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December 2004

The Promise of Mobility

An off-campus student rushing to class by car whips out her full-featured cell phone at a stoplight as she enters campus, checks the screen to find that the lot she had planned to park in is full, and instead chooses another lot.

As class ends, another student uses his notebook computer to reserve several books to check out later from the library. An almost-instant message back tells him that one book is checked out already, so he reserves the book at the student bookstore instead.

Still another student uses her cell phone from her dorm room to check her schedule of classes for the day via a personal portal designed specifically for her class. There, she is reminded that a quiz is planned for that day, and sends an instant message to a classmate asking to meet before class to review notes.

Mobility has become a way of life on college campuses—and even a determinant in which school a prospective student elects to attend. What kind of mobile solutions schools offer can affect the learning environment a student encounters, and the ability of faculty members to offer top-notch course materials. In short, it can shape the quality of today's educational experience.

The challenge for colleges and universities is providing that sort of mobility, all within the constraints of budgets, existing infrastructure, and established software solutions. Campuses must wrestle with the huge diversity of wireless devices that students bring to campus, with varied voice and network subscriptions. Student and faculty expectations run high, primed by home access to fast networks and wireless broadband service. How can schools provide top technologies, enhance the learning experience, and still maintain control over the networks?

In this paper, we look first at the huge growth of the wireless and mobile industry on campus, illustrating how important mobile solutions are to schools. We then examine a brand-new mobile portal solution from Sprint, in partnership with iAnywhere Solutions, a Sybase subsidiary, based on M-Business Anywhere software. Finally, we explore how two medical schools are creatively using M-Business Anywhere solutions to meet the mobile challenge.

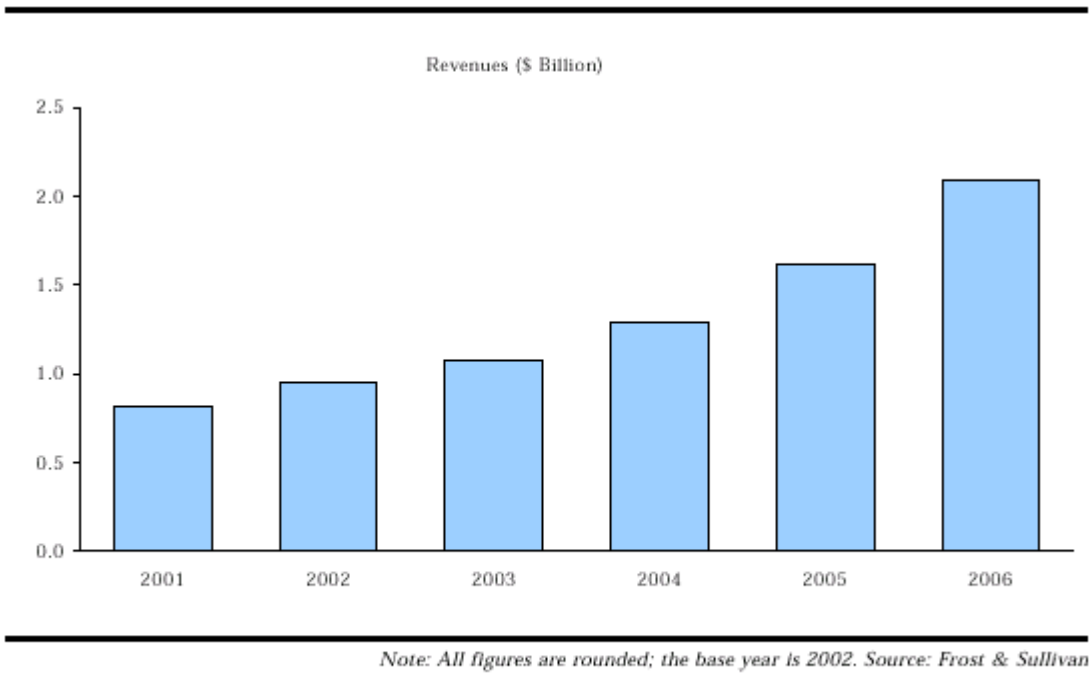
The Challenge: Providing an Ideal Mobile Solution

