provide the many services that students can get for free from Google.” Rowe said she likes Gmail’s integration with the other Google tools. “All these provide a 365-degree view of a user’s interactions with the university,” she stated. “Other e-mail solutions viewed e-mail as a simple communications tool.”

Cons:

Integrated internal management strategies. Some institutions find that the advantages of a highly integrated suite of campus-based communication services outweigh the cost advantages of an outsourced solution. Over time, “The cost and efficiency of maintaining our back-end e-mail service has dropped precipitously,” stated C. Van Wyatt, vice president for IT, Texas State University–San Marcos. “E-mail is not a unitary tool, and its connectedness to our collaboration tools precludes us from venturing to an outsource environment.” Wyatt feels that outsourcing is “helpful primarily to small and medium campuses. For large institutions, the cost and increased efficiency in maintaining our own e-mail, combined with the integration with collaboration tools, has taken us past the point where we look very seriously at outsourcing e-mail.”

Viability of vendors’ long-term plans. Other interviewees questioned commercial e-mail service providers’ long-term plans. As Cindy Bixler, CIO at Embry-Riddle Aeronautical University, told us, “My biggest reservation with Google is that higher ed is such a small percentage of their business. I am not sure how long they will remain in this segment. They could drop it next week and it would not be anything to them, but devastating to us.” Bixler also questioned their motives for offering free services. Wyatt questioned how long the services will be free, recalling Blackboard’s and WebCT’s initial tactics of “practically giving their tools away. Institutions sign on, get invested in them, and after a certain amount of time, they’re no longer free.”

Loss of control. Some, such as Oglethorpe University’s CIO William E. Morse, worried about losing control “over how the e-mail system works, its ability to integrate into the services you offer, and when vendors will update the system.” He also expressed concerns about security.

To us, the takeaway message from these practitioners’ comments is to remain receptive, even if outsourcing seems not to be the right option currently. As Morse explains, “Outsourcing is always an open question; the world is changing, and our answer may be different in the next three to four years. We have to keep an open mind and see.”
between faculty and students or between students themselves. It would be against protocol for any ‘administrative’ messages to be sent to these accounts. But that sentiment has been changing in the last few years. Partly out of a desire to save postage costs for reminders, bills, and so on, but also to provide a reliable channel for emergency communication, we have just agreed to assign e-mail accounts to all students in the fall for official college communication.” Stephen diFilipo, vice president and chief information officer at Cecil College, also reports that e-mail accounts for all students are in the works at his institution, spurred by the development of an institutional portal.

As was the case for faculty, students are more often required to have institutional accounts at private institutions than at the sometimes more laissez-faire publics. Even where institutional e-mail accounts are required, students often have accounts with other providers. Accounts with AOL, MSN Hotmail, Yahoo! Mail, and Google Mail are just a few examples. While a majority of institutions (70.1%) are willing to forward e-mail automatically from institutional accounts to the student’s preferred account at the student’s request, 29.9% of our respondent institutions will not. The practice is significantly associated with both Carnegie class and institution size. As Table 4-7 shows, institutions offering more-advanced degrees appear more willing to forward institutional e-mail to other accounts.

The practice is fairly common at small to medium-sized institutions, with between 60% and 70% of them willing to forward student e-mails (see Table 4-8). Among institutions that have more than 15,000 students, however, a remarkable 9 in 10 report willingness to do so.

Table 4-6. Institutions Requiring Students to Have Institutional E-Mail Accounts, by Carnegie Class

<table>
<thead>
<tr>
<th>Carnegie Class</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR (N = 82)</td>
<td>90.2%</td>
</tr>
<tr>
<td>MA (N = 102)</td>
<td>93.1%</td>
</tr>
<tr>
<td>BA (N = 64)</td>
<td>96.9%</td>
</tr>
<tr>
<td>AA (N = 46)</td>
<td>73.9%</td>
</tr>
</tbody>
</table>

Table 4-7. Institutions Willing to Forward Institutional E-Mail to Other Accounts, by Carnegie Class

<table>
<thead>
<tr>
<th>Carnegie Class</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR (N = 84)</td>
<td>86.9%</td>
</tr>
<tr>
<td>MA (N = 103)</td>
<td>70.9%</td>
</tr>
<tr>
<td>BA (N = 64)</td>
<td>64.1%</td>
</tr>
<tr>
<td>AA (N = 42)</td>
<td>52.4%</td>
</tr>
</tbody>
</table>

Table 4-8. Institutions Willing to Forward Institutional E-Mail to Other Accounts, by Institution Size (FTE Students)

<table>
<thead>
<tr>
<th>Institution Size (FTE Students)</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2,000 (N = 48)</td>
<td>60.8%</td>
</tr>
<tr>
<td>2,001–4,000 (N = 45)</td>
<td>63.4%</td>
</tr>
<tr>
<td>4,001–8,000 (N = 50)</td>
<td>69.4%</td>
</tr>
<tr>
<td>8,001–15,000 (N = 33)</td>
<td>66.0%</td>
</tr>
<tr>
<td>More than 15,000 (N = 57)</td>
<td>90.5%</td>
</tr>
</tbody>
</table>
Respondents are much more likely to have commercial providers host student e-mail services than to host faculty/staff e-mail. As we saw above (Table 4-4), only 2.3% of institutions report that commercial sources host faculty/staff e-mail. For student e-mail, the percentage is more than eight times as great, at 19.0% (see Table 4-9). Of institutions reporting that they had a primary e-mail system that provided service for students, only 77.2% said the central IT organization hosted it, as opposed to 96.8% who said their primary faculty/staff e-mail system was hosted by central IT. As was the case for faculty/staff systems, very few institutions reported that the student e-mail provider was another academic institution or another organization at the institution.

At about 8 in 10 doctoral, master’s, and bachelor’s institutions, central IT hosts the primary student e-mail system; at associate’s institutions the percentage is a much smaller 56.5%. At associate’s institutions it is much more common for another academic institution to host the primary student e-mail system (8.7% versus 1.2–3.1% for the other Carnegie classes) or for a commercial provider to host it (23.9% versus 13.8–18.4%).

Qualitative interviews highlighted two primary reasons for outsourcing student e-mail. One was cost. Cathy Horvath, director of IT at Minot State University, outsourced her student e-mail system because of the long-term cost savings, deciding “it would be more cost-effective to split off the students and outsource their e-mail service. We chose Exchange Labs based on student preference, operational efficiencies, and the product’s full feature set.” Cindy Bixler, CIO at Embry-Riddle Aeronautical University, upgraded the student e-mail system to Mirapoint, noting that it is web only and offers full functionality for students but “without a big back end that requires a multitude of servers, thus offering lower cost of ownership.”

Human resources were another issue. Chesapeake College outsources its student e-mail, using a Timecruiser portal. “We have a very small IT staff, and we were concerned about the impact of maintaining a student e-mail system internally. Sometimes it is easier to get funding money for outsourcing than to hire a new staff member,” Douglass Gray explained.

At associate’s institutions, taking Cecil College as our example, several reasons for outsourcing student e-mail come to bear. Stephen diFilippo lists them as “long-term budget impact for software license maintenance, servers, administrative support, etc.; lifelong communication via committed e-mail; functional features not provided by the college; and features such as portfolios that can add value to academic programs.”

Finally, drawing again from our quantitative research, while the association is only marginally significant by our standards, we would be remiss if we failed to report that respondents rate students’ satisfaction with e-mail services somewhat higher where the host of the primary student e-mail system is a commercial one than where central IT is the host.

Table 4-9. Host for Primary Student E-Mail System (N = 342)

<table>
<thead>
<tr>
<th>Host</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The central IT organization</td>
<td>77.2%</td>
</tr>
<tr>
<td>A commercial provider</td>
<td>19.0%</td>
</tr>
<tr>
<td>Another academic institution</td>
<td>2.6%</td>
</tr>
<tr>
<td>Another organization at the institution (school, college, center)</td>
<td>0.9%</td>
</tr>
<tr>
<td>Other</td>
<td>0.3%</td>
</tr>
</tbody>
</table>
Total Number of E-Mail Systems Hosted

The proliferation of e-mail systems is a common source of CIO complaint and is commonly cited as a proxy for an institution’s failure to act in a concerted “enterprise” fashion. Maintaining multiple e-mail systems has implications for an institution’s total hardware, software, and personnel costs. That said, our findings don’t suggest that the situation is out of hand, at least at institutions having fewer than 15,000 FTE students. Among institutions having 1–2,000 and 2,001–4,000 students, two-thirds host only one e-mail system for faculty, staff, or students, a bit more than a quarter host two, and a few host more than two (see Table 4-10). As size increases, so does the number of e-mail systems hosted. Among the largest institutions, more than three-quarters host more than two systems.

Table 4-11 shows our findings, by Carnegie class, for the 294 U.S. institutions that said they hosted at least one e-mail system. Doctoral institutions were by far the Carnegie class most likely to report hosting more than two e-mail systems, with nearly three-quarters doing so. Findings for all other classes of institutions were dominated (55.9% or more) by institutions with only one e-mail system. We feel sure that the majority of e-mail systems at institutions with more than two of them are departmental or school/college systems; the findings presented here square with our sense that at doctoral (and very large) institutions, school/college units often have more autonomy in technological matters than similar units at other types of institution.

Calendaring Systems

Calendaring systems can be an important part of an institution’s messaging environment. Often they are tightly integrated into the primary faculty and staff e-mail system or the campus portal. In other cases, however, especially where there is a proliferation of e-mail systems, it is possible for some members of the institutional community to have well-integrated e-mail and calendaring services and for other members not to. When “haves” and “have-nots” must accommodate each other’s environments, or when incompatible systems are in use in different offices, communications can become difficult, and productivity may be sacrificed.

<table>
<thead>
<tr>
<th>Institution Size (FTE Students)</th>
<th>Number of E-Mail Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
</tr>
<tr>
<td>1–2,000 (N = 77)</td>
<td>68.8%</td>
</tr>
<tr>
<td>2,001–4,000 (N = 73)</td>
<td>65.8%</td>
</tr>
<tr>
<td>4,001–8,000 (N = 72)</td>
<td>50.0%</td>
</tr>
<tr>
<td>8,001–15,000 (N = 50)</td>
<td>30.0%</td>
</tr>
<tr>
<td>More than 15,000 (N = 63)</td>
<td>11.1%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Carnegie Class</th>
<th>Number of E-Mail Systems</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>One</td>
</tr>
<tr>
<td>DR (N = 83)</td>
<td>14.5%</td>
</tr>
<tr>
<td>MA (N = 102)</td>
<td>55.9%</td>
</tr>
<tr>
<td>BA (N = 64)</td>
<td>67.2%</td>
</tr>
<tr>
<td>AA (N = 45)</td>
<td>57.8%</td>
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</tbody>
</table>
The number of calendaring systems is distributed across our respondent population a bit less evenly than the number of e-mail systems. The smallest classes of institutions (1–4,000 FTE students) most frequently reported having one or two calendaring systems, but substantial numbers had more than two (see Table 4-12). At the largest institutions, a majority (55.2%) reported having more than two. (Compare this with 77.8% from this size category reporting more than two e-mail systems.)

Doctoral institutions are the Carnegie class most likely to report more than two calendaring systems, but nearly a quarter of master’s and bachelor’s institutions do so, as do nearly 2 in 10 associate’s institutions (see Table 4-13). Our guess is that having multiple calendaring systems is more nearly the norm than having multiple e-mail systems because calendaring systems are more likely to serve specialized purposes (such as a campus events calendar system that is distinct from the calendar systems used to track individuals’ daily schedules) or constituencies (a portal-based calendar for student use that is distinct from the Microsoft Outlook calendar for faculty/staff meetings and appointments).

For the majority of respondents, the estimated number of calendaring systems hosted at the respondent institution was significantly associated with the estimated number of institutional e-mail systems the institution hosted for use by faculty, staff, and students (see Table 4-14). In general, where there were more e-mail systems, there were also more calendaring systems. Much of this association may be attributable to the fact

<table>
<thead>
<tr>
<th>Table 4-12. Number of Calendaring Systems Hosted, by Institution Size</th>
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<tbody>
<tr>
<td>Institution Size (FTE Students)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1–2,000 (N = 76)</td>
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<tr>
<td>2,001–4,000 (N = 72)</td>
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<tr>
<td>4,001–8,000 (N = 69)</td>
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<tr>
<td>8,001–15,000 (N = 44)</td>
</tr>
<tr>
<td>More than 15,000 (N = 58)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4-13. Number of Calendaring Systems Hosted, by Carnegie Class</th>
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<tbody>
<tr>
<td>Carnegie Class</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>DR (N = 74)</td>
</tr>
<tr>
<td>MA (N = 99)</td>
</tr>
<tr>
<td>BA (N = 60)</td>
</tr>
<tr>
<td>AA (N = 44)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4-14. Number of Calendaring Systems Hosted, by Number of E-Mail Systems Hosted</th>
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</thead>
<tbody>
<tr>
<td>Number of E-Mail Systems</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>One (N = 159)</td>
</tr>
<tr>
<td>Two (N = 78)</td>
</tr>
<tr>
<td>More than two (N = 88)</td>
</tr>
</tbody>
</table>
that e-mail systems often come bundled with calendaring systems. But it may also reflect the IT management philosophy of the institution: Where more e-mail systems are allowed on the campus network, more calendaring systems are also allowed.

A majority (64.1%) of respondents who reported that their institutions hosted more than one calendaring system for use by faculty, staff, or students rated the integration of those calendaring systems as very poor or poor (see Figure 4-2). Making up the remainder, 20.8% rated integration neither good nor bad, and 15.1% rated it as either good or very good.

Surprisingly, we found no statistically significant relationship between respondents’ evaluation of the integration of the calendaring systems in use and the estimated number of calendaring systems hosted. Apparently when integration is done well it is done well, even when systems are many; and (more often) when it is done poorly it is done poorly, even when systems are few. Faculty, staff, and student satisfaction with institutional e-mail services did not vary meaningfully with the number of e-mail or calendaring systems hosted at the institution.

The Future of Messaging

As mentioned above, there are many costs to a proliferation of e-mail systems; these costs can be minimized by reducing the number, perhaps by consolidating departmental e-mail systems into a central system serving all departments, or perhaps by outsourcing the e-mail service altogether. The findings presented in this section show that our respondents projected a declining trajectory for the number of future institutional e-mail services.

Also, we began this chapter with a brief discussion of the alternatives to e-mail, some new and some not so new. Among these were text messaging, RSS feeds, and social networking channels. In our survey, we asked respondents to predict for us what change in the use of e-mail might be brought about by each of these alternatives. Significant numbers felt each would result in a decrease in e-mail use, but as we will see below, responses were very mixed.

Change in the Number of E-Mail Systems

As we saw in the previous chapter (Figure 3-4), the mean change our respondents anticipated in the next three years in the importance of institutionally provided e-mail services was substantially less positive than

Figure 4-2. Integration Among Calendaring Systems in Use at Institution (N = 192)
for most other technologies. Details appear in Table 4-15. For faculty and staff, the mean anticipated change in importance was about 3.2, about two-tenths of a point above “no change” on our 5-point scale. For students, the mean anticipated change in importance was 2.61, little more than halfway between “no change” and “decrease.”

These importance findings are generally consistent with the anticipated change respondents reported for the total number of e-mail systems hosted by the institution in the same time frame (see Table 4-16). About half of respondents anticipated no change in the next three years in the number of e-mail systems hosted by the institution. Just over a third anticipated a decrease, and 7.0% anticipated a great decrease. Only a few predicted an increase, and none predicted a great increase.

Suggesting that the costs of e-mail system proliferation are being felt there, respondents who reported hosting higher-than-average numbers of e-mail systems at their institutions were more likely than others to report an anticipated decrease or great decrease in the number of e-mail systems their institutions will host in the next three years.

On average, smaller institutions less often predicted a decrease in the mean number of e-mail systems hosted at the institution in three years; that is, their mean response was closer to 3.0, or “no change.” See Table 4-17. The mean anticipated change at the largest institutions, however, was very close to “decrease.” This seems consistent with the finding reported in Table 4-10, which showed that the larger the institution, the more e-mail systems it hosted.

### Impact of Other Messaging Technologies on E-Mail

Despite the emergence of electronic communication alternatives such as mobile telephones, text messaging, and instant messaging, the vast majority of respondents (83.5%) said they expect that in the next three years, the overall volume of e-mail transiting their systems will increase or greatly increase (see Table 4-18). Only 7.0% expected no change, and 9.4% expected e-mail traffic to decrease or greatly decrease. The mean expectation for all respondents was 3.93 on our 5-point scale, or “increase.”

<table>
<thead>
<tr>
<th>Table 4-15. Anticipated Increase/Decrease in Importance of Institutionally Provided E-Mail Services in the Next Three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constituency</strong></td>
</tr>
<tr>
<td>Faculty</td>
</tr>
<tr>
<td>Staff</td>
</tr>
<tr>
<td>Students</td>
</tr>
</tbody>
</table>

*Scale: 1 = greatly decrease, 2 = decrease, 3 = no change, 4 = increase, 5 = greatly increase

<table>
<thead>
<tr>
<th>Table 4-16. Anticipated Increase/Decrease in Number of E-Mail Systems Hosted by the Institution in the Next Three Years (N = 342)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anticipated Increase/Decrease in Number</strong></td>
</tr>
<tr>
<td>Greatly decrease</td>
</tr>
<tr>
<td>Decrease</td>
</tr>
<tr>
<td>No change</td>
</tr>
<tr>
<td>Increase</td>
</tr>
<tr>
<td>Greatly increase</td>
</tr>
</tbody>
</table>
In addition to this question about overall change, we probed a little deeper by asking specifically about the effect of SMS text messaging, RSS feeds, and social networking websites on faculty, staff, and student use of e-mail in the next three years. Consistent with the mean anticipated increase in e-mail volume reported above, we discovered that respondents expected the alternative technologies to do very little to reduce e-mail use for faculty and staff.

For faculty and staff use of the three non-e-mail communication options, our survey results showed that most respondents (between 56.2% and 72.3%) anticipate no change in e-mail use to result from the alternative technology. Those who expect decreases (8.4% to 23.2%) were generally fewer than those who expect increases (18.2% to 23.5%). Dewitt Latimer, deputy CIO and chief technology officer, University of Notre Dame, is one who believes the use of e-mail will only increase. As he sees it, “The more you do on the network, the more applications you deploy, and the more you enable your user community, the more e-mail you will send.”

Respondents’ views about the impact of student use of the three communication alternatives were markedly different (see Figure 4-3). More than 50% of respondents expect SMS text messaging and social networking websites to result in decreased e-mail use among students. In the most extreme example, involving text messaging, 20.1% of respondents anticipated that text messaging would result in a great decrease in the use of e-mail, and 42.4% expected a decrease, for a total of 62.5%. Anticipated changes in e-mail use attributable to RSS feeds were more modest, presumably because it is a much less interactive technology. The percentage predicting an increase in e-mail use attributable to RSS feeds were more modest, presumably because it is a much less interactive technology. The percentage predicting an increase in e-mail use attributable to RSS feeds was similar to the percentages for the other technologies, but only about a third of respondents expected a decrease, and
a substantial plurality (43.0%) anticipated that RSS feeds would bring about no change at all in e-mail use in the next three years.

Qualitative interviewees were unclear on the exact mix of messaging technologies in their futures. Embry-Riddle’s Bixler states, “Students will demand a more collaborative form of communication. I am not sure whether it will be wikis, blogs, portals, or a combo. But I do know it will be different, and e-mail won’t be the primary means of communication. There will be a place for e-mail, but it will be supplemented by something much more collaborative.”

Perhaps Chesapeake College’s Gray summarizes the situation best: “We have never discarded any type of information storage. We still use stone tablets on occasion. I think the same thing is true with communication. We will continue to use e-mail and the telephone, but we will also use two-way video over IP, voice over IP, blogs, and video blogs. We are going to use more and more mediums—each one for a specific purpose.”

For each of the alternative communication technologies we asked about in our survey, the results for each of the three constituencies—faculty, staff, and students—were very strongly positively associated with those for the other two. To a high degree of consistency, institutions anticipating changes for one constituency anticipated changes similar in direction, if not extent, for the others.

We suspected that where respondents said the importance of e-mail to faculty and staff would increase in the next three years, we would find that respondents predicted less erosion in the use of e-mail owing to the use of alternate communication technologies. In fact, we did not find that to be the case. Responses to the two questions showed no meaningful association.

**Spam: The Dark Side of E-Mail**

Many of the freely available Web resources we appreciate are made possible by advertising revenues. Visitors to such sponsored websites are exposed to advertisements and respond to them in numbers that seem generally to justify the advertiser’s investment. The success of this sort of advertising—and the potential profitability of Internet businesses—is as apparent to the unscrupulous as it is to the scrupled, however, and one way in which the opportunity it represents is exploited is through unsolicited bulk e-mail, also known as spam.
While much spam consists of advertisements, other unsolicited bulk messages carry viruses or are components of denial-of-service attacks. One industry watchdog group, San Francisco’s Messaging Anti-Abuse Working Group (MAAWG), is a global trade organization whose “members include major Internet service providers (ISPs) and network operators worldwide with other associated industry vendors.” MAAWG reported for the second quarter of 2008 that all types of this “abusive” e-mail made up 85.4% of e-mail worldwide.

As we will see, this number tracks closely with the percentage of spam reported to be in the e-mail that our respondent institutions receive. In recent years, nearly all higher education institutions have been forced to devote scarce resources to minimizing the impacts of this high-visibility problem on their constituents. Oglethorpe’s Morse summarizes the general attitude conveyed by qualitative interview participants: “Yesterday’s messaging problem was storage; today’s issue is spam. How do you address the overwhelming amount of spam in an effective way and ensure that the spam filter is working well? Spam could overwhelm our e-mail system.”

Receiving Spam

On average, our respondents tell us that the percentage of spam in the e-mail that arrives at their institutions is 73.6% (median 83%). More than half (53.8%) report that at least three-quarters of the e-mail their institutions receive is spam (see Table 4-19). Because spam is so pervasive on the Internet, our assumption is that most of those who reported a percentage smaller than 75% were reporting the amount of spam that gets through their spam-filtering technologies. An unusually large number of respondents (16.9%) said they did not know what percentage of arriving e-mail was spam.

Interestingly, we found no significant association between the amount of spam an institution receives and the reported overall satisfaction of faculty, staff, or students with the e-mail services the institution provides. This may reflect the effectiveness of the spam-filtering measures many institutions have undertaken.

Indeed, most respondents (89.6%) said their institutions were at least somewhat effective in reducing the volume of spam carried by their e-mail systems. This includes a small majority (53.6%) who said their institutions were very effective at it. We found no acceptably significant association between reported effectiveness at reducing spam and the overall satisfaction of faculty, staff, and students with their institution’s e-mail services, probably because so few institutions are doing a poor job of it.

Nevertheless, during the qualitative interviews IT leaders voiced their frustration with both antispam technology and user expectations. “I would like to think that spam management will get easier, but so far it is not the case,” states Linda Deneen, director, IT systems and services, University of Minnesota Duluth. “It is a constant battle. When you install a new tool to prevent spam, the spammers figure out a new way around

<table>
<thead>
<tr>
<th>Percentage of Arriving E-Mail That Is Spam</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–25%</td>
<td>8.7%</td>
</tr>
<tr>
<td>26–50%</td>
<td>6.7%</td>
</tr>
<tr>
<td>51–75%</td>
<td>14.0%</td>
</tr>
<tr>
<td>76–100%</td>
<td>53.8%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>16.9%</td>
</tr>
</tbody>
</table>
it.” Oglethorpe’s systems and communications manager, Steve Renker, feels it can be hard to discuss this issue with the user community. “They expect spam filters to be perfect, which is not the reality. Users do not realize the actual number of spam messages that IT filters out. The situation worsens when the spam filter accidentally filters out a legitimate message, because then the user wonders how many other legitimate e-mails are filtered out.”

Spam Blocking and Institutional Policy

One method for combating spam is the use of spam block lists. Spammers’ e-mail addresses—and often the entire domain from which spam messages originate—are placed on these lists, which are used by many organizations to block messages from those addresses before they enter the organization’s e-mail stream. Among the organizations that use spam block lists are ISPs; this technique is particularly effective in keeping spam at bay on a large scale. The problem that comes with it, though, is of incorrect entries on the list—organizations that are identified incorrectly as spammers and whose often-essential communications with the outside world are thereby seriously disrupted.

Several circumstances can result in a college or university’s domain being placed on a spam block list. Poorly secured faculty, staff, or student computers on campus can be hacked and made platforms for outgoing spam. More rarely, users of the campus network can be persuaded by spam originators to turn their dorm computers into spam sources. Even the institution’s own mass-mailed official e-mail communications can be intercepted and mistakenly construed as spam by spam block-list agents.

One technique for minimizing the last type of exposure is to make sure that individuals sending mass e-mails on behalf of the institution are trained to do so in ways that will not result in the perception that the institution is spamming. We asked our respondents whether a policy existed allowing only certain individuals to send official e-mail messages over the Internet to large groups of recipients. Well over three-quarters of respondent institutions (82.8%) reported having such a policy. Of that subset of respondents, nearly half reported that their institution is “very effective” at limiting who sends messages over the Internet to large groups of constituents, and another third said it was “somewhat effective” (see Table 4-20).

Just over two-thirds of respondent institutions agreed (59.3%) or strongly agreed (9.3%) that the institution is able to send mass e-mailings without being placed on spam block lists. We suspect that at least the 13.9% of respondents who said their institutions were “somewhat ineffective” (8.0%) or “very ineffective” (5.9%) had recently experienced being placed on such a list.

Institutions with a policy allowing only certain individuals to send such messages are, on average, a little more positive than

<table>
<thead>
<tr>
<th>Effectiveness of Policy</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very ineffective</td>
<td>5.9%</td>
</tr>
<tr>
<td>Somewhat ineffective</td>
<td>8.0%</td>
</tr>
<tr>
<td>Neither ineffective nor effective</td>
<td>3.8%</td>
</tr>
<tr>
<td>Somewhat effective</td>
<td>33.1%</td>
</tr>
<tr>
<td>Very effective</td>
<td>49.1%</td>
</tr>
</tbody>
</table>
those with no policy in their agreement that the institution is able to avoid being placed on spam block lists.

Surprisingly, the effectiveness of an institution’s policy at limiting who sends mass e-mailings has no clear statistical relationship with the institution’s ability to send such mailings without being placed on spam block lists.

**Electronic Records Management**

In Chapter 3, we discussed the institution’s e-discovery policy and procedures. We found that fewer than half of institutions had a written policy in place to deal with e-discovery requests and that nearly 2 institutions in 10 had not assigned primary responsibility for that activity to a specific campus office. The picture that began to emerge from those findings was of an electronic information environment that was not thoroughly—and perhaps not very thoughtfully—regulated.

To expand on that set of issues, we also asked a series of questions about the institution’s electronic records (e-records) management policies and procedures, with particular emphasis on e-mail records. The topic is of more than just practical legal interest. While it is important to limit the length of time e-mail records are kept in order to put reasonable bounds around the institution’s obligation to produce archival material as evidence in legal proceedings, a conflicting pressure arises in the academic setting. In an interview associated with this study, Princeton’s Steven Sather drew a distinction between typical, business-related e-mail and messages with potential long-term scholarly value. “Institutions may want to delete business-related e-mail after 30 days for business reasons, but as a scholarly institution, we also want to preserve as much scholarly information as we possibly can,” he stated. “Important books are often based on the written correspondence of famous people, but nowadays that correspondence is happening via e-mail—not letters. So we feel some responsibility for finding a way to save these important documents for posterity.”

To establish a foundation for our analysis, we asked if the institution had a written policy for e-records management of faculty/staff e-mail, whether that policy specified how long those records were to be kept, and whether the policy was enforced consistently. We asked identical questions about student e-mail records.

Fewer than half (42.9%) of respondents reported having a written policy for e-records management of faculty/staff e-mail. That percentage is very similar to the 43.1% of respondents who reported having a written policy to deal with e-discovery requests, but only 25.7% of all respondents have both policies.

Of the 144 respondents with a faculty/staff e-records policy, about two-thirds (67.4%) said that the policy specified how long faculty/staff e-mails should be retained. Where a policy was in place, a third of respondents (33.1%) said it was enforced somewhat inconsistently or very inconsistently, and an unimpressive 47.4% said it was enforced somewhat consistently or very consistently.

Only a quarter (26.7%) of respondents reported having a written policy for e-records management of student e-mail (compared with 42.9% for faculty/staff e-mail). Of those 89 respondents, slightly more than two-thirds (69.1%—very similar to the 67.4% for faculty/staff) said that the policy specified how long student e-mails should be retained, and nearly two-thirds (63.9%) said enforcement is somewhat consistent or very consistent.

Interestingly, institutions that report more consistent enforcement of their faculty/staff e-records management policy were three times more likely to report having an e-records policy for student e-mail (see Table 4-21). This finding seems to suggest a link between more conscientious management of faculty and staff records and the development of a similar policy for student e-mail. There was no significant complementary association between enforcement of the student policy and the existence of a faculty policy.
Summary and Implications

E-mail has plenty of competition as a medium for quick personal communications, but it remains preeminent as the medium for official institutional communications. Majorities of respondents agreed or strongly agreed that faculty, staff, and even students are satisfied with institutional e-mail services. That satisfaction was greater at institutions whose messaging and communication infrastructure was reported adequate to meet the institution’s needs now and in three years, and among institutions that characterized themselves as early adopters of new messaging and communication technologies. So it appears that some attention to “keeping up” with the expectations noninstitutional e-mail providers have set for users pays off. Students, in particular, were reported as sensitive to the currency of the messaging and communication environment.

