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THE JOURNAL REPORT: TECHNOLOGY



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Telecommunications

What's New in Wireless

A look at mobile devices and services you can expect in the next year – and beyond

By AMOL SHARMA

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Remember when cellphones were just for calling?

Over the past few years, cellphones have evolved from simple communication devices into multimedia powerhouses. First came cameras, then Web surfing, then music players. Now, get ready for a host of new features.

In the next two to three years, consumers will be able to get TV broadcasts on their cellphones with better picture quality than current video offerings -- and a greater range of live programming from major networks like NBC, FOX, ABC and Comedy Central.

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[Businesses are finding](#)² all sorts of new uses for mobile devices. Plus, [technology companies dream of One Device](#)³ that can do it all. Now, if only we consumers would get on board.

- See the complete [Technology report](#)⁴.

Users will also get sophisticated software applications for surfing the mobile Web, and more services to connect with friends, share videos and exchange photos. And they'll likely see mobile devices that can roam seamlessly across Wi-Fi hot spots, cellular networks and new high-speed data networks, bringing a much faster and smoother surfing experience.

And that's just the beginning. In the longer term, advances in battery, display and storage technology could make it possible to squeeze ever more functions onto smaller handsets. And cellphones could extend even further beyond the realm of communications, to be used as credit cards to pay for groceries and airline tickets, ID cards to swipe at security checkpoints and data-storage devices.

As is often the case in the wireless industry, many of the new services are originating in East Asia -- with carriers in Japan and South Korea -- and trickling west to Europe and the U.S.

Everyone has a stake in innovation. Cellphone operators in developed markets face slowing subscriber growth as the percentage of consumers who don't own a cellphone shrinks. To boost revenue, they have to find new ways to integrate mobile devices into people's lives. Similarly, handset manufacturers have to convince people who already own phones to buy new ones. Start-ups have dreams of going public or being bought out to the tune of billions.

WSJ's Amol Sharma previews a handful of the top innovations brewing in the wireless world -- mobile broadcast TV, e-wallets, GPS services, printer phones and Wi-Fi.

Here's a closer look at some of the areas of mobile that will be busiest in the years to come.

Mobile Video

Mobile video is just beginning to catch on, with only about 2% of U.S. subscribers watching it. Today, consumers can watch short streaming clips of news, sports and entertainment pro-grams on some major carriers. Customers of many operators can also sign up for the service offered by MobiTV Inc., of Emeryville, Calif., which provides about 40 channels of programming from major TV networks and content providers.

Among other features, the service lets you watch a selection of programs at the same time they're broadcast on television. (There's a slight delay in the broadcasts and the local commercials are different, but otherwise the programs are the same.) The service costs about \$10 a month, and users must also buy a data plan from their carrier that usually runs \$15 to \$20 a month.

Some challengers are betting they can do better. MobiTV's service runs over the same cellphone networks that carry calls and let users download ringtones, which limits its video quality. The rivals think they can offer a better picture and quicker



channel-changing by building dedicated networks for broadcasting TV shows to phones. And, at least in theory, the broadcast networks are more efficient for delivering video and could result in lower costs for consumers.

MediaFLO USA Inc., a subsidiary of cellular chip maker **Qualcomm Inc.**, already has such a network in place. Verizon Wireless, a joint venture of **Verizon Communications Inc.** and **Vodafone Group PLC** of the U.K., has started offering MediaFLO's service to its customers in 20 markets, with a bigger deployment coming. The service is priced at \$15, or \$25 as a package with music and Web surfing. It's available on a Samsung phone that costs \$150 with a two-year contract, after a \$50 rebate. (Another phone from LG Electronics Inc. is on the way.) **AT&T Inc.**, formerly called Cingular Wireless, will offer MediaFLO's service later this year.

JOURNAL REPORT PODCAST

[Why are cellphone companies](#)⁵ so eager to introduce new services? And what stands in the way of wireless innovation? Hear a discussion with Wall Street Journal reporter Amol Sharma.

In South Korea and Japan, carriers have been offering these kinds of mobile broadcasts for some time. And they're already having success. Research firm In-Stat predicts mobile video revenue in Asia will reach \$3.1 billion by 2010.

MobiTV, whose service has more than two million subscribers, has plans of its own. The company says it is working toward a future when users will be able to pay one fee to subscribe to TV service and watch it on any Internet-capable device, whether it's a mobile phone, a PC or a television. Already, the company has struck a deal to have its mobile TV service marketed to AT&T's DSL customers so they can watch MobiTV channels on their PCs. The next step would be integrating the service into TV sets.

"It won't be perfect overnight, but the goal is to create a seamless experience where you have access to pretty much any TV you want on any of your devices," says Paul Scanlan, MobiTV's co-founder and chief operating officer.

In addition, carriers will increasingly integrate user-generated video into their services. Carriers have already made deals with the likes of video-sharing sites YouTube and Revver to make their videos available over cell networks. Carriers are also likely to develop a greater amount of original programming tailored to mobile phones by partnering with other providers.

