

# Your Mobile Office Upgraded: *Anywhere and Anytime*

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**T**he recent Consumer Electronics Show (CES) in Las Vegas, Nevada brought about new technologies this year such as three-dimensional television without the need for 3D glasses, as well as new mobile phones, including the Google Nexus One, whose announcement was timed with the start of CES.<sup>1</sup> Although many of these new and innovative gadgets appear to be geared for gadget collectors versus the practice of medicine, many of these innovations have implications for the medical office as well. This column highlights some of the upcoming hardware that will help the medical professional on the go.

## BACKGROUND

Lenovo announced a new “hybrid” notebook, the IdeaPad U1, which will be coming out in Summer 2010.<sup>2</sup> What makes this notebook innovative and “hybrid” is that it is a full function notebook with a 3G multi-touch detachable screen. This screen can then surf the Internet or browse through multi-media files, such as videos and pictures. It is able to do this because Lenovo has developed a specialized built-in Linux operating system (OS), called Skylight OS, which allows the screen to run like a slate tablet PC. The detachable screen has its own processor, the Qualcomm ARM Snapdragon, which is typically found in smartphones. This processor will be able to browse the Internet and edit documents well, but it is probably not suited for converting video streams into different formats and other data-intensive tasks. Physicians will want to consider this device since it works as a traditional laptop with Windows 7 OS for editing and reviewing records in an electronic medical record (EMR), but it also potentially becomes a convenient “bedside” medical information-viewing tool in its slate tablet mode. One caveat is that while in tablet mode, it has not been tested with various EMR suites and other online document editing services such as ThinkFree.com,<sup>3</sup> so compatibility for editing remains

to be seen. However, there is great potential in having one device that works both in a traditional notebook as well as tablet computer slate mode, which can go from the office to the inpatient ward and back.

Not to be confused with the Skylight OS, Lenovo has also announced a mobile device for browsing on the Internet to be released in Spring 2010 called the Skylight Smartphone.<sup>2</sup> This device weighs <2 lbs and has a 10-inch display, full size keyboard, touchpad for navigation, and 10-hour battery life. It is basically a smartphone “on steroids” due to its large screen size and full size keyboard, but it has less power than a netbook due to its Qualcomm Snapdragon processor. With both Wi-Fi and 3G wireless Internet access, it will potentially enable physicians to run their web-based EMR system or refill prescriptions electronically online with the National ERx software from Allscripts. Physicians who are often on the go and need medical information on the Internet will certainly be satisfied with the large screen and keyboard compared to that found on their smartphone, and its battery life will surpass the majority of notebooks. Additionally, the form factor is an asset since it is thinner than most smartphones and does not weigh as much as the traditional notebook computer.

Although the two devices above offer unique mobility with the detachable screen or longer battery life, sometimes

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physicians need something more from their computers. One complaint with laptop computers is that there is not enough screen space to view multiple windows. For example, some EMRs may have a secondary window pop open to show a different part of the record while keeping open the main window. The Kohinjisha DZ6KHE16E may just be the answer to this problem, with its two 10.1-inch LCD screens at 1024x600 resolution.<sup>4</sup> One screen is stored behind the other, but when needed, it can be pulled out so that both screens are active and work side to side together for a total 20-inch wide-angle view. Its total weight of only 4.09 lbs is half that of most 17-inch laptops, which have an average weight of 8 lbs.

In a similar fashion, MSI unveiled at the CES a concept netbook with dual screens that may be released later this year.<sup>5</sup> This computer comes in either 7- or 10-inch dual screen versions, with no keyboard. The dual screens can be viewed in portrait or landscape mode. Data entry is accomplished with the touchscreen virtual keyboard and navigation is managed via finger gestures on the screen. This device may be the one to have on the inpatient wards for data lookup; however, battery life may be a problem due to the energy consumption of two screens.

Netbooks have seen upgraded features to bridge the gap with standard notebooks. The HP Mini 5102 can be customized with a multi-touch display, which permits gestures, finger taps, and screen swipes to navigate through the Internet and various screens in lieu of using a mouse or keyboard.<sup>6</sup> This netbook can also be customized with either a four-cell battery for lighter weight or six-cell battery for longer battery life of almost 10 hours. In addition, an optional handle makes the netbook easier to carry. Mobile physicians may prefer this device with its 95% of full-size QWERTY keyboard and touchpad. It also has a 2-megapixel webcam built in, and HP has included facial recognition software for security. Users just face the webcam of the HP Mini 5102 to log in to the device without having to remember a password. More importantly, the HP Face Recognition for Protect software tool will enable users also to log into other Websites such as an EMR with just facial recognition. For some physicians, this security feature may be the most compelling selling point.

