**Title:** Egad, My Phone is Running CAD!

**EDUCAUSE Evolving Technologies Committee**
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**Introduction:**

“You’ve a meeting downtown. You’re late. Traffic is terrible….Desperate, you park illegally and run to the conference room – finding no one there and no note saying the meeting room has changed. All of that is an information problem, and it could be solved…” by your cell phone.

**What IS a Cell/Mobile Phone?**

Dr. Martin Cooper of Motorola is considered the father of the cell phone. In 1973, he called his research rival at Bell Labs from a portable handset in a modern adaptation of the famous Alexander Graham Bell line – “Watson, come here.” That original Motorola handset looks as big and bulky as the field phones seen in World War II footage. Despite the bulk, the mobile phone caught on and cell phone use has increased exponentially over these three decades not just in the US but world-wide.

For many traditional age students (18-23), using a cell phone is so pervasive that many institutions of higher education have abandoned a once lucrative revenue stream by discontinuing land-line phone service in residence halls. No wonder. Consider the findings of our recent, quick web search of the major cellular service providers: cell phones can take pictures, download music, offer games, receive text messages and email, and let the user browse the web. Want to know where the nearest trendy restaurant is? Text message Daily Candy and there on the phone is the answer. Don’t like the standard ring tone? No problem. Change it. Some phones are miniature televisions showing the latest from HBO. Cell phones (the term ‘mobile’ is often used outside of the US) are also alarm clocks, calendars, and GPS receivers. Toward winning the obesity war, connect with MyFoodService, take a picture of your double cheeseburger and send it to a nutritionist who, for not quite $10 a month, will help curb your appetite. And, if the pundits are correct, the convergence (Techworld, April 10, 2006 [www.techworld.com](http://www.techworld.com)) of all of these services onto Dr. Martin Cooper’s 30-year old device is imminent as we hurriedly move to ‘3G’ ([http://en.wikipedia.org/wiki/3G](http://en.wikipedia.org/wiki/3G)) (and soon to 4G) which, with greater bandwidth, will open up a host of other services including short video clips.

This fall, students at Wake Forest will have a special cell phone that can be silenced, by the professor, during class hours. When it isn’t silent, “you can surf the web and view video over WiFi,” reports Jay Dominick, chief information officer at Wake Forest in a September 2006 article in District Administration. Montclair State in New Jersey will offer students a safety feature literally tracking a student from one location to another late at night.

Ernestine, the telephone operator Lily Tomlin immortalized on Laugh-In might find today’s telephones quite confounding. Not only are they no longer attached to wires from poles or need connections through walls, but also are as tiny and wafer thin as a small candy bar. Most amusing, and the subject of this White Paper, is how comprehensive a computing and communication device it has become and how little this technology is actually used as a telephone.
What are Some of the Key Questions to Ask?

Agreeing that the cell phone is a permanent part of society’s wardrobe, why might we see this as a prom gown or tuxedo critical to higher education’s image? This White Paper focuses on two primary areas. The first is to visualize how we may use these rapidly expanding cell phone services on our campuses to augment (the Montclair State example cited above), eliminate, or enhance what we currently provide. We could even ask, given the number of uses for this device already, when is a cell phone not a cell phone?

The second, and probably the more important, is how to convince senior administrators, who usually command the budget, to take requests to adapt processes (such as cell phone enabled registration) seriously after we have constantly asked for money for ubiquitous network wiring, then asked for money for ubiquitous network wireless, followed by asking for money for ubiquitous classroom audio-visual capability, and then asking for money for a host of other requests.

First, What May it Augment, Eliminate or Enhance?

A review of the literature (sprinkled with a hefty dose of imagination) points to the technologies converging into the cell phone and their impact on higher education administratively, in the classroom, in student affairs, in fund-raising, as a research tool, in security both on campus and off, and, for information delivery of all varieties. Consider, as noted above, what we may be able to do or have to change as a result of these devices:

- Emergency and regular phone numbers: A single home phone number is no longer adequate. Students and parents have several telephone numbers as do faculty and staff. Our data fields need to expand to capture these additional numbers.
  - Do we begin to eliminate landlines for our own personnel who, by nature of their positions, are highly mobile (from development officers to athletic directors)?
  - What is the fate of the fundraising phon-a-thon when cell phone numbers are not listed and when caller ID can screen out unknown or unwanted calls?