Nearly all institutions’ primary e-mail systems for faculty and staff were hosted by the central IT organization. Only 2.3% reported that a commercial provider hosted them. Confidentiality of faculty/staff communications was a concern for institutions that otherwise might consider outsourcing of e-mail services for those constituencies, as were issues of control, security, and support. Student e-mail services were much more commonly outsourced, with 19.0% of responding institutions reporting that a commercial provider hosted their primary student system. Thus, with students, fewer institutions appear concerned about confidentiality and related issues. Bachelor’s institutions seemed the most eager to maintain a direct e-mail connection with their students, with 96.9% requiring that students have institutional e-mail accounts; associate’s institutions were the least insistent about this, although even there nearly three-quarters had such a requirement.

Most smaller institutions hosted only one or two e-mail systems for faculty, staff, and students. Larger institutions and doctoral institutions were much more likely to host more than two systems. The number of e-mail systems the institution hosted was not related to the level of overall satisfaction reported for faculty, staff, or students with the e-mail services provided to them. Larger institutions and doctoral institutions were also more likely to host multiple calendaring systems but seemed not to be doing much to make them work well together: Nearly two-thirds of institutions with more than one calendaring system rated the integration of those calendaring systems as poor or very poor.

On average, respondents predicted little change in importance of institutionally provided e-mail systems for faculty and staff but predicted that importance for students would decrease somewhat, presumably because many respondents anticipate outsourcing those systems within the next three years. Half of respondents predicted no change in the next three years in the number of e-mail systems they would host, but most of the rest predicted a decrease. Smaller institutions, on average, predicted less change in this area.

The use by students of two alternative communication technologies, text messaging and social networking websites, was expected

Table 4-21. Consistency of Enforcement of Faculty/Staff E-Records Policy, by Existence of Student E-Records Policy

<table>
<thead>
<tr>
<th>Consistency of Enforcement of E-Records Policy for Faculty/Staff E-Mail</th>
<th>E-Records Policy Exists for Student E-Mail</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Very inconsistently + somewhat inconsistently (N = 43)</td>
<td>62.8%</td>
</tr>
<tr>
<td>Neither inconsistently nor consistently (N = 23)</td>
<td>60.9%</td>
</tr>
<tr>
<td>Somewhat consistently + very consistently (N = 61)</td>
<td>21.3%</td>
</tr>
</tbody>
</table>
by half or more of respondents to result in a reduction in students’ use of e-mail in the next three years. Only about a third of respondents thought the third, less interactive alternative that we asked about—RSS feeds—would have such an effect.

A majority of institutions reported that spam accounted for upward of 75% of the e-mail their institutions received. The median percentage, 83%, is very close to one spam watchdog group’s estimate of the percentage of spam on the global Internet. Fortunately for faculty, staff, and students, just over half of respondent institutions report that they are “very effective” at reducing the volume of spam carried by their institution’s e-mail services. The institutions’ efforts at spam control must in fact be broadly successful; we found no meaningful relationship between reported effectiveness and the overall satisfaction of faculty, staff, or students with the e-mail services provided to them.

Respondents’ e-mail environments are generally not tightly regulated. As we saw in Chapter 3, fewer than half of institutions have written e-discovery policies in place. We find as well in this chapter that fewer than half of our respondent institutions have e-records management policies in place for faculty/staff e-mail, and only a quarter have both e-discovery and e-records management policies in place for faculty/staff e-mail. Even where e-records management policies are in place for faculty/staff e-mail, fewer than half of respondents say enforcement is somewhat or very consistent.

E-records management policies for student e-mail are even rarer, with only a quarter of respondent institutions having one in place. Enforcement is better than for faculty/staff e-mail, with two-thirds of respondents saying it was somewhat consistent or very consistent.

We suspect that it may take a few high-profile court cases involving higher education e-records to improve the community’s overall performance in these matters.

Endnotes
5

Telephony

When one door closes, another opens; but we often look so long and so regretfully upon the closed door that we do not see the one which has opened for us.

—Alexander Graham Bell

Key Findings

- At nearly 90% of respondent institutions, central IT is now responsible for landline telephony for faculty and staff. Stated plans indicate that this percentage will be exceeded in the next five years.
- Two-thirds of respondents agree or strongly agree that the landline telephone service the institution provides to faculty and staff will be financially sustainable over the next three years.
- A third of respondents predict that demand for faculty/staff landline telephone services will greatly decrease or decrease in the next three years, while only a sixth say it will increase; the remaining half say demand will not change in that timeframe.
- VoIP is clearly a technology on the ascendant, with virtually no respondents anticipating a decrease, only a quarter anticipating no change, and the remaining nearly three-quarters anticipating the technology’s importance for faculty and staff to increase or greatly increase in the next three years.
- About a sixth of respondents have completed work on their VoIP projects; because only about half of these report that all desksets now use VoIP, it appears that many projects do not have complete replacement of the PBX as their goal.
- Virtually all of the respondents who said they have completed adopting VoIP for faculty and staff landline telephone service agree that faculty and staff are satisfied specifically with the VoIP services their institution provides. Where a faculty/staff VoIP implementation is under way or completed, nearly half of respondents say the institution’s landline telephone service in general routinely exceeds the expectations of faculty and staff; where no VoIP implementation is under way, fewer than a third of respondents say the same.
- Only about a third of respondents have policies regarding the use of PC-based VoIP (e.g., Skype). Among those who do have policies, almost two-thirds report policies that allow but neither encourage nor discourage its use. Virtually no respondents report policies that encourage it, but its use is discouraged at a fifth of responding institutions and prohibited at an eighth.

It’s not often that one lives through a revolution—a change in a paradigm one has taken for granted all one’s life. But that’s what we see occurring now in the realm of two-way audio communication. The public switched telephone network has been a reliable fixture throughout the lives of most North Americans, but its future is uncertain as its function converges with Internet-based voice communication technologies. As early
as 2005, this phenomenon was dramatic enough to lead The Economist to print an article titled “How the internet killed the phone business.”

At the campus level, voice over Internet Protocol (VoIP) technologies are liberating institutions from their expensive, high-maintenance copper telephone wiring plants and private branch exchange (PBX) systems by allowing them to use their (expensive, high-maintenance) data networks and servers as the physical infrastructure for faculty/staff telephony. Many institutions are abandoning traditional in-room telephone service for residential students altogether because cellular telephones have made it obsolete.

In this chapter we look at the directions telephony is taking in higher education as the telecommunications revolution changes the context, the players, and the rules. Because the faculty/staff and residential student telephone environments at most institutions are not comparable, we treat them separately below.

**Faculty and Staff Telephony**

Telephones for faculty and staff have traditionally been provided by the institution, often paid for at the departmental level, and managed either by central IT or a dedicated telephone services organization. Lagging a bit behind the telecommunications revolution occurring in other contexts (including the student side of higher education), change in faculty/staff telephony has so far been more evolutionary, with advances in telephone instruments and services occurring slowly, on the whole. Changes at the infrastructure layer—the physical network the telephone system uses—have been gradual as well. As we will see, though, where institutions have made the transition from a dedicated telephone network to an IP-based one, the winds of change have been brisker.

**Telephone Service Options**

Our data show emphatically that the days when higher education central IT and telecommunication services were separate entities are long past. A strong majority (87.1%) of respondents reported that at their institutions the central IT organization was responsible for all landline telephone services for faculty and staff. Eleven respondents (3.4%) said central IT was not responsible now but planned to be in five years. One additional institution (0.3%) said central IT was responsible now but planned not to be in five years. The remainder, about 1 in 10 institutions (9.2%), said central IT was not responsible for those services. With 11 central IT organizations poised to take on provision of faculty/staff telephone services and only 1 planning to give them up, it appears that the trend in the next five years will be toward more, rather than less, central IT provision of those services. Disregarding future plans, 87.4% of respondents now provide landline telephone services to faculty and staff, and 12.6% do not.

Alone among our demographics, institution size (FTE students) was significantly associated with responsibility for providing faculty/staff landline telephone service. In general, the smaller the institution, the less likely central IT was to be responsible for that service. At the extremes, 75.3% of institutions with 1–2,000 FTE students reported that central IT was currently responsible, whereas 93.7% of institutions with more than 15,000 students reported that. Our survey did not ask, and so we do not know, to what extent the difference derives from more outsourcing at smaller institutions, or from more separation at smaller institutions between central IT and the organization that provides telephone services.

Three-quarters of all respondent institutions said they provided landline telephone service to all faculty and staff and did not allow individuals or departments to opt-in or opt-out (see Table 5-1). Nearly 2 in 10 institutions reported providing such service on an
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opt-in basis, and most of the remainder told us they allowed the individual or department to opt-out. At only two responding institutions (0.6%) was no institution-provided landline telephone service available. (Both are specialty programs within state universities.)

With the proliferation of alternatives to institutionally controlled landline service, we expect to see shifts in these percentages in the next few years in the direction of opt-in services. The institution’s traditional obligation to provide telephone services for its employees may break down in the same way its former obligation to provide residential student telephone services has done. (See the “Residential Student Telephone Services” section below). Outsourcing opportunities may increase the percentage of institutions that offer no telephone service, although inertia and risk aversion are likely to temper that, at least until some high-profile successes make the news. Within that time frame, however, we do expect many higher education institutions to ride the incoming tide of Internet-based telecommunications convergence and make substantial changes to their telephone services infrastructure. (See the “VoIP” section below.)

The options the institution offers for faculty/staff landline telephone service vary significantly by Carnegie class. Not surprisingly, the highly complex and diverse doctoral institutions were by far the most likely (42.4%) to report an opt-in program (see Table 5-2). Opt-out programs were reported available at 7.1% of doctoral institutions. Among our responding master’s and bachelor’s institutions, more than three-quarters said they provide landline telephone service to all faculty and staff, while small percentages said they provide opt-in or opt-out programs. All responding associate’s institutions reported providing service to all faculty and staff; none reported offering opt-in or opt-out programs.2

As Table 5-3 shows, although most respondent institutions said they provide landline telephone services to all faculty and staff, a majority of institutions with more than 15,000 FTE students reported providing that service on an opt-in basis, and 6.3% reported offering an opt-out program. As with doctoral institutions, many of which are also in this largest size category, we presume that a greater degree of flexibility in telecommunication options is required at larger, more complex institutions. Institutions having fewer than 15,000 students were much less likely to offer opt-in programs, though their opt-out results are roughly in line with the small percentages reported by the biggest institutions.

Landline service provided to all faculty and staff appears to be the norm at both private (87.4%) and public (68.4%) institutions, although public institutions were significantly more likely to say they offer faculty and staff landline telephone service on an opt-in basis (27.0%) than private institutions were (7.0%). About 5% of both categories of institution said they offered opt-out service.

### Table 5-1. Options for Institution-Provided Faculty/Staff Landline Telephone Service (N = 351)

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The institution provides landline telephone service to all faculty and staff.</td>
<td>75.2%</td>
</tr>
<tr>
<td>The institution provides landline telephone service only if the faculty/staff member (or department) requests it. (opt-in)</td>
<td>18.5%</td>
</tr>
<tr>
<td>The institution provides landline telephone service unless the faculty/staff member (or department) declines it. (opt-out)</td>
<td>4.8%</td>
</tr>
<tr>
<td>Other</td>
<td>0.9%</td>
</tr>
<tr>
<td>No institution-provided landline telephone service is available.</td>
<td>0.6%</td>
</tr>
</tbody>
</table>
Two-thirds (68.9%) of respondents agreed or strongly agreed that the landline telephone service the institution provides to faculty and staff will be financially sustainable over the next three years (see Figure 5-1). Although our survey was conducted before the economic crisis of 2008–2009 had fully broken, this is still a very strong show of confidence and probably reflects both the maturity of traditional institutional telephone funding models and the promise of cost savings held by VoIP, whose adoption was still in the future for most institutions at the time of our survey.

Perhaps because responses to this question were so heavily weighted toward the positive end of the scale, it was a poor differentiator when analyzed against our other findings. We found no meaningful associations between confidence in the sustainability of telephone services and our demographic data or other findings.

Of the 186 respondents who reported the average per-minute rate their institution charged for long-distance use of faculty/staff landline telephones, 88.7% reported a rate of 10 cents or less, and 52.7% reported a rate of 5 cents or less. Charges ranged from 1 cent per minute to 45 cents. The mean rate for the 186 respondents was 7.03 cents; the median was 5.0 cents.

Again, we found no meaningful associations between long-distance charges and our other study findings.

### Perceptions of the Service

An impressive 8 in 10 (79.1%) respondents agree or strongly agree that faculty and staff understand the landline telephone options available to them (see Figure 5-2). Mean agreement was 3.92 (S.D. 0.801), or just below “agree.” However, this may reflect the maturity of telephone services more than any particular excellence in the way the various aspects of the service are communicated to users.

Less impressively perhaps, but still positively, 39.2% of respondents agreed or strongly agreed that the institution’s telephone services routinely exceed faculty and staff expectations. The mean level of agreement was 3.34 (S.D. 0.863), a bit less than halfway between “neutral” and “agree.”

Agreement that faculty and staff understand institutional landline telephone service well was significantly associated with agreement that current messaging and communication infrastructure meets the institution’s

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### Table 5-2. Principal Options for Institution-Provided Landline Telephone Service, by Carnegie Class

<table>
<thead>
<tr>
<th>Carnegie Class</th>
<th>All Faculty and Staff</th>
<th>Opt-In Option</th>
<th>Opt-Out Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR (N = 85)</td>
<td>50.6%</td>
<td>42.4%</td>
<td>7.1%</td>
</tr>
<tr>
<td>MA (N = 103)</td>
<td>78.6%</td>
<td>14.6%</td>
<td>6.8%</td>
</tr>
<tr>
<td>BA (N = 64)</td>
<td>87.5%</td>
<td>7.8%</td>
<td>4.7%</td>
</tr>
<tr>
<td>AA (N = 45)</td>
<td>100.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

### Table 5-3. Principal Options for Institution-Provided Landline Telephone Service, by Institution Size

<table>
<thead>
<tr>
<th>Institution Size (FTE Students)</th>
<th>All Faculty and Staff</th>
<th>Opt-In Option</th>
<th>Opt-Out Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2,000 (N = 79)</td>
<td>91.1%</td>
<td>5.1%</td>
<td>3.8%</td>
</tr>
<tr>
<td>2,001–4,000 (N = 73)</td>
<td>89.0%</td>
<td>6.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td>4,001–8,000 (N = 72)</td>
<td>86.1%</td>
<td>8.3%</td>
<td>5.6%</td>
</tr>
<tr>
<td>8,001–15,000 (N = 50)</td>
<td>66.0%</td>
<td>28.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>More than 15,000 (N = 64)</td>
<td>39.1%</td>
<td>54.7%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>
needs (see Table 5-4). Where agreement about infrastructure was positive, mean agreement about understanding was 4.06, which is almost four-tenths of a point higher than where agreement about infrastructure was negative. This suggests that an inadequate or marginally adequate infrastructure goes hand in hand with a nonintuitive telephone service and/or an IT or telecommunications organization that fails to communicate effectively those things that the faculty and staff need to know.

**Changing Demand for Landline Telephone Service**

Our sense that a revolution is occurring in telephony derives from evidence that
alternative technologies such as e-mail and mobile telephones have, at many institutions, eroded the demand for landline telephone service. Looking at our survey findings, we see that more than a third of respondents (36.1%) anticipated that in the next three years demand for faculty/staff landline telephone services would “greatly decrease” or “decrease.” Nearly half (48.2%) said demand would not change in that time frame, and the rest (15.6%) predicted it would “increase” (only one institution predicted demand would “greatly increase”). The mean anticipated change was 2.76 (S.D. 0.760) on our 5-point scale, one-quarter point below “no change” in the direction of “decrease.”

In addition to change in demand, we asked what change in importance for meeting faculty and staff communication needs our respondents foresaw PBX-based landline telephony undergoing in the next three years (see Figure 5-3). Respondents’ views of changing importance for faculty were very similar to those for staff; the small differences between the two constituencies are probably not meaningful. There are meaningful differences, however, between anticipated importance and anticipated demand (discussed in the paragraph above). About half of respondents anticipated a decrease or great decrease in importance, but only a third anticipated that demand would follow suit. This suggests that the institutional conservatism we see in the provision of telephone services to faculty and staff is perceived by our respondents to be a bottom-up phenomenon. “Faculty and staff won’t need landline telephony so much in three years,” many respondents seem to be saying, “but they won’t let us stop providing it.”

Institution size and Carnegie class are associated with anticipated change in demand for faculty/staff landline telephone services; larger and more complex institutions are more likely to anticipate a decrease than smaller institutions or those offering fewer degrees. This fits a pattern often found in ECAR data of doctoral and larger institutions being, in general, more change oriented. Specifically, at doctoral institutions and institutions with more than 15,000 FTE students, the mean anticipated change was around 2.40 on our 5-point scale, a bit closer to “decrease” than to “no change.” At both master’s and associate’s institutions, mean anticipated three-year change was a substantially higher 2.96, or “no change,” while the mean of 2.59 found at bachelor’s institutions was a bit closer to that of doctoral institutions. At institutions with 15,000 or fewer FTE students, mean anticipated change was 2.85 (much closer to “no change” than to “decrease”).

**VoIP**

Whereas traditional (one might say “legacy”) PBX-based telephone systems are based on the institution’s copper telephone wiring plant and interface through a switching...
device to the broader public switched telephone network (PSTN), VoIP telephone systems are based on the institution’s existing copper/fiber data network and interface to the PSTN through switching software running on a VoIP system server. In this way, both types of institutional telephone system can exchange local and long-distance calls with off-campus telephones.

The principal advantage of a VoIP system is that it allows the institution to construct and maintain a single network to handle both data and voice communications. It is likely to offer substantial hardware and software savings, compared with an equivalently configured PBX system. For example, Thomas M. Sawyer, assistant vice president for IT, University of Louisville, estimates that UofL’s VoIP system saves the university about $1.5 million annually. One of the case studies accompanying this report, “The University of Louisville: Fulfilling the Promise of VoIP,” details that institution’s implementation and cost savings.

Depending on the system selected, VoIP may also offer features such as voicemail, caller ID, and multiparty calling at prices well below those of equivalent PBX features. VoIP inherits its principal disadvantages from the institution’s data network. If bandwidth is constrained, relative to the requirements of the VoIP system, delays in the reassembly of the voice-stream packets at the receiving end can result in latency (intervals of silence) and jitter (poor sound quality).

Qualitative interviews suggest that VoIP’s voice and data integration may prompt IT leaders to review current chargeback models to ensure future financial sustainability. For example, the integrated data and voice capabilities in the University of Louisville’s VoIP system highlighted the need for a new network funding model. “Telecommunications helped to finance our network and, in the past, we avoided a network connection charge,” states Priscilla Hancock, vice president for IT and CIO. “Now all services originate from the VoIP phones. So once we pay off our VoIP implementation, our next big challenge is to create a network chargeback model that enables us to invest in new technology and make transitions without cutting our wrists.” Middle Tennessee State University is in a somewhat different position. Telecommunications is central IT’s only chargeback area, with a standard fee per month imposed for each line, traditional or VoIP. According to Lucinda Lea,
vice president of IT and CIO, “VoIP has not and will not change this situation. The cost is never going away; it is just different.”

We asked what change in importance for meeting faculty and staff communication needs our respondents foresaw VoIP-based landline telephony undergoing in the next three years. As was the case for the PBX-based telephony question, responses about future importance of VoIP to faculty were closely comparable to those for staff (see Figure 5-4). But responses about VoIP could hardly be more different from those about PBX (compare Figures 5-3 and 5-4). Where the PBX results show a technology in decline, with about 10 times as many respondents anticipating a decrease in importance as expecting an increase, the VoIP results show a technology on the ascendant, with virtually no respondents anticipating a decrease, only a quarter anticipating no change, and the remaining nearly three-quarters anticipating the technology’s importance for faculty and staff to increase or greatly increase.

These results reflect the number of VoIP projects already completed, under way, or in the planning phase. As Table 5-5 shows, about a sixth of our respondents have completed work on their VoIP projects, and 3 in 10 respondents have VoIP projects under way but not completed. This is twice as many as have completed their projects. These respondents, considered together with the 2 in 10 who said they were planning to adopt VoIP in the future, constituted a strong majority (68.1%) of the survey population. The final third of respondents (31.9%) were either just considering or not planning to adopt that technology.

The weighting toward work in progress and projects planned for the future suggests that the VoIP adoption curve has several more

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Table 5-5. Status of Adoption of VoIP for Faculty/Staff Landline Telephone Service (N = 351)

<table>
<thead>
<tr>
<th>Status of Institution’s Adoption of VoIP</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not planning to do</td>
<td>9.4%</td>
</tr>
<tr>
<td>Considering</td>
<td>22.5%</td>
</tr>
<tr>
<td>Planned for the future</td>
<td>19.7%</td>
</tr>
<tr>
<td>Work is in progress</td>
<td>31.9%</td>
</tr>
<tr>
<td>Work is completed</td>
<td>16.5%</td>
</tr>
</tbody>
</table>
years to go before the technology reaches its saturation point. Some institutions may be waiting for their current PBX switches to reach the end of their product life cycle and/or for the newer technology to mature before investing in VoIP. That is the case at Seattle Pacific University, which is planning to replace its nearly 20-year-old digital PBX switch within a couple of years. CIO Dave Tindall hopes that, by that time, “VoIP is robust, sound, completely proven, and cheaper to deploy.” For other insights from our qualitative interviews, see the sidebar “Views from Qualitative Research: Challenges of VoIP Adoption.”

While a sixth of respondents said they have completed adoption of VoIP for faculty/staff telephone service, this does not mean that they have completely replaced their PBX systems with VoIP systems. Among the institutions that reported their adoption was complete, only about half (51.7%) reported that all desksets now use VoIP. About a quarter (24.1%) reported that 76–99% of desksets use VoIP, and the remaining quarter (24.1%) reported VoIP usage by 75% of desksets or fewer. Among those who considered their adoption work complete, the mean percentage of faculty/staff desksets currently using VoIP was 83.40% (S.D. 33.871).

We asked respondents who said they had VoIP projects in the planning stages, under way, or completed what percentage of desksets they expected would be using that technology in three years. Where the institution was only planning future adoption, the mean percentage of anticipated VoIP deskset use was 33.37% (see Table 5-6). Where work was in progress, the mean percentage was 54.91%, and where work was completed, it was 86.89% (just a few percentage points above the current mean for this group of 83.40%, as reported above). We interpret this finding to mean that VoIP projects in general are not envisioned as all-at-once “forklift” upgrades, but as gradual rollouts of this technology—perhaps because it is relatively untested, compared with PBX telephony.

As one might predict, anticipated change in importance of VoIP landline telephony to faculty is significantly associated with status of VoIP adoption. As Figure 5-5 shows, more than two-thirds of respondents not planning VoIP adoption expected the importance of VoIP for faculty not to change. Where VoIP was being considered, similar percentages expected VoIP importance to increase or greatly increase instead; the percentage of respondents who expected increases was a bit higher among those planning VoIP adoption for the future, and still higher among those who reported having adoption projects in progress. The percentage expecting an increase or great increase dropped to around half among those whose projects were complete. (The other half anticipated no change in importance, suggesting that they consider VoIP adoption to be at a steady state.) Very few respondents reported that importance of VoIP for faculty would decrease or greatly decrease regardless of adoption status.

Our findings about anticipated change in importance of VoIP for staff are almost identical to those for faculty.

As one would expect, respondents who said their VoIP implementations were complete were more likely than others to tell us they were early adopters of new communication and messaging technologies.

It appears that institutions whose faculty/staff landline service provider is not central IT are moving substantially more slowly in the direction of VoIP. Where central IT had responsibility for faculty/staff landline telephone service, the percentage of respondents who said they had completed work in adopting VoIP for faculty/staff landline telephone service (18.4%) was four times as great as it was where central IT was not responsible (4.5%) (see Table 5-7). The percentage reporting work in progress was 2.5 times as high where central IT was responsible. Institutions where central
Views from Qualitative Research: Challenges of VoIP Adoption

The qualitative interviews surfaced a number of concerns about VoIP from nonadopters, as well as some solutions from those who have implemented it already.

The first concern is VoIP’s dependence upon the less reliable data network and the potential for telephone service disruption. “It is a safety issue if the telephones go dead during a power outage,” stated Linda Deneen, University of Minnesota Duluth. “VoIP requires a lot of power backup systems to work in an outage, and this cost nearly always dissuades us from implementing it.” The University of Louisville’s IT organization tackled these concerns in its VoIP implementation, setting realistic expectations with senior administration up front during the vetting process and projecting three to four hours of outages per year. UofL’s Tom Sawyer noted that “the reality is that VoIP exceeded expectations—just a few outages and not as many problems as expected.” Adequate backup is indeed an issue, and to enhance reliability, UofL upgraded its VoIP system uninterruptible power supply (UPS) solution from one with 20 minutes’ capacity to one that will last an hour.

For others, the reluctance to move to VoIP stems from the institution’s investment in its current telephone infrastructure. A digital and up-to-date PBX switch combined with a large wire plant infrastructure discourages Texas State University–San Marcos from wholesale migration to VoIP. The university’s vice president for IT, C. Van Wyatt, feels that “abandoning that infrastructure simply to migrate to VoIP is not very appealing.” UofL was in a similar situation, but as Jay Vetter, director, communications services, observed, “Some of our copper cable had sat in the ground for 30 to 40 years and was in pretty bad shape.” He cited water damage and performance issues and the need for replacement. “Bottom line is you do save some of those maintenance resources that can be reallocated to VoIP.”

Finally, others question the campus’s interest or need for VoIP’s advanced capabilities. “Just because a core switch is capable does not mean the campus is ready for it,” stated Dewitt Latimer, University of Notre Dame. He continued, “There’s a lot to be said for the simplicity and stability of the old -48v DC power plant of legacy phone systems when compared to the added complexities and concomitant points of failure of a VoIP system. Throw in the growing use of cellular phones by faculty and staff, and the value add of a VoIP project gets quickly overwhelmed by its true implementation costs.” Or as another interview participant stated, “I think most people do not use 99% of what is available with VoIP.” Cindy Bixler at Embry-Riddle Aeronautical University addressed this concern by creating a training program that spoon-feeds instruction about VoIP’s advanced features over time. “Rather than overwhelming users, we concentrated on a few features in each session, following up with another program a month later to answer questions and teach them a few more tricks,” she stated. Minot State University’s IT director, Cathy Horvath, wants to solicit user feedback first before committing to VoIP. “We move in the direction of our users’ interest and business need. We won’t just purchase 400 IP phones and install them on the faculty and staff desks. Unified messaging is our Phase I, and we will ramp up from there.” To gain user support for VoIP, UofL instituted an expanding pilot program around the campus to introduce various departments to its capabilities. The participants’ positive feedback factored highly in the institution’s decision to convert its entire campus to VoIP.
IT was not responsible were more likely to report projects planned for the future, being considered, or not being planned. Virtually all (94.9%) of the respondents who said they have completed adopting VoIP for faculty and staff landline telephone service agreed (48.3%) or strongly agreed (46.6%) that faculty and staff were satisfied specifically with the VoIP services their institution provided. We also have indirect evidence that VoIP may provide more satisfactory faculty/staff telephone service overall. Where a faculty/staff VoIP implementation was under way or completed, nearly half of respondents (47.3%) expressed agreement or strong agreement that institutionally provided landline telephone service in general routinely exceeds the expectations.

Table 5-6. Percentage of Faculty/Staff Telephone Desksets That Will Use VoIP in Three Years, by Status of VoIP Adoption for Faculty/Staff Landline Telephone Service

<table>
<thead>
<tr>
<th>Status of Adoption of VoIP</th>
<th>Percentage of Faculty/Staff Telephone Desksets That Will Use VoIP in Three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Planned for the future</td>
<td>33.37</td>
</tr>
<tr>
<td>Work is in progress</td>
<td>54.91</td>
</tr>
<tr>
<td>Work is completed</td>
<td>86.89</td>
</tr>
<tr>
<td>Total</td>
<td>57.09</td>
</tr>
</tbody>
</table>

*Scale: 0–100%

Table 5-7. Status of VoIP Adoption for Faculty/Staff Landline Telephone Service, by Central IT Responsibility for Faculty/Staff Telephony

<table>
<thead>
<tr>
<th>Central IT Responsibility for Faculty/Staff Telephony</th>
<th>Status of Adoption of VoIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not planning to do</td>
</tr>
<tr>
<td>Not currently responsible (N = 44)</td>
<td>27.3%</td>
</tr>
<tr>
<td>Currently responsible (N = 305)</td>
<td>6.9%</td>
</tr>
</tbody>
</table>
of faculty and staff. Where no VoIP adoption was under way, fewer than a third (31.1%) agreed or strongly agreed.

**PC-Based VoIP**

Above, our discussion of VoIP technology centered on faculty/staff telephone services managed by the institution or, in a few cases, managed for the institution by a third party. VoIP is also used by commercial entities such as Skype and Gizmo5, which run on (among other devices) the faculty or staff member’s desktop PC. These services allow free calls between PCs located anywhere the global Internet reaches and provide PC-to-telephone and telephone-to-PC calling capability for a small per-minute fee, varying by destination and type of phone being called (landline or cellular).

While these services offer advantages in terms of cost, convenience, and features (they support video calls, for example), they come with some drawbacks or at least some complications. Call bandwidth can saturate the institution’s network if usage is high and bandwidth is not aggressively managed. Especially for faculty/staff calls that involve official business, calls routed through a PC-based VoIP service may leave an evidentiary trail that falls outside of or runs counter to institutional policies (such as e-discovery or records management policies). Some institutions may also have concerns about the effect these services might have upon employee productivity.

