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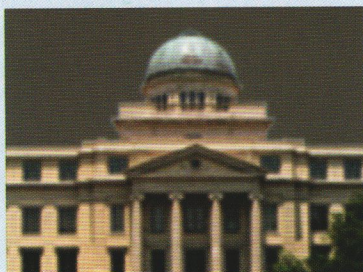
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REPORT FROM
THE ACUTA FORUM FOR STRATEGIC LEADERSHIP
IN COMMUNICATIONS TECHNOLOGY

CONVERGENCE OR DIVERGENCE: TECHNOLOGY POLICIES AND USER EXPECTATIONS

JULY 30-31, 2007
HOLLYWOOD, FLORIDA



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THE FORUM

Since 1997, the annual ACUTA Forum for Strategic Leadership in Communications Technology has provided a unique opportunity for campus leaders to exchange ideas and discuss issues relevant to the use of technology in meeting the goals of higher education. Held in conjunction with ACUTA's Annual Conference and Exhibition, this forum brings together men and women of vision, foresight, and authority to discuss strategic directions for the campus of the future.

GOALS

- To provide a venue for the examination of issues and challenges facing the higher education community as we grapple with planning, financing, and implementing technology on our campuses.
- To establish a forum in which senior university leaders with responsibility for communications technology can meet with their peers, share their collective expertise, and come away with solutions that will meet their institutions' needs.

EXECUTIVE SUMMARY 2007

- The rapid development and expansion of technology, changing student-body demographics, and increased security risks have created an environment of constant change on campus. Managing the technology landscape is exponentially more challenging than ever before.
- Although no one can know the future, some technological eventualities seem inevitable. Planning for tomorrow, based on well-considered facts true today, is critical for success.
- The tragic experiences of a few campuses have taught all of us a lesson about the importance of emergency notification in 2007.
- The University of Notre Dame and Florida State University demonstrate how traditional campuses are reinventing themselves to meet the needs and expectations of the 24x7 generation.
- Even as they satisfy our appetite for connectivity, some technologies introduce a whole new set of problems for existing systems. Duke University and the iPhone demonstrate what may happen when new and exciting meets tried and true.
- Privacy and security issues seem to define our culture in the 21st century. Northwestern has established the Information and Systems Security/Compliance group to meet the challenges that come with universal access.
- Human resource policies and safety issues combine with tax requirements to create a complicated legal maze for today's campus technology experts.

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CIOs face many trends in policy, culture and expectations that make the job interesting. How do you provide 24/7 services, deal with personal versus business use of technology, address increasing security issues, comply with legal and regulatory changes, and meet increased user expectations? And how can both convergence and divergence be happening at the same time?

Robyn Render and Scott McCollum were asked to address some specific questions:

- As more and more students, faculty, and staff are co-mingling personally owned devices with campus-provided technologies, have network access at their home, and perform work in a mobile and mixed-mode fashion, are your policies keeping pace with the work/life changes in our society and the changing culture and expectations of your users?
- Changing demographics means changing cultures. Is this considered in training customer service staff? Are you providing multi-language materials? How are you addressing ADA accessibility issues in technology?
- Who will our students of the future be, and how will they understand what we need them to understand?
- How do you make on-campus applications available to off-campus users?
- How do you ensure that personal devices are trustworthy and appropriate?

New uses of technology require the development of new policies. In the past an understanding of the technologies and customers might have been enough for the development of policies. The convergence of data and voice with the expansion of mobile technologies has changed the landscape. The complexity of the technical environment plus the need to protect data and the individual creates a challenging policy environment.

A significant issue is the impact of centralized versus decentralized technical support. Centralized tech support provides more control. Decentralized tech support places more pressure on support organizations, yet we have seen this change in the past. At one time mainframe support was centralized; but with the advent of personal computers, there was a significant change in support structures that in many cases resulted in decentralized support. How do new technologies such as MP3 players, cell phones, and memory sticks fit into legacy support strategies and local policies?

The University of North Carolina, a multi-campus system, is made up of 16 universities with about 200,000 students. The approach taken to deal with technology and support is based on local behavior and policy. While the system maintains an overall technology policy framework, individual campus policies address how people act and use the technology. There are requirements to archive email and follow security requirements. At small institutions there tends to be more control. Large institutions tend to have more people in technology support but also tend to be more decentralized. There is additional information technology support provided in campus departments. These departments want to provide better services and use bleeding edge technology. This approach creates risk, and may not fit the overall IT organizational policy.