Administrators at U.S. college campuses clearly recognize the value of wireless networks and mobile solutions. According to the latest Campus Computing Project survey, whose 2004 report is just being released, wireless technologies on campus continue to grow by leaps and bounds. "There's no question that wireless is growing by leaps and bounds in all sectors," confirms Dr. Kenneth Green, founding director of the project, which measures a range of technology issues in higher education.

The survey, begun in 1990, shows that wireless coverage is extending beyond early "wireless" areas like libraries and student centers. For example, fully a third of the schools surveyed now have wireless coverage in classrooms, Greene says.

Planning for new or additional wireless networks is growing quickly. More than half of U.S. campuses report strategic plans for wireless networks, up from 46 percent in 2003 and just 24 per cent in 2001. And fully four-fifths of campuses that participated in Greene's latest survey report wireless LANs in place, up from 77 percent a year earlier.

That college campuses are recognizing the value of mobile solutions can be seen in the huge leaps, current and projected, in wireless spending. According to figures from industry analyst firm Frost & Sullivan, the education vertical market is growing most rapidly in areas like broadband access and the Internet, LAN/WAN connectivity, and wireless services in niche education areas. Total telecom service expenditures are expected to reach $25 billion by 2006 (see Figure 1). According to the firm, the education market will experience a compound annual growth rate from 2002 to 2006 of a whopping 21 percent in wireless.



Note: All figures are rounded; the base year is 2002. Source: Frost & Sullivan

Figure 1: Spending on wireless networks in higher education will grow steadily through 2006 as colleges continue to invest in mobile solutions, according to analyst firm Frost & Sullivan.

Frost & Sullivan also reports a doubling in bandwidth requirements every 18 months in the higher education space, further highlighting the need for network spending to stay competitive.

But working with wireless isn't all blue skies. Mobile devices on campus can present IT administrators and university CIOs with special challenges. That's partly because students typically bring their own mobile devices, especially cell phones and PDAs (personal digital assistants). Over the course of four years, students may use multiple devices, or may casually switch products and wireless contracts during a single year, usually in the name of lower costs.

According to Gartner Research Director Marti Harris, that presents campus CIOs with a difficult challenge: In order to provide quality mobile access, schools find they must set some constraints on the type of products and services that can be used on campus. At the same time, schools must meet growing student and faculty expectations for a highly mobile campus experience. "By 2006," Harris says, "data network access from personally owned mobile devices will be the leading problem facing higher education IT managers."

Clearly, in order to compete effectively, schools need cost-effective, viable mobile solutions. The challenge, then: How to integrate diverse devices and standards into a campus network that meets the high expectations of students and faculty—preferably while using existing structures like portals and backend databases.

The Solution: How Sprint Makes the Connection

Recognizing the importance of mobility to today's student, and the challenges IT managers face in providing top-quality service, Sprint has partnered with iAnywhere Solutions, which has numerous software applications running on college campuses, to offer a mobile solution called Sprint Campus Connect.

Using Sprint's PCS wireless network, which is nationwide, Campus Connect runs on the M-Business Anywhere middleware platform from iAnywhere. Through a range of mobile devices, the

network can present students and faculty with a single, consistent interface to educational and administrative resources. Benefits include:

-- Campus Connect connects to a school's existing backend infrastructure, so legacy systems can be retained and used.

--Campus Connect can provide access to already developed university portals, so little customization is required to put a solution in place.

--The solution enables students, faculty and staff to communicate, as well as to access specific portals, even individual portals designed for a specific student or faculty member.

--Schools can pull information from backend databases, beginning with information as simple as class schedules, campus maps and lunch menus, building to detailed course information, including a specific student's class syllabus, notes and grades.

