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 Internet2 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 communica-
tions outcomes.

In Chapter 3, we examine respondent insti-
tutions’ use of digital technologies for official
communications, the adequacy and sustain-
ability 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’ communica-
tion 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 tech-
nologies 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 unso-
licted 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 telecommunica-
tion revolution. We examine both the faculty/
staff and residential student telephone environ-
ments, addressing them separately because they
are so distinct from one another. The sustain-
ability 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 tech-
nologies 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.

![Figure 2-4. Number of Residential Students at Institutions Studied (N = 348)](image)
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