Support of residential and non-residential students is converging because of new technology. Students and faculty demand mobility at all times. Students want privacy and free choice. File sharing is a significant challenge and is often the target of litigation. Yet residential networks have been outsourced by some schools to eliminate some of these problems. New issues arise as boundaries with K-12 are changing and new and younger clients are taking classes and becoming users of the campus networks.

Changing demographics have an impact on technology support. Four-year schools are finding more older students on campus. Sinclair Community College in Dayton, Ohio, serves more than 50,000 students annually. Traditionally community colleges had many students in their early 30s; now younger students are enrolling to save money. This new mix of students is creating new issues since younger students have better technical knowledge and a different level of preparedness. Additionally, the number of international students is increasing, and their impact in the form of language and culture is significant. Cultural differences need to be addressed in policy and in the way students and staff interact with international students.

Hours of support provided to students is becoming more of an issue. Only two schools in our audience provide 24x7 technical support. Distance learning and student lifestyles are increasing the need for longer support hours. Students may be in another time zone or even another country.

A significant policy issue is cell phone usage by staff. Public records law requires the university to show the phone bill if requested by auditors, media, or other investigators if the phone is paid for or provided by the university. One approach to the problem is to provide a cell phone allowance to staff. Staff members would not use a university-provided cell phone, but they would receive a monthly allowance to compensate for using a privately owned cell phone for university business. This does address some record-keeping issues, but the allowance is taxable. This issue is even more complicated because of the increased use of cell phones and PDAs to access email. Home computers used to access email are also subject to open records laws. Business and home networks are increasingly becoming blended. Another area of concern is Instant Messaging with questions about control and where individual rights begin and end.

Render and McCollum responded to these and other issues from the perspectives of four-year and two-year institutions. They engaged the audience to share their own experiences and consider some of the approaches various education institutions are implementing to address the diverging and converging usages of communications technologies at colleges and universities today.

CIOs DISCUSS THE DIVERGENCE OF TECHNOLOGY USE POLICIES, CAMPUS CULTURE, AND USER EXPECTATIONS

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POTENTIAL IMPACT OF FUTURE TECHNOLOGY DEVELOPMENTS: CAN TECHNOLOGY HELP US MEET INCREASING EXPECTATIONS FROM BOTH INSTITUTIONS AND USERS?

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The purpose of this session is to identify future technology developments that are expected by the year 2020 and ask if these emerging technologies can help meet increasing expectations from both institutions and users. How will changes in technology affect strategic technology infrastructure decisions being made today?

Technology is turning every 24 to 36 months. This means that we face four to six generations of technology during a planning cycle out to the year 2020. A major problem is that investment cycles lag the technology cycles. The result can be gaps between delivery and expectations in financial, service and technology areas. The challenge is to keep the expectation gap as narrow as possible.

In the past we planned for a useful life, an economic life, or a technology life. All three are now out the window. Now we have to plan for an acceptable life and deliver what students, faculty, and staff are accustomed to having in their homes.

Some of the technologies to watch for between now and 2020 are:

- 100 Mbps to the home: 2008
- Camera ballistics (each image is unique and can be traced to a camera or origin): 2009
- Chips with 1 billion transistors: 2009
- 90 percent tetherless society: 2009
- Mobile broadband 35x than today: 2010
- Fast bendable computers: 2011
- Chips with 15 billion transistors: 2019

Networks will emerge as the “new media,” and the following developments will make this change happen.

• Personal area networks (PAN). The future technologies of PAN include Bluetooth, Whitetooth, ultra wide band (UWB), radio frequency identification (RFID), and sensor nets. Bluetooth, a wireless specification designed to eliminate cable connections, is already being used. Whitetooth is a low-speed version of Bluetooth designed to support “white goods” such as refrigerators. UWB—an unlicensed spectrum that uses very low power (1/10,000 of a cell phone)—is used for short distances (up to seven meters). This will be a rapidly expanding area over the next few years. RFID has been used in recent years, but the significant change is the drastic reduction in cost and size. The cost is moving toward \$0.04 and the size toward that of a grain of rice. By 2010 sensor nets based on “smart dust” will be available. Smart dust will be no more than 1 cubic millimeter and include a solar cell, sensor, CPU, memory, and radio.