-- The solution is built on the M-Business Anywhere platform, which is already in use at a number of universities that have worked with iAnywhere.

The iAnywhere partnership is a strategic one, according to Wes Montee, Sprint's group manager for the higher education vertical market. Sprint can offer schools a range of communications services, including both wireline and wireless—something no competitor can do. And since iAnywhere has worked for years in the higher education market, it brings a depth of experience, along with Sybase technology, to the table. Market researcher IDC ranks iAnywhere as a leader in mobile middleware in the research firm's well-known "leadership quadrants" (see Figure 2).

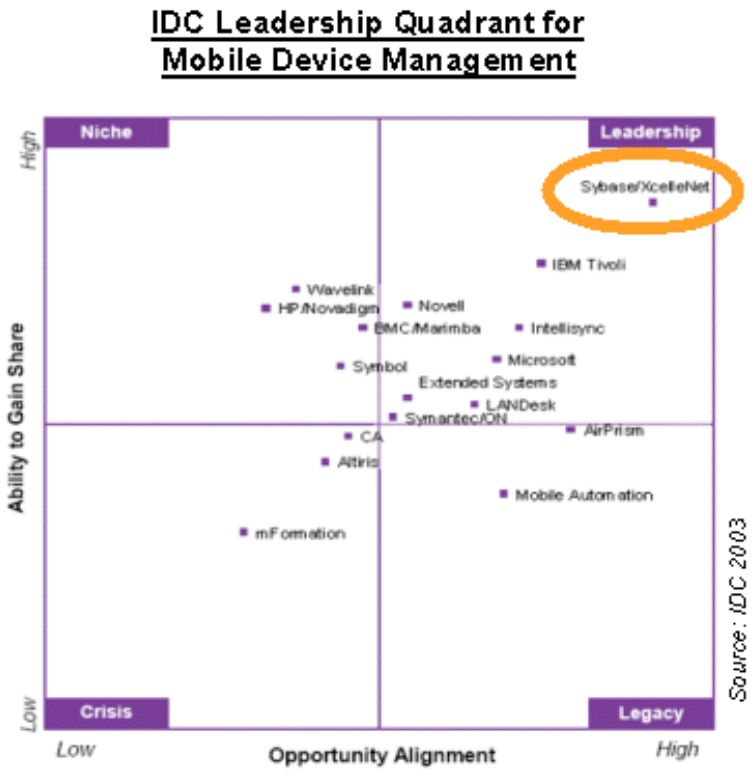


Figure 2: The IDC leadership quadrant for mobile middleware positions Sprint partner iAnywhere high in both ability to gain market share, and opportunity alignment, making its M-Business Anywhere platform an ideal mobility solution.

"Strategically, we're well-positioned with iAnywhere," Montee says. "They have the background and resources, and Sprint is positioned to develop customized solutions that address the specific needs of colleges and universities… We can provide holistic solutions to the university market that wirelessly integrate the campus and their technology applications. The Campus Connect solution is a perfect solution for universities that are working to enhance the educational experience with the use of wireless technology."

For schools already wrestling with too many technology platforms and solutions, an advantage of Campus Connect is that it comes ready to run with minimal setup for basic use. The M-Business Anywhere middleware can integrate directly with existing campus portals, and Sprint includes a basic set of applications (see Figure 3) that can be modified according to the school's needs. "An online directory is the most common request," Montee says—a configuration that can be set up almost immediately.

While the Sprint partnership is new, the M-Business Anywhere solution that underlies it has been in the market for years. iAnywhere has a long list of schools it has worked with in customizing the platform. In particular, medical schools provide a solid example of how schools can use mobile solutions creatively.

