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PHONE SMART

What Your Phone Might Do for You Two Years From Now

By **BOB TEDESCHI**

By now we can probably all agree that the [iPhone](#) is the Model T, the Sputnik, the [Lawrence Taylor](#) of the mobile technology realm. We are still waiting for the offenses to adapt, the competition to catch up.

Some of us are losing patience.

I have spent the last few weeks speaking with mobile technology researchers about hardware and software innovations that could, within two years, create a phone good enough to make the 2009 iPhone seem like a quaint relic.

The important takeaway is that the mobile devices of late 2011 might physically resemble the smartphones of today, but they will be much more computer than phone. Call it a PC, but this time it will be “personal” for real, because it will virtually never leave your person.

Today’s smartphones can do almost anything a PC could do in 2007, but in a couple of years smartphones may have enough computing power to enable much more sophisticated applications that truly take advantage of the device’s portability.

Just imagine a device with an 8-inch fold-out screen, a big virtual keyboard for easy text input, numerous sensors to detect your surroundings, and software smart enough to anticipate your needs and sharp enough to respond to conversational commands.

Open up the device, point it at the street and ask it to show you what the place looked like 200 years ago, and it offers a photo or video. Ask it where to eat lunch and it highlights a restaurant that suits your tastes. If you are heatedly debating food choices with a companion

when someone of marginal importance tries to call you, the phone will know better than to interrupt.

This blue-sky, composite prediction comes with a stiff warning: forecasts with a two-year horizon are especially chancy, technologists said, since those making the predictions are often overly optimistic about emerging designs and, at the same time, blind to some of the reasons the current generation of technologies looks as it does.

But why spoil things? Here is what you may see in your next device upgrade, two years down the line.

Research and development teams at technology incubators like SRI International, PARC and MIT's Media Lab, as well as designers and technologists at companies like [Nokia](#), [Intel](#) and others said smartphones of the future would not look much different from those today.

But James Begole, a principal scientist at PARC, the research lab based in Palo Alto, Calif., that was formerly known as [Xerox](#) PARC, said screens, at least, would be fundamentally different. "The one hardware development I'm feeling most certain about," he said, "is foldable displays."

Dr. Begole, who is known as Bo, said the current availability of the RADIUS ([RADIUS.com](#)), an e-book reader with an expandable display, suggested that smartphone makers could incorporate something similar in their devices within two years.

Researchers are also experimenting with virtual keyboards, he said, to overcome the size constraints of phone-based keyboards. With these, users move their fingers over an imaginary keypad, and sensors infer the keystrokes. (See [senseboard.com](#) for an example.)

But if displays are bigger, touch-screen typing may work just fine, said Norman Winarsky, a vice president at SRI International, another technology incubator based in Palo Alto. Dr. Winarsky said SRI had created "an electroactive polymer that vibrates beneath the glass, and gives your fingers the sense of touching individual keys."

That technology, he said, is within 24 months of reaching the market.

Henry Tirri, the Nokia senior vice president in charge of the company's global research centers, said cellphones of the not-so-distant future would contain supersensors, like higher-quality camera lenses that will see faraway detail much more clearly than the naked eye.

(This is different from the multitude of external sensors, like heart-rate monitors, thermostat readers and others that now — or will quite soon — connect to your smartphone.)

So if you are on the street and looking toward the top of the Empire State Building with your smartphone, Dr. Tirri said, it will infer the visual elements you are interested in, and fetch close-up images from the Web.

This sort of “augmented reality” approach, as it’s known in the tech industry, could also allow users to see their surroundings as they may have appeared in another era.

Somewhat along these lines, PARC and SRI International have also spawned software that, using GPS sensors and data about the user’s past behavior or current calendar, can suggest nearby restaurants, among other things.

PARC’s software, called Magitti, is in its testing phase in Japan, and could reach the American market in the spring of next year.

SRI International’s software venture, called Siri, is more ambitious, in that it allows users to speak or write natural-language requests into the device (“Find me a place to eat dinner tonight with Karen, reserve a table and put it on our calendars.”), which will complete the task independently and inform you when it is done.

In terms of long-term predictions, Siri is actually an easy bet. Dag Kittlaus, the company’s chief executive, said one of the four major carriers would introduce the service early next year, and he said it would also be available as an iPhone app. But over the next two years the technology should be able to complete a wider range of tasks.

And now a word from the reality-check department.

With today’s batteries and processing chips, running multiple apps like these would make the device so hot you could toast marshmallows near it, and would run down the battery at record speed. This is a big reason Andrew Lippman, associate director of MIT’s Media Lab, said he believed that smartphones in the near future “won’t be much smarter than they are today.”

But Justin Rattner, Intel’s chief technology officer, says there is reason for hope. Early next year, the company will begin shipping its Moorestown chips, which use one-fiftieth of the power of Intel’s previous generation of processor when in standby mode. Other improvements in efficient power allocation, he said, will reach smartphone chips in the next 18 to 24 months.

In another power-saving move, apps could reach across to nearby users for information, rather than push the phone's circuitry to its limits by grabbing GPS coordinates and parsing data from the Web.

Dr. Lippman, of MIT, and Dr. Winarsky, of SRI, said they could envision a not-so-distant generation of smartphones communicating more intensively with others nearby via Bluetooth and Wi-Fi.

Smartphone apps could, for instance, recognize when a doctor is in the building, and alert him if another person nearby had dialed 911. Or, your phone might capture images from a video camera around the corner from a subway station.

This idea, labeled "the third cloud" by David P. Reed of MIT, underscores the most profound change for smartphones currently coming to the market — namely, that they need not communicate with the carrier at all.

"Carriers used to control everything, and now the tables have utterly turned," Dr. Lippman said. "That's what'll make the future so interesting."

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