• Local area networks (LANs). Future LAN technologies include 802.11n, mesh networks, and cognitive radio. The next generation 802.11 wireless standard is 802.11n. It will replace 11 legacy wireless standards and provide gross speeds of up to 600 Mbps. The design goal is a net usable bandwidth of 100 meg per user. Mesh Networks will be built on 802.11s standards and will expand network capacity as they grow by allowing all network devices to transmit and route for all other devices thus adding to capacity as more devices are added to a network. Cognitive radios will avoid wireless traffic jams by exploiting unused radio spectrum. This technology will determine which frequencies are quiet, and the radio will pick one or more frequencies over which to transmit and receive data.

Metropolitan area networks (MANs). The future technologies of the MAN will include technologies like WiMax and cooperative diversity networks. WiMax, the Worldwide Interoperability for Microwave Access, provides the “first mile” or “last mile” at higher speeds and potentially lower cost than today’s 3G networks. Cooperative Diversity Networks are being developed at Rutgers where numerous test nodes are linked in a radio grid that integrates RFID, cell phones, Bluetooth, and WiFi. The radios “cooperate” in determining which technology is best suited for use at any given time for any give application presented to the network.

• Wide Area Networks (WANs). The future technologies of the WAN are 4G networks and WiMax again. There are no formal standards or definitions for 4G Networks. The intent is to unify different wireless networks. Target trials are being conducted in the Far East at the current time. Commercial availability is expected in the 2008–2012 time frame. WiMax as a WAN could be a problem because it is a significant change from conventional cellular. It is driven by the desire to reduce patent cost from 28 percent of the cost of goods to an estimated five percent. It is expected to arrive in 2008–2009.

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Other Developments: The future technologies of the other developments include indoor positioning systems, better batteries, joining sensing and processing, and NEMS nanoelectromechanical systems. Indoor positioning systems will locate equipment and people inside buildings. While this will have great benefits, it will also further open up privacy issues. Better batteries will provide five times as much power and allow recharging to 90 percent capacity in five minutes. These lithium-ion phosphate batteries use nanotechnology to dope other materials. It also lasts through 10x as many recharging cycles. Joining sensing and processing is similar to putting an eye and brain on a single computer chip. The goal is to have parallel optical processors to crunch 20 tereflops of information in real-time. This is the same as 10,000 PCs on a chip. The NEMS Nanoelectromechanical Systems is fusion of MEMS and nanotechnology. This will allow new nano displays, nano lasers, nano solar cells, and it will replace electrical interconnections on a chip with reconfigurable optical routers.

What do all these technology changes mean for the university and its networks? Network growth will explode. Next to product brands, the network will be the single biggest asset of your institution. The network will also be the single biggest vulnerability. Capacity will be king. Redundancy, resiliency, survivability, scalability will be the new mantra. Architectures based on three levels of redundancy will emerge as the design of choice within three to five years. Networks will connect everything and will be under-funded. Fixed and mobile infrastructure will both flourish. Fixed cost of infrastructure will increase due to cost and better full-cost financial reporting. Convergence will cost more. Data centers built before 1998 will be obsolete. Wired VoIP will be skipped as a core technology and be replaced by wireless SIP. Wireless will move to a commodity status faster than ever seen before. Investment cycles will shorten, and the total cost will increase. Legacy funding mechanisms will break and new funding models will be needed. The network will ultimately re-emerge as a significant source of new revenue.

What are the suggested strategies for your networks? Do not plan on wireless as a replacement strategy for the production data network. Plan on wireless complementing, not replacing your network. Plan on 802.11n becoming available during the next refreshment cycle in years 2008-2010. Examine a fully loaded funding model. Recognize terrorism as a real threat. Invest in network granularity, control, management, and flexibility. Prepare the physical plant for convergence that fits your enterprise. Do not put all your eggs in the wired VoIP basket.

Northwestern University has implemented a reverse 911 for student/faculty/staff emergency contact information. It was found that there was no process to get critical data out to the university population. The group asked several questions. What do you need? How do you get it? How do you protect it once it is collected?

At another university, two days after Virginia Tech, an emergency notification system went live and two days later an event happened. The system did not work. They had the wrong data, no procedures, and no policy.

Many things can create an emergency on campus. One university lost power to a facility for months due to flooding. Another lost their back-up generator due to an earthquake. When such calamities occur, there are many questions to deal with because each event might require a different technology to appropriately address the problem. Who has authority to initiate action and where are they? How do I contact them after hours, because emergencies don't happen just during business hours?