- Classroom: The possibilities for the classroom are growing exponentially both in the realm of academic uses and also, as has been highly publicized, in the use of these devices as sophisticated ways to cheat.
  - Acceptable Use Policies may need to be revised or at least reworded to disallow web access via phone or other device unless sanctioned by faculty.
  - Blackboard already has a package to send its courseware to mobile device. Will e-books be available next?
  - Is this a better way to teach languages?
  - Can the cell phone replace ‘clickers’ as classroom response devices? And, if so, who is responsible if they don’t work when needed?
  - Will canceling class become easier through a group text message?

- Campus Information delivery: Just when we thought email and portals were the preferred form of communication for most of the campus constituency, we realize that text messaging
may be a more effective means. This will require different delivery channels and processes. Penn State has already begun sending news alerts via this medium.

- What impact might this have on registrar systems?
- What are the ADA compliance regulations?
- Will this mean changes to the portal concept?

• Admissions and enrollment: With GPS and Google Maps, prospective students (and new students) can use their phone to find their way around campus. Some institutions are finding that email is so ‘20th-century’ and that text messaging is the preferred means of communication for traditional-aged students.
  - What might the impact be on admissions personnel if text messaging is the communication of choice?
  - Is there a need for different resolution (and information) for small screen formats?
  - Can the cell and text messaging build community for a commuter college such as is being tried at Baruch College in New York City where students are rarely on campus for extended periods of time but still seek connection to peers, professors and place?
  - Will the main webpage and its derivatives need to be redesigned to fit the small screen?
  - Is there need to consider the use of this technology as shortening or elongating the ‘digital divide’?

• Security: Campus administrators are already grappling with the consequences of mySpace. The agreement in the winter of 2006 between a mobile phone provider and mySpace to bring MySpace Mobile to its customers may create additional concerns about student safety.
  - When the cell phone data storage capabilities are more easily available, what are the security risks?
  - What about viruses, especially those that may easily transfer between technology ‘hosts’ such as computers, phones and PDAs?

• Impact on Wireless: Will the use of the cell supplant wireless? Even Bill Gates sees the cell phone as a frontier the giant Microsoft has been slow to conquer. The company hasn’t entirely, pardon the pun, left the phone off the hook in this area. A CNet online interview with Bill Gates by Ina Fried in February of 2005 reported that Microsoft is involved in 3G (third generation) as well as Bluetooth and Wi-Fi.
  - If the screen on the cell becomes larger, will more people opt to use this device instead of carrying a laptop?
  - Will there be a portable screen that can attach to the device itself?
  - What does all of this mean for security?

What are the Implementation Challenges?

Which leads to some fascinating implementation challenges if only we had some clear indication of what the implementation will be. Certainly the form factor for the small screen is one challenge. Or, at least it is a challenge to people over 40 whose eyesight may be changing. The form factor is also a challenge to designers who are already tested by web page design that must work on multiple size screens and on multiple platforms. The smaller screen, as well as the tiny keyboard, creates hurdles for
persons with disabilities. A further concern in implementation is the increasing concern on campus regarding data security. What, exactly, is being sent to the cell phone and who gets to see it?

One of the most pressing concerns for the campus IT organization is that any formal program using the cell phone on campus puts IT back in the phone business. (On the other hand, standardization of at least the provider can serve to offer benefits to the user such as speed dial to campus police in an emergency.) By their very size and use, cell phones are easily lost, dropped, or stolen.

And, what about faculty and administrators who eschew these devices? It has taken years for many faculty to become comfortable with learning management systems, audio-visual equipment in the classroom, and for a few holdouts- email. What will the adoption rate for cell phone use actually be?

