Volume 1, Number 5, November 2002

WGR Presents:

Mobile Entertainment analyst

In-depth coverage of the wireless entertainment business

# Television on Mobile Phones: The State of the Art

by Dustin Goot

Americans love television. US households have TV on more than eight hours per day, according to Nielsen Research. Satellite and cable networks are striving to give customers more than 500 channels from which to choose. It seems that people cannot get enough.

Therefore, allowing consumers to watch as much TV as they want — wherever they go — on a wireless device is a blockbuster service that everyone in the US wireless industry must be working on, right?

Not exactly. But some people are working on it. Whether it's perceived as a marketing expense to encourage consumers to upgrade to 3G or as an application with latent and powerful demand, TV on mobiles is on the docket at companies across the United States. Here's a quick survey of the state of the union:

## RealNetworks

"I don't think you're looking at people spending hours watching television on their phones," says RealNetworks' Mark Donovan, expressing a commonly held belief.

RealNetworks is counting on the eventual growth of the wireless video market, positioning itself as a leading provider of TV content to wireless operators. However, Donovan says TV programming "would have to be packaged differently for a mobile device."

According to Donovan, wireless consumers are more interested in short clips of personalized, time-sensitive content they can view on the go. RealNetworks is developing a service that would use an SMS message to alert users of breaking news or live events that might interest them. "Then you can say specifically, 'Hey, Barry Bonds is coming up to bat. Would you like to watch?'" Donovan explains.

## Mazingo

Carmine Gallo, spokesperson for video service Mazingo, agrees that clips are an important part of mobile video services, but he contends that there is still a market for more robust video content.

Continued on page 10 ►

# Impressions of the Tokyo Game Show

by Daniel Scuka

The end of summer in Japan marks the official start of typhoon season (the English word "typhoon" comes from the Japanese "taifuu"), and this country has seen its share of biggies. In September 1959, Typhoon Vera ravaged Japan's main island, Honshu, leaving more than 5,000 dead and 1.5 million homeless.

September also heralds the fall Tokyo Game Show. This year's event was, thankfully, less frenzied than a typhoon, but not by much. Judging by the din alone (not to mention the crammed together, perspiring, game *otaku* [enthusiast] bodies), the Computer Entertainment Supplier's Association — organizer of the TGS — must have been delighted with the turnout.

In addition to sweat and noise, the show appears to have been a not insignificant commercial success. Exhibitors included 60 CESA member game companies and organizations, as well as 25 non-CESA members from Korea, Hong Kong, Taiwan, Singapore, Japan and France, displaying some 500 new titles at 1,407 booths. Exhibitors paid 150,000 to 350,000 yen (US$1,203 to US$2,809) for a standard booth, and up to 400,000 yen (US$3,210) for a sales area booth.

Furthermore, according to CESA, attendance was expected to reach 150,000 (the final number had not been released as of press time), a 16% jump over the numbers at the 2001 fall show and, presumably, a significant windfall, given that entrance tickets cost 1,200 yen (about US$10).

Revenue of this magnitude indicates the significance of CESA's twice-yearly (spring and fall) game shows. Fans are obviously willing to make the 90-minute trek via train from Tokyo to the Makuhari Messe venue and pay to play all the latest titles. Game developers and publishers clearly regard presence at the shows — however

Continued on page 12 ►

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Mobile Entertainment Forum

## Contents

# Short message

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by Matthew Bellows

## Ten Cool Things from CTIA

The fall CTIA show (Las Vegas, 10/16 to 10/18) was full of cool stuff. The one-day Mobile Entertainment Summit, organized for the first time by MobileTechForum, brought dozens of new people into contact with the mobile entertainment market. Keynotes and exhibitions by industry giants had more than a few reporters and analysts taking notice. And there were quite a few new products being passed around the show. After looking at everything I possibly could, here are my CTIA Top 10 Cool Things.

**1. T300 and P800** (SonyEricsson, "available very soon worldwide"). Although Wildseed was showing prototypes of its Kyocera phone and Sendo was all over the Microsoft booth, on the device side, CTIA didn't have a lot to offer. Except for the new SonyEricsson handsets, that is. The P800 was the device everyone wanted to be seen with, and it is impressive. FatHammer CEO Brian Brunning showed me a very fun "Men in Black" game that his company developed for the handset. Finally, someone has made a game that lives up to the movie. It's a scripted FPS (like those Flash shooters you see on the Web), only with cut scenes, dialog and fantastic graphics that make it very fun to play. From an industry perspective, however, I'm more excited about the T300. Running the Mophun graphics engine, the T300 also sports a responsive joystick that makes gaming very easy. THQ has ported/developed two games for the T300: MotoGP, which plays fast, with good color and music but strangely fuzzy backgrounds and Toki Tori, the old GameBoy title, which was very true-to-form. SonyEricsson reps told me that the T300, in stores soon, will come bundled with a camera for only $150.

**2. EverQuest: Hero's Call** (Verizon, no date announced). One of the most impressive games I've seen on a mobile, this is Sony Online's first mobile adventure game. Designed by one of the EverQuest designers, Hero's Call has great graphics (even on the Sharp Z-800) and a simple but effective turn-based combat system. Sony Online has distilled the adventure genre to its essence. There are only two classes here (Fighter and Mage), but the game contains a full inventory system, both ranged and close combat weapons, dozens of levels, and hundreds of monsters to defeat. In a conversation after the show, Sony announced that they would be using the EverQuest brand in association with this game – a clear marketing coup for the mobile group there.

> Finally, someone has made a game that lives up to the movie.

**3. Splinter Cell** (Verizon, December 1). Playing with its parent company's Tom Clancy license, Gameloft has released one title, Rainbow 6, and will release another, Splinter Cell, in the next couple of months. Gameloft showed Rainbow 6 at E3 last spring and the finished version is looking good. A birds-eye shooter with a couple interesting features (you have to hold down a key for three to five seconds to defuse an adjacent bomb, which leaves you open to withering fire because these phones don't support chording yet), Rainbow 6 is pretty cool. But Splinter Cell, a dark and well-designed platformer, is the standout. The game (and the industry) should benefit from being included in Ubisoft's $3 million TV advertising campaign for the XBox/PC version.