A common problem is the issuing of a tornado watch/warning. This is a very complex problem because people work different shifts and the generation and updating of a data base is difficult. Do you use passive notification such as email or voice mail? Do you use an active approach such as a phone ringing, speakers, or sirens? Information technology often has the only 24x7 center on campus and will be involved in a complete range of events.

Some of the lessons learned from planning are that it must be part of the culture and part of everyone's job. You need to plan, and you need to practice what you plan. You must take a multilevel approach and look at different technologies for different emergencies. Look at the volume of traffic that each technological approach will cause. You need to have return confirmation of notification, at least for key people. Don't count on text messaging alone since it can be blocked as spam.

UPDATE ON EMERGENCY NOTIFICATION AND RESPONSE SYSTEMS

FORUM PARTICIPANTS

MEETING EMPLOYEE AND UNIVERSITY TECHNOLOGY NEEDS IN A 24x7 WORLD: INNOVATIVE SOLUTIONS FROM THE CAMPUS

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We live in a 24x7 world. The Internet never shuts down, and now students seem always to be on the 'Net. It seems that when most of us are done for the day, students are just beginning their day. There is an increasing demand for universities to provide active 24x7 support.

Notre Dame is a school in transition after being the classic two-semester-per-year, high-touch undergraduate school for most of its history. Growth in its research program and auxiliary enterprises has driven the school to be a more year-round enterprise. Virtually all Information Technology (IT) systems are now expected to be available 24x7 whether or not they were originally designed or funded to be.

At Notre Dame, the computer help desk provides Level 1 support for all IT services. The computer help desk is available during business hours and limited after-hour periods during the school year. During the summer support is limited to business hours. The university also provides a voice-services help desk during business hours. Even the university switchboard does not provide 24x7 support. Classroom support is provided between 8:00 a.m. and 10:00 p.m. during the school week. Computer lab support for

the eight on-campus labs requires significant support. Lab hours vary, but some are available 24 hours per day without staff support. Data center operations are 24x7 and provide monitoring of all centrally managed IT services and the network.

The data center operations have been transitioned to a network operations center and is being reshaped into a security operations center. This provides first-contact support for systems and the network. This will provide more immediate response to outage, security incidents or other issues. One major issue is the need to raise skill levels of operations staff in order for them to handle the new responsibilities. This change is required because of the need for 24x7 security monitoring and incident response.

Florida State University (FSU) does not provide 24x7 support for most technology areas. The data center does provide 24x7 support, and there are on-call lists for key enterprise systems. Web-based interfaces exist for users after hours.

At FSU the technology help desk provides level 1 support for all IT services, dormitory IT support, and campus directory assistance. It is available during business hours and limited after-hour periods and weekends. Telecommunications Services provides phone, network infrastructure, wireless support, and campus building security services support during business hours. Administrative desktop support and classroom support are provided during normal business hours with some limited extended hours for the classrooms. Computer lab support operates 7 days a week from 7:30 a.m. to midnight. Some labs were open 24 hours a day but have reduced hours now because of budget cuts. FSU has extensive distance learning, which uses Blackboard. It is centrally supported and has the same hours as other enterprise systems.

After-hours systems support is provided to a number of key IT systems by support staff who are available during these hours. After-hours support reverts to a 24x7 staffed machine room with extensive on-call list of system administrators, database administrators, network analysts, and programmers. Some issues are resolved after hours; others wait until the next business day.

During the discussion among Forum attendees, additional points arose.

- Data center people tend to be lowest level people in terms of technology and pay, yet they are often the only people working during off hours
- Are stipends provided to on-call staff? Notre Dame furnishes IDP/cellular allowance, bonuses, and rewards. Most Notre Dame employees are exempt staff whose job descriptions include being on call. There is more flexibility in private schools.
- Some schools are creating consolidated call centers by bringing together assets that currently have a narrow focus and making them into an organization that can deal with a variety of technical issues.
- The number of hours of support is all about funding. Support levels deal with who budgets for the support and who pays. A unified help desk can help extend hours without increasing the budget. Some schools emphasize "first and done." They train to reduce follow-up calls to second and third level support. Others have outsourced support, but in most cases it is limited to support of distance education. One school outsourced on a limited basis and then expanded the amount because of the success in the limited phase of the effort.
- Expectations are rising. The main question is how much information technology and support you can afford. There is a big difference in cost between zero down time and some down time.