Despite the advantages and drawbacks, nearly two-thirds of respondents (65.8%) said they had no policy toward the use of PC-based VoIP services for faculty and staff communications. Among the 117 that did report having such a policy, a majority (59.8%) reported policies that allow the use of PC-based VoIP but neither encourage nor discourage it (see Table 5-8). The technology’s use was prohibited at 15.4% of reporting institutions and discouraged at 22.2%. It was encouraged at 1.7% and mandated at 0.9% (a total of three institutions).

We expect the majority approach reflects experiences similar to those the University of Minnesota Duluth (UMD) had. “So far Skype has not caused us too many problems,” IT director Linda Deneen told us. “It might be one of those things that people are more worried about than is warranted in actual fact.” Originally, UMD discouraged Skype use because of its high bandwidth consumption, but its popularity on campus and its low cost for international calls prompted the institution to change its policy. Today, UMD’s IT organization relies on user education about bandwidth consumption rather than on policy prohibitions to keep the situation under control.

Policy toward faculty/staff use of PC-based VoIP was associated with the institution’s pace of adoption of new electronic messaging and communication technologies. Early adopters much more often said their policy allowed, encouraged, or mandated PC-based VoIP than prohibited or discouraged it (see Table 5-9). Mainstream adopters reported being a little less permissive. Among late adopters, though, the majority (62.5%) prohibited

<table>
<thead>
<tr>
<th>Institution’s Policy toward Faculty and Staff Use of PC-Based VoIP</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy prohibits its use</td>
<td>15.4%</td>
</tr>
<tr>
<td>Policy discourages its use</td>
<td>22.2%</td>
</tr>
<tr>
<td>Policy allows its use but neither discourages nor encourages it</td>
<td>59.8%</td>
</tr>
<tr>
<td>Policy encourages its use</td>
<td>1.7%</td>
</tr>
<tr>
<td>Policy mandates its use</td>
<td>0.9%</td>
</tr>
</tbody>
</table>
or discouraged PC-based VoIP and the remainder merely allowed it; no late adopter institution encouraged or mandated it. While allowing use of PC-based VoIP was not an unfailing differentiator among early, mainstream, and late adopters of new electronic messaging and communication technologies, the data do support our expectation that the average early adopter would be significantly more tolerant of the technology than the average late adopter.

### Residential Student Telephone Services

Changes in communication technologies have had a huge impact upon the provision of landline telephone services for residential students at colleges and universities. Inexpensive long-distance calling cards made institutionally provided long-distance services to residence hall telephones obsolete (and unprofitable) in the 1990s, and in the current decade the proliferation of cellular telephones has caused many institutions to remove landline telephones entirely from residence hall rooms, or to make them available only by special request.

Where the institution provided its own residence hall telephone service, this phenomenon may have cost the residence halls some income (recouped in some cases by Internet service charges) but has also saved the institution the costs of operating and maintaining an extensive residence hall telephone infrastructure. The University of North Carolina at Greensboro, for example, stopped offering landline telephone service in its on-campus housing units in July 2008. The university based its decision, in part, on its November 2007 survey of residential students, which revealed that 97.5% of students had and used mobile telephones. The university estimated it would save more than $700,000 per year by discontinuing telephone service in the residence halls!

### A Distinctive Telephone Service Environment

It stands to reason that the residential student telephone service environment would be unlike the faculty/staff environment. Student telephone service is closely analogous to residential service, while faculty/staff service is more like business service. The two may be managed on the same PBX switching gear or the same VoIP network, but that is more a testament to the flexibility of the telephone system than to the homogeneity of the service. The differences between faculty/staff and student telephony are reflected in the data discussed in this section.

Among institutions that reported having residential students, 88.9% said that the central IT organization was responsible for all landline telephone services for that constituency. The equivalent percentage for faculty/staff service was 87.4%. As was the case for our questions about faculty/staff landline telephone service, we did not ask who else might provide telephone service to students. Unlike responsibility for faculty/staff landline telephone service, central IT’s responsibility for

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<table>
<thead>
<tr>
<th>Pace of Adoption of New Messaging and Communication Technologies</th>
<th>Institution’s Policy Toward Faculty and Staff Use of PC-Based VoIP (e.g., Skype)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prohibits or Discourages Use</td>
</tr>
<tr>
<td>Early adopter (N = 21)</td>
<td>19.0%</td>
</tr>
<tr>
<td>Mainstream adopter (N = 63)</td>
<td>30.2%</td>
</tr>
<tr>
<td>Late adopter (N = 32)</td>
<td>62.5%</td>
</tr>
</tbody>
</table>
student service was not significantly associated with institution size.

As we discussed above, PBX-based telephony appears to be a technology in decline. This impression was even more vivid for students than it was for faculty and staff. Figure 5-6 adds data for the anticipated importance of PBX telephony for students (at institutions that have residential students) to the faculty/staff data already presented in Figure 5-3. The obvious difference is that for students, 3 in 10 respondents predicted that the importance of PBX telephony would greatly decrease; percentages for faculty and staff are about half that. Fewer respondents predicted no change in importance for students, and very few—even fewer than for faculty and staff—predicted an increase or great increase.

VoIP for Residential Students

For student residences that are already wired for Internet service, providing residential students with landline telephone service using VoIP gear holds the same advantages it does for faculty/staff service. Nevertheless, opinions about the potential importance of VoIP for residential student telephone service appear to be tempered by the waning importance of institutionally provided telephone services for that constituency. One interesting exception emerged from our interviews at the University of Louisville, as detailed in the accompanying case study, “The University of Louisville: Fulfilling the Promise of VoIP.” The VoIP implementation there prompted university officials to keep phone service in residence hall rooms when the IT organization developed an emergency notification application that transmits audio and text messages over wall-mounted VoIP handsets in the students’ residence hall rooms.

Figure 5-7 shows that compared to our findings related to faculty and staff, a few more respondents anticipated VoIP to decrease in importance for students, but many more (51.1%) predicted its importance for students would not change in the next three years. Far fewer anticipated its importance for students would increase or greatly increase.

Among the 288 respondent institutions that have residential students, three-quarters (78.1%) were not planning or were just considering a VoIP implementation for resident student landline telephony (see Table 5-10). Another tenth were just in
the planning stage. The remainder (11.4%) had projects under way or completed. This is less than one-fourth the percentage of institutions (48.4%) with VoIP projects under way or completed for faculty and staff.

Although an ongoing or completed adoption of VoIP for faculty and staff landline telephony is far from a guarantee that an adoption for residential student telephony is also ongoing, it does improve the odds. Considering only the 288 institutions that have resident students, where work on a VoIP implementation for faculty/staff telephony had not begun, only 2.7% of respondents reported a residential student implementation under way or completed (see Table 5-11). Where work on a faculty/staff VoIP implementation was under way or completed, seven times as many (20.7%) reported a residential implementation also being under way or completed.

Among the 48 institutions with residential students that reported work on the faculty/staff implementation as being complete, 20 (41.7%) reported that a student implementation was also complete. The 35 institutions with VoIP projects in progress or complete for student landline service reported the percentage of residential student desksets that were using VoIP. While one-third of respondents reported percentages ranging from 0 to 40%, the remainder reported that all resident student desksets used VoIP. As reported earlier in this chapter, that figure was 51.7% for faculty/staff VoIP telephone service, so it appears that the average student VoIP
implementation is more comprehensive than the average faculty/staff implementation.

**PC-Based VoIP**

As we did for faculty and staff, we asked respondents about their policy concerning the use of PC-based VoIP (e.g., Skype) services by students. Of the 288 respondents who reported having residential students, just over two-thirds (67.4%) said they had no policy toward the use of PC-based VoIP services. Among the 93 institutions that did report having such a policy, almost two-thirds reported policies that allow the use of PC-based VoIP but neither encourage nor discourage it. Use was discouraged at 20.4% and prohibited at 12.9% of reporting institutions (see Table 5-12). It was encouraged at two institutions and mandated at none.

Results for the similar question about faculty/staff use of PC-based VoIP (see Table 5-8) are similar, and the two sets of results are very strongly positively associated.

Unlike policy toward faculty/staff use of PC-based VoIP, student policy was not significantly associated with the institution’s pace of adoption of new electronic messaging and communication technologies.

### Summary and Implications

Overall, it appears that faculty/staff telephony is in good shape in higher education. At almost 9 in 10 respondent institutions it is provided to all faculty and staff. Only at 4 in 10 doctoral institutions, 1 in 7 master’s institutions, and a scattering of others are faculty and staff allowed to opt-in to the service voluntarily. Very few institutions provide telephony to faculty and staff on an opt-out basis.

A healthy two-thirds of respondents agreed at some level that faculty/staff landline telephony would be financially sustainable over the next three years. Fewer than 15% actively disagreed, which suggests that the technology is on sound financial footing at most institutions. More than three-quarters of respondents said faculty/staff landline telephony was well understood by its users, which is another positive finding, but only 4 in 10 agreed that it routinely exceeded user expectations, and nearly half were neutral. This may say more about the high level of expectations campus telephone users have for telephony in general than about the quality or feature set of the service; for most of us, there is little thrill left in even the lustiest dial tone.

Nearly half of respondents expected there to be no change in the importance of faculty/staff PBX-based landline telephony in the next three years, but most of the rest anticipated a decline. Very small numbers foresaw an increase in importance of this legacy technology. Their thoughts, and perhaps their hopes, appear to lie more in the direction of the newer technology of VoIP. About three-quarters of respondents anticipated that VoIP would increase
in importance in the coming three years. With most campus telephone services being provided by central IT, where versatile IP is a well-understood technology and where the campus IP network is most often centered, the move to VoIP should be easier and more natural than where telephone services and IT services are separate.

About a sixth of respondents, overall, have completed their adoption of VoIP, and another third have work under way. Just 1 institution in 10 reported no plans to adopt the technology. On a percentage basis, where central IT is not responsible for telephone services, fewer than half as many VoIP projects were under way, only a fourth as many had been completed, and four times as many respondents said they are not even considering the transition.

Completed VoIP projects have not always involved total replacement of the legacy PBX system. On average, only about 9 in 10 telephone desksets have been converted to VoIP in completed projects. Where the project is still under way, just a bit more than half of desksets, on average, have been converted.

The use of VoIP-based long-distance telephone services such as Skype is seldom actively encouraged for faculty/staff telephony and is mandated almost nowhere. It is tolerated, however, at 4 in 10 institutions. Most of the remainder either discourage or prohibit it and, perhaps predictably, nearly two-thirds of them characterize themselves as late adopters of new electronic messaging and communication technologies. Our findings about policies toward use of VoIP-based long-distance services by students were very similar to these.

Provision of telephone services for residential students is the job of central IT at 9 in 10 institutions, as it is for faculty and staff. The outlook for institutionally provided residential student telephone service is much more dismal than for faculty/staff service. Among respondents who had residential students, twice the percentage said they anticipate that the importance of PBX-based telephony will “greatly decrease” as said the same for the faculty/staff importance of that technology. That difference was not mirrored in responses about the future importance of VoIP telephony, though. As we discussed above, about three-quarters of respondents predicted the importance of VoIP would increase for faculty and staff in the next three years. But only a third reported similarly for its importance for students, with nearly half of respondents predicting no change and a sixth reporting a decrease.

In the fact that PBX telephony is expected to decrease substantially in importance for students and VoIP is not expected to take its place, we find at least circumstantial evidence to support what everyone already knows: that mobile telephony is the ascendant voice communication technology for students, whether residential or not. This phenomenon is reflected in the decision of many institutions to remove all or most telephone infrastructure from campus residence.

### Table 5-12. Institution’s Policy toward Student Use of PC-Based VoIP Services (N = 93)

<table>
<thead>
<tr>
<th>Institution’s Policy toward Student Use of PC-Based VoIP Services</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy prohibits its use</td>
<td>12.9%</td>
</tr>
<tr>
<td>Policy discourages its use</td>
<td>20.4%</td>
</tr>
<tr>
<td>Policy allows its use but neither discourages nor encourages it</td>
<td>64.5%</td>
</tr>
<tr>
<td>Policy encourages its use</td>
<td>2.2%</td>
</tr>
<tr>
<td>Policy mandates its use</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

In the coming three years.

With most campus telephone services being provided by central IT, where versatile IP is a well-understood technology and where the campus IP network is most often centered, the move to VoIP should be easier and more natural than where telephone services and IT services are separate.

About a sixth of respondents, overall, have completed their adoption of VoIP, and another third have work under way. Just 1 institution in 10 reported no plans to adopt the technology. On a percentage basis, where central IT is not responsible for telephone services, fewer than half as many VoIP projects were under way, only a fourth as many had been completed, and four times as many respondents said they are not even considering the transition.

Completed VoIP projects have not always involved total replacement of the legacy PBX system. On average, only about 9 in 10 telephone desksets have been converted to VoIP in completed projects. Where the project is still under way, just a bit more than half of desksets, on average, have been converted.

The use of VoIP-based long-distance telephone services such as Skype is seldom actively encouraged for faculty/staff telephony and is mandated almost nowhere. It is tolerated, however, at 4 in 10 institutions. Most of the remainder either discourage or prohibit it and, perhaps predictably, nearly two-thirds of them characterize themselves as late adopters of new electronic messaging and communication technologies. Our findings about policies toward use of VoIP-based long-distance services by students were very similar to these.

Provision of telephone services for residential students is the job of central IT at 9 in 10 institutions, as it is for faculty and staff. The outlook for institutionally provided residential student telephone service is much more dismal than for faculty/staff service. Among respondents who had residential students, twice the percentage said they anticipate that the importance of PBX-based telephony will “greatly decrease” as said the same for the faculty/staff importance of that technology. That difference was not mirrored in responses about the future importance of VoIP telephony, though. As we discussed above, about three-quarters of respondents predicted the importance of VoIP would increase for faculty and staff in the next three years. But only a third reported similarly for its importance for students, with nearly half of respondents predicting no change and a sixth reporting a decrease.

In the fact that PBX telephony is expected to decrease substantially in importance for students and VoIP is not expected to take its place, we find at least circumstantial evidence to support what everyone already knows: that mobile telephony is the ascendant voice communication technology for students, whether residential or not. This phenomenon is reflected in the decision of many institutions to remove all or most telephone infrastructure from campus residence.
halls. It remains to be seen whether future functionality developed for VoIP telephones will be sufficient to win a new place for institutionally provided telephone service in the residence halls. But as higher education IT professionals have all learned many times, a paradigm-shifting revolution in technology is always just one “killer app” away.

Endnotes
2. Excluded from these figures, for simplicity’s sake, were the one bachelor’s institution and the one associate’s institution that said they offer an “other” landline telephone service option, and the two “other” Carnegie institutions that said they offer no telephone service.
5. Albrecht and Pirani, “The University of Louisville.”
6

Mobile Communications

To be happy in this world, first you need a cell phone and then you need an airplane. Then you’re truly wireless.
—Ted Turner

Key Findings

- Eight in 10 respondents say they anticipate an increase or great increase in demand for institutional financial support of faculty/staff mobile communication services in the next three years.
- Fewer than a third of respondents agree that handheld devices (BlackBerry, Treo, iPhone) are now an essential tool for the higher education professional, but nearly two-thirds agree they will be in three years.
- The estimated percentage of the institution’s staff (only) who have handheld devices is significantly greater where the institution subsidizes or pays outright for a larger percentage of staff mobile communication service. This suggests that institutional funding plays an empowering role in the adoption of handheld devices by staff.
- As of the date of our survey, responding institutions had been slow at adapting preexisting web-based services for delivery to handheld devices and at developing new web-based services for those devices. Half of respondents had adapted no preexisting services.
- Of the institutions saying they had a strategic plan for IT, only 4 in 10 say their plan identifies mobile communications as an area of importance. And only 1 in 10 of all respondents say their institution has a documented strategy of any sort for making key institutional web services available via handheld devices. These findings suggest that the current priority assigned to mobile communications at most institutions is moderate, at best.
- Identifying mobile communications as an important area in the institution’s IT strategic plan appears to boost the priority of the institution’s projects to adapt preexisting web-based services and develop new ones for delivery to handheld devices.

The communications revolution we discussed in the last chapter was based in part on the replacement of landline telephone communications by those using cellular telephones—in particular, cellular telephony and SMS text messaging—and by the merging of telephone services onto the campus data network using VoIP. In this chapter, we discuss another aspect of the revolution: the convergence of networked computer applications with today’s multifaceted and rapidly evolving wireless communication environment.

Cellular telephone networks and devices brought most of us at least partial liberation
from the desktop handset 10 years ago or more. With the fairly recent advent of smartphones (e.g., BlackBerry, Treo, iPhone), the cellular network has further liberated us from the wired data network, and even from reliance on short-range Wi-Fi wireless service.

What we find in the information our respondents have shared with us is that they are, for the most part, responding reasonably and prudently to the modest demands that the users of mobile communication technologies have placed on them in the last few years. But as those technologies mature, decrease in price, and increase in what a realtor might call curb appeal, we think demand is likely to increase geometrically. In fact, we may all soon look back on the commercial release of the Apple iPhone in mid-2007 as an inflection point in the acceptance of handheld web communications. And it is probably a safe bet that within the current year, the expectations faculty, staff, and students have for support of those devices and for development of tailored services for them will hit central IT hard.

Two emerging (or at least evolving) technologies will also change the mobile communications landscape, although more incrementally than the web-enabled, handheld mobile communication device. The first of them, WiMAX, promises to provide Wi-Fi-like connectivity over the sorts of distances that are now covered almost exclusively by cellular technology. Only a few urban areas now have WiMAX service, but broader rollouts are planned for the next few years as the technology matures. The second transformative technology, satellite communication service, offers both telephone and data communication services virtually anywhere in the world, in most types of terrain, but is currently very expensive and comparatively primitive in its feature set; its data transmission rates are very slow by today’s standards. Neither satellite communications nor WiMAX are discussed further in this report.

Given this variety of options, it can be difficult to settle on what exactly constitutes a mobile device, at least without loading one’s terminology down with an unwieldy string of qualifiers. For the purposes of this study, we refer to web-enabled, handheld mobile communication devices such as smartphones simply as “handheld devices,” adding “web-enabled” only where ambiguity is a risk.

**Institutional Support for Mobile Communications**

In this section we examine some of the steps higher education institutions take to support mobile communications among faculty, staff, and students.

Various 2008 reports place the percentage of Americans who have cellular telephones at between 78% and 89%. We reported in Chapter 5 that a 2007 University of North Carolina Greensboro poll found that 97.5% of the institution’s students had and used cell phones, perhaps providing an approximation of the adoption of that technology by the overall college and university student demographic. ECAR’s annual survey of undergraduates stopped asking about basic cell phone ownership in 2008 after previous studies made it clear that mobile phone ownership was essentially ubiquitous. Clearly these devices—whether simple cell phones or highly sophisticated smartphones—are perceived widely to have value to the individual. At a scant majority of our respondent institutions, they are perceived to have sufficient value to the enterprise that the institution takes a hand in providing them to faculty and staff. At Georgia Gwinnett College, for example, Lonnie Harvel, vice president for educational technology and CIO, is a big promoter of mobility to enhance interaction and communications between faculty, staff, and students. His IT organization currently provides two-thirds of the faculty and staff with mobile devices and has an eventual goal of 100% adoption among faculty and staff in 18 months.
As we shall see, very few institutions intervene directly in students' ownership and use of mobile communication devices. However, perhaps in recognition of the devices' value to students, just over a third of institutions have made arrangements with mobile communication service providers to offer special rates on those services to their students, and a bit more than a quarter have arranged special student pricing for mobile communication devices.

Support for Faculty and Staff

In the United States, financial support for college and university employees’ use of mobile communications is complicated by Internal Revenue Service regulations that require such a benefit to be taxed to the extent that it is used for purposes unrelated to the employee’s work. Where the institution is the purchaser of record of the service, it becomes necessary for the institution to audit employees’ use of their institutionally provided cell phones in order to establish the percentage of personal use. This is difficult in the case of cell phone calls and text messages and, when the institutionally provided device is an Internet-capable smartphone, nearly impossible in the case of Internet data services.

At many institutions, this has led to a policy whereby the employee is the owner of record of the device and the institution pays a percentage of the monthly bill for the device on the basis of the employee’s estimated business usage. Variations on this model are many. Dave Tindall at Seattle Pacific University described his institution’s three-level monthly stipend structure to reimburse faculty and staff members for their mobile devices. Each department head determines the appropriate stipend amount on the basis of each mobile device user’s job responsibilities. Tindall estimates that this method has cut about 30% from the institution’s former mobile communications bill while simplifying the associated accounting.

Our study finds that, in fact, nearly equal numbers of respondents said they did (52.3%) or did not (47.7%) have an institution-wide process for providing faculty and staff with mobile communication services.

Providing those services appears to be a feature of technologically more advanced institutions. Majorities of respondents who characterize their institutions’ pace of adoption of new electronic messaging and communication technologies as either “early adopter” or “mainstream adopter” say they have an institution-wide process in place for providing faculty and staff with mobile communication services (see Table 6-1). Only 4 in 10 respondents who characterize their institutions’ pace of adoption as “late adopter” have such a process in place.

Among respondents who reported that such a process is in place, a quarter reported that their institution does not subsidize or pay outright for mobile communication services for any member of the faculty (see Table 6-2). This suggests that the process involves another form of assistance. Only 3.6% reported not subsidizing or paying outright for service for any member of the staff. More than 4 in 10 respondents reported subsidy or outright payment for 1–5% of faculty, while fewer than 2 in 10 said they provide it for such small percentages of staff. At institutions where 6% or more of faculty or staff receive service through subsidy or outright payment, staff fare better than faculty. Only a very few institutions reported that they subsidize or pay outright for mobile communication services for more than 10% of faculty or more than 25% of staff.

The related means and medians help confirm that subsidized or paid-for mobile services are more common for staff than for faculty: The mean percentage of faculty receiving such service is 8.19 (S.D. 16.034), and the mean percentage of staff is 17.80 (S.D. 19.193). The median percentage for faculty is 3 and the median for staff is 10.

Half of respondents (50.9%) agreed or strongly agreed that the institution’s financial support for mobile communication services
Eight in 10 of all respondents (79.1%) reported that they anticipate an increase or great increase in demand for institutional support for faculty/staff mobile telecommunication services in the next three years (see Figure 6-2). Fewer than 1 in 10 anticipate demand will greatly increase, so the anticipated increase, while widespread, is not generally an extreme one. Fewer than 1 in 20 (4.7%) said they anticipated a decrease or great decrease, and the remaining 1 in 6 said they anticipated no change.

Colleges and universities may find that institutional support changes the nature of faculty and staff members’ mobile telecommunications usage as well. For example, regarding Seattle Pacific University, Tindall told us that “the institution’s support has stimulated staff and faculty members’ transition to smartphones to take advantage of the devices’ e-mail capabilities.”

**Mobile Communication Signal Strength**

We were curious as to how mobile communication signal strength might vary among our survey population. For normal business purposes as well as purposes of communicating during a crisis, poor signal strength could limit an institution’s adoption of cellular telephone communications, SMS text messaging, and web applications developed or adapted for handheld devices. It could affect an institution’s willingness to subsidize mobile services for faculty and staff and could influence an institution’s dealings with mobile communication service carriers on behalf of its faculty, staff, and students.

For about two-thirds of respondents, the mobile communication service signal strength on the primary campus is mostly or
uniformly good (see Table 6-3). It is mostly or uniformly poor for only 5.3% of respondents, and the remaining 3 in 10 find that the signal varies widely among the carriers serving the local market. This suggests that for most respondents, poor signal strength should not be a barrier to using mobile communication options. A few qualitative interview participants told us they were under pressure to enhance mobile communication signal strength for a variety of reasons: to handle emergency notification applications, to compensate for the uptick in cell traffic during football weekends, and to accommodate growing student mobile device usage, especially as landline phone service in residence halls is discontinued.

To our surprise, we found no meaningful associations between mobile communication signal strength and our other survey findings, presumably because it is so uniformly good.
Support for Student Mobile Communications

While some institutions provide mobile communication services and devices to all students or to groups of students,5 our research turned up very few that do. Fewer than 1% of our respondent institutions require students to own mobile communication devices. Students typically come to campus equipped with their own cell phones, and the complications and inconvenience of owning and operating two of those devices—one personal and one institutional—may be part of what has limited our respondent institutions’ direct involvement with them.

Nevertheless, institutions do find ways to help. Slightly more than one-third of respondents (36.7%) reported that the institution had agreement(s) with one or more mobile communication service carriers to provide services to students at discounted rates. Fewer respondents, slightly more than one-quarter (28.3%), reported similar agreements involving mobile communication devices. Predictably, these two practices are strongly positively associated. Among institutions where agreements to provide services are in place, more than three-quarters (76.2%) also have agreements in place regarding devices.

Both practices are also significantly associated with Carnegie class. The highest percentages of institutions having agreements in place appeared among doctoral institutions. Master’s institutions followed at a distance of about 15 percentage points, with bachelor’s institutions following them a bit more closely and associate’s institutions relatively far back in the pack (see Table 6-4). In each class, agreements for discounted mobile devices were less common than agreements for services.

Both variables are also significantly associated with institution size. The smallest institutions are the ones least likely to have agreements for services (19.7%) and devices (11.5%) in place. Percentages increase gradually as institution size increases, topping out at 50.0% of institutions with more than 15,000 FTE students reporting agreements for services and 42.6% reporting agreements for devices.

There is no significant association between having agreements in place for discounted mobile services and devices for students and respondents’ projections of the importance for students in the next three years of either standard cell phones or Internet-capable cell phones.

Support for mobile communications for all constituencies often comes as a package, perhaps reflecting at least an acknowledgment, if not a formal institutional commitment, to the technologies that are revolutionizing the way we communicate. Among institutions that reported having no institution-wide process to provide mobile communication services to faculty and staff, only a quarter (24.2%) said they also had agreements in place with mobile telephone service providers to provide services to students at reduced prices. Where a process to provide faculty/staff mobile services was in place, twice as many institutions (48.6%) also had agreements with carriers for student services.

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Table 6-3. Strength of Mobile Communication Service Signal on the Primary Campus (N = 340)

<table>
<thead>
<tr>
<th>Signal Strength</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniformly poor</td>
<td>0.3%</td>
</tr>
<tr>
<td>Mostly poor</td>
<td>5.0%</td>
</tr>
<tr>
<td>Varies widely among the carriers serving the local market</td>
<td>29.7%</td>
</tr>
<tr>
<td>Mostly good</td>
<td>41.5%</td>
</tr>
<tr>
<td>Uniformly good</td>
<td>23.5%</td>
</tr>
</tbody>
</table>
When discussing institutional support for student cell phone use, a couple of qualitative research participants offered some interesting observations. One is that many students may belong already to plans whereby all family members receive mobile communication service at a highly discounted rate. Georgia Gwinnet College’s Harvel notes that this reason “rendered the carrier’s financial inducements to join our institution-sponsored program ineffective.” David Middleton, assistant vice president for finance and technology, Seton Hall University, offers advice for structuring student plans, observing that his institution’s research “has shown that students really care about data plans—voice plans are not as important—and interestingly, our students have no brand loyalty with regards either to devices or to carriers. That is why developing resources and services with strategic partners, including both device manufacturers and carriers, is critical and will help make a mobile initiative more effective and give it a broader reach.”

### Campus Services for Mobile Devices

Mobile communication devices enable the institution to extend services to faculty, staff, and students in a number of ways. Simplest, of course, are telephone calls and voice messages—enabling direct, service-oriented communications between the institution and its various constituencies. These communications can be personal, between live individuals in real time or time-shifted through the use of voicemail, or they can be more impersonal, involving automated telephone messaging systems. Telephonic communications don’t have to involve mobile devices, but the ubiquity of those devices, especially among students, ensures that they often will.

SMS text messaging is another way of communicating that leverages the convenience and ubiquity of the mobile telephone. Even simple, inexpensive cell phones can use it, and it has become a communication medium of choice among college-age Americans. Message length is limited to 160 characters, so its best institutional uses are for reminders and alerts; the potential of text messaging for emergency notification use has captured a great deal of attention recently, as we will see in Chapter 8.

For colleges and universities, the greatest promise of mobile communication technologies (so far) is in extending the institution’s web-based services to handheld devices—smartphones, such as BlackBerrys, Treos, and iPhones, as well as such handheld devices as the iPod touch, which accesses the web but is not a telephone. These devices generally have high-resolution, full-color LCD displays that can deliver miniature versions of standard web content and many web applications. At least that’s their potential.

To date, relatively few web resources have been adapted to sense that a mobile device is requesting content and, in real time, to customize that content for the specific

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Table 6-4. Agreements with Mobile Communication Service Providers for Discounted Student Services and Devices, by Carnegie Class

<table>
<thead>
<tr>
<th>Carnegie Class</th>
<th>Agreement(s) in Place for Discounted Student Mobile Communication Services</th>
<th>Agreement(s) in Place for Discounted Student Mobile Communication Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR (N = 83)</td>
<td>54.2%</td>
<td>44.6%</td>
</tr>
<tr>
<td>MA (N = 97)</td>
<td>39.2%</td>
<td>29.9%</td>
</tr>
<tr>
<td>BA (N = 64)</td>
<td>34.4%</td>
<td>19.0%</td>
</tr>
<tr>
<td>AA (N = 45)</td>
<td>18.2%</td>
<td>15.6%</td>
</tr>
</tbody>
</table>
device. The exceptions are impressive, though. Google’s simple interface has been adapted well to smartphone formats. The New York Times and Amazon.com are examples of more complex but equally effective mobile interfaces. Very few higher education institutions, however, have adapted their home pages to provide a welcoming interface to mobile users. Of the 19 institutions that reported having adapted preexisting web-based services for delivery to web-enabled handheld mobile communication devices to “a large extent” or “a very large extent,” only one, a Canadian institution, had a top-level institutional home page that formatted itself correctly for the author’s three-year-old Palm Treo 700w. However, even at that exemplary institution, not a single link on the top-level home page led to a correctly formatted subsidiary page.