**4. Tony Hawk Pro Skater 4** (AT&T first, release timed with the console title). AT&T Wireless is moving into games in a big way, and the Activision O2/JAMDAT relationship is bearing fruit. In his presentation on my panel, Scott Edison from AT&T Wireless showed a short but very cool looking avi of the upcoming Tony Hawk Pro Skater 4 mobile game. While the movie only showed one half-pipe and one skater, Scott assured me that there was more to see in the full version. THPS4 will move the credibility of mobile gaming in one direction or another. Although the movie was too short to be sure, based on JAMDAT's track record so far, I'm betting it gives our industry a serious boost.

**5. Fight Hard** (Verizon, no date announced). Misha from Reaxion Games, an emerging Russian publisher, showed me Fight Hard from developer G5. Fight Hard is a single-player RPG/fighter where you guide your simply-rendered stick figure through a series of bouts against computer controlled opponents. With three kicks (buttons 1, 4, and 7), three punches (2, 5, and 8) and three blocks (3, 6 and 9), Fight Hard gives you plenty to play with. The game adds in an interesting RPG aspect: You earn experience with every victory and increase your skills in four categories as you progress. The 3-D fly-in effects, the impressively rendered backgrounds (in the Toshiba 950 version) and the instant-replay features make this title a winner. Reaxion's access to skilled and inexpensive Eastern European programmers makes it a publisher to watch.

**6. Active Sky's Fox Sports application.** More an application for following a game, instead of

*Continued on page 6* ►

# Mobile Entertainment in India

by Vishal Gondal

India is in the middle of a telecom revolution. Since government-led privatization began in this country, telecom, IT and infrastructure industries have been expanding rapidly. This fast-paced growth has increased with the arrival of international telecom companies, which have formed joint ventures or taken equity participation with local Indian companies. International partnerships like Singtel with Bharati, France Telecom with BPL, Qualcomm with Reliance, Hutchison and AT&T with Birla, and Hughes and the privatized BSNL with VSNL (owned by Tata) combine international capital and equipment with local knowledge and skills. In the next few years the Indian mobile base is expected to grow to 90 million subscribers, compared with the current 8 million.

As in all other markets, Indian operators are trying to maximize their data revenues. All the GSM networks across the country will soon be GPRS enabled. In mid-October 2002, BPL became the first Indian operator to launch commercial MMS services. Reliance is currently testing its CDMA 2000 network, and internal sources have revealed that its main thrust is data revenues, including games, videos, ringtones and logos.

## Bollywood, Music and Cricket Will Be Major Drivers for Mobile Entertainment in India

Before you understand what mobile entertainment in India is or could be, you need to know about the entertainment business in India. Entertainment in India can be defined with three words: movies, music and cricket.

The Indian film industry, "Bollywood," makes more movies per year than any other country — around 800 films each year, compared to America's 100. Music is an integral part of the movies; every movie features half-a-dozen songs. Film stars are worshipped like gods in many parts of India. Today there are thousands of recorded songs from Indian movies, many hundreds of which are considered hits.

"Bollywood," makes more movies per year than any other country — around 800 films each year...

Cricket is its own religion in India. Millions of people watch five-day cricket matches. With our population topping 1 billion, it's not too hard to pull together a million-person audience. In short, India is an entertainment-crazy country from food to festivals to sports to movies: everyone's disposable income goes toward entertainment.

## SMS Has Arrived

SMS has already become the killer mobile data application in India. Around 400 million SMS messages are sent per month — on average 5 monthly messages per mobile subscriber. Overall usage of SMS is growing at a rate of 30% each month. SMS rates in India — at just US$0.02 per message — are among the cheapest in the world. Millions of people use SMS daily to communicate and big numbers are being generated by SMS services like Bollywood ringtones, Bollywood logos and icons, and online dating services. SMS cricket score services are very popular here. Messaging friends during our various festivals is very chic at the moment. Operators notice a spike in SMS traffic during festival times.

## Stat!

### Mobile Operators in India

*(Alphabetic List)*

1. **Aircell – GSM**
2. **Airtel – GSM**
   Partner with Singtel
3. **BPL Mobile – GSM**
   Partner with France Telecom
4. **BSNL – CDMA/GSM**
   Government Owned Now Privatized
5. **Dolphin – GSM**
   Owned by MTNL
6. **Garuda – CDMA**
   Owned by MTNL
7. **Idea – GSM,**
   Partners – AT&T & Birla
8. **JT Mobile – GSM**
9. **Orange/Hutch – GSM**
   Owned by Hutchison
10. **Reliance – CDMA**
    Partner with Qualcomm
11. **Spice – GSM**
12. **Escotel – GSM**
13. **VSNL/Tata Telecom**
    Owned by Tata

Indian media companies are cashing in on the SMS buzz by turning into aggregators. The *Times of India* launched its own short code, "8888," on which it offers news, jokes, cricket scores, games and dating. These services will be joined by a logo-ringtone download site. Murdoch-owned STAR TV launched short code "7827," which, in addition to the regular services, sports the Indian version of "Who Wants to be a Millionaire," called "Kaun Benga Karodpati" on SMS. India's leading new channel, Aaj Tak, launched its news and information services on SMS. Yahoo and MSN have also launched mobile channels in India and they actively push a whole lot of mobile entertainment services to its users.

*Continued on page 7* ►

London Calling

# i-mode's Prospects in Europe

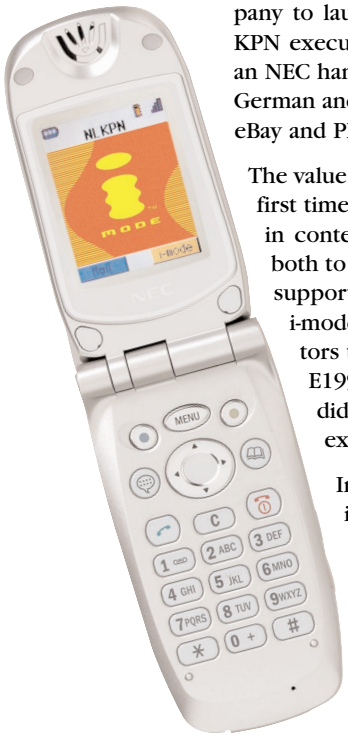
by Jamie Conyngham and Matthew Bellows

The early-2002 announcement that i-mode was coming to Europe carried with it a clear sense that NTT DoCoMo's mobile entertainment platform might just take over the world. At the time, more than 30 million people — 72% of NTT DoCoMo's customer base and 20% of the total Japanese population — were registered i-mode users. There were no competing alternatives in the marketplace. i-mode offered a compelling package of color handsets and network performance expectations, content providers, and a content management methodology and a business model to tie it all together. Plus, it had worked successfully in Japan. At the beginning of 2002, there was nothing that could touch the product, the track record or the mobile entertainment brand of i-mode.

