



## CTM Insider

### Wireless Healthcare Pathways to Anytime-Anywhere Monitoring and Treatment

Speak and Spark, Oct. 19, 2005, USC, with Donald Jones, Qualcomm

Currently, there is heightened activity and interest in wireless technologies and healthcare services. Although traditional telemedicine has been around for some time, the emergence of higher speed wireless networks and more multifunctional devices and technologies has opened up new possibilities. Many see mobility as the key – allowing patients, doctors, and medical records to engage without time or space considerations.

Wireless healthcare was the topic of a recent “Speak and Spark” discussion hosted by The Center for Telecom Management (CTM) at the Marshall School of Business at USC. CTM research investigates the evolution and convergence of the telecom industry with a special emphasis on users – both business and individuals, and the services and applications that seem poised to make a difference in daily life.

Our kick-off speaker for discussion of “Wireless Healthcare, Pathways to Anytime-Anywhere Monitoring and Treatment” was Donald Jones, VP of Business Development, Healthcare, for Qualcomm Inc. Don spoke about a number of promising cell-phone based devices and technologies that Qualcomm is working on with healthcare vendors. (Qualcomm designs and supplies chipsets using its CDMA cellular technology worldwide).

Some of the devices that Jones described: a glucose meter within a cell phone, now in use in Korea, allowing diabetics to prepare a standard blood-test paper strip that is fed into the cell phone to record results. The phone maintains a patient diary and can send test reminders. He also described a wearable EKG chest band that monitors the heart continually and contains a cell phone that can call a preprogrammed number automatically in an emergency.

Such devices may make monitoring their own health more convenient for patients, and make it easier for health care providers to deliver high-quality services. However, both the health care industry and the networked digital industry face challenges in integrating such devices. Barriers include resistance by the industry itself—including doctors, hospitals, and the AMA—and consumer acceptance of the devices, which can be complex and require more patient involvement in personal health care management.

Perceived Value for the User: Producing Tools not Toys

Despite the promise of the convergence of wireless technologies and medical devices, important market and technology constraints remain. One key as the industry advances, commented CTM member Pablo Valencia of Field Devereaux Architecture, is to keep development platforms flexible.

Also, in some 30 years of observation of technology and medicine, Valencia said, he's seen the market flooded with "toys rather than tools." While help for patients with chronic conditions like diabetes may be found with mobile devices such as the diabetic phone, he's concerned about effective tools for more difficult situations, such as emergency care. He urged platform flexibility so that vertical market providers can find efficient business models for a variety of market segments.

### Industry challenge: Processing the Data Overload

Although patients may want personal medical information and believe they can use it effectively, attendees questioned whether giving them such volumes of raw data is helpful.

Dr. David Sawcer of USC's Kerk School of Medicine questioned the usefulness of giving patients so much information. A cell-phone-embedded glucose meter, for example, produces large quantities of information, but may not be of much use to the medical profession in working to deal with diabetic patients.

Although connecting patient data to the medical infrastructure seems promising, Jones agreed that the health care system simply isn't ready to handle such an onslaught. The current industry focus remains on patient devices, rather than on how to collect and use patient data system-wide.

Jones conceded that most doctors and nurses simply don't want—and don't know what to do with—the reams of data that some wireless devices can produce, such as a 24/7 wearable heart device that continually monitors a patient's heart. Few physicians or institutions are prepared to deal with that level of detail in patient data.

### Technology Adoption Catalyst: wireless healthcare as the solution to delivery of quality healthcare in the face of shrinking resources

Some large companies struggling to control rampant health care costs have been discussing the need for a different structure of healthcare delivery – one that places more patient involvement in the process when possible, according to a comment by Alice Taylor of Boeing. To help control costs and improve service, some large companies are encouraging direct patient access to medical records. This kind of patient interaction with personal health care is something that wireless medical devices could facilitate—or complicate.

Large employers are driving those sorts of initiatives, Jones agreed. And although legal issues may ensue as the process develops, he suggested that the trend will continue. He cited a group of large technical companies in Northern California who are self-insured and have banded together to offer new types of medical benefits to employees. Steps they are taking include reimbursing providers for giving patients direct electronic access to their own health care records, and reimbursing physicians for e-mail interactions with patients.

Video-conferencing from the home is another area which many see as a promising means to monitor patients and control healthcare costs. With 13% of GDP spent annually in the U.S. on healthcare, it is possible that further investment in a broadband infrastructure to allow video-conferencing and other applications could reap returns in savings.

**Compatibility-Usability Challenge: patients and healthcare professionals drive demand and devices**

Ease of use is clearly a prerequisite for user acceptance of this next generation of diagnostic and monitoring devices. Additional research is needed to better understand interface issues, what kinds of devices will meet the greatest need, and how much people are willing to pay. Unless devices are easy to use and simplify health care chores, patients simply won't use them. The same holds true for adoption of technology by doctors, often viewed as the stumbling block to innovation in healthcare. The rapid growth of the mobile application e-Pocrates however, suggests that when a true need is met, and usability is high, technology adoption can occur.

**Issues for Further Study: business models, healthcare structures, and mobile user behavior**

To understand the prognosis for wireless healthcare, the focus is not really the technologies themselves. As Don Jones concluded, companies hoping to exploit new technologies in healthcare need to find the business models that make the ideas marketable. This requires further research about how people use mobile technology and how it can be incorporated into patient care. Other important factors driving the success or failure for devices are the medical culture, insurers, and reimbursement and payment systems.

Future directions for research surrounding the incorporation of wireless devices into the field of healthcare include the following questions: What are the technology catalysts and what will successful business models look like? Will wireless health services be able to avoid some of the pitfalls that have befallen telemedicine initiatives? What cultural and behavioral factors will challenge mobile care services? These questions remain relevant as we see the possibilities of mobility bringing together healthcare and technology in new ways yet unseen.

## CTM Model for Analyzing Technology Adoption: the global acceptance of technology (GAT)

One of the ways that CTM looks at questions like these is through our framework for analysis called the Global Acceptance of Technology Model, (GAT) which concentrates on 4 factors: perceived relative value, cultural-socialization drivers, usability-compatibility drivers and the technology adoption catalyst. The interplay of these factors indicates the likelihood of user willingness to adopt a technology. Thus important qualities for mobile healthcare services and applications might be expected to be those that are seen to meet an identifiable need, that fit in with cultural and social modes, are compatible with existing practices and processes, have a usable interface, and finally, those that are supported by the institutional structure or other significant stakeholders.

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