**How is This Technology Evolving?**

Some of these questions can be answered by looking at pure statistics. As reported in the Pittsburgh Post-Gazette in March of 2006, “cell phone users in the United States have increased from 34 million a decade ago to more than 203 million…” The Post-Gazette reported that the group we consider the ‘traditional-age’ college student (18-24) is on his or her phone some 22 hours a month. The article also offered that not only are the numbers of cell phones approaching one for every American but that the places where cell phone use occurs, some quite risqué, are also proliferating. The article posits that today only the confessional is free of the cell phone.

Consider, too, the proliferation of cell-phone applications introduced during just the 2005-2006 academic year: the ability to switch from using a wireless hot spot to using a cellular network was introduced at a trade show in April 2006; the ability to download games with 3D graphics; advertising via video over the cell phone; the applications at Wake Forest and Montclair State offerings safety features and linkages to courses; the heralding of the coming of the iPhone by Apple (talk and dance at the same time?); the parking space finder and weight-loss coach mentioned earlier; and the ability to carry, store and manipulate data.

Going forward, as has been the technological progression on campus since the coming of the mainframe, it will be registrars’ systems that will take the first evolutionary change. In addition to using the device to announce canceled classes or room changes, students will want to use the phone to find their grades, register for classes, add and drop classes, in short, do everything they can now do on the computer. And, with the requirement that all cell phones have global information system positioning software, it will be much easier to find where the classroom has moved!

Possibly one of the most challenging requests will be to somehow have the campus calendar set up so that it can be personalized, have preferences sent directly to it, beep when necessary, and allow other users to read and to make entries when authorized.

Yet, some of the coming changes as listed in wwwtools education, an Australian web resource for educators, include its use in education. The wwwtools bibliography includes using the phone to create art, as a digital book, for educational games, as a repository for music for classes, as the best way to learn a language, as a tutor, and for data analysis.
What are the Likely Impacts in the Coming One-to-Three Years?

All of this, from the registrar to security to the classroom will have significant impact on campus IT infrastructure and on the ongoing dilemma of whether to buy, outsource, or combine the two. First, and most important, the literature points to no stabilization of the technology. Pei Zheng of Microsoft and Lionel Ni of the Hong Kong University of Science and Technology discuss a ‘fifth wave of computing,’ a concept outlined in Business 2.0, July 2005 (reference included in the footnotes to the Pei and Ni article)\(^1\). In this ‘fifth wave’ there will be additional wireless-enabled devices which will fill society’s growing requirement that we be able to do our own computing and communicate wherever and whenever by some combination of 3G (third generation) and Wi-Fi hotspots (p. 1).

With this ability, in addition to all of the services mentioned in this White Paper, people will be able to pay for services as well as collect and access data in real-time and on that little phone. We already see some of this functionality but it will continue to proliferate. We also already see potential complications as manufacturers continue to ‘develop their own proprietary, highly customized operating systems.’ (p. 2) If our IT organizations will be pulled into the design and development of registrar and even webpage small form function screen design, proprietary systems will create as much angst as the traditional Apple vs. PC has caused in the past.

There are other impacts, some to campus IT and some certainly to the end user. Zheng and Ni cite the need to watch for battery life changes, memory and storage requirements, software platform interoperability, and Java and other similar application opportunities and/or pitfalls.

A more plebian concern, our campuses are already facing with the proliferation of laptops, is the need for more electrical outlets so that batteries can be recharged. Even though battery life on mobile phones is getting better, flash and extensive data applications may reverse the increasing battery-life upward trend.

And, the multiple-use cell phone has already joined the ranks of the blurring between personal devices, privacy issues, and ethical behavior. In addition to using cell phones for cheating in class and taking obscene pictures in locker rooms and elsewhere, its ability to take moving picture clips plus audio bring innumerable new possibilities to violate codes of conduct.

There are less sinister possibilities. We have already seen the growth of undergraduate and graduate programs in video game design as outlined in a previous EDUCAUSE Emerging Technology Committee White Paper.\(^1\) The cell phone brings with it potential for additional research and educational programs from engineering to small screen function design.