For example, GoTV Networks Inc., of Sherman Oaks, Calif., supplies mobile TV programming to U.S. carriers. The company is developing a mobile TV series based on the friendship of four teenage girls, centered on a main character named Bailey. The show, called "Being Bailey," is shown in three- to five-minute episodes called "mobisodes." GoTV's chief executive, David Bluhm, declined to say when

the series will launch and on which carriers.



Advertising

So far, part of what has deterred consumers from using mobile video services is price. "The bigger limitation isn't going to be technology, the bigger limitation is going to be consumers' willingness to pay for it," says Jeff Glass, a venture partner at Bain Capital. Wireless carriers often charge consumers as much as \$15 a month for access to their mobile TV offerings, plus additional charges for premium services like MobiTV.

CALL OF THE WILD A host of mobile developments are in the works. Clockwise from upper left: Polymer Vision's rollable screen, MediaFLO's TV offerings and DoCoMo's "wallet" phone.

But carriers world-wide are beginning to think about lowering the cost of video content, as well as mobile Web access and other content services, by carrying ads.

Vodafone has said it will take that path. Big carriers in the U.S. like Verizon and **Sprint Nextel Corp.** are said to be considering it, too.

Vodafone has said it will take that path. Big

Carriers are just beginning to toy with those business models -- they aren't likely to give up video-subscription revenue easily, especially given the continuing declines they're seeing in voice revenue. But over time, many analysts say, carriers could come to view advertising as an even greater source of revenue than subscription. The logic: By lowering prices, operators could spur the kind of consumer usage of Web and video services that would attract big spending by marketers.

Another factor that might push carriers to the ad model: They're in a strong position to become ad brokers -- or at least partner with intermediaries that can help sell ads. Carriers have access to a wealth of information about subscribers that could help marketers better target their ads, including what sites customers view, what content they download and where they live. Carriers haven't put much of this information to use yet, anxious about protecting user privacy, but most analysts expect they will eventually take advantage of their unique position.

The trick for carriers will be to avoid alienating consumers by keeping ads "highly entertaining and relevant," says Anil Malhotra, founder of Bango.net Ltd., a U.K.-based firm that helps companies develop mobile Web services.

Meanwhile, some start-up companies, including Rhythm NewMedia Inc., of Mountain View, Calif., are developing the technology to help carriers insert snippets of video advertisements before TV programs. Britain's **Hutchison 3G UK Ltd.** has already announced it will use Rhythm NewMedia's system to embed ads in

a range of free video content, including news, comedy and celebrity gossip, which it will offer free beginning in April. Vodafone and **Deutsche Telekom AG's** T-Mobile are testing out Rhythm NewMedia's technology. Video spots would add to the other forms of advertising that have already been tested on mobile Web pages, including sponsored text links and graphic banners.

Beyond Communications

Telecom consultant Rory Altman previews some new options for cellphones, like video sharing and GPS systems, and discusses their expected added costs for consumers. Cellphones have already evolved into cameras and music and video players. Now device makers and carriers are eyeing other possible uses for mobile handsets.

One promising area: using phones as credit cards to make small purchases at the dry cleaner, movie theater or gas station. Consumers would hold the phone up to a reader and automatically make a payment, using funds they had electronically stored on the device.

Japan's **NTT DoCoMo Inc.** has already signed up 1.3 million customers for its mobile credit-card service. Other handset makers, like Samsung Electronics Co.,

Nokia Corp. and **Motorola Inc.**, are taking a close look at the idea, too. In the U.S., AT&T's wireless unit is conducting a test of a system called MasterCard PayPass, through partnerships with Nokia and **Citigroup Inc.**

Another area of interest is beefing up Global Positioning System services. More phones in the U.S. and abroad are coming with GPS chips built in to pinpoint a user's location. To date, that feature has mostly been used for navigation applications. It will become more popular, analysts say, in services that let users track the whereabouts of their friends and family. Start-up carrier Helio, a Los Angeles-based joint venture of **EarthLink Inc.** and SK Telecom Co., and Sprint Nextel subsidiary Boost Mobile have already launched such buddy-finder applications.



John Kuczala

to help people search on phones for their local pizzeria or
ving to type in a ZIP Code, as they do on the mobile search
ow.

ine GPS and other technologies under a plan called
ie idea, still a ways off from coming to market, is that
a phone with a built-in video camera at a building or person
mation pop up on the screen.

example, could bring up a menu, and scanning a stadium with the phone could help locate a friend. In the nearer term, Nokia is opening up its GPS and mapping information to third-party software developers, hoping they'll come up with catchy services.

"Which one of them will take off on a big scale, nobody knows," says Tero Ojanpera, the handset maker's chief technology officer.

Another creative application, says Richard Wong of venture firm Accel Partners, will be letting consumers blog about particular locations as they travel. Then those blog entries would be automatically tagged with their geographical coordinates. So if you were to post photos or blogs from, say, a scenic rest stop on a long drive, others could find the same spot later. Companies like New York-based Kamida that offer such "geotagging" services now require people to enter their location manually but are integrating GPS to remove that step.