Still, many colleges and universities acknowledge the need to develop mobile-friendly web content and applications. As Princeton’s Steven Sather observes, “Web-based applications for handhelds are the next active frontier as we strive to provide appropriate campus information in the most desired and appropriate form factor. People want to access information on the fly that should display as well on a mobile device as a computer screen. One example is a traveler determining the departure time for the next New York-bound train while walking to the station.”

This chapter details the progress our institutions are making in the adoption of mobile communications and some of the practices that appear to differentiate institutions from each other in that context.

Acknowledging the Need

As Figure 6-3 shows, nearly three-quarters (73.9%) of respondents agreed or strongly agreed that the ubiquity of mobile communication devices will cause institutions to make significant changes to their online services in the next three years. Two in 10 were neutral, and only 6.8% disagreed or (one respondent) strongly disagreed. These responses are, on the whole, very positive, and so it would appear that the stage is set for the deployment of online services targeted to mobile communication devices.

Text Messaging: The Lowest Common Denominator

As we mentioned above, SMS text messaging is supported on virtually all contemporary cellular telephones and smartphones. Its use is nearly ubiquitous among students in higher education; The ECAR Study of Undergraduate Students and Information Technology, 2008 reports that 76.3% of students 18–19 years old say they use text messaging “several times a week or more.” In our survey, we asked if respondent institutions made use of text messaging for official, non-emergency communications with six constituencies:

- faculty and staff,
- students,
- parents of students,
- prospective students,
- alumni, and
- vendors.

Not surprisingly, as Table 6-5 shows, the constituency with which the institution communicates most widely via text messaging is students, followed closely by faculty and staff and less closely by prospective students. For communications with parents, vendors, and alumni, substantially fewer institutions reported using text messaging.

Faculty and staff, followed by students, were the two most frequently cited constituencies among those institutions that reported using text messaging for two or three constituencies; parents and prospective students were also substantially represented. Among those using text messaging for four
or more constituencies, only vendors were consistently underrepresented.

Fully two-thirds of respondents (66.9%) told us their institutions had adapted no preexisting online services for delivery via text messaging (see Figure 6-4). Small percentages reported doing a little of this, but only six institutions said they did it to a large extent, and three reported doing it to a very large extent.

In general, where an institution has gone to the trouble to adapt preexisting online services for text message delivery, it also reported using text messaging to communicate with a broader range of constituencies.

For a collection of insights about text messaging from our qualitative interviews, see the sidebar “Views from Qualitative Research: Text Messaging for Official Communications.”

[Figure 6-3. Mobile Communication Devices Will Cause Institution to Make Significant Changes to Online Services in the Next Three Years (N = 337)]

<table>
<thead>
<tr>
<th>Institution Uses Text Messaging for Official Non-Emergency Communications with:</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students (N = 345)</td>
<td>14.2%</td>
</tr>
<tr>
<td>Faculty and staff (N = 345)</td>
<td>13.3%</td>
</tr>
<tr>
<td>Prospective students (N = 334)</td>
<td>9.9%</td>
</tr>
<tr>
<td>Parents of students (N = 337)</td>
<td>5.3%</td>
</tr>
<tr>
<td>Vendors (N = 334)</td>
<td>3.0%</td>
</tr>
<tr>
<td>Alumni (N = 332)</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

[Table 6-5. Institution’s Use of Text Messaging for Official Non-Emergency Communications]

**Web-Enabled, Handheld Mobile Communication Devices**

The capability for converged mobile voice and data is becoming widespread among undergraduate students, though actual use remains relatively low. The 2008 ECAR study of undergraduate students and IT7 reports Internet-capable cell phone ownership by 66.1% of the 27,200 undergraduate students in the study population, although only 13.7% of owners access the Internet with them more than once a week, 9.3% between once a month and once a week, and 7.8% between once a year and once a month; just over two-thirds (69.2%) never access the Internet at all with that device. Students cite the size of the screen, the slow speed of the mobile network,
and the high cost of data service as barriers to more frequent Internet use.

Looking at the broader U.S. population, the Pew Internet & American Life project reported in September 2008 that 13% of all adults, 19% of working adults, and 30% of employed professionals (lawyer, doctor, teacher, accountant) owned “BlackBerry, Palm, or other personal digital assistants.”

Unfortunately, not all personal digital assistants have Internet capability, so for comparison with the data from the ECAR undergraduate study, these numbers are probably a bit high. Pretty clearly, though, Internet-capable cell phones are less than half as common among the Pew demographic that includes higher education faculty and staff as they are among students.

While a preponderance of our respondents seem to feel that the web-enabled handheld mobile communication device isn’t yet an essential tool for the higher education professional, they clearly anticipate that such devices soon will be. Just under a third of respondents (31.8%) agreed or strongly agreed that those devices are now essential (see Figure 6-5). A similar number (36.4%) either disagreed or strongly disagreed. Mean agreement was 2.97 (S.D. 0.998) on our 5-point scale, or just under “neutral.” However, when asked if handheld devices would be an essential tool in three years, respondents’ agreement was much more positive. Nearly two-thirds (63.9%) agreed or strongly agreed, while only 14.7% expressed disagreement or strong disagreement. Mean agreement here was 3.71 (S.D. 1.019), much closer to “agree” than to “neutral.”

Despite this difference, today’s skeptics are far from universally convinced that handheld web devices will be essential in three years. Responses to these two questions are strongly associated with each other. Predictably, among the 110 respondents who agree or strongly agree that web-enabled handheld mobile communication devices are now an essential tool, 99.1% agree or strongly agree that the same will be true in three years. However, among the 223 respondents who are neutral or do not agree that such devices are currently essential, only 47.2% agree or strongly agree that they will be in three years.

Respondents’ mean level of agreement that handheld devices are now an essential tool and that they will be essential in three years was significantly positively associated
Views from Qualitative Research: Text Messaging for Official Communications

Qualitative interview participants had a lot to say about their campuses’ use of text messaging. Most utilize that technology for emergency notification only.

Their concerns about using it more widely revolved around “the question of whether text messaging will lose its potency for conveying an emergency situation if it is used for many different things,” in the words of Chuck Chulvick, Raritan Valley Community College. As Ken Stafford, University of Denver, observes, “If there is an emergency, we want people to see the message and not get used to receiving 20 university text messages per day.” Middle Tennessee State University initially conceived its text messaging system for emergency notification and such applications as student tracking/location and administration services notification (e.g., notifying students their financial aid package is ready), but Virginia Tech’s tragic shooting incident shelved the university’s plans for non-emergency applications. “After that incident, text messaging’s importance as an emergency notification medium became obvious,” states Lucinda Lea.

Still, along with others, Chulvick believes, “It is a matter of time before we will have developed and put into place non-emergency text messaging applications.” Driving the trend, in part, are the third-party vendors that manage many institutions’ text messaging services; some of these vigorously promote non-emergency applications of their products. Other CIOs, like C. Van Wyatt of Texas State University–San Marcos, believe user demand will force institutions to open text messaging beyond emergency notification. “We have to realize that our preference is trumped by the market,” Wyatt says. “We have 29,000 students and an increasing number of faculty who text message. We are foolish if we think we will drive the use of those tools ultimately. I am constantly asked how we can better support text messaging applications throughout the campus.”

Qualitative interview participants admit grappling with “how to differentiate between emergency and non-emergency text messaging applications without generating confusion on campus,” as Lea put it. “We don’t have that piece figured out.” Spamming and overuse of text messaging is a concern. As John Mangrich, manager, central computing and security, University of California, Irvine, states, “Campus entities like the bookstore or the athletic association want to take advantage of text messaging’s commercial potential, but we got some pushback from students who do not want to receive text messaging advertisements. This fear made students hesitant initially to sign up for the emergency messaging text messages.” University of Louisville’s Tom Sawyer believes students are savvy enough to manage their text message service options and to identify a message with emergency implications, but says, “My concern is how to configure text messaging services without violating student privacy laws.”

Some institutions plan to monitor and assess text messaging usage. Embry-Riddle Aeronautical University has decided to keep its text messaging system closed to non-emergency applications for two years and then revisit the issue. Texas State University–San Marcos is already evaluating text messaging’s potential for instructional applications. “The real issue for us is how to systematize or formalize the adoption of the protocols that capture text messaging as a useful tool instructionally,” states Wyatt. “The ad hoc use of text messaging on campus is out of our control. But corporately, we want to understand how to embrace the use of this tool in a systematic way to have a demonstrable, measurable effect on the learning process.”

We assume that text messaging is here to stay for at least a few years before it is made redundant by the next generation of personal communication devices or is absorbed into the next “killer” social networking application (e.g., mobile Twitter) and loses any separate identity. Its adoption now is clearly a challenge for higher education in general, and its effective use is becoming emblematic of the alert and agile central IT organization.
with three other, mutually reinforcing findings from this section of our report. Respondents' mean agreement with both statements about handheld devices was higher where they anticipated an increase or great increase in the next three years in the importance for faculty of Internet-capable mobile telephones and of SMS text messaging, and where they agreed or strongly agreed that the ubiquity of handheld devices would cause their institutions to make significant changes to online services in the next three years. In all three cases, mean responses were 0.5–0.6 points more positive on our 5-point scale where respondents agreed or strongly agreed that handheld devices are and will be essential.

As we discuss below, 88.0% of respondents said they provided technical support for handheld devices to faculty, staff, or students. We asked only those respondents who said they did that to estimate the percentage of faculty, staff, and students on their campuses who currently have handheld devices. About two-thirds of those respondents said that 20% or fewer faculty and staff had such devices (see Table 6-6).

Our interviewees tell us that adoption of handheld devices is uneven, often encountering resistance from faculty and staff unfamiliar with the technology and its benefits. As noted earlier, the IT organization at Georgia Gwinnet College is distributing mobile devices to all faculty and staff members. The college’s Harvel recalls, “When I began the program, the typical faculty member said: ‘This is interesting, but I have no idea why I would want this phone.’” Yet six weeks later, a dean asked Harvel to supply a new faculty member with a mobile device because the dean felt the new hire could not conduct his job without it. “It took just a couple of months for the device to evolve from a novelty to an essential job tool,” Harvel continues, “because the level of interaction between faculty members and with their students transformed the mobile device into a tool they were unwilling to give up.”

While the percentages in Table 6-6 of students who had handheld devices were much higher than those for faculty and staff, they may nevertheless represent a serious underestimate. As mentioned above, the 2008 ECAR study of undergraduate students and IT found that 66.1% of students said they owned Internet-capable cell phones (an apt synonym for most, if not quite all, handheld devices). Our respondents’ estimates for handheld devices were much lower than the ECAR study’s find-
ings, with two-thirds of them (66.0%) estimating that fewer than 61% of students have handheld devices. This suggests that the low strategic priority so many of our respondents appear to be giving to mobile applications, discussed later in this chapter, may leave them underprepared in the coming year or two if students’ objections to using their devices for Internet access are overcome.

In our qualitative interviews, IT leaders suggested several reasons for the growing popularity of handhelds among students. First is cost. Embry-Riddle’s CIO, Cindy Bixler, observes, “Before, it was elitist to own a handheld device, but as the cost has declined and the cool factor has increased exponentially, user demand has grown, especially among our students. The demand for applications and access goes up accordingly, and I think it is critical that we respond and deliver.” University of Louisville’s assistant vice president for IT, Tom Sawyer, cites the “lug” factor, noting that students will no longer want to carry around heavier laptops as the handheld device’s functionality grows. Others cite the specific appeal of Apple’s iPhone. At Oglethorpe University, students’ enthusiasm for the iPhone prompted the IT organization to enable these device owners to sync their e-mail, calendaring, and contacts directly with the university’s Exchange server. The IT organization is currently working with the technology advisory group to develop online teaching and learning applications and hopes to accommodate mobile usage when rolling out ERP services.

For all three constituencies, possession of handheld devices is significantly associated with Carnegie class. Doctoral institutions have the highest reported mean ownership, master’s institutions second, bachelor’s institutions third, and associate’s institutions fourth. Within each Carnegie class, students are by far the constituency respondents report as being most likely to own handheld devices.

The estimated percentage of staff (only) who have handheld devices is significantly greater at institutions where a larger percentage of staff have mobile communication service that is subsidized or paid for by the institution. This suggests an empowering role for institutional funding, perhaps helping staff overcome the cost barrier to ownership of these more expensive devices and their associated data access charges. The fact that there is no equivalent association for faculty suggests that their adoption of handheld devices is more independent of institutional support—seen more as a personal investment, perhaps—than staff adoption.

We found no significant associations between estimated percentage of ownership of handheld devices among faculty, staff, or students and either the existence of a documented strategy for making web services available to handheld devices, the identification of web-enabled mobile communications as an area of importance in IT’s strategic plan, or executive leadership’s understanding of the implications of extending web services to handheld devices.

### Technical Support for Handheld Devices

Regardless of an institution’s opinion concerning the essentialness of handheld devices, the institution is likely to be called

<table>
<thead>
<tr>
<th>Constituency</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0%</td>
</tr>
<tr>
<td>Faculty (N = 262)</td>
<td>4.6%</td>
</tr>
<tr>
<td>Staff (N = 271)</td>
<td>0.0%</td>
</tr>
<tr>
<td>Students (N = 223)</td>
<td>4.5%</td>
</tr>
</tbody>
</table>
upon to provide technical support for them, and strong arguments can be made that it should do so. As Chesapeake College’s Douglass Gray sees it, “Higher education has to support current communication trends and the accelerating speed of information transmission.” He referred to an example from Thomas L. Friedman’s *The World Is Flat*, which contrasted the two-week lag time for the news of Lincoln’s assassination to reach England to the 20 minutes it took CNN to broadcast footage of Reagan’s assassination attempt. “Technology today has trumped even that,” Gray continues, “because now, with today’s advanced handheld devices, students can share text, pictures, and even video as events occur.”

A strong majority of respondents (88.0%) reported that their central IT organizations provide technical support to faculty, staff, or students for handheld devices such as BlackBerry, Treo, and iPhone. Most appear to be doing at least an adequate job. A near majority of respondents (49.8%) either agreed or strongly agreed that users of handheld devices feel the central IT organization provides effective support for them (see Table 6-7). Nearly a third (32.8%) were neutral on that question, and just over a sixth (17.3%) disagreed or strongly disagreed. Mean agreement was 3.36 (S.D. 0.924) on our 5-point scale, or a third of a point above “neutral” in the direction of “agree.”

Agreement that users feel that central IT provides effective support for handheld devices is significantly associated with having a documented strategy for making key institutional web services available via those devices. Where no such strategy is in place, mean agreement about effective support is 3.31 (S.D. 0.920), between “neutral” and “agree.” Where such a strategy is in place, mean agreement is 4.00 (S.D. 0.535), or “agree.”

At institutions where respondents agree or strongly agree that handheld devices are now an essential tool for the higher education professional, support for handheld devices was more likely to be rated as effective, probably reflecting a more focused support effort on the part of central IT at institutions where the value of the tool is acknowledged. At those institutions, mean agreement that central IT is felt to provide effective support was nearly half a point higher than where respondents were negative about the essentialness of handheld devices (see Table 6-8). There is no parallel association for opinions about the essentialness of handheld devices in three years.

**Delivery of Applications to Handheld Devices**

Perhaps the most exciting promise of the handheld device is its potential for anywhere/anytime access to traditional websites and services and emerging Web 2.0 services. As we mentioned above, screen size, slow network speeds, and high data service costs are all obstacles to widespread use of handheld devices for these sorts of applications, at least among students. Minuscule keypads, uncomfortable form factors, short battery life, and browser incompatibilities with scripted web services are also common complaints.

But for most regular users, the core functionality of the handheld device is sufficient to overcome these drawbacks. Short of lugging a laptop computer with a wireless broadband adapter everywhere, there is no better way to stay in touch while on the go.

As we mentioned in the introduction to this chapter, there are challenges to delivering web applications on handheld devices. A web page that is laid out gracefully for a full-sized video monitor will often be ungainly when displayed on a handheld device. Web servers can recognize the browser a visitor is using and can customize the display for that browser, but adapting web content to a variety of handheld device browsers can be difficult, time-consuming, and expensive—often all three—and absent a strong profit or prestige motive, has been a rare practice across the web.
By the date of our survey, progress among our responding institutions had been slow at adapting preexisting web-based services for delivery to handheld devices and at developing new web-based services for those devices. Half of respondents (50.6%) had adapted no preexisting services, a third (32.9%) had adapted them to a very small or small extent, and only one in six (16.5%) had adapted them to a moderate, large, or very large extent. Only 19 respondents reported having adapted preexisting web-based services for delivery to mobile communication devices to a large or very large extent. For a detailed discussion of one institution’s bold move into the mobile services space, see the accompanying ECAR case study “Massachusetts Institute of Technology: Transforming the Campus Experience with the MIT Mobile Web.”

As Figure 6-6 also shows, development of new web-based services lagged behind even the slow pace of adapting existing ones. Nearly 6 in 10 respondents had developed none, about 3 in 10 (28.3%) had done so to a very small or small extent, and the remaining 1 in 8 (12.5%) had developed them to a moderate, large, or very large extent. Twenty respondents (6.0%) reported having developed new applications to a large or very large extent.

To attempt a rough quantification of the progress being made, we asked how many key institutional web services our respondents had made available for handheld devices, without specifying whether they were adaptations of preexisting services, newly developed ones, or new services developed elsewhere (e.g., by a vendor). A bit more than 4 in 10 respondent institutions have made none available (see Table 6-9). Another 4 in 10 have made only “a few” such services available. Whereas 12.1% say they have made “several” such services available, institutions making “many,” “most,” or “all” services available total only 3.4%.

While spectacular showings are rare, large institutions are significantly ahead of smaller ones in making key institutional web services available for handheld devices. More than half...
of institutions with 4,000 or fewer FTE students and nearly half of institutions with 4,001–15,000 students reported that they had done so for no key web services (see Table 6-10). A comparatively small 17.9% of institutions with more than 15,000 students reported no progress in this direction. Between a third and a half of all institutions reported making a few such services available, but only for the largest class did more than a tenth (32.1%) report having made several available. Whether larger institutions simply have more resources available for this kind of work or have constituencies that more effectively lobby for these services or whether it’s attributable to some other factor, we do not know, but a few insights emerged from our qualitative research.

Brian D. Voss at Louisiana State University observes that “Deploying handheld apps is an institution-specific decision. Some institutions are further along in their IT life cycles and can put energy into it because they have solved many of the problems that are still big action items in others’ strategic plans.” Howard Ramagli, associate vice president, information technologies and resources, Lynchburg College, concurs: “We are still trying to meet the demands for normal web applications and normal enhancements to current systems. There would have to be a critical mass for us to move in the direction of mobile services, and we are not anywhere close to that.” Linda Deneen at the University of Minnesota Duluth sees develop-
Development of web applications for handhelds unlikely at her campus because “there just are not enough IT staff members to work on it. Instead, our plan is to wait awhile and adopt any relevant applications that larger campuses may develop.”

Looking at the factors associated with making a larger number of key web services available for handheld devices, we find that institutions reporting higher current numbers also tended to report:

- a brisker pace of adoption of new electronic messaging and communication technologies,
- adaptation of more preexisting online applications for SMS delivery,
- more extensive adaptation of preexisting web-based services for delivery on handheld devices,
- more extensive development of new web-based services for delivery on handheld devices, and
- greater agreement about the essentialness of the handheld device for higher education professionals now and in three years.

This cluster of associations represents an area of common ground among institutions that are giving higher priority to services for handheld devices.

### Strategy, Planning, and Executive Leadership

Other findings reinforce our impression that extending web applications to mobile communication devices is something respondents see as an obligation that is coming but is still over the horizon. Of the 290 institutions saying they had a strategic plan (84.5% of respondents), only 4 in 10 (39.7%) said their plan identified mobile communications as an area of importance. And only 10.6% of all respondents said their institution had a documented strategy of any sort for making key institutional web services available via handheld devices.

These two findings are significantly and strongly associated. Where the IT strategic plan does not identify mobile communications as an area of importance, only 2.3% of respondents said the institution has a strategy for extending web services to handheld devices. Where the IT strategic plan does identify mobile communications as an area of importance, more than 11 times that percentage (26.1%) said the institution has a strategy for extending web services to handheld devices.

These findings suggest that the priority of mobile communications for most institutions is moderate at best. Findings from our qualitative research suggest that resource limitations are behind the generally slow rollout of services for handheld devices. Reinforcing that, we found that half of respondents (49.5%) disagreed or strongly disagreed that their institution’s executive leadership understands the implications of extending institutional web services to handheld devices. About a quarter were neutral, and the remaining quarter agreed at some level (see Figure 6-7). Strong agreement was expressed by only 4.8% of

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**Table 6-10. Number of Key Institutional Web Services Available for Handheld Devices, by Institution Size (FTE Students)**

<table>
<thead>
<tr>
<th>Institution Size (FTE Students)</th>
<th>None</th>
<th>A Few</th>
<th>Several</th>
<th>Many</th>
<th>Most</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–4,000 (N = 143)</td>
<td>53.8%</td>
<td>33.6%</td>
<td>8.4%</td>
<td>2.8%</td>
<td>0.7%</td>
<td>0.7%</td>
</tr>
<tr>
<td>4,001–15,000 (N = 112)</td>
<td>45.5%</td>
<td>47.3%</td>
<td>6.3%</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>More than 15,000 (N = 56)</td>
<td>17.9%</td>
<td>44.6%</td>
<td>32.1%</td>
<td>3.6%</td>
<td>1.8%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
respondents, less than a third the percentage that expressed strong disagreement.

As one would expect, agreement that executive leadership “gets it” about mobile web services is stronger where respondents said the IT strategic plan identified mobile communications as an area of importance and where there was an institutional strategy for extending web services to handheld devices.

**A Documented Strategy**

Although very few institutions reported having a documented strategy for making key institutional web services available via handheld devices, not surprisingly the existence of such a strategy is significantly associated with the extent of the institution’s activity on initiatives related to services and applications for delivery on mobile devices. Strategy, in this case, may have bumped the priority of these efforts and stimulated progress. As we saw earlier, the extent to which respondent institutions are providing services for handheld devices is generally low, but where a documented strategy exists, it is greater. Where no strategy exists, the mean extent to which new web-based services have been developed for delivery to handheld devices is 0.71, substantially below “a very small extent.” And where a strategy does exist, the mean extent is 2.12, slightly above “a small extent.”

Finally, we see evidence that strategy stimulates action in our finding that the number of key institutional web services made available for handheld devices is significantly greater where a documented strategy exists for making key web services available to those devices. Where there is no documented strategy, nearly half of respondents reported making no key services at all available via handheld devices (see Table 6-12). Where a strategy was in place, fewer than a tenth reported no key services for handheld devices, a third reported “a few,” and nearly a third reported “several.” Almost 2 in 10 reported “many,” and there were even multiple reports of “most” and one of “all.”

**Identification in the IT Strategic Plan**

Not all responding institutions had a strategic plan for IT. Of the 343 respondents to our question about it, 53 (15.5%) said they had no such plan. As we reported above, among the 290 who did have such a plan, 4 in 10 said it identified web-enabled mobile communications as an area of importance, suggesting that most institutions have
 Messaging and Communications in Higher Education

 placed at best only a moderate priority on web-enabled mobile communications. An exception appears to be among the largest institutions (more than 15,000 FTE students), where 60.4% of respondents said their plans acknowledged the importance of the mobile communications area. Only 34.9% of smaller institutions did.

Several findings above suggest that institutions where the pursuit of new technologies is more vigorous are making the most progress with mobile communication technologies. In line with this, we also find that the pace of adoption of new electronic messaging and communication technologies is brisker where mobile communications has been identified as an area of importance in the respondent’s IT strategic plan. A small majority (57.6%) of early adopters said their plan did so, while only half as many late adopters (26.4%) did.

Identifying web-enabled mobile communications as a strategically important area appears to boost the priority of an institution’s projects to adapt and develop web-based services for delivery to handheld devices. Where the IT strategic plan does not mention mobile communications as important, nearly two-thirds of institutions had adapted no preexisting web-based services for handheld devices and nearly three-quarters had developed no new ones (see Table 6-13). Where the plan did mention mobile communications in that way, only about half as many had adapted or developed no preexisting web-based services, and about a quarter had adapted or developed them to a moderate or greater extent—three to four times as many as at institutions where the IT strategic plan did not address mobile communications in that way.

Table 6-11. Adaptation and Development of Web-Based Services for Handheld Devices, by Existence of Documented Strategy for Making Key Institutional Web Services Available via Handheld Devices

<table>
<thead>
<tr>
<th>Existence of Documented Strategy</th>
<th>Adaptation of Preexisting Web-Based Services for Delivery to Handhelds</th>
<th>Development of New Web-Based Services for Delivery to Handhelds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
</tr>
<tr>
<td>No</td>
<td>0.93</td>
<td>298</td>
</tr>
<tr>
<td>Yes</td>
<td>2.00</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>1.04</td>
<td>331</td>
</tr>
</tbody>
</table>

*Scale: 0 = not at all, 1 = a very small extent, 2 = a small extent, 3 = a moderate extent, 4 = a large extent, 5 = a very large extent

Table 6-12. Number of Key Institutional Web Services Made Available for Handheld Devices, by Existence of Documented Strategy for Making Key Institutional Web Services Available via Handheld Devices

<table>
<thead>
<tr>
<th>Existence of Documented Strategy</th>
<th>None</th>
<th>A Few</th>
<th>Several</th>
<th>Many</th>
<th>Most</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>No (N = 285)</td>
<td>48.4%</td>
<td>41.1%</td>
<td>9.8%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Yes (N = 35)</td>
<td>8.6%</td>
<td>34.3%</td>
<td>31.4%</td>
<td>17.1%</td>
<td>5.7%</td>
<td>2.9%</td>
</tr>
</tbody>
</table>
Paralleling this finding, where an institution’s IT strategic plan identified web-enabled mobile communications as an area of importance, the mean response regarding the number of key institutional web services the institution has made available for handheld devices was nearly three times as high as for institutions whose plans did not address mobile communications in that way.

**Executive Leadership**

As we discussed briefly in reference to Figure 6-7, half of respondents disagreed at some level that their institution’s executive leadership understands the implications of extending institutional web services to handheld devices. Only about a quarter agreed or strongly agreed. Strong agreement was expressed by 4.8% of respondents, less than a third the percentage that expressed strong disagreement. All things considered, this is probably not too poor a showing for an emerging application of recently converged technologies. Executive leaders in higher education are involved in a wide range of critical issues, and it seems reasonable that their attention to mobile communication technologies would be limited. Institution size seems to make a difference in executive leadership’s engagement in this issue. At institutions with more than 15,000 FTE students, twice as many respondents (43.3%) agree or strongly agree that executive leadership understands the implications of extending web services to handheld devices than at smaller institutions (21.3%).

The brisker the pace of adoption of new electronic messaging and communication technologies, the stronger respondents’ agreement was that executive leadership understands those implications. Among late adopters, mean agreement about executive leadership’s understanding was 2.23, well below the midpoint between “disagree” and “neutral” (see Table 6-14). Among early adopters, the mean was 3.41, nearly halfway between “neutral” and “agree.” Among mainstream adopters, who make up the majority of our respondent pool, mean agreement was half a point greater than the mean for late adopters and almost three-quarters of a point below the mean for early adopters.

It is interesting to speculate about causality here. Does a more knowledgeable executive leader stimulate a brisker pace of adoption of new institutional messaging and communication technologies? It certainly seems possible. But it also seems possible that where the pace of adoption of technology is brisker, topics

| IT strategic plan identifies mobile communications as an area of importance. | Adaptation of Preexisting Web-Based Services for Delivery to Handheld Devices | Development of New Web-Based Services for Delivery to Handheld Devices |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Not at All | A Very Small Extent | A Small Extent | A Moderate Extent | A Large Extent | A Very Large Extent |
| No (N = 171) | 62.0% | 17.0% | 12.9% | 5.3% | 1.2% | 1.8% |
| Yes (N = 109) | 31.2% | 19.3% | 22.0% | 17.4% | 8.3% | 1.8% |
| No (N = 168) | 73.8% | 12.5% | 8.3% | 3.0% | 1.8% | 0.6% |
| Yes (N = 109) | 33.9% | 17.4% | 23.9% | 12.8% | 9.2% | 2.8% |
Respondents who agreed or strongly agreed that the institution's executive leadership understands the implications of extending institutional web services to handheld devices expressed higher mean agreement than others that the handheld device is now an essential tool for the higher education professional and higher mean agreement that in three years that will be the case. The difference in mean between those who were positive in their agreement about executive leadership’s understanding of the implications involved ("agree" or "strongly agree") and those who were not positive was about 0.6 points on our 5-point agreement scale (see Table 6-15).

The extent of the work the institution has done to develop new web-based services for delivery to handheld devices is also significantly associated with executive leadership’s understanding of the implications involved. Where agreement about executive leadership’s understanding is “strongly disagree” or "disagree," the mean extent to which new services have been developed for handheld devices is 0.58 on our 6-point scale, between “not at all” and “a very small extent” (see Table 6-16). Where agreement was “agree” or “strongly agree,” the extent of development of mobile applications was 1.36, between “a very small extent” and “a small extent.” The effort is in its infancy, as we have seen, and while the difference in progress associated with greater executive leadership understanding is small, we think it is meaningful.