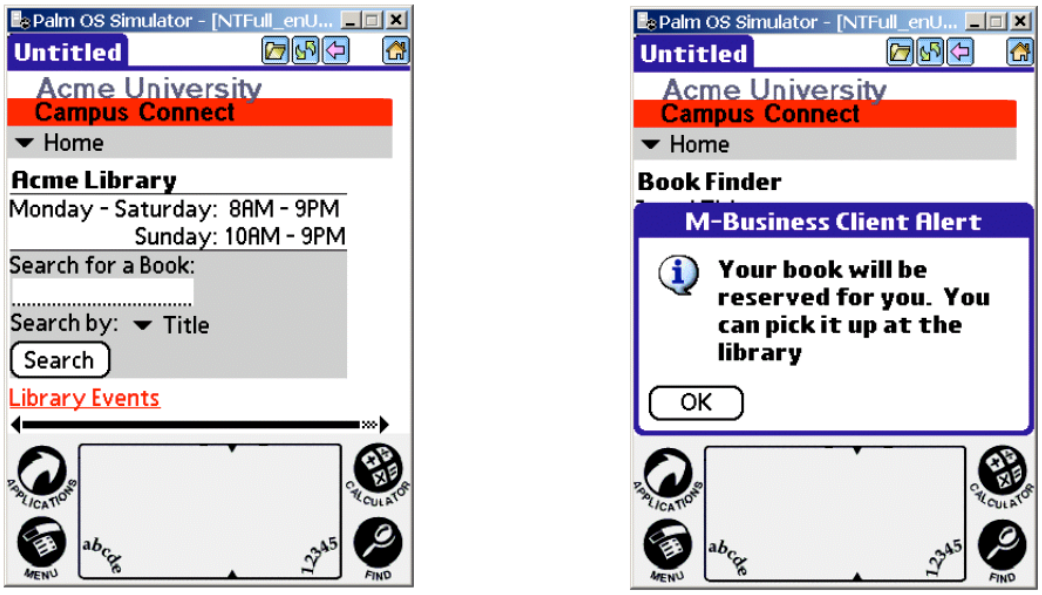


Figure 3: Examples show how Sprint's Campus Connect software might be used by a student on a device such as a high-end cell phone or other handheld device to remotely search for and reserve a book at the school library.

Medical Schools: Mobility in Action

An excellent illustration of how wireless technologies are being used creatively on campus comes from medical schools. That's because it's a huge challenge for medical students to absorb the ever-larger amounts of information they're required to learn. That makes for a perfect use for mobile technologies that provide that information quickly almost anywhere via mobile devices.

Two examples of the M-Business Anywhere software in use are Harvard Medical School, and the University of Cincinnati College of Medicine. "We're trying to move away from cramming all knowledge into students' heads," confirms Dr. John Kues, assistant dean for continuing medical education and professor of family medicine at the University of Cincinnati. For one thing, he jokes, "we can't get students with big enough heads." More to the point, the body of knowledge in modern medicine is continually changing. Rather than memorizing, say, endless drug interactions, a student's time can be better spent learning where that information is available, and how to find it quickly and use it appropriately.

Medical Mobility at Harvard

Harvard Medical School, in Cambridge, Massachusetts, is leading the charge in offering innovative mobile solutions to its medical students. The school is using software it custom-developed using the M-Business Anywhere platform. With Harvard's software, medical students can use handheld devices or wireless notebook computers to log case notes on patient rounds, check class schedules and rotation details, review lecture notes, and even study animated anatomy illustrations. Administrators estimate that the school began saving money almost immediately after rolling out the first applications.

The Harvard solution, called MyCourses, is a one-stop Internet portal that gives faculty, students and staff access to a range of educational and administrative resources. Dr. John Halamka, who has been driving the project from the Harvard Medical School side, is the CIO of Harvard Medical School and Harvard Clinical Research Institute, and an associate dean. He also serves as CIO of the CareGroup Health System, which runs Harvard-affiliated medical centers, and chairs the New England Health Electronic Data Interchange Network.