Who are the major ET vendors?

The ET vendors include the major cell phone service providers including Verizon, Sprint-Nextel, Cingular, Qwest and a host of others. The convergence of provider and device is also an important aspect of this ET with Blackberry and Treo in perpetual application escalation. On the hardware side, Nokia and Motorola are also in direct competition.
How we can differentiate among the commercial vendors, however, may not be as immediately important as what we want to outsource and what we want to do ourselves. A further consideration is the disparity between cellular technologies in the United States and abroad. The US has lagged behind Europe and certainly Asia in text messaging adoption.

Writes Zheng and Ni: “with the deployment of 3G and Wi-Fi hotspots nationwide and the adoption if smart phones by the masses, we expect to see a spectrum of new services and applications targeting smart phone users that essentially mobilize people’s daily lives and enterprise computing.” (p. 10)

So, How Can We Convince Others the Constantly Changing Phone is Here to Stay?

Our immediate concern about the ubiquitous cell phone, however, is not what it will soon do but, once again, how we should or will be able to fund applications for it. Society and consumerism are again dictating what campuses need and how rapidly we need to have it. This is the second point of this White Paper. How can we convince the people with the money, with so many other competing interests on our campuses, that we need to start migrating applications into cell phone readiness. All of the uses, the concerns and the opportunities outlined in this White Paper are mute unless we are agile at convincing the people on campus with the money that this isn’t going to go away. Here are some suggestions:

- judiciously offer services on the cell by examining their cost and efficiency and by replacing other service delivery systems
- engage students both by watching how they use the cell phone and in asking them for suggestions
- understand or define what device campus IT considers to be necessary for data retrieval, storage and dissemination and whether that device can be, as is the cell/mobile phone, a consumer device
- build into decision making the issue of price point – in other words, should the student and even administrator or faculty member pay for a device rather than the university
- partner with the service providers and software firms catering to this market
- try low budget applications such as offering security features in concert with campus police
- keep senior administrators aware of the changes in the technology such as 3G and include the implications and uses
- help senior administration understand the implications to rapid technological obsolescence and how the salient fact can be built into the budgeting process (some replacement costs will go down, others may increase)
- maintain a dossier of uses at other campuses
- stay abreast of issues through Educause materials and special interest groups

Or (facetiously) if none of these approaches work, revert to the timeless Ernestine line: “Next time you complain about your phone service, why don't you try using two Dixie cups with a string?”
Related EDUCAUSE 2006 Sessions

- Monday 11:40 a.m. - 12:30 p.m. --Track 1: Modeling the 21st Century Student Experience: Ubiquitous Computing in Higher Education
- Wed 8:10 a.m. - 9:00 a.m. --Track 1: Connecting Your Campus with SMS

Endnotes

1 Retrieved from USA Today.com May 3, 2006
2 Leo, Peter, Cell phone statistics that may surprise you, Pittsburgh Post Gazette, March 16, 2006 www.post-gazette.com Retrieved April 18, 2006
3 Panetierri, Joe, Mobile Technology: One for All, District Administration, as noted in University Business online. Retrieved from the World Wide Web September 12, 2006
4 Cornwell, Lisa, Colleges go cellular to contact students, Boston.com July 9, 2006 Retrieved July 11, 2006
6 insidehighered 7/13/06
7 Yuan, Li and Rebecca Buckman, Social Networking goes Mobile, Wall Street Journal, April 4, 2006, p. D1
9 Leo, op.cit.
10 http://magazines.fasfind.com/wwwtools/m/2717.cfm?x=0&rid=2717 retrieved September 11, 2006
13 In Inside Higher Ed, July 14, an article on Campus Cells at Montclair State referenced Rave Wireless “a company that specializes in software for college students’ cell phones and that anticipates starting 12 new colleges on its services in the fall.” http://insidehighered.com/layout/set/print/news/2006/07/23/cells