Whereas most institutions have made very few key institutional web services available for web-enabled handhelds, the mean number is higher where agreement is more positive that executive leadership understands the implications of mobile web delivery. Where agreement about executive understanding was “strongly disagree” or “disagree,” the mean response to our question about the number of key institutional services available for handhelds was 0.50, halfway between “none” and “a few” (see Table 6-17). Where agreement about executive understanding was “agree” or “strongly agree,” the mean response was 1.26, between “a few” and “several.” As ECAR has seen in many other contexts, it appears that an engaged, knowledgeable executive leadership goes hand in hand with progress toward embracing new technologies.

### Summary and Implications

As we saw in Chapter 5, it is all but universally expected that the institution, and the central IT organization in particular, will provide landline telephone service to faculty and staff. Far fewer institutions—only about half—have a process in place to

<table>
<thead>
<tr>
<th>Pace of Adoption</th>
<th>Executive leadership understands implications.</th>
<th>Mean*</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early adopter</td>
<td></td>
<td>3.41</td>
<td>39</td>
<td>1.069</td>
</tr>
<tr>
<td>Mainstream adopter</td>
<td></td>
<td>2.74</td>
<td>185</td>
<td>1.103</td>
</tr>
<tr>
<td>Late adopter</td>
<td></td>
<td>2.23</td>
<td>104</td>
<td>0.997</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2.66</td>
<td>328</td>
<td>1.123</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
provide mobile communication services to those constituents, mostly by subsidizing or paying outright for services. Even among institutions that do provide such services, relatively few faculty and staff are served in this way: Only about 1 institution in 10 reports doing so for more than 10% of faculty or more than 25% of staff. About
half of respondents from institutions with a process in place agree at some level that the process is financially sustainable, and about 45% agree that faculty and staff understand it well; but fewer than 2 in 10 respondents report that it regularly exceeds the expectations of faculty and staff. Nevertheless, 8 in 10 respondents from our entire survey population expect demand for the service to increase at some level in the next three years.

The institution’s support for mobile communications for students is of a different sort. For that constituency, at around a third of respondent institutions, support comes in the form of agreements with mobile communication carriers to provide discounted prices to students for services and devices. Doctoral institutions are more likely to support their students in this way than institutions in other Carnegie classes, as are institutions with a process in place to provide mobile services to faculty and staff. These findings are independent of local mobile communication signal strength, which most institutions report is mostly or uniformly good.

The current frontier for mobile communications in higher education is the delivery of information and services to cell phones and other mobile communication devices. Such devices are in nearly everyone’s hands now, and three-quarters of respondent institutions agree at some level that their ubiquity will cause the institution to make significant changes to online services in the next three years.

Apart from a voice call to a student’s mobile telephone, text messaging is the simplest and most pervasive channel for mobile communication because virtually any mobile phone can use it to send and receive messages. Text messaging is the channel of preference among students in higher education, at least for casual communications, but as yet it has not been adopted much by the institutions those students attend. Of our respondent institutions, only one in seven reports using text messaging to communicate with students; slightly fewer use it to communicate with faculty and staff, and fewer than 1 in 10 use it to communicate with any of the other constituencies we asked about. Fully two-thirds of institutions say they have adapted none of their preexisting online services for delivery via text messaging. Most of the rest have done so to only a small or very small extent.

The more exciting channel for mobile communications is the web-enabled handheld mobile device. Here the frontier is even more untamed than for text messaging. The most recent ECAR study of undergraduate students reports that while two-thirds of students own handheld devices that are capable of some sort of interaction with the Internet, only one in seven reports using them to do that. When asked if the handheld device is now an essential tool for the higher education professional, just under a third agreed or strongly agreed that it is. When asked if the same would be the case in three years, about two-thirds agreed, with nearly a quarter strongly agreeing. About half of respondents report that they are now providing support services for handheld devices.

We believe that higher education is a bit behind the curve in embracing handheld devices and that this is most obvious in the area of services—web services in particular—that the institution has adapted or developed anew for the devices. Half of respondents said their institution had adapted no preexisting web-based services for handheld devices and a third had done so only to a small or very small extent. The numbers are even smaller for the development of new services.

Institutions that are further ahead in this effort often share a number of characteristics that may be instructive to those that follow them. More often than others, they describe themselves as early adopters of new
Messaging and communication technologies in general, have adapted more preexisting online services for text messaging, and express stronger agreement that the handheld device is now essential and will be so in three years. They tend more often to report a documented strategy for providing web services to handheld devices, agree that their executive leadership understands the implications of doing that, and say that mobile communications is specifically identified as an area of importance in the IT strategic plan.

It seems clear from these findings that the time has passed for considering mobile web connectivity to be a fad. The average respondent sees demand for handheld device services and support looming on the horizon, if not already at hand.

Higher education is far behind the commercial sector in adapting its web home pages for display on handhelds and for making its interactive web applications work on those miniature platforms. Unlike the early days of the Internet, when higher education institutions called the march, brought forward new technologies and services, and raised the expectations of the general population, it is now the commercial sector that has taken that role for mobile communications. Those in higher education who are even slightly ahead of the game are now enhancing their ability to attract and engage a generation of tech-savvy prospective students, faculty, and staff. We predict that the alternative to prompt and reasonably aggressive action in the mobile communications domain will be a difficult and expensive game of catch-up in the face of urgent pressure to restore, or at least protect, the institution’s competitive standing.

Endnotes
1. A September 2008 report from the Pew Internet & American Life project found that 78% of adult Americans (including 89% of American workers and 65% of unemployed adults) have a cellular telephone. Mary Madden and Sydney Jones, Networked Workers (Washington, DC: Pew Internet & American Life Project), September 24, 2008, http://www.pewinternet.org/pdfs/PIP_Networked_Workers_FINAL.pdf.
7. Ibid., 43–44.
7
Crisis Communications

There cannot be a crisis next week. My schedule is already full.
—Henry Kissinger

Key Findings
- Four of the six most common emergency notification system (ENS) channels are also the channels in which respondents’ mean confidence is greatest. These are e-mail, SMS text messaging, dedicated emergency websites, and outdoor public-address systems.
- More than two-thirds of respondents test their systems at least once a year, with more than 2 in 10 saying they test their ENSs annually and nearly half saying they test them two or more times a year.
- Overall confidence that delivery of emergency notifications will be accurate and will be timely is significantly greater where the institution’s crisis communication plan was more complete and better integrated with the institution’s emergency management plan. It is also significantly greater where crisis communication systems are tested more frequently.
- Nearly two-thirds of respondents agreed or strongly agreed that their crisis communication processes would function effectively if campus telephone service was not unavailable, but only 4 in 10 said they feel the same about unavailability of local mobile telephone service.
- Overall confidence that the delivery of emergency notifications will be accurate is greater where the institution has acquired or developed an integrated emergency notification system (IENS).
- Integrated emergency notifications take time to build and tune to reliable performance. On average, only half the channels used in systems installed in 2008 exhibited good or very good performance in their most recent test. Where the IENS was installed prior to 2008, performance was at that level for two-thirds of channels.
- Among those who agreed or strongly agreed that the institution is well prepared, overall, to notify constituents of an emergency, mean confidence that the delivery of emergency notifications will be both accurate and timely is more than 1.25 points higher on our 5-point scale than the means for those who did not agree that the institution is well prepared.

Most CIOs, from experience, can spin a good worst-case scenario. It’s second nature to imagine the financial records system crashing during end-of-year processing or the student system going down during fall registration. And most CIOs fend off those crises by creating islands of stability for those systems at those times amid the sea of technological change that surges around IT year by year.
But a crisis can happen at any time. Technology can fail without warning. A data center—or an entire city—can flood from an unexpected spell of stormy weather. And human failings, accidental or malicious, can precipitate a crisis when it’s least expected. What cannot be prevented must be prepared for, and perhaps the accusation the CIO wants least to hear is, “You weren’t prepared.”

The tragedies of the last several years—earthquakes, hurricanes, shootings—have vaulted emergency planning to a level of national prominence. The ability of higher education institutions to respond to a crisis has been tested in ways that are etched into our memories. And among these, the failings of communication systems—to warn, to organize, to reassure—have taken a particularly high profile in the world of higher education IT.

In this chapter, we look at what institutions are doing to prepare for their communication needs during a crisis. We look at the communication channels institutions have chosen, the robustness of the systems those channels make up, the extent to which the system is integrated, the institution’s processes for managing emergency notifications, and our respondents’ assessment of their preparedness.

Preventing for the Worst

Crisis communications involve a number of stakeholders from many campus units. As we will see below, the crisis communication teams at most institutions had between 6 and 10 member organizations. Coordination of a diverse group of officials for so essential a function as crisis communication is best done in the context of a written plan, with effective leadership and executive endorsement of its priority. We found that most of our respondent institutions are rising to this multifaceted challenge.

Planning and Executive Leadership

Former President Dwight D. Eisenhower is reported (by Richard Nixon) to have said, “In preparing for battle I have always found that plans are useless, but planning is indispensable.” If that principle can be extended to our context, it may be that the ultimate value of having a written crisis communication plan is that to come up with it, the institution had to go through a planning process. More than three-quarters of our survey respondents (77.4%) said their institutions had a written plan for crisis communications (see Figure 7-1). Two-thirds (68.6%) reported that their institution’s plan was part of the institution’s emergency response plan, and 8.8% reported having a stand-alone crisis communication plan. Just under 2 in 10 (19.6%) said they were developing such a plan, and a gratifyingly small 2.9% reported having no crisis communication plan at all.

A brisker pace of adoption of new electronic messaging and communication technologies went hand in hand with the status of the institution’s crisis communication plan. Late adopters reported more than twice as frequently (32.4%) as early and mainstream adopters (14.2%) that their crisis communication plans were under development. Early and mainstream adopters substantially more frequently (77.6%) than late adopters (56.2%) reported that their crisis communication plans were part of the institution’s emergency response plan.

As we observed earlier, the coordination of the many stakeholders in a crisis communication planning effort should proceed more smoothly if a highly placed institutional executive considers that effort to have high priority. Such sponsorship is also helpful in ensuring funding for the inevitable costs of implementing that plan. Happily, we find that more than three-quarters of our respondents (78.6%) agreed or strongly agreed that their institution’s executive leadership placed high priority on crisis communication planning (see Figure 7-2). Mean agreement
was an impressive 3.99 (S.D. 0.963), or “agree,” on our 5-point scale.

Among early and mainstream adopters of new electronic messaging and communication technologies, mean agreement that executive leadership places high priority on crisis communication planning is about four-tenths of a point higher than at institutions that characterize themselves as late adopters (see Table 7-1).

The Crisis Communication Team

Crisis communications must involve personnel from many parts of the institution. Effectively creating and implementing a plan for communicating during a crisis requires input from those many stakeholders, and the plan’s implementation is more likely to succeed if it has their buy-in. Here, we see where in the institution the leader of the crisis
communication team is situated and which other units are represented on that team.

Emphasizing the importance of the job of crisis communication and the priority that is placed upon it is our finding that nearly all institutions (96.1%) have designated an officer to be responsible for coordinating institutional crisis communications. At almost a third of institutions (30.9%), that officer is situated in the public affairs office (see Figure 7-3). Slightly more than half that many institutions (16.4%) reported that the crisis communications coordinator is situated in the emergency services office. The office of the president/chancellor is the only other office represented at or above the 10% level. Apart from the 4.4% of institutions where the crisis communications coordinator is in “other” offices, the least common organizational home for that officer is central IT.

While central IT seldom leads the crisis communications team, that unit can still play an important role in coordinating the function. For example, Lucinda Lea of Middle Tennessee State University felt so strongly about the importance of a coordinated, campus-wide emergency notification response that she created a new position within her IT organization called communications technology analyst to interact in that role with the entire institution. As she describes it, “This position is not so much about the technology but to coordinate and promote emergency notification systems on campus.”

Virtually all respondent institutions (97.0%) reported that the institution had designated a crisis communication team. Despite our finding that the coordinator for crisis communications was very rarely situated in the central IT organization, central IT is, at 86.5%, the organization most frequently reported to be a member of the crisis communication team (see Figure 7-4). Charles Rowley, associate vice chancellor, computing and communications, University of California, Riverside, underscored the importance of IT involvement on the crisis communication team “to ensure that the emergency notification system is developed in an integrated fashion and that vendor software and equipment is not bought and installed in a piecemeal way.” Public affairs, the office of the president/chancellor, and the office of student affairs were all also represented on the crisis communication team at 80% of institutions or more. Between 70% and 80% of respondents cited the offices of emergency services, academic affairs, facilities services, and business affairs as members of the committee. The organizations least often represented were the faculty council/senate and the student council/senate, suggesting that crisis communication is seen mostly as a staff function at most institutions. “Other” organizations were reported as being represented by only 6.4% of respondents, suggesting that our list of 13 offices left few represented organizations unnamed.

<table>
<thead>
<tr>
<th>Pace of Adoption</th>
<th>Executive leadership places high priority on crisis communication planning.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Early adopter</td>
<td>4.10</td>
</tr>
<tr>
<td>Mainstream adopter</td>
<td>4.12</td>
</tr>
<tr>
<td>Late adopter</td>
<td>3.72</td>
</tr>
<tr>
<td>Total</td>
<td>3.99</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly disagree
A tally of the number of organizations represented (excluding “other”) finds that two-thirds of reporting institutions (67.8%) reported that between 6 and 10 of the organizations listed were represented on their crisis communication team. Slightly fewer than 2 in 10 teams (19.3%) had more than 10 representatives.

It appears that a greater degree of inclusiveness of organizations on the crisis communication team goes hand in hand with the sharpness of the institution’s focus on crisis communications. The mean number of organizations (excluding “other”) represented on the institution’s crisis communication team was significantly associated with the status of the

Figure 7-3. Organization in Which Crisis Communications Coordinator Is Situated (N = 317)

Figure 7-4. Representation on Crisis Communication Team (N = 326)
institution’s written crisis communication plan. The mean was 7.59 organizations at institutions where the crisis communication plan was being developed, and it was nearly the same (mean 7.54) where the institution’s crisis communication plan was part of the institution’s emergency response plan. It was substantially greater (8.78) where the institution had a stand-alone, and presumably more specialized, crisis communication plan (see Table 7-2).

Crisis Communication Channels

An institution’s ENS is the aggregate of the various technologies—or channels—that the institution uses to communicate with its various constituencies about a crisis. In the past several years, these channels have been the subject of much discussion in forums such as the listservs for the EDUCAUSE CIO and emergency communications constituent groups. Of greatest recent interest, for example, has been the use of text messaging as an ENS channel. Text messaging in this context is discussed in detail in “Louisiana State University and A&M College: Optimizing Text Messaging and Other Emergency Notification Systems,” and a similar use of the LCD screens of landline telephones using voice over Internet Protocol (VoIP) is discussed in “The University of Louisville: Fulfilling the Promise of VoIP.” Both are case studies associated with this research report.

Dewitt Latimer, deputy CIO and chief technology officer at the University of Notre Dame, recommended a multimodal approach to crisis communications in a recent EDUCAUSE Review article. He observed that “mass notification systems that are able to deliver critical messages via many modalities—phone, e-mail, IM, text, visual, and auditory—help ensure that during any emergency, everyone will get the message. If voice channels are congested, a text message may reach its destination. If cellular is overloaded, e-mail should get through. If affected parties are not near a phone or a computer, they might be near a campus cable TV feed.... By relying on a series of overlapping technologies and old-fashioned word-of-mouth, an institution can spread the emergency message quickly throughout campus.”

We asked our respondents about their confidence in each of 11 ENS channels and about the performance of those channels in their most recent test. The channels were:

- e-mail,
- automated telephone messaging,
- human-mediated telephone trees,
- SMS text messaging,
- dedicated emergency websites,
- outdoor public-address systems,
- indoor public-address systems,
- instant messaging,
- LAN-based pop-ups,
- RSS feeds, and
- social networking websites.

This is not a comprehensive list of ENS channels. Some institutions use their campus television distribution systems as part of their ENS, especially in residence halls; others use advanced features of their VoIP telephone systems, as the University of Louisville case study mentioned above discusses; and certainly there are others. But our list of 11 covered the ENS channels we felt would be in widest use.

ENS Components

The channels used by the greatest percentage of respondents were e-mail (97.5%) and automated telephone messaging (86.1%). (See Figure 7-5.) Somewhat less frequently used, but still by majorities, were human-mediated telephone trees (79.7%), SMS text messaging (77.8%), and dedicated emergency websites (74.8%). A bare majority (50.3%) used outdoor public-address systems. Diminishing numbers, all below 35%, reported using indoor public-address systems, instant messaging, LAN-based desktop messaging (pop-ups), RSS feeds, and social networking channels.
Qualitative interview participants also recognized the importance of word-of-mouth as an unofficial ENS channel. For example, Dave Tindall at Seattle Pacific University observed, “Over time we have found that if we can communicate quickly with 30% of the university population, they will likely communicate to the other 70% in a short timeframe. If we can reach a good portion of the population very, very quickly, it’s proven sufficient to get the word out to the entire SPU community.”

For most ENS channels, at least 70% of respondents reported testing them occasionally or more frequently (see Table 7-3). The channels reported as being tested by fewer than 70% of institutions that use them were human-mediated telephone trees, RSS feeds, and social networking websites, the first perhaps being taken for granted and the two others perhaps being too new at some institutions to have been worked into the ENS testing cycle. Still, each of the channels we asked about was tested at least occasionally by more than two-thirds of respondents.

In addition to usage and testing, we asked about respondents’ confidence that each ENS channel would perform effectively under peak load, as well as their assessment of the channel’s actual performance in the
Table 7-3. Testing of ENS Channels

<table>
<thead>
<tr>
<th>ENS Channel</th>
<th>Number Using Channel</th>
<th>Percentage Testing Channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automated telephone messaging</td>
<td>277</td>
<td>87.7%</td>
</tr>
<tr>
<td>E-mail</td>
<td>319</td>
<td>86.8%</td>
</tr>
<tr>
<td>SMS text messaging</td>
<td>251</td>
<td>85.3%</td>
</tr>
<tr>
<td>Instant messaging</td>
<td>98</td>
<td>80.6%</td>
</tr>
<tr>
<td>Indoor public-address systems</td>
<td>109</td>
<td>78.9%</td>
</tr>
<tr>
<td>Outdoor public-address systems</td>
<td>169</td>
<td>78.1%</td>
</tr>
<tr>
<td>Dedicated emergency websites</td>
<td>243</td>
<td>74.1%</td>
</tr>
<tr>
<td>LAN-based pop-ups</td>
<td>73</td>
<td>72.6%</td>
</tr>
<tr>
<td>Social networking</td>
<td>43</td>
<td>69.8%</td>
</tr>
<tr>
<td>Human-mediated telephone trees</td>
<td>232</td>
<td>68.1%</td>
</tr>
<tr>
<td>RSS feeds</td>
<td>64</td>
<td>67.2%</td>
</tr>
</tbody>
</table>

institution’s most recent emergency notification test. Figure 7-6 presents the findings for confidence. (For additional statistical details, see Appendix D, Table D-1.) Confidence in all channels was between “neither low nor high” and “high” but varied considerably within that range. The three channels with the highest mean confidence ratings—e-mail, outdoor public-address systems, and dedicated emergency websites—were understandably reliable, being established technologies whose use has been shown to scale reasonably well or, in the case of outdoor public-address systems, for which scale is not an important factor. We are a little more surprised by the relatively high confidence ratings for text messaging. It is a relatively new addition to most ENSs and has been shown to fail at times under peak load conditions.5

The three channels with the lowest confidence ratings were RSS feeds, social networking websites, and human-mediated telephone trees. The first two are relatively new technologies. Low confidence in RSS feeds may reflect their being an unknown quantity; as we observed in our discussion of Table 7-3, that channel was tested by relatively few respondent institutions. As any regular user can attest, social networking channels perform sluggishly at particular times (after school and during early evening hours). Poor performance at peak times is likely a function of rapid growth in their user bases. For the year prior to September 2008, the Nielsen Company reports a 116% growth rate for Facebook and a staggering 343% rate for Twitter, with growth rates within that range for several other social networking websites as well.6 The human-mediated telephone tree has perhaps been used the longest of the channels we asked about, but as discussed above it is tested by relatively few institutions. It is a relatively hit-or-miss method of emergency notification, relying on each person in the tree to receive an emergency call and pass it along to others. This may explain why it inspired less confidence in our respondents than the other channels.

Figure 7-7 presents our findings for the actual performance of the ENS channels on our list. (For additional statistical details, see Appendix D, Table D-2.) Performance of all channels was rated between four-tenths of a point below “good” and four-tenths of a point above it. The e-mail channel—in which mean confidence was highest, as we saw above—is also the channel whose performance ranks highest among our respondents. In second place for performance is the text messaging channel,
perhaps helping to explain why mean confidence in it is so high. Not surprisingly, the channels for which the poorest mean performance was reported are also the channels for which the lowest mean confidence was reported.

Each ENS channel’s confidence rating is significantly and very strongly associated with the corresponding performance rating: Where confidence was high, in general, performance was also high. For several channels, mean confidence was also about a half
point higher on our 5-point scale among those institutions that had tested the channels than among those that had not. The channels for which this relationship held were e-mail, text messaging, automated telephone messaging, outdoor public-address systems, and human-mediated telephone trees. All other channels showed similar differences in mean confidence between those who tested and those who did not, but the statistical significance of those associations was poor, making them suspect.

Most ENSs are made up of multiple channels. Only two institutions reported that their systems relied on a single channel, and only five reported relying on just two (see Figure 7-8). About two-thirds of respondents (67.6%) reported using four to seven channels in their ENSs, with the use of five or six being reported by more than half of them. Institutions using more than seven channels made up less than a quarter of the total (23.6%). Figure 7-8 shows an anomalous spike of 6.8% of institutions reporting the use of all 11 of the channels we asked about. We suspected that these institutions might be using commercial integrated emergency notification systems (IENSs) (see the next main section) but found no association between the number of channels used and adoption of an IENS.

Presumably reflecting the reliability benefits of more advanced telephone and e-mail systems, confidence in the automated telephone messaging, human-mediated telephone trees, and e-mail channels was significantly better where the institution’s pace of adoption of new electronic messaging and communication technologies was brisker.

Of the 11 emergency notification channels we asked about, respondents’ mean level of confidence in the performance of only one of them—SMS text messaging—varied according to the status of the institution’s written crisis communication plan. Among institutions whose plan was being developed, mean confidence that the text messaging channel would perform effectively under peak demand was 3.26 (S.D. 1.032) (between “high” and “very high”). Where the institution had a stand-alone plan, mean confidence was 3.75 (S.D. 0.928), half a point closer to “very high.” And where the institution’s crisis communication plan was part of a larger emergency response plan, mean confidence in the performance of the text messaging channel was 3.98 (S.D. 0.903), or “very high.” That this relationship exists only for text messaging may have to do with the publicity that channel has received among higher education institutions and the attention that may therefore have been given to building a confidence-inspiring text messaging infrastructure by the many respondents who have taken time to write emergency response plans.

Leadership’s influence may be evident in the number of ENS channels an institution reports using. Where respondents agreed or strongly agreed that executive leadership placed high priority on crisis communication planning, the mean number of channels used in the institution’s ENS was significantly greater, at 6.43 on a scale from 1 to 11 channels (S.D. 1.930), than where agreement was negative or neutral (mean 5.20; S.D. 2.179).

The ENS as a Whole

We learned above that more than two-thirds of respondents whose institutions used each of our 11 representative ENS channels had also tested that channel at least once. We were interested, as well, in the frequency with which the entire ENS—the collection of all the channels an institution uses—is tested.

More than two-thirds of respondents (69.6%) said they test their systems at least once a year (see Figure 7-9), with more than 2 in 10 (22.1%) saying they test their ENSs annually and nearly half (47.5%) saying they test their systems two or more times a year. About a sixth (16.4%) said the ENS was tested less than once a year or on an ad hoc basis, and
4.6% reported never testing their systems. A fairly high percentage (8.3%) said they didn’t know how often the ENS was tested, and 1.1% said the question was not applicable to them, presumably because they had no ENS. While even one untested ENS may be thought of as a disaster waiting to happen, a finding of 4.6% untested systems is gratifyingly low, given the many conflicting priorities and the often tightly constrained resources in our respondents’ environments. Although direct comparison is not warranted, we can’t help contrasting this finding with the massively higher 62.9% of respondents who reported in a 2007 ECAR study that they had not conducted tests of their institutions’ readiness to support business continuity.

We gauged our respondents’ overall level of confidence in their ENSs in two ways. We asked how confident they were that messages
sent by their ENSs would reach their intended recipients (accurate delivery) and how confident they were that those messages would be received in time for the recipient to take appropriate action (timely delivery). Whereas most respondents (68.9%) expressed high or very high confidence about accurate delivery, significantly fewer (46.5%) were equally confident that delivery would be timely (see Figure 7-10). The mean level of confidence, on our 5-point scale, that delivery would be accurate was 3.83 (S.D. 0.937), a fraction of a point below “high.” Mean confidence that delivery would be timely was 3.41 (S.D. 0.960), less than halfway between “neither low nor high” and “high.”

For most channels, the central IT organization has a role to play in the accurate delivery of ENS messages. That organization manages much of the underlying infrastructure for most of the channels, including faculty/staff landline telephone service at 87.4% of all respondent institutions and residential student landline telephone service at 88.9% of institutions that have residential students. Concerning another ENS message transport technology, at institutions that have residential students, 70.0% of our respondents said that wireless networks are accessible in 50% or more of residence halls (52.9% say all residence halls have wireless). And, 97.4% of respondents said their institutions have a central directory service such as Active Directory or LDAP, a resource that supports technologies such as emergency notification that rely on the institution’s knowing how to reach specific individuals.

This degree of institutional influence over the accurate delivery of emergency notifications may help explain the higher confidence scores respondents reported for that component of the notification process. Lower scores for confidence about the timely delivery component may be explained, at least in part, by the fact that our respondents have little or no influence over the message-reading habits of the recipients or over their ability to take appropriate action when they do. Unlike many staff, for example, few students sit at a networked computer all day with an e-mail application running constantly in the background—or with a campus landline telephone at their elbow. Relatively few staff, on the other hand, feel free to check the text messages on their cell phones as often as students do. Different channels are more effective for some constituencies than others, no doubt, but short of implanting wireless devices in people’s ears, timely delivery of notifications to all or nearly all constituents is clearly an unattainable goal, and we believe the findings reported above reflect that.

Mean confidence about timely delivery of emergency notifications is significantly greater among respondents who characterized the institution’s electronically disseminated official information as timely, suggesting that attention to the general case goes hand in hand with attention to the more specific case (see Table 7-4.)

Mean overall confidence that delivery of emergency notifications will be accurate is significantly higher among respondents who agree or strongly agree that their institution’s current messaging and communication infrastructure is adequate. Those who feel better about the adequacy of that infrastructure are half a point more confident about accurate delivery (mean 3.98; S.D. 0.876) than those who disagree or strongly disagree (mean 3.47; S.D. 1.037) that the infrastructure is adequate.

Reinforcing ECAR’s frequent finding that a written plan can help improve the application of a technology, we found that mean overall confidence that delivery of emergency notifications will be accurate and will be timely was significantly greater where the institution’s crisis communication plan was more complete and better integrated. Mean confidence that delivery will be accurate was a relatively low 3.33 on our 5-point scale (between “neither low nor high” and
“high”) among institutions whose plans were being developed (see Table 7-5). The mean was nearly half a point higher (3.77) among those reporting they had stand-alone crisis communication plans, and it reached “high” (4.01) among those who reported their crisis communications plans were part of the institution’s emergency response plan. As Table 7-5 also shows, a similar pattern, although with uniformly lower means and smaller differences between means, emerges from responses to the question about confidence that delivery of emergency notifications will be timely.

Similarly, where executive leadership places high priority on crisis communication planning, confidence is greater that the delivery of emergency notifications will be accurate and timely.

As we might expect, where the number of channels used in an institution’s ENS is higher, the respondent’s mean level of confidence that delivery of emergency notifications will be accurate and timely is greater. Where only 1–3 channels are used, mean confidence that delivery will be accurate is 2.90 (just below “neither low nor high”), but it is 4.03 (“high”) where 10–11 channels are used (see Table 7-6). With regard to timely delivery, where 1–3 channels are used, mean confidence is 2.63 (between “low” and “neither low nor high”), but where 10–11 channels are used, it is 3.65.
Our data have shown us persistent suggestions that confidence in the timely delivery of emergency notifications is the more difficult assurance to gain; the fact that use of a high number of channels makes a significant difference in respondents’ confidence that delivery of notifications will be timely may argue for taking an “overkill” approach to configuring the campus ENS.

Confidence that the delivery of emergency notifications will be accurate and timely is significantly greater where crisis communication systems are tested more frequently. The difference in confidence between those who test less than once a year and those who test more than twice a year is about six-tenths of a point on our 5-point scale (see Table 7-7). (Among those who said they “never” test their crisis communication systems, the confidence in accuracy and timeliness was even lower.)

Table 7-5. Confidence That Delivery of Emergency Notifications Will Be Accurate and Timely, by Status of Institution’s Written Crisis Communication Plan

<table>
<thead>
<tr>
<th>Status of Institution’s Written Crisis Communication Plan</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Accurate</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Timely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
</tr>
<tr>
<td>Our plan is being developed.</td>
<td>3.33</td>
<td>67</td>
</tr>
<tr>
<td>We have a stand-alone crisis communication plan.</td>
<td>3.77</td>
<td>30</td>
</tr>
<tr>
<td>Our crisis communication plan is part of the institution’s emergency response plan.</td>
<td>4.01</td>
<td>233</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.85</strong></td>
<td><strong>330</strong></td>
</tr>
</tbody>
</table>

*Scale: 1 = very low, 2 = low, 3 = neither low nor high, 4 = high, 5 = very high

Table 7-6. Confidence That Delivery of Emergency Notifications Will Be Accurate and Timely, by Number of ENS Channels Used

<table>
<thead>
<tr>
<th>Number of ENS Channels Used</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Accurate</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Timely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
<td>N</td>
</tr>
<tr>
<td>1–3 channels used (N = 31)</td>
<td>2.90</td>
<td>31</td>
</tr>
<tr>
<td>4–6 channels used (N = 183)</td>
<td>3.85</td>
<td>183</td>
</tr>
<tr>
<td>7–9 channels used (N = 102)</td>
<td>4.00</td>
<td>102</td>
</tr>
<tr>
<td>10–11 channels used (N = 31)</td>
<td>4.03</td>
<td>31</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.83</strong></td>
<td><strong>347</strong></td>
</tr>
</tbody>
</table>

*Scale: 1 = very low, 2 = low, 3 = neither low nor high, 4 = high, 5 = very high

(a third of a point below “high”).
systems, the number of respondents is too small for meaningful comparison with the other testing frequencies.)