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- One school has developed a knowledge base of common calls. A top-ten list is developed each week. Students use this list, and it reduces calls to the help desk. Faculty members don't use the list.
- Another technology being used is live chat on IT web page. It is easy to deploy and fits the way the student generation want to interact. You end up with a record of the chats that can easily be added to the knowledge base.
- Skype and chat sessions are being used for overseas interactions.

If your campus is like most, the iPhone has already arrived whether you are ready or not.

The iPhone is just one example of the dramatic changes that are taking place in communications technology. Technically it exemplifies what convergence is. But not only does it introduce new technology for the delivery of entertainment, it also represents a change in the role of the consumer in the introduction of new telecommunications technology on campus.

In the past we had to select between two models of control of the introduction of technology into our environments: centralized or decentralized. In the centralized model all technology introduction was controlled. In a decentralized model departments and independent units were allowed to find technology they needed and it became part of the campus network. The iPhone exemplifies a new method for technology innovation—consumer control. It doesn't have to be a call from your president or the provost requesting an iPhone for their use; it might be a 16-year-old high school student on campus for a summer camp who requests access to your network for his iPhone.

The shift to the consumer is part of a larger change over time. In the past the enterprise drove technology development and then the consumer benefited from the changes in technology. Now we see the consumer adopting new technology (Instant Messaging, IP phones, cellular, etc.) and then the enterprise running to catch up and provide these services demanded by the consumer.

The iPhone is the first significant WiFi device to appear on the campus. How will this fit into the enterprise? What happens if quantities of these devices show up on campus? What will be the impact on the network and help desk? Will the iPhone impact or replace iPod use in classes? Duke University tried to answer these and other questions by purchasing 6 iPhones and looking at issues with help desk, enterprise email, calendars, device support, and network impact.

The university developed documentation for power and novice users to facilitate the introduction of the technology on campus. Setup was accomplished in 30 minutes or less by the power user, but it took three to four hours for the novice user. A significant realization was that the iPhone is designed for the consumer product and not the enterprise. Activation requires that the user provide his or her Social Security number, which might not be a major issue for a consumer but is an issue for enterprise activation. The iPhone does not currently interface with Lotus Notes, Outlook, or other enterprise products.

Another issue is whether email will be stored on campus or off-campus. There have been reports of network issues caused by the iPhone. The iPhone uses proposed protocols that have not been completely finalized. As a result, some network devices were not able to handle specific network traffic and thought that there was a security issue. The result was a failure of the network. This issue has been addressed by the network device manufacturer. These are not issues of interest to the consumer until they show up on your campus and request access.

The next step for Duke this fall is to develop a blog for the sharing of user experiences. The network will be closely monitored to see if there is any adverse impact on performance that can be attributed to the iPhone. The help desk will provide as much assistance as possible, as they do for any non-standard device. The main help will be in the procedures of how to link into the campus network. Advice will also be provided on a website for campus users of the iPhone.

The iPhone is addictive. Students will not be the only people asking for the iPhone. Faculty and administrators will not only buy their own devices and want them connected to the network, they will expect the iPhone to be provided as an enterprise device. This will require education and flexibility. We now have to live up to consumer expectations of what will be available as network access and services.

The iPhone will come because it is different and people are curious. The iPod has created a community of potential users, and people expect more connectivity. There are also reasons that will delay its widespread infiltration into the campus: It currently has only one carrier source (AT&T), the cost is significant, there are always those who fear new products, there is a shortage of third-party applications, and security issues abound.

The advantages will, before long, outweigh the disadvantages for the consumer, so plan now. The iPhone is coming to your campus.

IPHONES ON CAMPUS

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SAFEGUARDING INFORMATION, NETWORKS, AND USER PRIVACY IN A CHANGING ENVIRONMENT

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At Northwestern University the central information technology organization contains all of the traditional groups that would be found at similar universities. One critical group that is focused on the safeguarding of information, networks, and user privacy is the Information and Systems Security/Compliance (ISS/C) group.

The mission of the ISS/C group is to enable the university to conduct business in a secure manner with a staff of only 3.6 people. The group has three major focus areas to accomplish the mis-

sion. The first is information security which is applied across the entire university. The next focus is disaster recovery and business continuity planning, which includes emergency operations planning, which is part of university-wide planning. The third focus is compliance, which must not be treated as an afterthought.