...the i-mode brand was more familiar to mobile operators than to consumers.

How things have changed. But back then we didn't know any better.

KPN Mobile Group, via its German operator e-plus in March and KPN Netherlands in April, was the first company to launch i-mode in Europe. The launch, which KPN executives called "A new way of life," combined an NEC handset (N21i), content partnerships with top German and Dutch magazines, as well as Web sites like eBay and Playboy, with millions of euros in marketing.




The value proposition for consumers was that, for the first time, they could buy a color handset with built-in content services. Consumers reacted positively, both to the large color screens and the polyphonic support of ringtones. It's fair to say, though, that the i-mode brand was more familiar to mobile operators than to consumers. With handsets priced at E199 at launch, i-mode in Germany and Holland did not generate the initial market interest that executives had hoped it would.

In the meantime, European and North American operators have launched mobile entertainment services that incorporate some of NTT DoCoMo's best ideas about i-mode (color, content, business models and a tight rein on handset design) with new features (most notably, downloadable applications) and brands that reinforce the local carrier, not a Japanese one.

So what are the prospects for i-mode in Europe? Let's look at what's on the European i-mode services now.

## What's on EU i-mode?

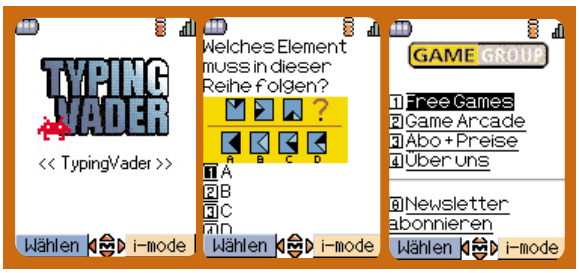
One of the distinguishing features of the overall i-mode offering is its incorporation of content. Currently, i-mode is available in three European countries, Germany (on e-plus), the Netherlands (through KPN Mobile) and Belgium (through BASE). As the first to launch, e-plus has the widest range of content providers. More than 100 certified content providers are listed on the e-plus site, and many more independent sites are accessible through e-plus i-mode phones. Looking at the top e-plus i-mode sites, it's clear that the service has penetrated beyond the technology savvy early adopters and into the mainstream.

### E-Plus Top i-mode Sites

| | |
|---|---|
| 1. **Jamba** | Ringtones, screensavers and games |
| 2. **Playboy** | Articles |
| 3. **Chat Mode** | SMS chatting |
| 4. **handy.de** | Ringtones, screensavers and games |
| 5. **eBay** | Auctions |
| 6. **CoolSound** | Cybird's ringtones and screensavers site |
| 7. **mobilePicture** | Mobile photo album |
| 8. **x-clips** | R- and X-rated screensavers |
| 9. **DateandChat** | HudsonSoft's SMS chat/ mathmaking site |

The mobile games available on e-plus are fairly limited. UnwiredFactory has launched BattleMachine, the first geo-location game on the service, which is notable for its originality. German developer/publisher Handy Games has developed two i-mode titles for e-plus – Boom and Space Seals. "These games are played much more than similar WAP titles," Christopher Kassulke, CEO of Handy Games said. "And both are very popular compared to other games on the i-mode channel. We're definitely making revenue on them, but profit depends on how you see it. I doubt that anyone is making a huge profit in mobile entertainment right now."

Otherwise, despite content from successful Japanese i-mode developers like Dwango and Taito, the games on e-plus' i-mode site look pretty uninspiring.




Screenshots from three e-plus i-mode games

KPN services available in the Netherlands and in Belgium are almost identical. Both claim 96 content partners and list games like Dungeon Keeper from Mobilescope and a series of minigames like roulette, blackjack and slot machines.

Although, this content compares favorably to some European WAP offerings because of the color handsets, the current menu of EU i-mode content is not impressive.

## Prospects for Growth

Of course, i-mode is only seven months into its European excursion. Additional carrier rollouts, price chopping and momentum from marketing efforts of other operators should help i-mode. French operator Bouygues Telecom has announced its intention to launch i-mode on its network in mid-November 2002. Telefonica Moviles, Spain's largest operator, says it will roll out i-mode during "the first half of 2003". Both of these carriers have large-enough customer bases to ensure European i-mode subscriber growth in 2003. KPN Mobile is drastically cutting its handset (from E199 to E49) and content pricing (only E2 for unlimited ringtones) in a bid to improve customer growth rates. Forrester Research, recalling the growth of Japanese i-mode once rivals KDDI and J-Phone launched, predicts that the marketing effort associated with Vodafone Live! will help drive EU i-mode expansion.

> Of course, i-mode is only seven months into its European excursion.

## Leapfrogged?

However, European i-mode operators lag in one area that's proven important to all mobile entertainment services — the ability to download applications. NTT DoCoMo was the first company to offer downloadable content to its customers. The company called the service i-appli, and DoCoMo's Japanese competition quickly followed suit. In Europe, North America and Asia, downloading applications to mobile phones is now widely available. So far, none of the European i-mode operators have announced download services.

Meanwhile, the other distinguishing characteristics of i-mode — color screens, quality content and always-on networks — are being offered by mobile operators all over the world. i-mode, the product that redefined mobile entertainment in 1999 and came to Europe in early 2002 with promises of revolutionizing the mobile customer's experience, has been leapfrogged by products from operators like Vodafone, O2, T-Mobile, Verizon, Sprint.

| | 200 KB | 1 MB | 5 MB | 10 MB | 25 MB |
|---|---|---|---|---|---|
| Data bundel per maand | € 2 | € 10 | € 15 | € 25 | € 45 |
| Toegang tot i-mode per maand | € 3 | € 3 | € 3 | € 3 | € 3 |
| Totaal abonnement i-mode per maand | € 5 | € 13 | € 18 | € 28 | € 48 |
| Buiten bundel per kB | € 0,0250 | € 0,0125 | € 0,0040 | € 0,0035 | € 0,0023 |

## What is i-mode?

After all is said and done, what is i-mode? Is it a technology? A brand? A new religion?