**Robustness of Crisis Communication Procedures**

Most readers of this document will be members in good standing of the digital culture. Whether we are natives or immigrants to that culture, we have come to rely on digital technologies for much of what we do in our professional and personal lives. For that reason, when there is an outage in the digital communication networks that serve us or in the underlying electrical power grid, it disrupts what we are doing, at least, and not uncommonly completely disables our work environments. By themselves, these infrastructure disruptions are bad enough, but when they occur in tandem with natural or man-made crises, as they often do, they can throw even a well-laid emergency response plan into chaos.

To see how well prepared our respondent institutions were to deal with such compound crises, we asked if the institution’s crisis communication procedures would function effectively if the following infrastructure services were unavailable:

- campus telephone service,
- campus data network service,
- local grid electrical power, and
- local mobile telephone service.

For convenience in the discussion that follows, we refer to the ability of crisis communication procedures to function effectively during outages in these underlying infrastructure elements as the robustness of those procedures.

Campus telephone service seems to be the item most institutions are prepared to get along without in time of crisis. Almost two-thirds (65.8%) of respondents agreed or strongly agreed that their institutions’ crisis communication procedures would function effectively if campus telephone service became unavailable (mean 3.54; S.D. 0.973). (See Figure 7-11.) It seems likely that much of this confidence is based on the availability of mobile telephone service to fill in for landline service, because mean confidence that crisis communication procedures would function effectively if local mobile telephone service was unavailable is comparatively low (mean 2.98; S.D. 1.036). Those who strongly disagreed or disagreed about the effective functioning of their crisis communication procedures if local mobile telephone service was unavailable represent 40.2% of the population, the highest percentage of negative responses for any of the four infrastructure services. Indeed, qualitative interview participants discussed enhancing their mobile telephone service capacity to handle traffic upticks during a crisis. In one example, Lonnie Harvel at Georgia Gwinnet College worked

<table>
<thead>
<tr>
<th>Frequency with Which Crisis Communication System Is Tested</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Accurate</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Timely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>Less than once a year + ad hoc</td>
<td>3.53</td>
<td>57</td>
</tr>
<tr>
<td>Once a year</td>
<td>3.83</td>
<td>77</td>
</tr>
<tr>
<td>More than once a year</td>
<td>4.15</td>
<td>165</td>
</tr>
<tr>
<td>Total</td>
<td>3.95</td>
<td>299</td>
</tr>
</tbody>
</table>

*Scale: 1 = very low, 2 = low, 3 = neither low nor high, 4 = high, 5 = very high*
with Sprint to install a custom solution to enhance coverage throughout the entire campus and to provide sufficient capacity during an emergency situation.

As is visible in Figure 7-11, the percentage of respondents who agreed or strongly agreed that crisis communication procedures would function effectively if the campus data network was unavailable is substantially lower, at 47.2% (mean 3.14; S.D. 1.084), than the equivalent percentage for campus telephone service, probably reflecting the fact that at most institutions most communication devices are not equipped to access a broadband wireless (“cellular” or other) network.

Electrical power outages are among the most common crises an IT organization faces. In ECAR’s 2007 study *Shelter from the Storm: IT and Business Continuity in Higher Education,* among the roughly 50% of respondents who reported experiencing any disaster serious enough to trigger a central IT emergency response, 82.1% reported an electrical power outage as such a trigger. Confidence among our respondents that crisis communication procedures would function effectively if local grid electrical power was unavailable was about the same as for mobile telephone service; the means are identical at 2.98 (S.D. 1.112).

Loss of communication capacity during an electrical grid failure is a very real concern for institutions that have experienced prolonged outages. For example, Louisiana State University and surrounding Baton Rouge lost electrical power for an extended period during the aftermath of 2008’s Hurricane Gustav, forcing the university’s emergency operations committee to use whatever means possible to communicate internally and externally—including a daily one-page flyer distributed locally—after landline phones, cell phones, two-way radios, media outlets, and the Internet became unreliable or inoperable.

Among our quantitative survey respondents, where the pace of adoption of new messaging and communication technologies at the respondent’s institution is brisker, mean agreement is higher that crisis communication procedures would function effectively if campus telephone service and campus data network service were unavailable (see Table 7-8). Early adopters report greater mean agreement about the robustness of their crisis communication procedures in the face of an outage.
of both types of outage. Pace of adoption of new technologies made the greater difference (0.82 points) in the context of a campus telephone service outage.

As one might suspect, the more positive respondents’ agreement was that executive leadership places high priority on crisis communication planning, the more strongly they agreed that the institution’s crisis communication procedures would function effectively in the event of outages of all four of our infrastructure services (see Table 7-9). Where agreement about executive leadership’s priority on crisis communication planning made the most difference (0.89 points) was for outages in local mobile telephone service, the technology without which respondents seemed least sure their crisis communication procedures could function effectively. Our data don’t give us any insight into why this should be. It seems possible that increased executive priority could translate into greater support for alternatives to mobile telephony such as public-safety radio and satellite phones. We asked no questions about satellite telephones, but analysis of responses to our question about central IT’s support for public-safety radio showed that it did not go hand in hand with executive leadership’s priority on crisis communications planning.

Robustness of the ENS infrastructure appears to be a component of our respondents’ overall confidence that the delivery of emergency notifications will be accurate and timely. That confidence is greater where agreement is more positive that the institution’s crisis communication procedures will function effectively in the event of failures in each of our four infrastructure elements (see Table 7-10). For both aspects of notification delivery, confidence was nearly a full point higher among those who agreed or strongly agreed that crisis communication procedures would function effectively if the campus telephone system was unavailable. The patterns of variation in mean confidence are similar, but progressively less pronounced (smaller differences), for agreement that crisis communications will be effective during outages in the campus data network, local mobile service, and local electrical grid. As noted in the table itself, while the association between confidence in the timeliness of emergency notifications and agreement that crisis communications will

### Table 7-8. Robustness of Crisis Communication Procedures, by Pace of Adoption of New Messaging and Communication Technologies

| Pace of Adoption | Crisis communication procedures will function effectively if: |               |               |
|------------------|---------------------------------------------------------------|---------------|
|                  | Campus telephone service is unavailable                      |               |
| Early adopter    | Mean* | 3.97 | 39 | 0.873 |
| Mainstream adopter | 3.67 | 187 | 0.901 |
| Late adopter     | 3.15  | 107 | 1.017 |
| Total            | 3.54  | 333 | 0.977 |
|                  | Campus data network service is unavailable                    |               |
| Early adopter    | 3.56  | 39  | 1.188 |
| Mainstream adopter | 3.21 | 188 | 1.063 |
| Late adopter     | 2.88  | 107 | 1.016 |
| Total            | 3.15  | 334 | 1.082 |

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
function effectively if the local electrical grid is unavailable followed the same general pattern, it was not statistically meaningful.

**IENSs**

It can be a challenge to coordinate the flow of crisis communications through a number of channels with different underlying technologies. By themselves, the varying user interfaces of the channels we have discussed would pose challenges even if the message being broadcast through them were the same. The message itself does vary, however, depending on the channel. The message posted to the institution’s dedicated emergency website can be much richer, for example, than the content of a text message. And those will be different from the messages delivered by telephone.

To help institutions manage the release of notifications, a constellation of vendors offer IENSs that provide a more or less unified interface to a broad range of channels, as well as tools for developing effective notifications. Among the benefits of such systems, Chuck

<table>
<thead>
<tr>
<th>Executive leadership places high priority on crisis communication planning.</th>
<th>Crisis communication procedures will function effectively if:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Campus telephone service is unavailable</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.07</td>
<td>29</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.09</td>
<td>45</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.68</td>
<td>260</td>
</tr>
<tr>
<td>Total</td>
<td>3.54</td>
<td>334</td>
</tr>
<tr>
<td></td>
<td>Campus data network service is unavailable</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>2.59</td>
<td>29</td>
</tr>
<tr>
<td>Neutral</td>
<td>2.82</td>
<td>45</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.26</td>
<td>261</td>
</tr>
<tr>
<td>Total</td>
<td>3.14</td>
<td>335</td>
</tr>
<tr>
<td></td>
<td>Local grid electrical power is unavailable</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>2.43</td>
<td>28</td>
</tr>
<tr>
<td>Neutral</td>
<td>2.74</td>
<td>43</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.07</td>
<td>256</td>
</tr>
<tr>
<td>Total</td>
<td>2.98</td>
<td>327</td>
</tr>
<tr>
<td></td>
<td>Local mobile telephone service is unavailable</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>2.18</td>
<td>28</td>
</tr>
<tr>
<td>Neutral</td>
<td>2.93</td>
<td>44</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.07</td>
<td>255</td>
</tr>
<tr>
<td>Total</td>
<td>2.98</td>
<td>327</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree*
Chulvick at Raritan Valley Community College cites ease of operation. “We tried the do-it-yourself approach to adding text messaging to our emergency notification system but ran into obstacles with our local carriers when unsent messages began to bounce back. The problem stemmed from the carriers’ policy not to transmit messages in bulk as a way of preventing spam. Eventually we contracted with a third-party IENS vendor that not only provides more ENS channels but provides documentation about system performance.”

Off-site location is another advantage of a commercial IENS. For example, Seattle Pacific University contracted with a third-party IENS because of the vendor’s sites in Wisconsin and Michigan, which are far removed from the Seattle area’s earthquake zone.

We asked our quantitative survey respondents if they had IENSs, how the systems were hosted and developed, how robust the respondents felt their systems were, how many constituents subscribed to notifications from them, and whether the systems were used for purposes other than emergency notification. (Note: With noted exceptions, the discussion in this “IENSs” section deals only with the 140 respondents who reported having an IENS. Discussions dealing with ENS channels in preceding and subsequent sections involve the entire survey population.)

Table 7-10. Confidence That Delivery of Emergency Notifications Will Be Accurate and Timely, by Robustness of Crisis Communication Procedures

<table>
<thead>
<tr>
<th>Crisis communication procedures will function effectively if:</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Accurate</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Timely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus telephone service is unavailable</td>
<td>Mean* N Std. Deviation</td>
<td>Mean* N Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.15 66 1.056</td>
<td>2.76 66 0.946</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.57 49 1.000</td>
<td>3.20 49 0.889</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>4.12 221 0.735</td>
<td>3.68 217 0.854</td>
</tr>
<tr>
<td>Total</td>
<td>3.85 336 0.932</td>
<td>3.42 332 0.951</td>
</tr>
<tr>
<td>Campus data network is unavailable</td>
<td>Mean* N Std. Deviation</td>
<td>Mean* N Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.41 111 1.013</td>
<td>3.06 107 0.970</td>
</tr>
<tr>
<td>Neutral</td>
<td>4.01 67 0.862</td>
<td>3.54 67 0.910</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>4.08 159 0.792</td>
<td>3.62 159 0.884</td>
</tr>
<tr>
<td>Total</td>
<td>3.85 337 0.932</td>
<td>3.42 333 0.949</td>
</tr>
<tr>
<td>Local mobile service is unavailable</td>
<td>Mean* N Std. Deviation</td>
<td>Mean* N Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.48 132 0.992</td>
<td>3.12 129 1.000</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.97 73 0.881</td>
<td>3.52 73 0.884</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>4.15 124 0.772</td>
<td>3.67 123 0.873</td>
</tr>
<tr>
<td>Total</td>
<td>3.84 329 0.937</td>
<td>3.42 325 0.958</td>
</tr>
<tr>
<td>Local electrical grid is unavailable</td>
<td>Mean* N Std. Deviation</td>
<td>Mean** N Std. Deviation</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>3.62 126 1.003</td>
<td>3.24 124 0.974</td>
</tr>
<tr>
<td>Neutral</td>
<td>3.91 76 0.836</td>
<td>3.47 76 0.871</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>4.03 127 0.881</td>
<td>3.55 125 0.963</td>
</tr>
<tr>
<td>Total</td>
<td>3.84 329 0.936</td>
<td>3.42 325 0.954</td>
</tr>
</tbody>
</table>

*Scale: 1 = very low, 2 = low, 3 = neither low nor high, 4 = high, 5 = very high
**Association not statistically meaningful—included for completeness only
Adoption and Utilization

Just over 4 in 10 respondents (42.0%) reported having an IENS, indicating that this technology of convergence, while common, is not yet pervasive in higher education. Of these, more than 8 in 10 respondent institutions (81.2%) reported that their IENSs were hosted at commercial providers’ facilities. Most of the remainder were hosted at the respondent’s institution (13.8%) or at a government agency (4.3%). Virtually all (93.3%) respondents with an IENS report the source of their IENSs to be commercial software. Only a few (4.4%) said they use homegrown software, and even fewer (2.2%) said they use software from other sources.

Having an IENS was somewhat more common among doctoral (55.8%) and bachelor’s (51.7%) institutions than among master’s (41%) institutions, and substantially more common than among associate’s (21.7%) institutions. While having an IENS was not significantly associated with institution size, it was significantly associated with the number of residential students the institution had (see Table 7-11), which explains the Carnegie class difference: Associate’s institutions have by far the fewest residential students, and doctoral institutions have the most. We infer from this that having an IENS reflects a concern for the safety of students—especially residential students—more than an abstract interest in the administrative efficiency or technical elegance of an IENS.

Institutions that have IENSs test their crisis communication systems more frequently than those that don’t. Among respondent institutions that have no IENS, fewer than half (43.7%) test their crisis communication systems more than once a year; nearly two-thirds (64.6%) of institutions that do have an IENS test their systems that often. Just as an IENS is easier to use than a collection of nonintegrated channels, it is also easier to test. The requirement to regularly test an IENS would seem a beneficial contract provision for both the vendor and the purchasing institution.

Where the institution reported having an IENS, the mean number of emergency notification channels in which the respondent had high or very high confidence was 4.04 on our scale of 1–11 channels (S.D. 1.881). Where there was no IENS, the number was three-quarters of a channel lower, at 3.26 (S.D. 2.137). There was no similar, statistically significant association between having an IENS and the mean number of ENS channels the respondent rated as having good or very good performance when tested, suggesting that the advantages of an IENS may be more in the consolidation of ENS channels than in fine-tuning their performance. Surprisingly, there was no significant association between having an IENS and the total number of channels used in the institution’s ENS.

Mean overall confidence that the delivery of emergency notifications will be accurate is only about a half a point higher (4.11, or just above “agree”) where the institution has an IENS (see Table 7-12). There is a similar association between existence of such a system and confidence that the delivery of emergency notifications will be timely. We are surprised to see that having an IENS makes so little difference in confidence about both aspects of the

Table 7-11. Existence of an IENS, by Number of Residential Students

<table>
<thead>
<tr>
<th>Number of Residential Students</th>
<th>Percentage of Institutions with IENS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (N = 58)</td>
<td>19.0%</td>
</tr>
<tr>
<td>1–2,000 (N = 138)</td>
<td>42.0%</td>
</tr>
<tr>
<td>2,001–4,000 (N = 80)</td>
<td>48.8%</td>
</tr>
<tr>
<td>More than 4,000 (N = 54)</td>
<td>55.6%</td>
</tr>
</tbody>
</table>
delivery of emergency notifications. Just intuitively, we expected to see a difference of a full point or more for both.

Agreement that crisis communication procedures will function effectively during infrastructure outages was generally stronger where respondents reported having an IENS. Among those who reported having an IENS, mean agreement about the robustness of those procedures was between 0.42 points (for local mobile telephone service) and 0.66 points (for local grid electric power) higher on our 5-point agreement scale than it was among those who had no IENS. For the other two infrastructure elements, campus telephone system and campus data network, the differences were intermediate, at 0.58 points. The greater difference in the context of local grid electric power almost certainly reflects the fact that IENSs are often hosted off campus, independent of the institution’s local electrical grid. Differences in the robustness of crisis communication procedures if each of the other technology infrastructure outages occurs may also reflect the advantages of remote hosting.

The IENS is a fairly recent phenomenon on our respondents’ campuses. Nearly 40% of respondent institutions’ first IENSs were put in place in 2008, and another 54.3% were put in place in 2007. Only 4.3% of institutions had their first installation in 2006, and 1.4% had theirs in 2005. No respondent said their institutions’ IENS was installed prior to 2005.

Apparently, an IENS takes a little time to build and tune to reliable performance. On average, respondents who installed their first IENSs in 2008 reported that about half (45.9%) of the emergency notification channels they use exhibited good or very good performance in their most recent test. Where the IENS was installed prior to 2008, performance was at that level for two-thirds of channels (67.5%).

Having an IENS gives an institution a structure upon which to build by adding ENS channels, and most institutions that have such systems are taking advantage of that ability. We asked respondents with IENSs how many channels they had added in the past 12 months. Only 14.5% said they had added no channels, and only 2.6% had added only one (see Table 7-13). A majority (64.1%) had taken more advantage of the expandability of their IENSs and added two or three channels, 9.4% had added four, and the remaining 9.4% had added more than four.

### Robustness of the IENS

Overall, respondents were very confident about the robustness of their IENSs, with more than 90% reporting that those systems were accessible from off-campus locations and would continue to function if local electrical power was unavailable (see Table 7-14). More than 85% said the IENS would continue to function if the institution’s wide area network service was unavailable and that technical support was available for users at all times. Eight in 10 (81.2%) reported confidence that their IENSs would continue to function if regional electrical power was unavailable.

<table>
<thead>
<tr>
<th>Existence of an IENS</th>
<th>Confidence That Delivery of Emergency Notifications Will Be Accurate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>No</td>
<td>3.62</td>
</tr>
<tr>
<td>Yes</td>
<td>4.11</td>
</tr>
<tr>
<td>Total</td>
<td>3.82</td>
</tr>
</tbody>
</table>

*Scale: 1 = very low, 2 = low, 3 = neither low nor high, 4 = high, 5 = very high
Disagreement was strongest (14.0%) that the IENS would fail over immediately to a hot standby system if the primary host failed. A little disturbingly for a system that the institution will rely on during an emergency, the percentage of "don't know" responses about failover was 29.4%—twice the number for the regional electrical power aspect of robustness, and more than triple the number for each of the remaining aspects. While a majority of institutions having IENSs agreed that failover would be immediate, that aspect of robustness was by far the weakest of the six we asked about.

Of the 140 institutions that reported having an IENS, 129 responded to our question about the percentage of institutional community members opted-in to that system. Of these, 26 said the question was not applicable, suggesting that their IENS is not an opt-in system. Another 24 said they did not know what percentage of institutional community members had opted-in to their IENSs. Of the remaining 79 respondents, about 4 in 10 (39.3%) reported that more than half of the community had opted-in, with only 2 institutions (2.5%) reporting 100% participation (see Table 7-15). About a third reported that a quarter to a half had opted-in, and a bit more than a quarter reported a participation rate of 25% or less.

Results of a recent survey conducted under the auspices of the EDUCAUSE Net@EDU Converged Communications Working Group Steering Committee illustrate the advantages of an opt-out ENS. Where the model is opt-out, they found that on average their respondents’ ENS subscribers unsubscribed less than 8% of the time, leaving a healthy 92% of the population enrolled. Where the
model was opt-in, less than 40% of the population elected to receive the protection the ENS provided. For our own respondents’ discussion of the challenges inherent in an opt-in approach to IENS subscription, see the sidebar “Views from Qualitative Research: Enrollment in the IENS.”

Discussion of IENSs ends here. In the sections that follow, discussion reverts to the more generic ENS (the institution’s collection of emergency notification channels, whether part of an IENS or not) and once again includes the entire 351 survey respondents.

**Managing Communication Flow**

As the fable of the boy who cried “wolf” teaches us, there are drawbacks to communicating too frequently using any ENS. The strong sanctions against non-emergency use of the 911 emergency telephone number in the United States derive from a philosophy of reserving emergency channels for genuine emergencies, in part to prevent the attendants from becoming insensitive to the urgency of a true emergency call, but also to help ensure that scarce human resources are not tied up responding to trivial requests when a genuinely urgent one comes in. Recently, among some members of our profession, the term “mass communication system” has been applied to systems that were formerly reserved for emergency use, a semantic adjustment that reflects a legitimate desire to maximize the benefit of a costly investment.

To help us get a sense of how ENSs were being used, our survey included questions touching on what they were used for, who operated them, and what resources were available to assist the operators.

### Institutionalization of the ENS

An integrated system for emergency notification is useful for communication purposes other than crisis communication, but many institutions are reluctant to use their ENS too often, for fear of numbing their constituents’ sensitivity to the messages it conveys. Indeed, nearly 9 in 10 (86.8%) respondents reported that they do not use their ENSs for purposes other than emergency notification. As Notre Dame’s Latimer observed in an interview with us, “We do not want our emergency notification system, ND Alert, to be diluted. When a text messaging notification goes out and the recipient sees the words ‘ND Alert,’ we want them to know to pay attention to it.” One result of this is that Notre Dame has opted not to overtest their system, testing it only once per semester.

One way of preventing the overuse of ENS channels is to limit their use to a small number of individuals. A strong majority of institutions (79.6%) reported that the assignment of responsibility for sending emergency notifications is addressed in a written institutional policy or procedure. Not surprisingly, where such a policy exists, the institution was significantly more likely (87.1%) to report an existing written crisis communication plan (whether stand-alone or part of the institutional plan) than where responsibility for sending emergency notifications is not codified in policy (46.8%).

---

**Table 7-15. Percentage of Institutional Community Members Opted-In to IENS (N = 79)**

<table>
<thead>
<tr>
<th>Percentage of Institutional Community Members Opted-In to IENS</th>
<th>Percentage of Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–25%</td>
<td>27.8%</td>
</tr>
<tr>
<td>26–50%</td>
<td>32.9%</td>
</tr>
<tr>
<td>51–75%</td>
<td>16.5%</td>
</tr>
<tr>
<td>76–100%</td>
<td>22.8%</td>
</tr>
</tbody>
</table>
Executive leadership’s prioritization of crisis communication planning is very similarly related to the assignment of responsibility for sending emergency notifications.

Institutions that assign responsibility for sending emergency notifications in a written policy tend to be institutions in which there is more ENS activity, as demonstrated by a significantly higher total mean number of channels in their ENSs. That activity is of a higher quality, too, as reflected by significantly higher mean numbers of channels in which they express high/very high confidence that the channel will perform effectively under peak load and for which they report good/very good performance in the most recent test. Mean level of confidence that delivery of

Views from Qualitative Research: Enrollment in the IENS

Emergency notifications are effective only if people receive the message. Thus, the issue of enrolling users in the system generated considerable discussion during some of our qualitative interviews. Some participants voiced frustration. Ken Stafford, vice chancellor of technology, University of Denver, complained, “We e-mail students about the program and we visit them in classes. They listen, and then they do not sign up. I don’t know why.” John Mangrich, manager, central computing and security, University of California, Irvine, added, “We don’t have any way to collect students’ phone numbers except with an opt-in program. The ways we have chosen to reach the students require their cooperation, and students are often reluctant to opt-in to something, even to a program as important as emergency notification.” At Raritan Valley Community College, Chuck Chulvick saw a similar level of disinterest until the first winter snowstorm prompted a flurry of registrations. “As a commuter college, there is an incentive that appeals to students, faculty, and staff if they think enrolling in the ENS will help them avoid traveling needlessly to the campus.”

Others discussed aggressive recruitment tactics that fall just short of mandatory enrollment. At the University of California, Riverside, users cannot access the campus administrative portal or the student self-service portals unless they have registered a decision online about their emergency text messaging notification participation. If the user has not signed up, a pop-up appears stating that in order to proceed, the user needs to decide. “We don’t force anyone to use the emergency notification system, but we force the person to acknowledge that they read about the system and understand what it means to opt-in or opt-out, and to make a decision accordingly,” states Charles Rowley. The pop-up occurs only if the user has not registered a decision. Thereafter, it appears annually to require participants to update their decision and contact information. Highlighting the role of institutional leadership in matters like this, Rowley added, “It would have been impossible for us to proceed as we have without the support of our former chancellor, Robert Gray. His leadership allowed us to require that each user make an explicit choice.”

Louisiana State University has instituted a similar program, forcing participants to review their decision every six months. Brian Voss reports that this strategy has increased the enrollment percentage to approximately 80–85% of the total LSU community, translating into 25,000 participants. “We stay in their face,” he says. “Marketing and communications efforts have value in promoting penetration, but their impact is not like jumping on the user’s desktop and grabbing them by the necktie.”
emergency notifications will be accurate is also significantly higher where institutions formally assign responsibility for the sending of emergency messages.

Agreement that contact information for the individual(s) responsible for sending emergency notifications is discoverable by any member of the campus community was bimodally distributed. About 4 in 10 respondents (39.7%) disagreed or strongly disagreed, and slightly more (43.1%) agreed or strongly agreed, while only 17.2% were neutral. As one might expect, mean agreement about this is significantly greater where crisis communication is more institutionalized, i.e., among those who agree that executive leadership places high priority on crisis communication planning and where assignment of responsibility for sending emergency notifications is addressed in a written policy or procedure.

Resources for Emergency Notifiers

To take the temperature of the institution’s support for the staff who send emergency notifications, we asked for respondents’ agreement with six statements concerning the resources that are available to those individuals. Specifically, we asked if the individuals who send emergency notifications:

- have immediate access to top-level decision makers,
- fully understand their responsibilities,
- are able to carry out their duties fully from off-campus locations,
- have templates to guide their preparation of notification messages,
- have received adequate training, and
- have 24 x 7 x 365 access to technical support services.

At least two-thirds of respondents agreed or strongly agreed that each of these resources was available. Mean agreement ranged from 3.69 to 4.08 on our 5-point scale, or from about a third of a point below “agree” to almost a tenth of a point above it (see Table 7-16). Mean agreement was highest (4.08) with regard to individuals who send emergency communications having immediate access to top-level decision makers and with regard to their fully understanding their responsibilities (3.92). Agreement was lowest (3.69) with regard to their having 24 x 7 x 365 access to technical support, although that mean was still nearer to “agree” than to “neutral.”

To a significant extent, the existence of a written crisis communication plan went hand in hand with stronger agreement that the individuals who send emergency

Table 7-16. Resources Available to Individuals Who Send Emergency Notifications

<table>
<thead>
<tr>
<th>Individuals who send emergency notifications:</th>
<th>Mean*</th>
<th>N</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have immediate access to top-level decision makers</td>
<td>4.08</td>
<td>333</td>
<td>0.787</td>
</tr>
<tr>
<td>Fully understand their responsibilities</td>
<td>3.92</td>
<td>327</td>
<td>0.849</td>
</tr>
<tr>
<td>Are able to carry out their duties fully from off-campus locations</td>
<td>3.84</td>
<td>317</td>
<td>0.931</td>
</tr>
<tr>
<td>Have templates to guide their preparation of notification messages</td>
<td>3.76</td>
<td>304</td>
<td>0.987</td>
</tr>
<tr>
<td>Have received adequate training</td>
<td>3.75</td>
<td>321</td>
<td>0.901</td>
</tr>
<tr>
<td>Have 24 x 7 x 365 access to technical support services</td>
<td>3.69</td>
<td>332</td>
<td>1.055</td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
communications had adequate training, had 24 x 7 x 365 access to technical support services, were able to carry out duties from remote locations, and had templates to guide the preparation of emergency notification messages. Mean agreement about the availability of these support resources and that the individuals who send emergency notifications fully understood their responsibilities was significantly greater where agreement was also positive that executive leadership placed high priority on crisis communication planning.

Access to these support resources seems as well to go hand in hand with the number of ENS channels whose effective performance under peak load inspires confidence and whose performance in the most recent test was reportedly better. Also to a significant degree, confidence that delivery of emergency notifications will be accurate and timely varies with agreement about access to these support resources. In the case of timeliness, the highest levels of confidence are associated with greater mean agreement that those who send emergency messages have received adequate training, fully understand their responsibilities, and are able to carry out their duties fully from off-campus locations.

Assessing the Institution’s Readiness

A crisis may come or it may not. Nothing a CIO can do (as far as we know) will influence the storm track of a hurricane or prevent an outbreak of violence on the campus. The robustness of the public switched telephone network is out of the CIO’s hands, as is that of the local electric power grid or the local mobile telephone service. Apart from making campus systems as failure-proof as possible, all a CIO—or any of us—can do about a foreseen crisis is to prepare for it intelligently and then do our best to deal with it when it comes. Of these tasks, preparation is the one a CIO can tackle now.

As we mentioned early in this chapter, “You weren’t prepared” is an accusation no CIO wants to hear. Accordingly, as the capstone to our survey, we asked respondents for their agreement about the institution’s overall preparedness to

- communicate with first-responders via public-safety radio at the onset of a crisis,
- notify constituents on campus that an emergency exists,
- communicate with external stakeholders such as parents, alumni, and vendors about a crisis,
- communicate internally during a crisis, and
- communicate with other interested parties, such as the news media, about a crisis.

Their assessments and an analysis of how those fit in with the other elements of our study make up the remainder of this chapter.