HP has also announced the Touchsmart TM2, a convertible notebook that can be configured into a slate tablet PC.<sup>6</sup> This device updates the previously released Touchsmart TX2 by incorporating the Windows 7 OS, having the option of a faster graphic processor with the ATI Mobility Radeon, and using the newest processor for more speed and battery life. It has a fingerprint reader for secure log in, which helps diminish the dependency on remembering passwords. This notebook may

appeal to physicians who want to try out a tablet PC since it includes a digital pen for handwriting recognition. Physicians in solo practice may want to give Medscribber Lite, a Tablet PC-based EMR, a try since it is available for free.<sup>7</sup>

Spring Designs' Alex Reader is a new entry into the electronic reader competition.<sup>8</sup> Many users are familiar with the Amazon Kindle, one of the first e-readers.<sup>9</sup> This e-book reader has built in AT&T wireless 3G Internet access that is paid for by Amazon for browsing for and downloading titles. One issue with the Kindle is that it uses a proprietary format, so any electronic documents have to be converted by sending them via e-mail to the converter server, which sends back the converted document in an e-mail attachment. The converted document then has to be installed on the Kindle for viewing, which takes little more than "dragging" the document into the Kindle folder. Since the majority of scientific journal articles can be downloaded online in the Adobe PDF, they must be converted for reading on the Kindle 2. Only the Kindle DX, the large 9.7-inch display device, supports viewing PDF files without conversion. The Nook from Barnes and Noble can also download from the Internet via Wi-Fi or on the AT&T 3G network, and it can read PDF, PDB, and EPUB documents without conversion.<sup>10</sup> It also adds a color touch screen for navigation and an expansion slot for more memory. However, the Amazon Kindle offers limited web browsing and text-to-speech capabilities using a synthesized voice.

The Alex reader runs the Google Android OS, which is often found in many smartphones. It has two screens; the top larger 6-inch screen is for reading text but the lower 3.5-inch touchscreen LCD screen can be used for web browsing. For example, physicians can browse on the lower screen to find an article on Pubmed.gov, and then view it on the larger upper screen. It can also play movies, news clips, or any MP4 and Flash videos; view pictures; and play MP3 sound files. This device has Wi-Fi, 3G, GSM, and EVDO/CDMA, which means that the Alex reader can connect to the Internet in a variety of methods, and is not locked into a particular network. With its Android backbone, the Alex also has applications such as E-mail and a calculator, which neither the Nook nor Kindle offers. Although the Lenovo Skylight Smartphone may be better for web browsing and content viewing, the Alex Reader has a more portable form factor in the size of a thin paperback book.

Plastic Logic announced its Que e-reader at CES as well.<sup>11</sup> This device has a larger 10.5-inch screen size with its paper-like 8.5x11-inch dimensions. The Que also reads PDFs and EPUB documents, but can also view Microsoft Word, PowerPoint, and Excel documents as well, which are transferred from either a computer or Blackberry smartphone.

It comes in two different versions, 4GB with only Wi-Fi, and 8GB with both Wi-Fi & AT&T 3G wireless network. Documents can be viewed and annotated with notes and the Que can also receive E-mail. The primary downside to this device is that it only has black and white on the screen. However, it weighs ~1 lb and the display is shatterproof.

New smartphones also provide an option to consider for the tech-savvy physician. The Google Android OS for smartphones has created a notable competitor to the Apple iPhone.<sup>12</sup> These devices offer medical and other applications that are extremely popular with physicians on the iPhone, such as Lexi-Drugs drug reference<sup>13</sup> and medical reference texts available through Skyscape.<sup>14</sup> The extremely popular Epocrates drug reference will also be released as an application on Android as well.<sup>15</sup>

The Motorola Cliq is a newly announced smartphone running the Android platform.<sup>16</sup> This device has a keyboard underneath the touchscreen for ease of text entry. It synchronizes personal and work contacts via a service called Motoblur, which streams all E-mails and social network conversations into one feed. The advantage of this service is that users will not have to switch from one application to another, nor will they have to log into all of these accounts. Many professionals will appreciate its ability to connect to a Microsoft Exchange server for corporate calendar, E-mail, and contacts synchronization in real time. With included Quickoffice, many of the Microsoft Office Suite documents such as Word and Excel can be viewed on the Cliq. Right now, the Cliq is available only on the T-Mobile wireless provider network, but may be available on other GSM networks such as AT&T. In contrast to the Cliq, the Google Nexus One Android phone does not have a physical keyboard, but it is significantly slimmer at only 0.45 inches thickness. The Nexus One is also available on T-Mobile but will also be on the Verizon network. Although an unlocked Nexus One phone is available, it will not work on the AT&T wireless network 3G at 850 Mhz. It will still work for E-mail, web browsing, and text messaging on AT&T's 2G/EDGE network, but that data speed is not optimized for video streaming.