What started out as a unique mobile entertainment product bundle is now a brand name, and it's increasingly an obsolete one. DoCoMo's technology advantage, an always-on packet switched network, is available all over the northern hemisphere. DoCoMo's i-mode business practices, with its focus on content partnerships and a sustainable revenue share arrangement, have been adopted by mobile operators as the most effective way to develop mobile content (although not quite with the generous revenue split that DoCoMo launched). And DoCoMo's iron-fisted approach to handset vendors has also been emulated by other mobile operators. Instead of expanding the meaning of i-mode, DoCoMo gave a new name to a crucial feature for mobile entertainment, application downloads. Therefore, it's no surprise that Telefonica Moviles' announced partnership with NTT DoCoMo for i-mode in Spain will be marketed under the existing Telefonica data services brand "e-mocion."

## The Future of i-mode in Europe

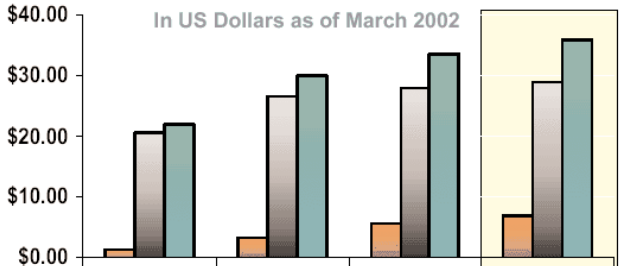
When someone asks, "Will i-mode be big in Europe?" they are basically asking whether KPN, Bouygues and NTT DoCoMo will be able to market

*Continued on page 7* ►

## Stat!

### BREW™ Drives Higher ARPU

KTF ARPU by Customer Segment




| | 2G | 1x Grey | 1x Color | BREW (Multipack) |
|---|---|---|---|---|
| Data ARPU | $1.19 | $3.29 | $5.75 | $7.07 |
| Voice ARPU | $20.69 | $26.76 | $28.06 | $29.04 |
| Total ARPU | $21.88 | $30.05 | $33.81 | $36.12 |

May 2002 ARPU $38.08

Source: Korea Telecom FreeTel, May 2002, 1Q Earnings Release

playing one, it's cool nonetheless. Active Sky built a BREW client that takes sports data from the news feeds and streams it to your Verizon phone. The version shown included MLB, NFL, college football and NASCAR results, statistics and minimally delayed (45 seconds) play-by-play games. Active Sky promises to support more sports and Fox Sports promises a lot of free promotion.

**7. Q-Bert** (no carrier or date announced). Centerscore has been busy lately, with a great soccer title almost finished and other games on the way, but my favorite is Q-Bert. A very well-executed port from the old arcade game, Q-Bert fits perfectly on a mobile phone. The movement, color and gameplay all translate well. It's great to see this old title get new life from a very talented developer.

**8. Scooby Doo** (no carrier or date announced). I always root for good brands to make the jump to mobile phones, and this time it looks like Digital Bridges is going to deliver. John Grotland showed me Denki-Blocks and a very early version of the upcoming King of Fighters game, but their standout is the newest Scooby Doo title. This horizontally scrolling adventure features nicely rendered graphics, several hours of gameplay and a *Call of Cthulhu* sanity meter for our friend Scooby. Ghosts roam the halls, and every time they run into Scooby, he loses a little bravery. The only way to restore your canine's composure is gobbling Scooby snacks. A very nice transposition of a cultural icon.

**9. Etch-a-Sketch** (Verizon now, AT&T, Alltel, US Cellular "this month"). Craig Holland from Thumbworks stopped by our booth to show me the new Etch-a-Sketch port. More than 40 million Etch-a-Sketch tablets have been sold worldwide, and Thumbworks is bringing that addictiveness to phones. Etch-a-Sketch is a simple drawing game. Using the keys or joystick, you move a tiny cursor around a screen to create a drawing. Pressing the "5" key erases your masterpiece with a vibrating buzz. Why is this diversion Top 10 material? Its brand will draw downloads, its simplicity will convert new users to mobile entertainment, and its addictiveness will keep people playing for a very long time.

**10. Indiagames' Photo Applications** (no carrier or date announced). Founder and director Vishal Gondal showed me a very cool photo morphing application for the Nokia 7650. Same idea as iomo's photo apps, but it's way more powerful. Vishal took a picture of THQ's Stewart Platt and then, with a couple quick menu selections, morphed his face into especially horrific proportions. Reaching into the in-app library, Vishal added a obscenely-gesturing hand to complete the picture. The app is like Kai's Power Goo for the mobile phone. Very cool.■

Cricket is the Religion – Sachin Tendular is the God

## I-mode

*Continued from page 5*

a brand name successfully. To date, there is no indication that the i-mode brand has resonated enough to Europeans to reward KPN for its first-mover efforts. Telefonica's product branding decision suggests that there is no magic to the i-mode name even in mobile operators' offices. Data services from all carriers will certainly benefit from market education efforts of each one, but the current European i-mode product lacks such an important part of the mobile entertainment package that efforts to build the brand as a future-forward offering will be severely hampered.

The real innovations of i-mode — color handsets, data-aware networks, compelling content and a sustainable mobile entertainment ecosystem — have successfully spread to mobile operators, content creators and consumers worldwide. It's doubtful that i-mode as a distinct brand will get much farther in Europe than it already has.■

## India

*Continued from page 3*

SMS has also turned out to be a big favorite with advertisers. The likes of Coke, Pepsi, Unilever and P&G are all paying for SMS-based contests, games and promotions. Users have a chance to win thousand of dollars as prizes by sending SMS messages and participating in various branded contests.

> There are actually more English-speaking people in India than in the UK.

## Conclusion

With the launch of color handsets and Java-enabled phones in India, all major operators are preparing Java launches. Operators hope that Java gaming will be the most exciting mobile entertainment service, so a lot of effort is being dedicated to local content. Games centered on Indian movies, actors and cricket are the kind of content that will be an instant hit with the masses in this country. While there is most certainly a market for the "Cartoon Network," "Disney," and Hollywood movie-based branded content, local content will have more mass appeal.