Evaluating Preparedness

Among the preparedness items we asked about, respondents were most positive about the institution’s preparedness to communicate with first-responders via public-safety radio at the onset of a crisis, with more than a quarter (28.3%) strongly agreeing. (See Figure 7-12) Mean agreement that the institution was well prepared to communicate in that way was 3.92 (S.D. 0.970) on our 5-point scale, just short of “agree.” Respondents were nearly as positive about preparedness to notify constituents that an emergency exists (mean 3.84; S.D. 0.879), to communicate with other interested parties such as the news media about a crisis (mean 3.83; S.D. 0.792), and to communicate internally about a crisis (mean 3.81; S.D. 0.804). They were substantially less positive, on average, about their preparedness to communicate with external stakeholders such as parents, alumni, and vendors (mean 3.37; S.D. 0.973, below the
midpoint between “neutral” and “agree”). Nonetheless, respondents were more positive than negative about all five of these elements of preparedness.

Responses to all preparedness items except preparedness to communicate internally during a crisis varied significantly with Carnegie class. In those four cases, the mean agreement of doctoral institutions was greater than that of other classes, and the mean agreement of associate’s institutions was least. As we observed in our discussion of IENSs and Carnegie class, having residential students on campus seems to intensify the institution’s commitment to emergency notification. This is borne out again here in our finding that doctoral institutions, which generally have the greatest numbers of residential students, reported being substantially better prepared to communicate during a crisis than associate’s institutions, which have the smallest residential populations.

Demonstrating once again that planning can lead to positive outcomes, institutions with fully developed crisis communication plans expressed agreement or strong agreement that the institution was well prepared to communicate with other parties, with external stakeholders, and internally during a crisis and to notify constituents of an emergency significantly more frequently than institutions whose crisis communications plan was still in development.

As one might expect, executive leadership plays a role in the institution’s preparedness to communicate during a crisis. Mean agreement about all five elements of preparedness was significantly greater where respondents agreed or strongly agreed that executive leadership places a high priority on crisis communication planning. As shown in Table 7-17, for the most challenging of the elements—preparedness to communicate with external stakeholders during a crisis—the difference...
is greatest: nearly a full point. Differences for other preparedness items ranged from 0.48 to 0.73 points.

Many hands would seem to make light the work, at least for preparing to notify constituents of an emergency and to communicate with external stakeholders. The greater the number of organizations represented on the institution’s crisis communication team, the greater respondents’ mean agreement was that the institution was well prepared for those two responsibilities (see Table 7-18).

**Preparedness and the ENS**

We found significant associations—far too many to discuss in detail—between respondents’ preparedness to communicate and their ratings of their confidence in and the actual performance of many of our 11 ENS channels. Understandably, those that stand out are in the context of: preparedness to notify constituents of an emergency. Mean agreement that the institution is well prepared to do that was greater (generally “agree” or better) where there was higher confidence in the automated telephone messaging, e-mail, instant messaging, RSS feeds, and outdoor public-address channels and where actual performance was better for the automated telephone messaging, e-mail, SMS text messaging, and instant messaging channels. Institutions wishing to increase their preparedness to notify constituents of an emergency might, we speculate, do well to consider including—or improving the effectiveness of—these channels in their ENSs.

Also understandably, we found that higher confidence in the dedicated emergency web pages channel, as well as better performance of that channel during testing, went hand in hand with the institution’s preparedness to communicate with external stakeholders during a crisis. It would seem that institutions are relying on external stakeholders such as alumni, parents, and vendors to “pull” information from institutional sources rather than having it “pushed” to them by the institution. This may be related to the fact that while various parties within the institution know how to communicate with those constituents, the constituents’ contact information is not generally kept in the directories and other databases that are used to generate the more active forms of emergency notification. This channel is among those most often reported to be untested, yet it appears to be among the most useful for communication with the difficult external stakeholders constituency.

It should come as no surprise that respondents’ sense of preparedness to communicate during a crisis in the five ways we asked about varies with confidence that the delivery of emergency notifications will be accurate and timely. Among those who agree or strongly agree that the institution is well prepared, overall, to notify constituents of an emergency and to communicate internally during a crisis, mean confidence

<table>
<thead>
<tr>
<th>Leadership places priority on planning.</th>
<th>Institution is Well Prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>Strongly disagree + disagree</td>
<td>2.61</td>
</tr>
<tr>
<td>Neutral</td>
<td>2.72</td>
</tr>
<tr>
<td>Agree + strongly agree</td>
<td>3.56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.37</strong></td>
</tr>
</tbody>
</table>

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
that the delivery of emergency notifications will be both accurate and timely is more than 1.20 points greater than the means for those who do not agree that the institution is well prepared. Differences in mean level of confidence range from 0.90 to 1.28 points for our other three areas of preparedness.

Anticipating Infrastructure Failures

Earlier, we discussed the robustness of the institution’s crisis communication procedures—that is, their effectiveness in the face of outages in each of four underlying elements of communications infrastructure: campus telephone service, the campus data network, local mobile telephone service, and local grid electrical power. Our analysis suggests that proofing the institution’s crisis communication procedures against outages in the first three of these technologies leads to greater mean agreement that the institution is well prepared to communicate with first-responders using public-safety radio, notify constituents of an emergency, communicate with other interested parties, communicate internally during a crisis, and communicate with external stakeholders. The reported robustness of crisis communication procedures in the face of a local grid electrical power outage was not meaningfully associated with any of these five preparedness items.

Agreement with four of our five preparedness items went hand in hand with having an IENS. Among those who said they had one, mean agreement was about half a point greater that their institution was well prepared to communicate with first-responders and notify constituents of emergencies, and mean agreement was about a third of a point greater that their institution was well prepared to communicate internally and communicate with external stakeholders (see Table 7-19). The association between having an IENS and preparedness to communicate with other interested parties such as the news media was not meaningful.

Three elements of the institution’s efforts to manage the flow of information during a crisis also vary with agreement that the institution is well prepared to communicate during a crisis in all five of the ways discussed here. These are the codification into policy of the assignment of responsibility for sending

Table 7-18. Preparedness to Notify Constituents and Communicate with External Stakeholders, by Number of Organizations Represented on Crisis Communication Team

<table>
<thead>
<tr>
<th>Number of Organizations on Crisis Communication Team</th>
<th>Institution is well prepared to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Notify constituents of an emergency</td>
</tr>
<tr>
<td></td>
<td>Mean*</td>
</tr>
<tr>
<td>1–5 members</td>
<td>3.48</td>
</tr>
<tr>
<td>6–10 members</td>
<td>3.86</td>
</tr>
<tr>
<td>11–13 members</td>
<td>4.21</td>
</tr>
<tr>
<td>Total</td>
<td>3.88</td>
</tr>
</tbody>
</table>

|                                                    | Communicate with external stakeholders |
|                                                    | Mean*  | N     | Std. Deviation |
| 1–5 members                                        | 3.03   | 36    | 0.910          |
| 6–10 members                                       | 3.35   | 215   | 0.950          |
| 11–13 members                                      | 3.85   | 62    | 0.765          |
| Total                                              | 3.42   | 313   | 0.941          |

*Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree
emergency notifications, agreement that contact information for the senders of emergency notifications is discoverable, and agreement about the availability of all six support resources for emergency notifiers (as presented in Table 7-16). Where respondents were more positive about all these things, they also agreed more strongly, on average, that the institution was well prepared in all five ways to communicate during a crisis.

**Summary and Implications**

Under any circumstances, communication is key to the smooth operation of the higher education institution, and this is especially so during a time of trouble. Functional communication channels and procedures may be needed under those circumstances to warn others of danger, to call for help, to coordinate emergency procedures, to reassure distant family members, or to keep the public informed of the status of a crisis. The campus organizations responsible for the institution’s communication channels must prepare them for challenging circumstances to make sure their failure doesn’t become a crisis within a crisis.

Planning is an essential first step in preparing to communicate during a crisis, and three-quarters of our respondent institutions have risen to that challenge either by developing a stand-alone crisis communication plan or, more commonly, by including crisis communication planning in their overall emergency response plans. Of those without
a plan, most report that one is under development. Three-quarters of respondents agree or strongly agree that their executive leadership places a high priority on crisis communication planning.

Teamwork is essential to ensure that communications flow smoothly during a crisis, and nearly all respondents reported that their institution had a crisis communication team and an officer to lead it. For nearly a third of institutions, the leader was situated in the public affairs office, but leaders also frequently came from the emergency services organization or the office of the president/chancellor. Central IT leadership of that group was very rare. Most teams comprised representatives from six or seven campus organizations, although both smaller and larger teams were common.

Emergency notification may be the most important role for crisis communications. It would be hard to exaggerate the importance and priority of getting people out of harm’s way in dangerous times. Virtually all institutions are taking a multimodal approach to emergency notification, adopting a number of communication channels to accomplish that task. Most use from 4 to 7 of the 11 channels we asked about. Most use from 4 to 7 of the 11 channels we asked about. For each of the 11 channels, we found that at least two-thirds of its users tested it at least occasionally, and while the average user’s level of confidence in peak-load performance was rated “high” only for the e-mail channel, for 7 of the 11 channels actual performance during its most recent test averaged “good” or better. Where performance of the channel was better, confidence in it was higher, and vice versa. Confidence was highest in the e-mail, text messaging, dedicated emergency website, and outdoor public-address system channels.

For most institutions, emergency communication channels are aggregated to some extent into an ENS. Seven in 10 respondents test their ENSs at least once a year; only 4.6% say they don’t test them at all. This contrasts sharply with ECAR’s 2007 study of business continuity practices, where we found that 62.9% of respondents do not conduct tests of their institution’s readiness to support business continuity. Apparently emergency communication is given by far the greater priority of the two. Overall confidence that the institution’s emergency notifications will reach their intended recipients (accurate delivery) is a bit stronger than confidence that notifications will be received in time for the recipient to take appropriate action (timely delivery). Confidence in accurate and timely delivery is higher where respondents agree that the messaging and communication infrastructure meets the institution’s needs, where a written crisis communication plan is in place, where more ENS channels are in use, and where the ENS is tested more frequently.

Among the infrastructure elements that underlie crisis communications are the campus telephone and data networks, the local electrical grid, and local mobile telephone service. Loss of availability of any of these items could cripple an institution’s ENS and its other crisis communication procedures. When asked about each of these four infrastructure elements specifically, respondents were most confident that crisis communication procedures would function effectively if campus telephone service was unavailable, presumably because they could then just switch over to cellular telephones for voice communication. They were least confident that crisis communication procedures could be effective if local mobile telephone service was unavailable, again presumably because cell service is their backup to campus telephone service. Confidence that the delivery of emergency notifications would be accurate and timely was higher where the institution was more confident that it could weather outages in each of the four infrastructure elements. And confidence that it could weather those outages was higher where
respondents agreed that the institution's executive leadership placed high priority on crisis communications.

In the wake of recent campus tragedies—earthquakes, hurricanes, and shootings, in particular—the criticality of effective emergency notification procedures has gained a high profile. A number of commercial entities produce integrated ENSs that have utility in higher education. Slightly more than 4 in 10 of the institutions we surveyed had acquired an IENS; they are more than twice as common at doctoral and bachelor's institutions and nearly twice as common at master's institutions as at associate's, reflecting concentrations of those systems at institutions that have greater numbers of residential students. Confidence that delivery of notifications will be accurate and timely is higher where the institution has an IENS, although having an IENS is not meaningfully related to the number of ENS channels an institution uses. Enrollment in an institution's IENS, where that is optional, is far from pervasive; 6 in 10 respondents said 50% or fewer of institutional community members had opted in.

Presumably to prevent its impact from being diluted, nearly 9 in 10 respondents said they used their ENS or IENS for emergency purposes only. Specifying in policy who may use the system to send notifications is one way of ensuring that its impact remains strong, and 8 in 10 institutions told us they do that. This practice is more common where the institution has a written crisis communication plan, uses more ENS channels and has higher confidence in them, and has higher confidence that delivery of emergency notifications will be accurate. Where institutions gave more positive responses to most of the planning and confidence findings discussed so far in this summary, they tended also to respond more positively about the support resources the institution provides to individuals charged with sending emergency notifications.

In assessing preparedness to communicate with various constituencies during a crisis, the average respondent was most positive about the institution's ability to communicate with first-responders via public-safety radio at the onset of a crisis and was nearly as positive about preparedness to notify constituents that an emergency exists, to communicate with other interested parties such as the news media about a crisis, and to communicate internally about a crisis. Respondents were substantially less positive, on average, about their preparedness to communicate with external stakeholders such as parents, alumni, and vendors, possibly because these constituents are less frequently included in the electronic directories from which the institution draws its information about whom to contact in case of emergency.

Doctoral institutions tend to be the most positive about their preparedness, perhaps again reflecting the large number of residential students they typically serve. The existence of an institutional crisis communication plan and executive leadership that places high priority on crisis communication appear to vary with respondents’ sense of preparedness to communicate in an emergency. And, signaling the value of teamwork, where the institution’s crisis communication team comprises representatives from a larger number of campus organizations, respondents said the institution was better prepared to notify constituents of an emergency and—what would appear to be the most difficult crisis communication challenge—to communicate with external stakeholders.

Agreement that the institution is prepared to communicate with external stakeholders during a crisis is stronger where respondents’ confidence in the dedicated emergency website channel is higher and their rating of that channel’s performance during the latest test of the ENS is better. That channel was used by a moderate number of respondents but was
among the channels least often tested, suggesting that developing a testing schedule for it can help strengthen an institution’s ability to communicate with this difficult key constituency.

Finally, institutions with integrated ENSs gave, on average, more positive responses about their preparedness in the event of a crisis to communicate with first-responders, notify constituents, communicate internally, and communicate with external stakeholders. Similarly, institutions that were more organized in the ways they appointed and supported the individuals who send emergency notifications were more positive in their assessment of the institution’s preparedness to communicate with all five constituencies during a crisis.

The institution’s strengths at communicating in a crisis are accompanied by benefits such as preventing injury or loss of life among community members, minimizing property damage, bringing outside help to campus, relieving the anxiety of concerned parents and alumni, and coordinating the many efforts needed to deal successfully with the situation. Most of the institutions we heard from appear to understand this. While some clearly have gaps in their preparedness, most have taken an organized, inclusive approach to planning and preparing for the worst and are confident in the robustness of systems they have put in place. Inevitably, some of these systems will be tested under actual emergency circumstances; many will succeed and some will fail. From all of these real-life tests, the higher education community will learn valuable lessons. While little net good can be said to come from an institutional catastrophe, the stories about what worked and what didn’t work in the way of crisis communications have served, and will continue to serve, the thousands of unaffected institutions whose own plans are informed by them. In this way communications—and in particular, communications about communications—help make us all a little safer.

Endnotes

8. Ibid., 17.
Rosa, 20, sits on a cushion on the floor in the TeraCampus/Twin Cities student union’s SimPit staring up at a big screen displaying a virtual 1980s-themed nightclub. Her head bobs up and down as she watches the screen while swiftly moving her fingers in a typing motion in the air. Occasional laughter by many other viewers in the room creates a sense of being the lone passenger on an airplane who didn’t pay for the romantic comedy. Billy Idol is sneering live on the stage in the background of the simulated club.¹

Suddenly, Rosa stops typing and pushes a button on a multicolored bracelet on her arm and says to no one in particular, “Hi Mom... no, I’m playing Circa 1980 at the Union, it’s hysterical!... I know, I’m so excited to get started on our fabric engineering project, too. Professor Li just holo-pinged us with the outline: The rest of the class will be working on the design of the synthetic human models, you and I will work with Desmond and Mikey from NYU on the fabrication of optical fiber material, and the team in Hong Kong will design the accessories. He’ll grade our work based on our MyFace logs. Yeah, I know it’s so cool we get to work together on this project. I’m heading to my SmartFashion class, I’ll see you at the holo-lab at four o’clock, OK? Te quiero.”²

Then she looks back up at the screen and quickly air-types, “Bye for now, Des, I’m off to class. I’ll ping you to tune in if anything applies to our project. Try not to spend all day in the ‘80s!” A chime alerts Rosa to push a button on her bracelet. “Hey Jerome!” she exclaims. “There you are! I was hoping you’d plug in before I head off to class. Are you up for a movie tonight? Great, let me see what’s playing.” She types in the air while looking at a screen built in to a column next to her cushion and says, “There’s a Brad Pitt retrospective at the DigiPlex right next to campus, what do you think?” She laughs and says, “It’s not going to be a chick flick...alright, next time we’ll do retro anime! Let me confirm our tickets.” With a push of a button on her bracelet, Rosa says, “Done...and we got a discount for the sushi bar across from the theater, want me to book a reservation? OK, I’ll see you at seven. Bye.” She pushes another button on her bracelet and the holographic keyboard she had been typing on disappears.³

“How do you like your ‘WristWrocket 2’?” asks a 50-something woman who is walking by. “I heard there were a lot of glitches with the first release.” Smiling, Rosa says, “I love it! I got mine through my school. They custom designed it for me, and it’s sweet-tight with the Universal College System MacroNet.”

“I’m such a late adopter. I’ll probably stick with my iTool 50g until Apple finally decommissions it! But, it docks with the

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“MacroNet really well, too,” the older woman replies. “So, which schools do you dock with?”

“I’m majoring in electric fashion engineering, a co-op degree with MIT and the Fashion Institute of Technology. But I got my core through the University of Arizona, so that’s still my official base system.”

“Oh, so Arizona logoed your WristWrocket? I heard that all the schools were customizing them.”

“Yes, not only am I tied into the local campus architecture, I can PingText, InstaChat, MyFace, and fly my whole personal metaverse with it.” Rosa smiled as she stuck her arm out to show her jeweled bracelet.

“Sweet design! I can still remember the days when we had a zillion services and devices to do the same thing! By the way, why did you move from sunny Arizona?” the other woman asked.

“I moved up here last year with my folks because my dad was relocated to Minneapolis. I’m so glad the new NeuroNet cyberstructure let me keep my Arizona presence. If we were still on the old Internet, I’d have had to set up a whole new CyberID for myself,” Rosa said as she packed her bags and got up from the cushion.

“All Arizona had to do was flip a switch and my base network was set to this TeraCampus, so I get all the local campus-wide messages and can use this campus TeraBank to store my content. It worked out great for my degree plan, too. Mom and I both love art and our smart-clothes, so we decided to take this fashion engineering program together. We want to start our own wearable solar battery design firm.”

“That’s really fascinating. My name is Regina Juarez-Johnson, by the way,” she said, reaching across to shake hands.

“I’m Rosa Martinez,” the younger woman replied. “Nice to meet you. What are you studying?”

“I got my undergrad in the ‘90s in accounting and eventually got my CPA, but the Globalized Labor Exchange Agreement in 2013 commoditized the work I was doing, so I decided to go to grad school for a master’s in green business administration. I picked the University of Chicago–managed curriculum, and this is my first semester.”

“You’re going to love this TeraCampus flexi-class system. Are most of your classes holo-based?” Rosa asked as she picked up her bag.

“About half. The engineering stuff is mostly coming from the University of Mumbai via holo-professor, but we get some great profs who take the fast train over from Chicago once a week. I have one class where the professor simulates enviro-crime and we have to solve the problem.”

“Oh, I heard about that class, ‘The Green Scene: Problems and Solutions.’ How is it?”

“Awesome!” Regina raved. “These second-generation simulated worlds are amazing.”

“I know. I can’t imagine what college was like before HE-TEA set the sim networking standards. I have to head to class. Are you walking toward PodWest?”

Regina pulled a 3-inch round disc out of her jacket pocket and looked at the circular screen. “I think so. It’s time for my wind-power lab in room PW300...yep, my iTool is pointing me to PodWest. What’s ‘HE-TEA’?” Regina asked.

“The Higher Education Transportability and Exchange Act. It set up the system where schools can co-curriculate degrees and exchange class data and student information through a standard protocol. It also implemented the Uniform Personal Communicator standards so we can use any device we want rather than the school telling us what we have to use. That’s why your iTool still works here... hey, I haven’t seen one in ages. I forgot it was shaped like an apple!”

Looking down at her device, Regina sighed. “Yeah, it was so state-of-the-art
It may seem that immersive holographic entertainments and intelligent agents suave enough to inspire a schoolgirl crush are the most ambitious elements of our futuristic scenario (circa 2020). But whatever new tools may enter our technology environments, their power to transform will be enormously amplified by a development already emerging today: the disappearance of discrete single-function channels in favor of a user-centric environment of unified communications. Today’s messaging environment provides us with a profusion of channels for reaching each other. The temptation sometimes is to “shotgun” our messages, sending them through multiple channels in hope of finding the intended recipient at the end of one of them. Just count how many phone numbers, e-mail and social networking accounts, and actual communication devices you juggle to keep in touch with your family, friends, and professional colleagues. And think of the many different messaging channels you employ to reach them. In some families, it would be standard practice for a parent to “Facebook” the teenage daughter, “text” the 20-something son, and e-mail the 40-something sibling about next weekend’s family get-together. In higher education, administrators and faculty members face similar dilemmas, struggling to mix and match protocols to communicate effectively with the institutional community, especially to reach a student population that increasingly thinks “e-mail is for old people.”

The next generation of communication services will flip this paradigm into one whereby communication protocols, software, and collaborative tools are mashed up into uniquely designed communication applications funneled to the recipient’s preferred device-of-the-moment. This device will increasingly be an intelligent mobile device that is aware of its owner’s geographic location, availability, and preferred communication channels. In the academic context, students,
faculty, and staff will be able to communicate effectively regardless of location or device type, with significant implications for collaborative research, course project work, online education, administrative services delivery, and emergency notification.

Moving from here to there promises a variety of benefits while posing a variety of challenges. This chapter discusses three aspects of the new communications order—the expansion into multimodal communications, the convergence onto a unifying technology platform, and the rise of the intelligent mobile device—and their implications for the information technology leader.

From One to Many
One of the major findings of Spreading the Word: Messaging and Communications in Higher Education is e-mail’s shifting role in higher education. While ubiquitous, e-mail’s primacy as a communications medium is waning, especially from the student perspective. In its place, a new multimodal communications tapestry is emerging, one whereby people don’t just e-mail each other directly but reach out across a variety of communication channels. The ECAR 2008 study of undergraduate students and IT also describes this emergent environment. More than 85% of students responding to that survey reported using social networking sites—and most said they do so on a daily basis; text messaging is used by 83.6%, and instant messaging is used by 73.8%.11

Another shift is occurring, too. Users’ perceptions are changing as e-mail becomes only one of a growing number of mainstream communication protocols. Theresa Rowe, chief information officer, Oakland University, puts it this way: “Today’s e-mail user is no longer simply communications oriented. The user has grown beyond that, creating a strong expectation that e-mail will be integrated with every communication tool such as chat, file sharing, and calendaring.” This expectation tracks with the emerging messaging and communications environment. Nortel’s Mark Hinckley describes how service-oriented architectures (SOAs), network appliances, and extensible server technology will “enable the on-demand ‘mashup’ of communications services such as voice, media, and messaging services that all present themselves through a simplified user interface. These services will be linked or directly imbedded into an enterprise application (such as an ERP) allowing organizations to communication-enable business process. This modular approach significantly reduces the cost of integration and dramatically increases speed-to-decision for any business or institution that benefits from the collective power of knowledge workers.”12

This transformation has ramifications for institutions and IT organizations alike.

First is the issue that colleges and universities today rely on e-mail as the primary—and at many institutions, the official—channel for communications. But how effective and timely can an institution’s administrative communications be with its students, faculty, and staff when it sends messages on a channel that the recipient may or may not use regularly? Several participants in our qualitative research described how infrequently students checked their e-mail. “The students’ perception of e-mail as an official communications medium is more casual than the university’s,” states Dave Tindall of Seattle Pacific University. Institutions will have to rework their communications policies if they want to remain in touch with their constituencies, especially their students. As C. Van Wyatt of Texas State University–San Marcos acknowledges, “In the foreseeable future, we will play a constant game of analyzing the message to be dispersed, its target audience, and the appropriate communications tool that optimizes the message’s transmission.”

A second challenge is that of incorporating the collaborative and networking aspects of multimodal communications into today’s
In many ways, the current situation mirrors the nascent World Wide Web of the 1990s when higher education, corporations, and society as a whole recognized the web’s importance but grappled with how to make it applicable to their lives. As the University of Wisconsin–Madison’s academic technology director Kathy Christoph observed in a recent EDUCAUSE podcast, today’s social networking world “feels like chaos. We are observing the chaos and what comprises it and sorting it out in a way that will provide some benefit to the students.”

Institutions and IT organizations must wrestle with how and whether to integrate such technologies as Facebook and Twitter into their IT services and infrastructure. Christoph, along with colleagues Joanne Berg and Lori Berquam, describes a matrix of enhanced campus services made possible through the interplay of campus applications and messaging technologies such as e-mail, social networking, poke, chat, and others. (See Table 8-1.)

When reviewing the matrix, the questions that pop to mind relate to central IT’s role in providing, managing, and supporting these services, and its ability to do so. How does IT integrate them in a meaningful way for the institution and, more importantly, for the user? Does central IT build its own applications—losing the networking opportunities that more commodified services provide and adding to its support burdens—or does it watch constituents develop dependencies on external products over which the IT organization has no control?

Because students and other constituents were introduced to emerging communication services in contexts far removed from their “official” relationships with institutions, it’s difficult for institutions either to provide substitutes for the services or to parse the ill-defined social and cultural rules that surround those services. For example, Tindall recalls his IT organization’s attempt to introduce an internally developed social networking tool two years ago just when Facebook and MySpace were gaining popularity. He and his team were attracted to the idea that people could communicate with their campus peers in a campus-controlled area apart from the wider—and perhaps wilder—Internet. Interestingly, it failed because students and others felt the service was too closely tied to the university. While Seattle Pacific’s application had few restrictions, its users did not feel as free and easy as they did on similar, commercially available services. After a couple of years of little use, the IT organization let the service die and has now taken a hands-off approach to similar services because, Tindall says, “so many third parties are so good, we didn’t need to compete in that space.”

As for becoming an institutional “friend” via commodity platforms, this remains a challenge because of the multitude of stovepiped platforms and because institutions run the risk of crashing a party where they aren’t welcome. ECAR’s 2008 study of undergraduates found that while half of respondents used social networking sites (SNSs) to communicate with classmates about course-related topics, barely 6% used them to communicate with instructors. Whether this is due to student aversion or lack of opportunities isn’t clear, but it certainly indicates that the vigorous incorporation of peer relationships into student SNS culture hasn’t been matched by the comparable incorporation of other kinds of relationships that institutions care about.

As Cornell University’s Tracy Mitrano, director of IT policy, points out, social networking is demonstrating some longevity as a “cool new tool, and it behooves the higher education institution’s IT thought leaders and practitioners to stay connected to its emerging technologies, its social norms and psychological meanings, its advertising and market models, and its legal and policy queries on a global scale.” The same could be said of microblogging (e.g.,
Table 8-1. Campus Impacts of New Messaging and Communication Technologies

<table>
<thead>
<tr>
<th>Core Campus Activities</th>
<th>Connecting on Ideas</th>
<th>Making Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>• Display information in a way that makes it more flexible for students to play with their schedules&lt;br&gt;• Access tentative snapshot of new syllabus or posting of old syllabus&lt;br&gt;• Check with friends about suggestions for classes and see which classes friends are enrolling in&lt;br&gt;• Read about the instructor, his/her requirements&lt;br&gt;• Access links to faculty evaluations&lt;br&gt;• See photos of instructors&lt;br&gt;• Identify courses with service learning components</td>
<td>Registrar&lt;br&gt;Academic Technology&lt;br&gt;Service Learning Providers&lt;br&gt;Faculty&lt;br&gt;Portal Service Providers&lt;br&gt;IT Architects</td>
</tr>
<tr>
<td>Tutoring</td>
<td>• Poke an expert&lt;br&gt;• Know when other students from class are online and available to answer a question</td>
<td>Tutoring Services&lt;br&gt;Advisers&lt;br&gt;IT (identity management)</td>
</tr>
<tr>
<td>Study Groups</td>
<td>• Connect with other students, see their photos, form interest groups&lt;br&gt;• Build project teams&lt;br&gt;• Create online groups, in real-time</td>
<td>Academic Technology&lt;br&gt;IT (identity management)&lt;br&gt;Portal Service Providers</td>
</tr>
<tr>
<td>Class Scheduling</td>
<td>• Project the future&lt;br&gt;• Determine history of courses that &quot;go with&quot; other courses (Amazon.com model: &quot;students who enrolled in this course also registered for . . .&quot;)</td>
<td>Registrar&lt;br&gt;Academic Technology&lt;br&gt;Faculty</td>
</tr>
<tr>
<td>Counseling</td>
<td>• Have a place where difficult conversations can occur privately&lt;br&gt;• Follow up with students about campus issues&lt;br&gt;• Answers given 24/7</td>
<td>Dean of Students&lt;br&gt;Counselors&lt;br&gt;Advisers&lt;br&gt;IT Architects&lt;br&gt;Registrar (FERPA)&lt;br&gt;Health Services (HIPAA)</td>
</tr>
<tr>
<td>Academic Advising</td>
<td>• E-mail/poke regarding progress in class/major&lt;br&gt;• Self-built portfolio of achievements ready to share with the world and updated regularly&lt;br&gt;• Poke an adviser (adviser to poke student)&lt;br&gt;• Ask a dean academic questions (provide support electronically)&lt;br&gt;• Online peer advising (volunteer opportunities on campus)&lt;br&gt;• More online “chat” features&lt;br&gt;“Playing” with possible schedules, majors, and degrees (can it be a game?)</td>
<td>Registrar&lt;br&gt;Advisers&lt;br&gt;Service Learning Providers&lt;br&gt;Academic deans&lt;br&gt;IT (identity management)&lt;br&gt;Academic Technology</td>
</tr>
<tr>
<td>Directory Information</td>
<td>• Provide photos and e-mail addresses in a portal environment; create groups easily&lt;br&gt;• Provide staff profiles</td>
<td>IT (identity management)&lt;br&gt;ERP System(s)</td>
</tr>
</tbody>
</table>

Cont’d
From Many to One

While communication options are likely to continue to multiply, next-generation communications will channel them into a single reception and redistribution technology. Whereas calls and messages now each follow separate paths to dedicated devices, future calls will be directed to a common distribution system. That system will “know” to whom the communication must go and will adapt itself according to its knowledge of the receiving device(s) that recipient prefers and has access to at the moment. Obviously, this is a tall order,
and constructing a distribution system with these capabilities requires several precursors.