## CONCLUSION

While there are always new devices on the horizon and many of the new features described above seem nothing more than “eye candy,” it does make sense to consider technology upgrades from time to time. Ideally, there should either be an increased speed of the processor, larger storage capacity, improved ability to connect via Wi-Fi or wireless Internet, or perhaps innovative new features such as document viewing compatibility or user interface for control to make the upgrade compelling. The goal is to avoid purchasing novel and cutting-edge devices for merely technology sake since nothing is more frustrating to physicians than a waste of time and money. In addition to reading the various technology blogs, trying out devices in the store, and checking with colleagues who have already taken the plunge, it may be prudent to wait 3–6 months after product availability to determine whether the marketplace has identified it as the “next best thing.” However, do not wait too long as the allure of waiting for the new feature in the next device may trap users into a perennial “wait-and-see” cycle that may have others consider them to be Luddites! **PP**

## REFERENCES

1. Google Nexus One. Available at: [www.google.com/phone](http://www.google.com/phone). Accessed January 5, 2010.
2. Lenovo IdeaPad U1 and Skylight Smartphone. Available at: [http://shop.lenovo.com/us/landing\\_pages/products/new-product-showcase](http://shop.lenovo.com/us/landing_pages/products/new-product-showcase). Accessed January 8, 2010.
3. Thinkfree Online. Available at: [www.thinkfree.com](http://www.thinkfree.com). Accessed January 14, 2010.
4. Kohinjsha DZ series. Available at: [www.geekstuff4u.com/kohinjsha-dual-screen-dz-series.html](http://www.geekstuff4u.com/kohinjsha-dual-screen-dz-series.html). Accessed January 8, 2010.
5. HP Mini 5102 and HP TouchSmart TM2. Available at: [www.hp.com/hpinfo/newsroom/press/2010/100106xb.html](http://www.hp.com/hpinfo/newsroom/press/2010/100106xb.html). Accessed January 10, 2010.
6. MSI Dual-screen touch enabled netbook. Available at: [www.pcworld.com/article/186563/msi\\_displays\\_dualscreen\\_toucheabled\\_netbooks.html](http://www.pcworld.com/article/186563/msi_displays_dualscreen_toucheabled_netbooks.html). Accessed January 10, 2010.
7. Medscribber. Available at: [www.medscribber.com/EMR/SmallPractices/](http://www.medscribber.com/EMR/SmallPractices/). Accessed January 10, 2010.
8. Alex. Available at: [www.springdesign.com](http://www.springdesign.com). Accessed January 12, 2010.
9. Amazon Kindle. Available at: [www.amazon.com/kindle](http://www.amazon.com/kindle). Accessed January 12, 2010.
10. Barnes and Noble Nook. Available at: [www.barnesandnoble.com/nook](http://www.barnesandnoble.com/nook). Accessed January 12, 2010.
11. Plastic Logic Que ProReader. Available at: [www.que.com](http://www.que.com). Accessed January 12, 2010.
12. Google Android. Available at: <http://developer.android.com/index.html>. Accessed January 12, 2010.
13. Lexi Drugs. Available at: [www.lexi.com](http://www.lexi.com). Accessed January 12, 2010.
14. Skyscape. Available at: [www.skyscape.com/intro/androidintro.aspx](http://www.skyscape.com/intro/androidintro.aspx). Accessed January 12, 2010.
15. Epocrates. Available at: [www.epocrates.com](http://www.epocrates.com). Accessed January 12, 2010.
16. Motorola Cliq. Available at: [www.motorola.com/Consumers/US-EN/Consumer-Product-and-Services/Mobile-Phones/ci.Motorola-CLIQ-US-EN.ait](http://www.motorola.com/Consumers/US-EN/Consumer-Product-and-Services/Mobile-Phones/ci.Motorola-CLIQ-US-EN.ait). Accessed January 12, 2010.