Northwestern University has a typical infrastructure for a large university. The university has enterprise systems including human resource, student, and alumni systems. The two data centers host about 400 servers and one mainframe. The network supports about 3,000 devices, wireless devices, and VoIP. The environment is distributed and heterogeneous, which makes implementing a security policy much harder.

The university faces several challenges and opportunities.

- *A culture of independence.* The university culture is characterized by independence and a dislike of controls. This is not good news for someone who is trying to implement security policies that control and reduce independence. A university IT group needs to have appropriate credentials which will lead to credibility. If the group is viewed by the university community as a credible organization, there is an increased chance that policies will be accepted.
- *Resources for network support.* The environment faced in a university is different from what is found in industry. The university has significantly higher casual use of the network. Funding is always a limiting factor and requires a well done business case for all expenditures, especially in the security area. Resources to do the security job are always limited. Northwestern added a person to do free security assessments for university organizations as long as they would agree to fix any problems that were found.
- *Expectations.* Differences in expectations between the group and the clients can be significant. Is there a way to solve all problems now? What is reasonable to do now? What are the long-term solutions? Security problems didn't happen over night, and they aren't going away over night.
- *User support.* Departments, schools, and centers create silos that complicate security policy and compliance. Tools and approaches developed for industry don't always work in universities. Technology is rapidly changing, and universities are always trying to catch up.

There are solutions to the challenges and opportunities listed above. The first thing to do is to plan. The plan will need to change, and it will be hard to keep updated; but it is the starting point for addressing security issues. Incident response includes reporting what has happened and could include a copy of the incident response on the website. People are your most important asset, but they are also the biggest liability. Education is important, and there are many approaches that can be taken such as security days, guest speakers, and brown-bag lunches. Collaboration and relationships are key ingredients of a successful program. Security assessments and the correction of issues that are uncovered are also part of a complete program. Policies, standards, documentation, metrics, and reports are all part of the accountability required for a successful program. While we often want to rely on technology, it is really more important to have people and processes in place to deal with security issues. The bottom line is to do *something*.

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- How are institutions dealing with personal use of business technology and business use of personal technology?

The average employee uses employer equipment and the network for about two hours per day. In general, the policy should state for appropriate use. Policy should be based on good human resource practices. It is impossible to enforce a policy that allows no personal use, and it is not good for business. Work expectations are the real measure of whether an employee is misusing business technology.

Business use of personal technology such as Blackberries creates a records issue. Institutions need a policy, and it should focus on behavior not the technology.

There are significant tax issues involved in this question. IRS rules are out-of-date because of changes in technology. Mobile technology rules are especially out-of-date because of changes in cost structures and technology. The IRS requires detailed record keeping, which is not done by most institutions and is complicated by the introduction of personal technology into the equation. Business cell phones use can be taxable, and the IRS has penalties if you don't have records to support business use. Some universities give individuals an allowance for their cell phone and do not provide one from the institution. This removes the record-keeping issue, but the allowance is taxable.

Some state laws ban personal use of state property, and state university policies should be consistent with state law. However, it is typically very difficult to enforce a policy that allows absolutely no incidental personal use of state-provided resources.

University employees are not always under the same rules as other state employees. Also, most state agencies don't enforce rules because they are out of date. There is a significant lag between the laws and reality. The laws were written when the technology was very expensive and usage caused direct increases in cost. Today most of our technology has zero marginal cost.

- Who has IRS penalized for inappropriate use of cell phones?

There is no published list, and the IRS will not tell, but they do levy fines. Their target will be executive officers of the institution. An additional problem is that the IRS will not give specific definitions of what is acceptable. When we look at making copies, one is acceptable but making a copy of a book is not acceptable. One personal cell phone is acceptable, but how many calls are not acceptable? The IRS does not have clearly defined rules in this case.

- Does being required to carry a cell phone change things?

The short answer is no. There are a few exceptions for police, fire, and maintenance personnel.

- What about Internet access from home?

Cell phone usage has strict rules, but there are different rules for Internet access because there are some business purposes that can be defined.

- What is the impact on land lines as we provide cell phones?

Notre Dame is one of an increasing number of schools where there are no land lines provided in the dorms except in a common area for emergency use. Of the 8,000 students in Notre Dame dorms, only 67 requested land lines.

- Are there location-specific 911 issues for safety?

There are at least two issues: providing emergency information to students and legal obligations to respond to an event at a specific location on campus. The University of Louisville left phones in dorm rooms to enhance their 911 and emergency warning system. The lack of land lines in the dorm could hamper 911 responses. Leaving some land-line connections in the dorm hallways is a way to partially address this potential liability.