Looking even further down the road, researchers are looking at ways to integrate printers into phones that are capable of producing color photo prints. A company called Zink Imaging LLC, of Waltham, Mass., says it has found a way to print color images without ink or ribbons, by using special paper with crystals that can be dyed through heat.

And there are even more-ambitious innovations on the drawing board. DoCoMo has a promotional video that describes its vision of the future, tracking a day in the life of Mr. Kotani, a fictional Japanese businessman who uses a mobile handset for a variety of functions. When he arrives at the office, his device communicates with nearby security checkpoints to confirm his arrival and validate his identity. At a meeting with a client, it stores files that he uses for his presentation. And throughout the office, it projects holographic images of an assistant helping him to plan his day.

"All of those functions combined should be provided by a single handset," says Masaki Yoshikawa, president and chief executive of DoCoMo's U.S. unit.

Given all the new services being crammed into phones, and the likelihood that consumers will continue demanding the slimmest and smallest devices possible, device makers face two huge challenges: How do they maintain battery life and create displays that are large enough for consumers to enjoy? In Japan, DoCoMo and No. 2 carrier **KDDI** Corp. are developing small, portable fuel cells to provide additional power to cellphones, through partnerships with Aquafairy Co., **Toshiba** Corp. and **Hitachi** Ltd.

There's a potential solution in the works for the display issue as well. **Polymer Vision** Ltd., a Netherlands-based spinoff of Philips Electronics NV, has developed a rollable paper-like display technology that consumers would unfold to create a large screen for their small device, making it easier to watch movies, view maps

and surf the Web. The screen would fold up into the phone when not in use.

The first product it's offering is the RADIUS, a PDA with data capabilities but without voice capabilities for now. It will be available from **Telecom Italia SpA** sometime this year, with mobile-phone versions to come later. The prices will be set by the carriers.

Better Access

One of the mobile Web's biggest limitations has been access -- consumers want a high-speed connection wherever they go, at a decent price. Cellphone carriers' 3G, or third-generation, networks are good for downloading music and checking sports scores, and offer good coverage. But they are still too slow to support heavy Web surfing.

All of that is changing. In coming years, consumers will have multiple ways to access the Web at high speeds.

First, there's Wi-Fi. Most people know Wi-Fi as a way for laptops to get a high-speed wireless connection to the Web. But as Wi-Fi hot spots proliferate, handset makers are beginning to include Wi-Fi chips in their phones, so the phones can jump back and forth between cellular and Wi-Fi networks. Not only does that mean faster surfing, but you don't use any costly minutes when you roll your regular voice calls onto a Wi-Fi network. (Carriers will likely charge a few dollars a month for such services.)

Over 80 cellphones now come with Wi-Fi access built in, from manufacturers such as Samsung, Nokia and HTC Corp. **Apple Inc.**'s iPhone also includes a Wi-Fi chip.

Still, to make these phones useful in the growing number of hot spots, manufacturers need to strike agreements with hot-spot operators like Boingo Wireless Inc., of Santa Monica, Calif., which oversees more than 60,000 access points globally, and T-Mobile USA, a part of **Deutsche Telekom AG**, which has 30,000. That will enable users to take their phone to a Starbucks, airport or hotel and keep using it without having to go through several logins.

"It's one thing to bolt a Wi-Fi radio into a phone," says Sky Dayton, a technology entrepreneur who founded both Helio and Boingo. "It's another to make it a seamless experience for the user. That's where the magic is."

Sony Corp., for one, has already made a deal with a big hot-spot provider. The company's Mylo device, a personal media player that enables mobile Web surfing, instant messaging and multimedia downloads, comes with one year of free access to T-Mobile USA hot spots.

There are other high-speed options on the way. Cellular carriers are upgrading their

existing networks to make them more powerful, and some are investing in entirely new ones to make significant jumps in speed. In the U.S., Sprint Nextel has said it plans to spend up to \$3 billion to roll out a higher-speed network based on a technology called WiMax, making it available to 100 million Americans by the end of 2008. The company says the service should initially offer speeds of two megabits to four megabits per second -- roughly twice as fast as Wi-Fi -- at prices comparable to those of cable operators, which are usually around \$50 per month.

Sprint Nextel Chief Technology Officer Barry West predicts speeds will rise to 10 megabits per second in the future. And he says that will lead to a big change in the industry: With mobile surfing so easy and fast, people will want to use mobile devices that are specifically built for surfing rather than making phone calls. An example: Nokia's N800 personal media tablet, which has a big screen and easy access to email, the Internet and chat services.

"The personal media player is going to be a big part of the WiMax world," Mr. West says. Later, he says, video cameras, gaming devices and other consumer electronics could be equipped with WiMax access.

In Asia, operators have similar plans. In South Korea, a technology similar to WiMax, known as WiBro, is taking hold. In Japan, DoCoMo is planning for an ambitious upgrade by 2010 -- an ultra-high-speed wireless network that it says will allow download speeds of up to 100 megabits per second. That would put the network on par with the highest-end fiber-optic landline Internet connections.

--Mr. Sharma is a staff reporter in The Wall Street Journal's New York bureau.

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