The school is in its third year since the first mobile applications were rolled out, and Halamka estimates that approximately 300 mobile devices are now synchronized daily by professors and students, viewing an average of 33,000 new pages.

According to Halamka, a key selling point in selecting the underlying mobile solution was the fact that the software "leverages the existing HTML from any Web site and does not require re-engineering." That means students can use virtually any high-end cell phone / PDA combination, whether Palm or Microsoft-compliant, to run the program. Medical students can bring any mobile device to school; the IT staff configures the software specifically for that student. The device then synchronizes with the backend database each time it's used.

Currently, about 60 percent of the medical school's students use wireless notebooks; 40 percent use PDAs—or multiple-function cell phones that have all the features of a PDA. According to David Bozzi, a MyCourses technical specialist who supports the program at Harvard, the applications are simple to use and browser-dependent. That's attested to by the fact that Bozzi spends little time supporting students, who tend to find the programs largely self-explanatory. Instead, Bozzi largely focuses on faculty support. That's because faculty members use the system in more complex ways—posting content, presenting course material, and so forth. With MyCourses, "We provide the tools so that faculty can provide rich content to the students," Bozzi explains.

The decision to go with the platform-independent underpinnings of the M-Business Anywhere solution also meant the school needed minimal programming effort to adapt its existing student portal to a mobile solution. The IT department at Harvard Medical School has just three developers supporting the school's 2,000 students. In making the choice, Halamka says, "We felt Microsoft solutions were too limiting, because they needed Palm support." The school also looked at several proprietary solutions, including a Palm-based development language, but in the end, Halamka says, they concluded that those solutions "were too risky" in limiting the school's choices in mobile devices.

The initial project budget, Halamka says, was $250,000. He estimates the school is saving $150,000 per year in reduced staff, mostly from automating its survey and evaluation business processes.

The Move from Paper to Digital

Cost savings, while important to any school, seldom tell the whole story in going mobile. For example, the University of Cincinnati College of Medicine is saving significant amounts of money by having medical students complete course surveys on handheld devices rather than paper. Scores of lengthy course surveys are completed a year, so the paper cost savings alone are considerable.

But the benefits of using mobile applications don't end there, according to Dr. John Kues, a professor of family medicine at the university, and assistant dean for continuing medical education. The Checklist application the school uses to collect survey information also gives instructors instant feedback from students. That, in turn, allows them to alter course content immediately instead of waiting as long as a quarter for results, as often happened with the previous paper-based system.

The university is currently conducting studies on what it has saved with its mobile applications, Kues says, but notes that while the cost savings are probably significant, they will be a relatively small part of the advantages the medical school is realizing through mobile software applications. The survey application, for example, moved all course evaluations to handhelds or the Web. In doing so, the school saved upwards of 20,000 to 30,000 sheets of paper a year. But mobile applications have other benefits—they reduce errors, save students' time, increase participation in survey completion, and reduce the need for clerical staff to input paper-based results.

The Checklist mobile application now in use requires third and fourth-year students to document over 30 clinical procedures that they must either observe or complete to graduate. Students can

document their participation on their PDAs or high-end cell phones wherever a procedure occurs—often at a patient bedside or in the operating room. The application features drop-down menus tailored to PDAs, making form completion simple and fast. Students then synchronize their handheld devices with a central database, thus sending their record of observations to the faculty member present at the procedure, and verifying their attendance. Syncing to the database also downloads information back to the student, so the student can track and review what's been completed.

By using software that runs on handheld devices to track student participation in the procedures, Kues says, the school has eliminated a cumbersome and ineffective paper form system that used carbon copies. It has also been able to make observation of the procedures a graduation requirement, since attendance is now easy to verify.

As with Harvard, the university wanted to tap into its existing database—and wanted to own the application code when complete. Like Harvard, the school worked with iAnywhere's technology partner ArcStream Solutions in developing several of its applications. ArcStream has used the M-Business Anywhere middleware platform in building mobility solutions for a number of U.S. medical schools, including Harvard, Columbia, Dartmouth, and the University of Southern California.