UNIVERSITY LEGAL COUNSEL, TAX ATTORNEY AND HR PROFESSIONALS RESPOND TO QUESTIONS

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This joint session brought together legal, tax, and human resources experts to address current topics of interest to information technology and telecommunications professionals at universities. The questions/statements were generated by the attendees.

continued on page 10

- What are some of the issues dealing with security of data and personally owned devices or university-owned devices taken off campus?

At one university the policy is very clear: You can't take sensitive data off campus, and if you do, you can get fired, especially if the data includes Social Security numbers (SSN). An institution must dramatically restrict access to certain data, especially SSNs. You need a clear policy, and you need to work with the security officer, human resources, the registrar, and the general counsel to develop a complete policy. If university-owned equipment with sensitive data on it is lost, the university should report the loss as a theft to the police. If personally owned equipment is lost, there is not necessarily the same requirement, but there might still be a violation of policy for having sensitive data on a private machine.

In some states notice is not required if the data is encrypted. Notification laws are now in effect in 37 states. Any policy should focus on data, not devices. As part of the policy a university may prohibit or limit its employees from placing sensitive data on mobile devices or taking such data off of secure central servers.

- How do you handle and store SSNs?

Many vendors and locally developed systems use SSNs as a primary key. SSNs are used in many systems that are not expected. Cornell University has software that can be used to look for patterns that are SSNs. The Spider tool from Cornell is reasonably good at finding the "hidden" uses of SSNs in systems. Paper records are also a problem. Class rosters are a big problem. Notre Dame is worried about productivity and mobility, yet it requires encryption and other security tools.

To address the problem you need to communicate and educate. You need to help reduce faculty and staff risk and exposure. One good policy is to keep sensitive data on a machine that is not on the Internet.

State laws are very different regarding what is required and how soon. Indiana gives the institution two days to notify the Attorney General in a release of SSN data. This gets the attention of faculty and staff. State laws require security standards for sharing certain data such as vendors that print W2s.

There are also vendor issues. What if a vendor loses data? Many schools are going to vendors with security audits. There are valid worries about smaller vendors, and institutions are giving them tools to bring in best practices.

ROUNDTABLE DISCUSSION

Forum participants shared their views and experiences during lunch on the following question:

How is your campus preparing strategically (residential, academic, community outreach, and business processes) for the Millennial Generation while meeting the support needs of today's campus constituents?

Mobility is a significant issue facing campuses as the Millennials arrive on campus. There is increasing demand for new technology now, such as the iPhone. Many students have better technology at home than is provided on campus.

Parents are having an increased impact on schools, throughout the year, not just in August or September. Mobility and 24x7 security requirements are changing

staffing requirements. Some universities are merging public safety, information technology, and facilities management to create a center capable of responding to 24x7 requirements of student, faculty, and staff.

Social interactions are important to new students coming onto campus. Students want portals that they can customize. Some universities are outsourcing email to Google or similar groups to reduce workloads and provide services that students demand. Students want an electronic community. Some schools are using Facebook or MySpace to advertise their programs. Students have a consumer mentality—they know what they want, and they want it now.

There is a disconnect between student desires and what is provided by information technology on campus. Some universities work with student government to build good will and help guide new services. Students want to be allowed to pick and choose what they want. The prediction is that there will be a mobile campus with lots of text messaging, 2nd Life, FaceBook, and MySpace.

When you were born tells a lot about your attitudes, objectives, and what you expect from an employer or school. We need to look at several generations in order to understand the changes that we face and how the leaders will react to the needs and desires of the new generations of employees and those entering college.

- The G.I. Generation was born between 1901 and 1924. They were children during World War I and the Roaring '20s and came of age in the Great Depression and World War II. They transformed colleges in the mid-1920s and "helped build the system" in an era of reform and change. Now mostly retired, they shaped our universities and approach to students.

- The Silent Generation was born from 1925 to 1942. Their childhood was defined by the Great Depression and World War II. They came of age and were shaped by what is called the American High in the post WWII era. This group silently changed colleges in the early 1950s and were recognized as "organization men." The last of this generation is leaving our universities but their impact is strong because they are the senior people and those with great institutional knowledge.