Although content is being localized, the language of the content itself can be in English. There are actually more English-speaking people in India than in the UK. The big mobile markets are cities like New Delhi, Bombay ("Mumbai"), Calcutta, Chennai and Bangalore. But as mobile phone penetration rises, thousands of small towns and cities will become strong markets for mobile data.

Mobile entertainment is poised for colossal growth in the next few years. With color phones, GPRS and CDMA networks and increased availability of great content, the Indian consumer will have his hands full.

For more information about the Indian mobile phone market, browse through some of the major mobile sites in India.

http://in.mobile.yahoo.com/

http://www.msn.co.in/Mobile/default.asp

http://8888.indiatimes.com ■

Aishwarya Rai. Ex Miss World and Bollywood Actress is the top Logo and Picture download

## Stat!

### Top Ten Downloads – Ringtones

| Rank | Song Title | Album/Movie | Download Code | Download Title |
|---|---|---|---|---|
| 1. | Dil Chahta Hai | Dil Chahta Hai | 97 | Dilchahtahai |
| 2. | Sarara-Lehrake Balkhake | Mere Yaar Ki Shaadi Hai | 3888 | lehrakebalkhke |
| 3. | Mission Impossible Theme | Mission Impossible | 687 | mi2 |
| 4. | Churaliya Hai | Yaadon Ki Baarat | 87 | churaliya |
| 5. | Ek Hasena Thi | Karz | 1607 | Ekhasenathi |
| 6. | Khallas | Company | 3406 | khallas |
| 7. | You Are My Soniya | Kabhi Khushi Kabhie Gham | 195 | soniya |
| 8. | Kambakth Ishq | Pyar Tune Kya Kiya | 143 | kambakth |
| 9. | Kabhi Khushi Kabhie Gham | Kabhi Khushi Kabhie Gham | 140 | k3g |
| 10. | Koi Kahe Kehta Rahe | Dil Chahta Hai | 149 | koikahe |

*Source Yahoo.co.in*

Bollywood Rules : Please note Mission Impossible tune as the #3 download

Technology Explained

# Batteries Everywhere

by Cashman Andrus

Battery life is not a big concern for the current generation of mobile phones. If you use a phone that was manufactured in the past two years, you probably have at least 100 hours of standby and enough talk time that your wallet will empty before your battery does. It wasn't always that way.

The earliest analog phones needed monstrous battery packs just to make it through an eight-hour workday, and it wasn't until 1997 or so that most users could skip a nightly charge and be confident they'd make it through the next day.

Battery life is one area in which the new generation of phones is taking a step backward. Large color screens and high-speed data connections are taking their toll on battery reserves, and the first models of these advanced phones show noticeably worse run times than the more boring devices they're superceding. Poor battery life has been blamed for contributing to the poor uptake of WCDMA in Japan — the first devices were rated for no more than 100 minutes of talk time on a full charge, and even less when using a data connection.

## What Makes a Good Battery

There are many factors that go into the choice of a particular battery. Size, weight and cost are the obvious ones, but there are also subtler issues. Durability when being recharged many times is a consideration, as is the cell's efficiency, shelf life and even the shape the battery can be fit into.

From an engineering point of view, the two most important measures of a battery are the amount of juice it can store, and the amount of power it can give when the device needs it. The former is called "energy density," and it is usually measured in either watt-hours per kilogram, or watt-hours per liter, depending on whether weight or space is the bigger concern. The latter is "power density," measured in watts per kilogram or watts per liter.

The complications begin once you realize that there is a strong interaction between these two measures — if you put a high drain on a battery, it becomes much less efficient at storing energy and won't last nearly as long as its energy density would suggest. For example, if you double the power drain, the battery might last only one quarter as long as expected. Quadruple the drain, and you may get only 10% of the life you were expecting. This is a big part of the reason most modern phones deliver around a hundred times as much standby as talk time — sure, it takes more power to transmit your conversation, but not that much more — the battery is just less efficient at the higher power drain.

A battery is really just a chemical means of storing electricity, and the particular chemical reaction involved determines a lot about how well the battery works. The history of battery technology has taken us through lead-acid, alkaline, nickel-cadmium, and nickel-metal hydride, among others. Currently, most batteries for mobile devices use a lithium reaction, which has shown the best power and energy densities with reasonable cost and durability. While still not exactly cheap, lithium ion cells are now found in the majority of phones, laptops, PDAs and digital cameras.

Lithium polymer cells, the next step in battery technology, have started to appear in high-end devices. Lithium polymer can be molded into almost any shape, so batteries can be made very thin or can be integrated into oddly shaped spaces. Lithium polymer also enables slightly higher energy density than lithium ion, but it comes at a higher price.

There is a lot of research going into lithium battery technology, and it can be expected to continue its market domination for the next few years as further incremental performance gains are squeezed out. For a big jump in battery life, look elsewhere, as the gains are not expected to top more than 10% to 20%. Furthermore, lithium is a rather nasty substance to dispose: it's toxic *and* explosive.

Another battery technology getting some use, at least in niche applications, is zinc-air. Primarily used in nonrechargeable form, zinc-air cells have nearly twice the energy density of lithium batteries. The zinc-air batteries currently available are sold mainly to replace or recharge the phone's normal battery when the user is in in emergency situations or away from conventional power jacks for many days. Researchers are working on rechargeable versions, but so far they haven't been able to get them to survive enough recharge cycles to be commercially viable.

## Hope for the Future

One technology that shows promise is the supercapacitor. Capacitors are electrical components that can store energy as an electric charge between two thin metal plates. Because the energy is stored electrically (and not chemically, as in a battery), the charge can be released very quickly and with high efficiency. Supercapacitors work the same way, but they can store much more energy by using more advanced materials and construction methods.

Several startups have developed supercapacitors for use in wireless devices alongside the main battery.

The idea is to run the phone's electronics off the supercapacitor, then use the main battery to keep it charged. The supercapacitor deals with short-term high drain when a call is in progress, so the battery only has to supply a low drain over a period of hours or days, thus increasing efficiency. Supercapacitors could make a big difference in the effective battery life of phones, especially as color screens and fast processors increase their peak power drain.