The first step in achieving this vision is to create an integrated platform that ties everything together. The term now associated with the underlying technologies is unified communications (UC). UC gathers messages and information from different sources—instant messaging, text messaging, video, e-mail, voicemail, and others—and delivers them in the preferred method to the user on a real-time or nearly real-time basis. Another important, but not yet broadly deployed element in UC is “presence,” in which the distribution system maintains a set of continuously updated information about the recipient’s location, availability, and preferred means of communication. The continued convergence of communication devices into a single platform will provide mobility, presence, and contact capabilities that extend beyond the phone to all devices people may use or have at their disposal. UC’s potential can be realized in three phases.

Phase 1: Protocol Layer Convergence

This represents the industry’s current, ongoing shift from proprietary, media-dependent telecom-based operating systems that operate autonomously to those using the Internet Protocol (IP). IP creates a common network protocol layer that allows applications to communicate ubiquitously in a localized campus environment or via the global Internet. This was a very powerful first step in unifying communications. As Nortel’s Hinckley describes it, “The shift to IP was the great liberator of network-based communications. Via IP, we were able to create a common network transport layer that would link the expanding Internet with corporate enterprise and, eventually, the consumer market.” Adoption of IP and open standards in PC and Mac operating systems, mobile computing devices, browsers, intranets, extranets, and LAN-based server architectures among many other things made it possible for “the communications industry to rally around IP as the default communications protocol for the base network construct. Multiprotocol systems converged around IP, and the foundation for UC was born.”

Phase 2: Physical Layer Convergence

In this phase of the movement toward UC, there is a decoupling of devices and services. For example, the PBX-based phone system that switches calls to stationary phones via dedicated copper evolves to a network in which telephony and telephone-based services are served by separate IP-based appliances. This reduces the number of physical networks the institution must maintain and allows it to select optimal hardware platforms service by service and manage maintenance contracts optimally. More importantly, it facilitates the integration of different information and communication services.

Many institutions are already taking this step by integrating their phone service into the institution’s data network via voice over IP (VoIP). As noted in Chapter 5, 48.4% of institutions have adopted or are adopting VoIP for faculty/staff telephone service.

In turn, VoIP can be a springboard for other applications. For example, the University of Louisville’s IT organization discerned quickly that its VoIP phones “were basically a mini PC sitting on your desk,” according to the university’s Tom Sawyer. “If we bought the right handset, we would be able to write and deploy our own applications.” Over time, the university has created a number of VoIP applications, notably an emergency notification system that can transmit a voice and text message to every one of the university’s 10,000 VoIP handsets in less than a minute and a half. Another popular VoIP application is a University of
Louisville phone directory, which provides the same information found in the university e-mail directory. (See the ECAR case study “The University of Louisville: Fulfilling the Promise of VoIP” to learn more about that university’s VoIP implementation.)

**Phase 3: Person-Centric Communications**

With the network layer in place, the convergence of IT technology, workflow process, and user-specific presence begins to take hold in phase 3, where unified messaging becomes what Burton Group’s Jack Santos calls “a logical evolution beyond VoIP. At this point, functions such as calendaring, presence, and collaboration enable geographically separated personnel to function as if they were in the same room.” Thus, the network is no longer delineated by the physical location of phone jacks and switch ports; the network now becomes the collective interaction of its users no matter where they are, what they are using, or what they are doing. The users, not their tethered devices, are now the center of communications, and the network adapts itself to these users. In real time, network intelligence, presence, and user context manifest who you are, where you are, and what your preferences, organizational expertise, availability, and communications capabilities are. The result is twofold: the creation of new, innovative services, and, as Nortel’s Hinckley believes, the transformation of existing layered business process as the network transforms from a physical infrastructure utility to a workflow enabler via human-to-human, human-to-machine, and machine-to-machine communications, especially as the population of UC-enabled devices grows.

Phase 3 depends upon two key enablers. The first is the incorporation of standards-based web services, perhaps developed under an SOA. While its promise has yet to be realized broadly, SOA’s reliance on open standards seems to some to be ideal for a UC platform. As Jim Phelps and Brian Busby explain in *EDUCAUSE Quarterly*, the SOA notion of building services from reusable software components in different combinations, along with SOA’s Internet-based platform and its process transparency, seems to mirror UC’s basic premise of interchangeability.

The second enabler of a UC platform is the means to transact these services in a device-independent manner. To accomplish this, the solution of choice is Session Initiation Protocol (SIP), an Internet Engineering Task Force standard. SIP creates session-oriented connections between two or more IP network endpoints, as, for example, telephones, instant messaging clients, or participants in a collaborative multimedia teleconferencing application. According to the SIP Center, SIP’s resemblance to HTTP and SMTP means SIP resides alongside Internet applications, enabling telephony to become another web application that integrates easily into other Internet services. A key element of SIP is the Session Initiation Protocol for Instant Messaging and Presence Leveraging Extensions (SIMPLE), which delineates how to share and transmit UC’s presence elements among devices and applications.

**A Communications Mashup?**

Together these standards-based services and protocols form a basis from which to realize the mashed-up nature of the next-generation communications model: services and devices that are combined to create personalized application experiences. The users are at the center of processes, allowing them to communicate when and how they like and in the mode most efficient or productive for them on the basis of the specific task they are doing. Add
in such capabilities as mobility, presence, high-definition video, and imbedded intelligence and a new order of communications emerges in which customization, collaboration, and content converge. Witness the converged services environment that characterizes the 2020 of Rosa and Regina. More proximate examples are likely to include

- Intelligent emergency notification systems (ENSs) that automatically send alerts in the recipient’s preferred modes (e.g., voicemail, e-mail, phone call, or text message), using agreed-on conventions for distinguishing different emergency levels (e.g., code red for a sniper on campus versus code yellow for an ice storm).

- An almost unimaginable array of smaller-bore applications like the geolocational and knowledge-base mashup envisioned by MIT in which students use their mobile devices to match daily menus with their dietary needs or preferences and locate the appropriate dining facility nearest to their current location.

- Increased interactivity of classes and coursework by incorporating conferencing tools and video to link up students and professors from wherever they happen to be located at the moment: office, residence hall, library, or café. Students can share and edit documents simultaneously while working on projects. Faculty and students become easier to reach because a single message finds them wherever they are.

- Centralized directories in every building that will identify and direct people to their meeting locations. For example, on the first day of class, a student enters a classroom building and touches a wall unit that then identifies her or him, accesses the appropriate registration information, and directs the student to the appropriate classroom.

UC’s premise of enhanced interconnectivity offers numerous benefits, but it presents challenges as well. One challenge is its dependence on broad vendor adoption of SIP or other key standards to enable device- and application-level integration and interconnectivity. Though hundreds of companies now claim to provide SIP services and products, at least one major vendor is missing currently—Google. Google has stated its intention to support SIP in the future, but its lack of compliance today may stymie an application developer’s efforts to provide a universal solution.

And just as broad vendor acceptance of standards is key to unified communications, so is extensive user adoption. As Indiana University’s (IU) IT organization seeds UC adoption in departments around its campuses, IT staff members have observed that due to its collaborative nature, all team members—not just one or two—have to adopt it. “A sole person using it [UC] in a workgroup is not productive, and this person does not experience its advantages,” states Matt Dixon, senior systems engineer. “Everyone in the workgroup needs to use the unified communications’ IM application and presence indicators to reap all of its benefits.” Interestingly, IU IT staff members have seen how synergy builds up following a UC implementation, pushing adoption outward into the department as the early adopters tell others about their positive experiences.

As this example suggests, peer influence and cultural evolution could have as much to do with how UC works as technical capability. Users are likely to greet their ability to sit at the center of a growing universe of communications services with a mixture of excitement, wariness, and confusion. Already, the explosion of electronic communication possibilities has sparked controversies about how to set reasonable expectations for availability and how to balance the benefits of interconnection with the costs of interruption and
loss of privacy. While UC may help filter out some noise and inconvenience in individuals’ communications environments (for example, through smarter and more robust preference profiles), it will also feed still further a default assumption of constant “reachability,” and it will leave detailed trails of personal behavior. Institutional communications in this environment will have to be sensitive to the nuances of cultural mores still to be determined. This is all the more reason why institutions need to monitor today’s emergent communication behaviors, even when they seem remote from current institutional needs.

The logical nexus around which unified communications “unify” will be the individual user. But the physical nexus will be a device that can cross what were once completely separate realms of communication—voice and data, audio and video, geospatial information and personal presence. Such devices, already transforming the mobile telephony market into an increasingly data- and applications-oriented space, will be ubiquitous under UC.

**Toward a Convergent Device**

Mobile phones are rapidly evolving from simple cellular phone instruments into intelligent, user-friendly, handheld communication devices. Google’s G1, Apple’s iPhone, Palm’s Pre, and the BlackBerry Storm have all attracted enormous attention. In actuality, these devices are miniature computers that converge messaging, voice communications, web browsing, GPS, and many other applications into a device that fits in the palm of your hand.

And while they are substantially more robust than past-generation devices, today’s mobile devices merely hint at the capabilities of models to come. Indeed, many experts who participated in the Pew Internet & American Life Project predict that tomorrow’s phone, though it will most likely look similar to today’s, will functionally resemble a multitasking computer, used less for voice communications than for other tasks.\(^{29}\) Mobility, not deskbound communications, is clearly the wave of the future. This panel of experts believes that the “mobile device will be the primary connection tool to the Internet for most people in the world in 2020.”\(^{30}\)

Along with its enhanced capabilities, the mobile device inherently supports UC’s concept of presence. Through GPS technology, even today’s mobile communication service carriers can pinpoint the location of all their subscribing devices, but the incorporation of the SIP standard for call controlling and signaling functions into the compelling new 3G mobile communication standards further solidifies the UC vision by making any SIP-enabled service accessible in mobile situations. The SIP Center notes that SIP’s element of presence is particularly important in the world of mobility, with its ability to locate the student on campus, the administrator in a meeting, or the faculty member at a conference once the individual’s mobile device registers his or her location with a SIP server. As mobility becomes more commonplace, the ability to move services across platforms becomes increasingly important.\(^{31}\)

It’s true that converged devices continue to have weaknesses that could affect their adoption as the frontline devices of UC. One serious issue is battery life. New research is offering dramatic increases in the power storage capacities of batteries themselves, while other research focuses on more efficient radio and microprocessor technologies in an effort to extend the life of the current generation of batteries. MIT’s Technology Review reports that Intel’s new microprocessor for mobile Internet devices, called Atom, can be put to sleep at up to six different power levels, depending upon the tasks at hand.\(^{32}\) Adobe and chipmaker ARM have formed an alliance to enable the next generation of Adobe Flash Player to use the graphics subprocessor found on some ARM chips to render graphics more efficiently on
mobile devices, thus saving battery power. Google is taking another approach. It launched a program whereby users download and evaluate applications developed for Android, the Open Handset Alliance’s mobile platform, on which Google’s G1 mobile device operates. Users assess the applications’ drain on the mobile device’s battery during the evaluation process, motivating developers to create power-efficient applications so that users won’t vote them down.

As more and more people incorporate mobile devices into their daily activities, the second challenge emerges—the adaptation of applications for mobile devices. Anyone who has tried to access web-based information via a mobile device can relate painful experiences about the process. While need recognition is high, enabling web applications is not an easy task on which to embark because of the numerous mobile operating systems in play, the sometimes lagging commercial software vendor community, and the lack of internal resources for IT organizations to tackle such a project. Notwithstanding these difficulties, a variety of institutions such as Stanford, Seton Hall, the University of Cincinnati, Duke, MIT, and others are committing themselves to “mobilizing” a great many institutional services.

Furthermore, as Apple’s iTunes App Store demonstrates, vendors are developing software distribution models specific to converged mobile devices, and developers are busily reinventing those devices with applications that exploit such features as GPS, accelerometers, video, and—crucially—social networking. The whimsical Smule Ocarina application for the iPhone not only turns the device into a musical instrument—users blow into the microphone and finger video “keys” on the display to create sounds—but also permits users to listen to, and join in with, other players in real time over 3G networks. By removing much of the integration friction and channel stovepiping currently inherent in the communications infrastructure, unified messaging can deliver this kind of inventive multimedia interaction across platforms to a widespread community of users pursuing a multitude of interests. Capabilities like this may pave the way for the behavioral changes needed for successful adoption of UC, making presence announcement and on-the-fly joining of purposeful groups more “natural” and even socially essential.

Implications for the IT Leader

As we think about the future of messaging and communications, we are again reminded that the past is prologue.

The coevolution of operating systems for the Palm, Apple, BlackBerry, and Google platforms is a cycle that longtime IT practitioners have seen played out many times before. It seems reasonable to predict that standards battles will continue to rage and that there will be winners and losers. It is also likely that ultimately those technologies that abstract software from hardware will prevail, that network-based services and standards-based architectures will proliferate, and that markets will anoint winners and losers in a process that leads ultimately toward device independence, if not outright convergence. The case for UC is too compelling, and frankly, we are already too close for any responsible technologist to play the naysayer. We can only quibble about what degree of unification or agnosticism will come on stream and when it will come on stream. While this is a more limited debate, it is nonetheless an important one, if one’s goal is keeping the enterprise at or near the cutting edge.

That said, the vision of a presence-enabled communications infrastructure that integrates telephony, desktop, personal, and business applications to deliver a unified user experience is not without implications for leaders within higher education.
The biggest challenge facing those responsible for managing enterprise communications is the increasing movement of this marketplace toward the consumer. In 1967, messaging was technically complex and socially straightforward. There were four nodes on the original ARPANET, and the earliest communicators across this network were specialists who were well known to one another. The scale of computing was large, and control of computing and communications was institutional, if not national.

The fundamental architecture of the Internet—IP—was built on assumptions about scale and human conduct in cyberspace that did not completely predict today’s challenges respecting personalization, consumerization, identity, security, privacy, and other weighty issues. Not surprisingly, social challenges like virus mongering, identity theft, denial-of-service attacks, phishing, and the like constitute the lion’s share of challenges that will constrain, slow, and perhaps define the future course of messaging and communications.

The consumerization of technology means now that many of us walk around with devices that carry voice communications, transmit data, and store movies, music, documents, and other bits and bytes of modern life that span our personal and our professional lives. We arrive on campus laden with multiple computers, a smartphone, a terabyte of external storage, an e-mail account, a router, a set of widgets, an e-book reader, dozens of profile-based website affiliations, and a dizzying and dazzling library of books, music, videos, and applications. While the enterprise can legislate or even assert the standards of appropriate use of technologies that reside within its domains, it will become harder and harder to do so as the boundary between enterprise use and personal use of technology continues to erode. And because the institution no longer owns the means of messaging, it will become harder and harder to exercise control over messaging and communications. In short, the institutional role in supporting messaging and communications is transforming from that of provider to one of integrator. Providers build, ration, protect, and control, while integrators expose, mediate, and enable.

Realizing the futuristic vision of a presence-enabled communications infrastructure will depend on a robust identity infrastructure. For such an infrastructure to succeed, members of a higher education community will need to be identified as such in institutional directories, and their access rights will need to be defined and instantiated in institutional IT infrastructure. Inanimate objects too will need to be somehow affiliated with institutions and with individual or organizational “owners,” and rules regarding their accessibility and use will also need to reside in institutional information systems. These identity capabilities and their actualization in institutional IT are not inherently complex. They are, however, socially challenging, as they require a consistency of rule making and a level of policy transparency that many institutions will find challenging or countercultural. Colleges and universities are loath to implement building security and other forms of access restriction. Most are even more uncomfortable making these kinds of access decisions publicly known. When a “smart” building recognizes you and rejects you—while admitting your colleagues—you will understand the limitations and challenges of telepresence, imbedded intelligence, and identity services in institutions like ours.

These issues suggest not only the need to invest rather seriously in identity services and in federated identity management but also the need for IT providers to explore new ways of engaging with the institutional community. IT leaders will need a deep understanding of the institutional culture and the ways its citizens communicate. Essential to developing such an understanding is developing and promoting awareness that communication values and mores are rarely monolithic—
witness the frequently surprising collisions of openness and privacy on Facebook (where your prospective employers may surf photos of last night’s bacchanal). As always, the best form of engagement is communication with IT’s stakeholders. For example, to help with long-term planning, Cathy Horvath, director of IT, Minot State University, is gathering user input through a series of short surveys of faculty and staff. Horvath’s surveys track telephone features used or sought and probe such issues as how students or faculty would complete their daily work using only a cell phone. Recall (Chapter 3) that shared understanding of the communication preferences of IT’s stakeholders is closely associated with our survey respondents’ belief that the current and planned messaging and communications infrastructure meets the institution’s needs. In this case, familiarity seems to breed contentment.

Because much of the communications landscape is being created and socialized first outside the bounds of our institutions’ IT environments, successful IT leaders will need to become adept at spotting new trends, extracting “the wisdom of crowds,” and assembling the right people to determine whether, when, or if a new communication channel should be institutionalized. Distinguishing today’s messaging and communication flash in the pan from tomorrow’s killer communication app will likely get harder and harder as the number of apps and their frequency of invention increases. Flexibility will be an essential organizational attribute in this environment. While it is reasonable to speculate about the nature of a UC end state, it is axiomatic that there will be no single or even direct route to next-generation communications. Rather, the road ahead will be characterized by twists, turns, and multiple lanes. “We had an understanding of what feature set we could offer,” states Indiana University’s Dixon. “But as we built our UC platform, we discovered we had to rethink our strategy because in actuality the feature integration worked differently. It was part of the learning process.”

While many of the most vexing and interesting challenges on the road ahead will be social in nature, next-generation messaging and communications will present numerous technical challenges as well. Again, a broad vision needs to be in place to deal with these issues effectively. For example, this report shows that two-thirds of institutions are at least planning to implement VoIP. If made with an eye to the future, this change can lay the groundwork for SIP. While there are not many SIP-capable applications currently, there are many SIP-ready switches on the market. According to Jennifer Van Horn, manager, network distribution, when Indiana University planned its upcoming communication initiative, “We did not want to install VoIP just for VoIP’s sake.” Through trial and error, Indiana University eventually chose a solution that facilitated the institution’s eventual move into UC.

Interoperability, while a predictable goal, will be a technical and an organizational challenge. Integration from the enterprise VoIP server to the mobile device is necessary to ensure connectivity without regard to a user’s location or device. And as the data network assumes centrality, the need to build in redundancy and backup throughout the transmission chain will become even more critical. A single failure—whether it is a dead cell phone battery, a service carrier disruption, or a server down—can simultaneously impact several communication channels. Scalability is important, too, to handle next-generation communication’s growing number of users and increasing demands. Institutions will need a strategy to web-enable applications across communication channels.

The future of messaging and communications is bright. We really can look forward to a near-term future that incorporates much of what we thought of yesterday as science
fiction. Rosa’s universal communicator, avatar, and holographic displays are all in development and will move quickly from the laboratory to our pockets, our clothing, our homes, and our cars. The domination of this landscape by Google, Apple, Palm, RIM, and the world’s largest telecommunications carriers ensures both a battle royal regarding standards and a breathtaking infusion of capital. This capital ensures rapid progress, though progress will surely be constrained when competition plays out in case-hardening the bunkers of proprietary technologies.

This titanic struggle is complemented by a large and growing open-source movement. To the extent that the messaging and communication landscape will be shaped in part by a converging infrastructure and in part by the proliferation of open-source widgets that facilitate the individual’s control of his or her messaging environment, the consumer is the clear winner. The challenge for the institution, therefore, is to develop a messaging and communications architecture and support strategy that define technical, support, and policy promises and limitations. Just as today, one-quarter of surveyed colleges and universities have already outsourced student e-mail to Google or Microsoft (unthinkable even five years ago!), tomorrow’s higher education leaders will begin to question why their institutions need to provide student e-mail at all. Still others will begin to shift the dialogue from a focus on the things an enterprise must provide to a focus on the things an institution needs to know about (and have access to). This dialogue lies at the heart of future leaders’ conversations about institutional needs and consumer rights. Such a dialogue almost inevitably will lead to questions about deep policy matters—privacy, access, speech, hate words, and so forth.

In short, the future is likely to witness an increasing shift in interest from how we communicate to what we communicate. As author and futurologist John Naisbitt argues, “The most exciting breakthroughs of the 21st century will not occur because of technology but because of an expanding concept of what it means to be human.”

**Endnotes**

1. “TeraCampus” high-tech flexible campus concept—EdCampus is a for-profit concept development in Chaska, Minnesota. It is a “state-of-the-art, boundary-breaking, collaboration-building destination for learning and innovation...that combines students from diverse institutions, backgrounds and disciplines into one dynamic campus—outfitted with the best available technology, customizable space and student-centric services,” http://www.edcampusmn.com; also Alex Soojung-Kim Pang, “Academic Spaces Move from Contemplative to Collaborative,” November 6, 2007, http://www.significant.org/en/forecasts/academic-spaces-move-contemplative-collaborative.

2. Parents, grandparents, and their children will be going to school together in increasing numbers. Research has shown that only about 15% of higher education students still fit the traditional definition of young adults ages 18 to 22 who live on campus and go to school full time. Many today are working adults, often with families, who want to advance in their careers. Michael J. Offerman, http://www.theother85percent.com/about/.


18. Hinckley, letter to Katz. Note that TCPIP did not become part of the Microsoft operating system until 1994 with the release of Windows 95.


20. Albrecht and Pirani, “The University of Louisville.”


22. Mark Hinckley, telephone conversation with Richard Katz, Mark Sheehan, Judy Pirani, and Ronald Yanosky (all ECAR), and Matt Konwiser (Nortel), October 15, 2008.


Appendix A

Institutional Respondents to the Online Survey

Abilene Christian University
Alliant International University–San Diego
Antioch University System Administration
Aquinas College
Arizona State University
Armstrong Atlantic State University
Art Center College of Design
Assumption College
Athabasca University
Auburn University
Austin Community College
Baker College System
The Banff Centre
Barton County Community College
Bates College
Baylor University
Bellevue Community College
Benedictine University
Bethel University
Black Hills State University
Boise State University
Bowling Green State University
Brandeis University
Brenau University
Bridgewater State College
Broome Community College
Brown University
California Polytechnic State University, San Luis Obispo
California State Polytechnic University, Pomona
California State University, Bakersfield
California State University, Chico
California State University, East Bay
California State University, Long Beach
California State University, Sacramento
California State University, San Bernardino
California State University, San Marcos
California State University, Stanislaus
Camosun College
Campbell University
Canisius College
Carleton College
Carroll University
Catawba College
The Catholic University of America
Cecil College
Central Connecticut State University
Central Michigan University
Chapman University
Chesapeake College
Chicago State University
Christopher Newport University
Cincinnati State College
The Citadel
Clark State Community College
Colby-Sawyer College
The College of New Jersey
The College of Saint Rose
The College of Saint Scholastica
College of the Holy Cross
College of William and Mary

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St. Louis College of Pharmacy
Sullivan University
SUNY College at Oswego
SUNY College at Plattsburgh
SUNY College of Optometry
SUNY College of Technology at Delhi
Swarthmore College
Sweet Briar College
Syracuse University
Tennessee State University
Texas A&M University at Galveston
Texas Lutheran University
Texas State University–San Marcos
Trinity University
Tufts University
Tulane University
UCLA
Universidad Carlos Albizu
University at Albany, SUNY
University of Alberta
University of Baltimore
The University of British Columbia
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Merced
University of California, Riverside
University of California, San Diego
University of California, San Francisco
University of California, Santa Barbara
University of California, Santa Cruz
University of Central Missouri
University of Central Oklahoma
University of Cincinnati
University of Colorado at Boulder
University of Denver
University of Detroit Mercy
University of Hartford
University of Houston—Downtown
The University of Kansas Medical Center
University of La Verne
University of Louisville
University of Maine at Fort Kent
University of Maine at Presque Isle
University of Manitoba
University of Maryland Eastern Shore
<table>
<thead>
<tr>
<th>University System of Maryland</th>
<th>Webster University</th>
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<tr>
<td>Ursinus College</td>
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<td>Vanderbilt University</td>
<td>West Virginia Northern Community College</td>
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<td>Vermont Law School</td>
<td>Westchester Community College</td>
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<td>Vermont State Colleges</td>
<td>Western Illinois University</td>
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<tr>
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<td>Western Kentucky University</td>
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<td>Virginia Military Institute</td>
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<td>York University</td>
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<td>Washington College</td>
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Appendix B

Interviewees in Qualitative Research

Cecil College
Stephen diFilipo, Vice President and CIO

Chesapeake College
Douglass Gray, Chief Technology Officer

Embry-Riddle Aeronautical University
Cindy Bixler, CIO

Fresno City College
Don Lopez, Director of Technology

Georgia Gwinnet College
Lonnie D. Harvel, Vice President for Educational Technology and CIO

Glendale Community College
KC Hundere, Director of Information Technology

Harper College
David McShane, CIO and Vice President Information Technology

Indiana University
Matt Dixon, Senior Systems Engineer
Jennifer Van Horn, Manager, Network Distribution

Linn-Benton Community College
Ann L. Adams, Director, Information Services

Louisiana State University and A&M College
Brian D. Voss, Vice Chancellor for Information Technology & CIO

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Lynchburg College
Howard Ramagli, Associate Vice President, Information Technologies & Resources

Manchester Community College
Jason Blosser, Director of Information Technology

Massachusetts Institute of Technology
Wilson D’Souza, Director, Infrastructure Software Development and Architecture
Andrew Yu, Mobile Devices Platform Project Manager

Middle Tennessee State University
Lucinda Lea, Vice President of Information Technology and CIO
Steve Prichard, Director, Telecommunication Services

Minot State University
Cathy Horvath, Director of Information Technology

Oakland University
Theresa Rowe, CIO

Oberlin College
John E. Bucher, Chief Technology Officer and Director of the Center for Information Technology

Oglethorpe University
William E. Morse, Chief Information Officer and Director, IT Services
Steve Renker, Systems and Communications Manager

Princeton University
Steven Sather, Associate CIO

Raritan Valley Community College
Chuck Chulvick, Vice President, Learning & Technology Services

Seattle Pacific University
Dave Tindall, Assistant Vice President for Technology Services and CIO

Seton Hall University
Paul E. Fisher, Jr., Director of the Teaching, Learning, and Technology Center
David Middleton, AVP, Finance & Technology

Texas State University–San Marcos
Mark A. Hughes, Assistant Vice President, Technology Resources
C. Van Wyatt, Vice President for Information Technology

University of California, Irvine
John Mangrich, Manager, Central Computing and Security
University of California, Riverside
Charles Rowley, Associate Vice Chancellor, Computing & Communications

University of Denver
Ken Stafford, Vice Chancellor of Technology

University of Louisville
Priscilla Hancock, Vice President for Information Technology and Chief Information Officer
Thomas M. Sawyer, Assistant Vice President for Information Technology
Jay Vetter, Director, Communications Services

University of Minnesota Duluth
Linda Deneen, Director, Information Technology Systems and Services

University of Notre Dame
Dewitt Latimer, Deputy CIO and Chief Technology Officer
Appendix C

Bibliography


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Appendix D

Statistical Details

(Selected Tables)

Table D-1. Supplement to Figure 7-6. Confidence That ENS Channels Will Perform Effectively under Peak Load

<table>
<thead>
<tr>
<th>ENS Channel</th>
<th>Confidence That Channel Will Perform Effectively Under Peak Load</th>
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<tbody>
<tr>
<td></td>
<td>Mean*</td>
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<tr>
<td>E-mail channel</td>
<td>4.04</td>
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<td>Outdoor public-address systems</td>
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<td>Dedicated emergency websites</td>
<td>3.87</td>
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<tr>
<td>SMS text messaging channel</td>
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<td>Instant messaging channel</td>
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<td>LAN-based pop-ups channel</td>
<td>3.64</td>
</tr>
<tr>
<td>Automated telephone messaging</td>
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<tr>
<td>Indoor public-address systems</td>
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<tr>
<td>RSS feed channel</td>
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<td>Social networking channel</td>
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<td>Human-mediated telephone trees</td>
<td>3.13</td>
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</table>

*Scale: 1 = very low, 2 = low, 3 = neither low nor high, 4 = high, 5 = very high
Table D-2. Supplement to Figure 7-7. Actual Performance of ENS Channels during Most Recent Test

<table>
<thead>
<tr>
<th>ENS Channel</th>
<th>Actual Performance of Channel in Most Recent Test</th>
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<tr>
<td>SMS text messaging channel</td>
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<td>Dedicated emergency websites</td>
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<td>Automated telephone messaging</td>
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<td>4.10</td>
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<td>LAN-based pop-ups channel</td>
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<tr>
<td>Indoor public-address systems</td>
<td>3.93</td>
</tr>
<tr>
<td>RSS feed channel</td>
<td>3.74</td>
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<td>Social networking channel</td>
<td>3.70</td>
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<tr>
<td>Human-mediated telephone trees</td>
<td>3.61</td>
</tr>
</tbody>
</table>

*Scale: 1 = very poor, 2 = poor, 3 = neither poor nor good, 4 = good, 5 = very good