- A member of the Boom Generation was born between 1943 and 1960. Their childhood was defined by the American High. They came of age and were shaped by what is called the Consciousness Revolution of the '60s and '70s. The Boom Generation rejected the system and caused great changes in colleges during the late '60s and early '70s. Many faculty, staff, and administrators entered the system during this time period.

- The Gen Xers were born from 1961 to 1981. Their childhood was defined by the Consciousness Revolution of the '60s and '70s. They came of age and were shaped by what is called the Culture Wars and '90s Boom. This generation is characterized by self-reliance, market-driven competition, and being a free agent. Most Xers have already graduated, but they are significant because they constitute the younger faculty and administrators who are most adept at using the newest technologies. Because they work and are motivated differently from previous generations, they must be understood in order to tap into their potential.

Gen-Xers think differently about work. They feel they are either a free agent or a slave. Work is a means to an end, not an end in itself. What counts is my performance, not my attitude. No sane person trusts the organization. These attitudes are almost directly opposite those of previous generations.

How do you attract, retain, and motivate Gen-Xers? They want concrete promises and explicit agreements. Provide lots of goals, feedback, and autonomy. They will respond to customized "deals" matched to their performance. This generation will respond to flexibility and less professional ritual and will work well as risk-takers, cost-cutters, and hands-on supervisors.

- A member of the Millennial Generation was born in 1982 or later. Millennials are the college students of today and the employees of the future. They have grown up with community service, service learning, and teamwork. This generation also has more ethnic diversity: 41% are nonwhite. Millennials can be described as special, sheltered, confident, team-oriented, conventional, pressured, and achieving. Following are some ways to respond to their unique profile.

Special: Parents of this generation are heavily involved in their children's lives. As students they have a lot and expect a lot. The school needs to offer personalized interfaces, strong links to family, and ways to make them the center of campus life.

Sheltered: Market to these students and parents a safe, protected, and "accountable" campus. Students will respond to a small-school feel that has a focus on people, not process. The school must protect privacy, offer FERPA opt-outs, and provide total emergency preparedness.

Confident: Stress good outcomes and require personal progress plans. Create contextual, project-based, and career-oriented environments, especially for men. IT should integrate interning, work-for-credit, and career training into campus life.

Team-oriented: Showcase groups, teach team skills, and create service links to the community. IT needs to move from point-to-point to networks with virtual seminars, project software, structured IM and chat rooms, and community media.

Conventional: Define college more as a big-brand bonding experience and less as careerism, radicalism, or self-discovery. IT must balance the evils of copying and file sharing with the virtues of collaboration and consensus.

Pressured: Millennials will respond to long-term life planning, guarantees, and balance over short-term opportunities and risks. You need to make all tasks achievable with continuous testing, assessment, feedback, and redirection. This will require 24/7 access to grades, dates, podcasts, notes, sources, quizzes, and teacher evaluations.

Achieving: Structure all learning and grading around mastery of goals. They want the campus to look like a world-class workplace. IT will need to provide cutting-edge networking to empower students and realize teaching efficiencies.

Once the Millennials enter the workplace you will find them as confident, trusting, and teachable. Their negative reputation says they are pampered, risk-averse, and dependent. You will need to watch over them, but allow these junior citizens to fill the role of your departing G.I. senior citizens.

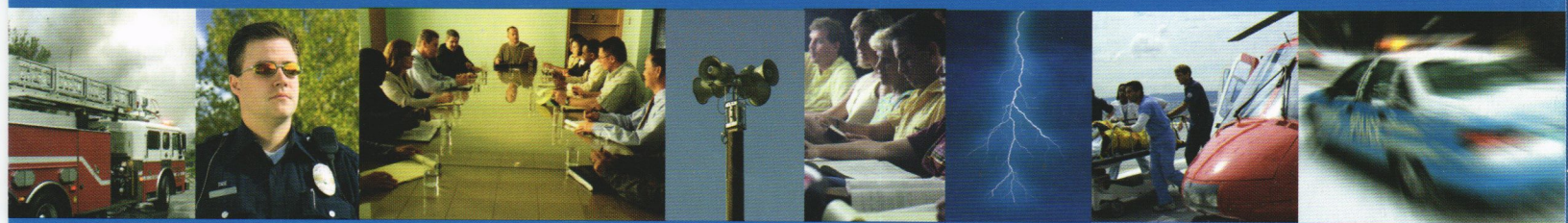
MILLENNIALS ENTERING THE WORKFORCE: GENERATIONAL ISSUES AND TECHNOLOGY EXPECTATIONS

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