Batteries are getting better, but not very quickly.

A little bit further out, the next big hope for portable power involves a much bigger change: fuel cells. A fixture in the aerospace industry, fuel cells use a chemical reaction involving hydrogen and oxygen inside a sealed liquid bath. Instead of recharging by plugging into the wall, fuel cells run on, well, fuel. By inserting an ampoule of alcohol, lighter fluid or some other hydrocarbon fuel into the cell, your phone gets another full charge. The energy density of a methanol fuel cell is theoretically vastly greater than that of lithium batteries, but plenty of problems need to be solved before making a practical fuel cell is a true option. Laptops are the first mobile device likely to get fuel cells: 2004 is the most optimistic prediction anyone is willing to make.

Thinking even further outside of the box, there's the microturbine. MEMS (microelectro-mechanical systems) manufacturing techniques would be applied to build a gas turbine the size of an aspirin. By etching the mechanical parts out of silicon, a tiny jet engine could be constructed and harnessed to generate electricity. Much like the fuel cell, the microturbine would be powered by kerosene or alcohol; recharging would be accomplished by topping off the tank. Theoretically, a microturbine could generate huge amounts of power in a very small device and operate very efficiently using cheap fuel. It's still a very long way from being commercially available, but development is proceeding amid much interest from the US Army, which is always looking for better ways to power all the gear the modern soldier needs to carry.

## The Path to Power

Outside of these perhaps fanciful possibilities, the story is clear: *Batteries are getting better, but not very quickly.* The most common portable battery technology in use today (D-cell flashlight batteries) was invented more than 100 years ago. In comparison, modern alkaline batteries of the same size have about 2.5 times the energy density of the original, which works out to about a 1% improvement per year! Not an encouraging precedent.

The way to extend battery life is to reduce power consumption. Device makers will need to find ways to cut the wasted power of their gadgets, while still providing the features and performance customers expect. This effort is already well under way; every year brings more highly integrated chips, lower-voltage semiconductors and better power-management software. The challenge going forward is continuing to implement the kind of improvements design engineers already know how to make, while looking for new angles to save power.■

# Handset Highlights

### Nokia N-Gage gaming deck


Modes: GSM/GPRS
Price: ?
Screen: 176x208 pixels?, color
Apps: Symbian native, MIDP Java
Available: February 2003

Nokia has revealed its plans to launch a new gaming-focused device to compete with the Nintendo Game Boy Advance. Based on Symbian and the Series 60 user interface, the N-Gage will use removable cartridges to load games. Sega has already signed up to develop games for it, and more partners are expected.

### Sharp GX10

Modes: GSM/GPRS 900/1800
Price: £199 with contract
Screen: 120 x 160 pixel, 65k color
Apps: MIDP Java
Available: Now

Inspired by DoCoMo's success in shepherding hardware manufacturers, Vodafone worked closely with Sharp to produce the flagship handset for their new Live! service. It's a high-function phone, with large color screen, polyphonic tones, built-in camera, a solid Java engine, a dedicated soft button (with the Vodafone logo) to go straight to the download catalog, and far more prominent Voda branding than Sharp.

### HTC/Orange SPV

Modes: GSM/GPRS 900/1800/1900
Price: £169 with contract
Screen: 176 x 220 pixel, 65k color
Apps: Microsoft Smartphone
Available: Now

The long awaited Microsoft Smartphone 2002 operating system is finally here, and this is the first handset to ship. Sold in Europe by Orange as the SPV (Sound Pictures Video), this phone is actually manufactured by HTC, which also built the iPaq and the O2 XDA. Orange is aggressively pricing it, so it will be interesting to see if customers go for Microsoft's vision.

### Motorola T720

Modes: GSM/GPRS 900/1800 or
GSM/GPRS 850/1900 or
CDMA 1xRTT 800/1900
Price: $200–400, varies with carrier and version
Screen: 120 x 160 pixel, 4096 color
Apps: Java or BREW
Available: Now

When Motorola develops a phone, it doesn't just make one phone, it makes a whole family of them. And like George Foreman's kids, the members of this family all share the same name. The T720 comes in versions for every carrier, whether GSM or CDMA, Java or BREW. It's getting a lot of interest from developers, so there should be plenty of software available shortly.

## Television

*Continued from page 1*

Pointing to the increasing popularity of portable DVD players, he says, "There has to be a demand out there for longer-format programming on a portable device."

> "A lot of our focus groups say, 'Oh, I'd love to get TV shows on this.'"

Mazingo's service currently allows subscribers to download video content via PC or WiFi connection to a video-enabled wireless device for viewing. However, Gallo says the company would gladly offer live TV if the wireless infrastructure could support it, noting, "A lot of our focus groups say, 'Oh, I'd love to get TV shows on this.'"

RealNetwork's Donovan has heard this idea before and counters that there is no feasible business model for streaming television because of prohibitive operator costs. If it is offered at all, he says, it would be considered another marketing expense to get people excited about 3G services.

### The Carriers

The ultimate arbiters of this debate, the network operators, are noncommittal about what, if any, TV services they plan to roll out. "Is live television even a viable application?" asks AT&T Wireless spokesperson Alexa Graf. "It's too early to tell where the market will go."

Carriers say that streaming video would require speeds greater than one Mbps, which will not be an option for at least two to three years. Even Sprint, which launched its 3G network in August, promotes a maximum network speed of only 144 kbps. Dan Wilinsky, a Sprint spokesman, says that services for watching TV or movies on a mobile phone are "years away."

In the meantime network operators will be keeping their eyes on overseas markets, where wireless video services are already available on advanced 3G networks. Korea's SK Telecom offers clips of breaking news, sports highlights and other content. As of March 2002, the service was attracting more than 2,000 video downloads per day.

In Japan NTT DoCoMo offers streaming video clips via its V-Live service, launched in September 2001. Rival J-Phone has a ShaMovie service that allows users to record a five-second video clip and send it to their friends.

Domestically, an important development to keep an eye on is the rise of download-and-go video services, which capitalize on the spate of new portable devices capable of playing high-quality video.