Since M-Business Anywhere integrates with existing software, development can proceed rapidly. Implementing the Checklist mobile application, for example, happened fairly quickly. The medical school started testing a year ago, then began using the new program with students this spring. In July, the Checklist application was fully integrated into the curriculum.

The software works with any Palm-based or Java-compliant device. Medical students are advised to bring a PDA, but it's not required, since the medical school also offers a parallel Web version of all its applications for notebook computers. Most of the campus now has wireless coverage, and as with Harvard, individual handheld devices can be set up by the IT staff so that the log-in procedure is automatic. The school has set up numerous central "syncing areas" that are platform-agnostic, allowing students to use a station to synchronize whatever brand or type of device they're using.

The usefulness of PDAs as a portable knowledge repository is tremendous, Kues says. "The largest single group of users of PDA technology are probably our residents." (Residents are new doctors doing further training in a particular specialty.) "They need the current information to make decisions," Kues says, and find the devices "very valuable, [since] they don't have the clinical experience or background yet that a lot of attending [physicians] do."

Also, when students change shifts, Kues says, they can quickly and easily synch up PDAs to transfer all the latest information about a case to their colleagues.

According to Carolyn Eady, a medical student in her third year at the University of Cincinnati, the medical school's various programs for both her PDA and notebook computer are extremely helpful. In addition to the university's custom-developed Checklist application, Eady also uses programs through her handheld like an online drug interaction software called e-pocrates, and First Consult, an online clinical information system. That also helps prepare her for life as a doctor, where studies show that PDAs are playing a larger and larger role.

The programs "definitely save you time and effort," Eady says. "As I'm seeing a patient, I can be looking up what I need to let them know to keep themselves healthy and what drugs I need to start writing prescriptions for... My Palm's much lighter than carrying four different books around."

The school struggled with whether or not to mandate a particular type of handheld device. "We had long discussions about that," Kues says. In the end, they decided on the platform-agnostic solution offered by M-Business Anywhere. That accommodates both students who are power users and want to rely heavily on their PDAs, and students who prefer less costly PDAs, and use them mostly for phone numbers and a daily calendar.

"The challenge," Kues acknowledges, is that "it's incumbent on us to support everything that's out there."

Moving to the mobile applications, Kues says, has been a learning experience in itself, but not because of the systems. “The biggest hurdle in moving from a non-automated system to any kind of automation,” he says, “is getting people comfortable with a new culture.” The biggest challenge, Kues says, isn’t students, but faculty and administration members who see any change as additional work. Once they realized that the new system meant “not more work, just different work,” Kues says they fell in line.

His advice to others rolling out mobile packages: “Engage the people who are going to be most impacted by the application. And that’s usually not the developers.” Instead, he says, work with students, faculty and administrators, including faculty secretaries—“They can tell you how they use the data, and how it all works.”

Conclusion

Higher education is clearly embracing wireless technologies and mobile devices as a way to serve students and faculty—and to foster a sense of community, increasingly important to today’s universities. The use of mobile applications built on iAnywhere’s M-Business Anywhere platform and in use at forward-looking universities like Harvard Medical School and the University of Cincinnati illustrate how the right solutions can enhance the learning process.

The best mobile solutions address the challenges that schools face in increasing their mobile offerings to serve students and to remain competitive: They leverage existing legacy systems to save schools money, for example. They can integrate with backend databases already in place. They extend existing university portals for students and faculty to wireless devices. They provide seamless wireless access, and can be used with any Web-enabled mobile device. And in doing so, they can provide anywhere, anytime access to essential information.

Schools who meet the mobility challenge with the right solutions can distinguish themselves from other institutions in ways that extend well beyond academics—and give themselves a competitive advantage.

ABOUT US

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