### Hotspotting

Another approach to mobile video involves connecting to the device only when the wireless network has the bandwidth; for instance, in a mobile data hotspot. RealNetworks, Mazingo and Kanakaris Wireless all offer subscriptions for downloading video content to a PocketPC via a WiFi network. Portable viewing is also made possible by the Archos

> "Is live television even a viable application?"

Jukebox Multimedia 20, which can store and play up to 20 gigabytes of MPEG-4 video (or other multimedia files) transferred from a consumer's PC.

Another entrant into the download-and-go video market is SonicBlue. In partnership with Intel, the company is designing a personal video player (PVP) that will allow customers to load stored content from a ReplayTV personal video recorder and watch it wherever they want. The product is expected to have at least 40 gigabytes of storage and debut in Q3 2003.

The goal of these products and services is to offer mobile TV viewing in some form without having to wait for true streaming video over 3G networks.

Intel business development manager Ken Salzberg says that the challenge for companies trying to sell mobile video now is answering the question, "how do you fit into the

> ...mobile TV viewing in some form without having to wait for true streaming video over 3G networks.

existing structure?" Salzberg says Intel is helping several companies, including SonicBlue, to push forward with video services, in the hopes of creating a new market for its chips.

### On-Board TV Tuners

Another Intel partner hopes to enable full-blown live TV on a mobile device without relying on 3G networks. Semiconductor Ideas to the Market (ItoM), a Dutch company, has partnered with Intel on a reference design for handset chips with a television tuner built in.

This innovation would allow phones to decode broadcast signals straight out of the air, just like antenna-based TV sets. This approach is brilliant in its simplicity: Why stream video when it's all around you? The drawback to this approach is that, as ItoM's Ruth Cox admits, "There are many places where TV reception is not going to be very good." Nonetheless, Cox adds, "It's our belief that we're

# Games We Like

by Avery Score

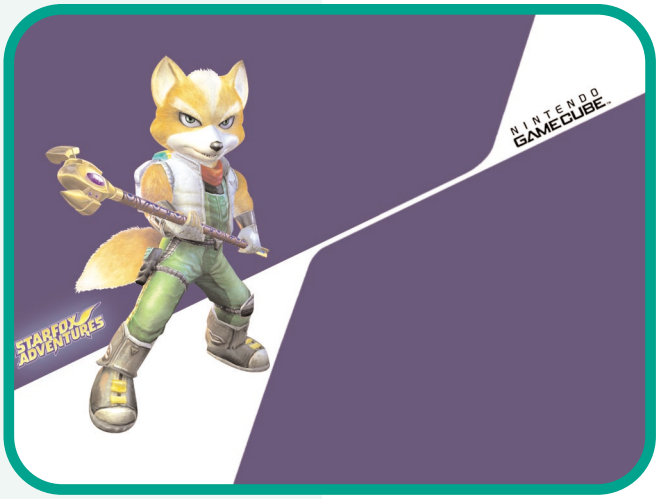
## Star Fox Adventures: Dinosaur Planet

Up to now, the game magicians at Rare have consistently created outstanding titles for Nintendo's consoles. The company's formula is simple: improve on Nintendo's successes. Nintendo brought its already hugely successful Mario franchise to the SNES, revolutionizing the platformer. Rare responded by creating Donkey Kong Country, a series with richer graphics and more immersive gameplay than any of Nintendo's previous offerings. Rare continued its success on Nintendo's next console, the Nintendo 64. Nintendo once again redefined the platformer with its Mario 64, and Rare learned from Nintendo's success, using a similar camera system and gameplay structure in its own Banjo Kazooie, a smash hit that sold almost as well as Mr. Mustache himself.

Star Fox Adventures: Dinosaur Planet, Rare's new hotness for the Gamecube, bears a lot of similarity to Nintendo's Zelda series for the Nintendo 64. Indeed, Star Fox Adventures also began as an N64 title, called Dinosaur Planet. Rare then spent almost two years porting the game to Nintendo's new console, completely revamping the graphics engine and adding the Star Fox characters to the mix. Star Fox uses combat and camera systems similar to those in Zelda; but the improvements it makes to each well outweigh what it borrows.

The result is one of the most polished, longest gaming experiences to be found on the Cube. Star Fox: Dinosaur Planet is very good action RPG, featuring beautiful transparencies, high poly counts and a terrific method of item organization It seamlessly mixes pre-rendered and real-time cut scenes with in-game play. The real-time cinematics feature more detailed versions of the in-game models.

Starting the game, I was immediately thrown into the action — an aerial fight mini-game against a flying pirate ship — and, in an instant, completely immersed in the game's world. The voice actors were speaking a strange language. At first, it seemed like gibberish, but after listening for a while, I realized that the same words were used to mean the same things. Much like the creators of "Star Trek," who created an actual language for the Klingons, Rare has invented an entire language for the Dinosaur race, complete with its own grammar rules and vocabulary.




Now that Microsoft owns Rare (for a cool $430 million) I've got to wonder if Star Fox is the last of the great Rare titles. Even if it benefits the folks in Redmond, the gamer in me hopes it's not.

Star Fox Adventures: Dinosaur Planet is a very polished experience overall. Each moment of its 20+ hours is well crafted, and progression through the game is intuitive and fun.

**How to get started:** The opening scene of the game pits you against a flying pirate ship. Use the analog directional pad to avoid getting hit, while simultaneously pressing the A button to fire. After boarding the ship, search below decks for a key to the door to the captain's quarters.

**What to look for:** Intuitive puzzles, great graphics, a tight gameplay experience.

**What to ignore:** The dearth of trademark Star Fox moments: The few flight sequences in the game seem superfluous and were obviously added quite late in the game's development as they are not up to the caliber of the rest of the title.■

going to have good quality TV for people to watch on their handheld devices."

## Compress It

A company taking a different approach toward offering live television, while still fitting into the existing structure, is Idetic. With its technology platform, ReachTV, Idetic proposes to convert a regular television feed into a format that can stream over a GPRS (2.5G) or WiFi network.

Idetic vice president of marketing Paul Scanlan explains that the video can be scaled back in terms of its sound quality and frame rate in order to function at 15 to 20 kbps. Though the video would fall short of broadcast quality, Scanlan contends that it is very watchable, noting that Idetic had to implement a policy banning its employees from watching ReachTV during meetings.

Scanlan says that if wireless operators are aggressive and secure

*Continued on page 13* ►

## Tokyo Game Show

*Continued from page 1*

costly — as a major requirement for sparking fan buzz, not to mention domestic sales, for their newest PS2, mobile, GameBoy, and Xbox offerings.

Conspicuous among participants was — Surprise! — "special sponsor" NTT DoCoMo, owner of the i-mode wireless Internet service and host to the famous "i-Appli" Java-based mobile computing platform (with more than 15 million Japanese users as of the end of September). Japan's much-ballyhooed game industry can no longer be measured without reference to mobile gaming as a major constituent channel.

By platform, Sony's PlayStation and PlayStation2 represented a 36% share of all titles announced before or at the show, far ahead of any competition. Only GameBoy Advance and PC also hit double-digit shares, at 14.2% and 12.5%, respectively.


But while PC-, console-, and arcade-platform owners may consider a massive presence at the TGS a given, Japan's mobile platform owners don't share the same sense of urgency. Sure, i-Appli's NTT DoCoMo was there, but the other two major wireless carriers, J-Phone/Vodafone (owner of the equally successful — if decidedly smaller — "Java-Appli" service) and KDDI ("EZplus"), failed to show.

These competitors are not insignificant where Java is involved. While only DoCoMo makes its Java subscriber figures public, this author estimates J-Phone and KDDI have 5 million and 2 million Java users, respectively, as of September 2002. Why didn't these two come to the TGS?

> Game developers and publishers clearly regard presence at the shows — however costly — as a major requirement for sparking fan buzz...

The answer may lie in the fundamental structure of wireless Internet systems in Japan. Carriers build the platforms, engineer and sell the handsets, furnish the connectivity, and define the Java standards to be used by game developers. But they do not create the content — that's left up to independent third parties, who have the incentive to do so because the carriers share most of the content subscription fees (or Java download purchase fees) with the developers.

Therefore, there's little reason for the carriers to appear at TGS, and — sure enough — J-Phone and KDDI were absent, while DoCoMo's booth largely comprised "booth-lets" that were made available to third-party Java game providers like Hudson Soft, Taito, Sega, Dwango and others. These companies, of course, all had their own corporate booths elsewhere, but the DoCoMo venue was their chance to show off their mobile Java wares on DoCoMo's ticket.

Even more ironic, while Japan may be the epicenter of the mobile world's data revolution, games for mobile platforms actually represented just a small fraction of all titles released at the show and accounted for a modest 9.3% share.

Pessimists will charge this proves mobile has yet to gain credibility as a serious gaming platform. But in context, 9.3% is actually pretty darn good. Xbox, Microsoft's multibillion-dollar platform definition initiative, accounted for a paltry 5.3% share, while long-time game industry players Nintendo (Game Cube) and Sega (Dreamcast) scraped in with an 8.6% share between them. Mobile's not doing so poorly after all.

Remember, that a 9.3% share represents a steep increase from 4.1% (of 339 titles) at the fall 2001 show, which itself was a downturn from the 11%, 14.7%, and 17.1% shares seen at the spring 2001 (309 titles), fall 2000 (334 titles), and spring 2000 (380 titles) shows, respectively.

In other words, after some early success in 2000 and 2001, mobile gaming as a platform at the Tokyo Game Shows lost popularity, but now it seems to be making a steady recovery.

Various genres and architectures for Java mobile games exist, but multi-user network games, for example, are still in the minority. "Games are the No. 1 usage on mobile Java," says Shoichi Iida, CEO of Java development house Net Village (www.netvillage.co.jp), but "there's not so much multi-user [activity]. It's mostly individual downloads and playing against a server."

### September 2002 Tokyo Game Show on Streaming Video

*For an insider view of the action at September's Tokyo Game Show, access WirelessWatchJapan.com's video report, at:*

http://www.wirelesswatchjapan.com/eps/34.htm

*There's also a pretty good gallery at:*

http://www.photokyo.com/gallery2.asp?category=tokyogameshow

Overall, non-mobile platform titles offered some surprises; makers clearly put a lot of work into launching new titles. One BBS posting summed up game community feelings about the fall TGS lineup: "This is a surprise because everyone believed that all the main title games were done (for) this year, and 2003 was going to be quiet. . . (but) it looks like another big title year." Square offered Final Fantasy XII (PS2), Sega deployed Sonic Adventure 3 (multiple platforms), and Capcom fielded Resident Evil 3 (Game Cube), among many others. There were also new offerings from Namco, Sony, Enix and Takara.

In the mobile space there were fewer surprises. In fact, while publishers did field new titles, many were simple additions to existing Java line-ups. For obvious reasons, mobile Java games tend to be smaller (and less sexy) than PS2 or PC titles. They are churned out on monthly production lines as mobile content providers liven up the mix of games available on their for-subscription-fee mobile channels. Few merit any special marketing coverage, but all earn revenue.

> ...after some early success in 2000 and 2001, mobile gaming as a platform at the Tokyo Game Shows lost popularity, but now it seems to be making a steady recovery.

Taito showed "Astrotheater," its real-time star-tracking and fortune-telling appli, while Genki' displayed its Sports Mania lineup for J-Phone, including "Pocket Tennis," "Pocket Boxing," and "Pocket Beach Volleyball" (http://www.genki.co.jp/keitai/smani/index.html). Otherwise, there were no new mobile titles to rival, for instance, Dwango's epic "Samurai Romanesque," the highest rated game on WGR (http://www.wirelessgamingreview.com/reviews/samurai021402.php).

In addition to the corporate business and marketing angle, the Tokyo Game Shows also draw a gathering of gamers unlike any in Japan (and, by extension, the world), and they represent serious fun for the dedicated devotee. September's show theme was "Playing is in our DNA," and while there's no proof of that assertion, attendance at Japanese game shows may indeed be directly governed by (mostly male) hormones — if the plethora of scantily clad "booth babes" is any measure. Fans dressed as their favorite characters, omnipresent speakers pounded out thumping renditions of game series' soundtracks, and some of the booth shows easily rivaled anything that the gaudiest Vegas hotel ever dreamed up.

The fall Tokyo Game Show turned out to be a great start to the typhoon season here. Now that it's over, we've got to start gearing up for the springtime Tokyo Game Show. You can be sure that MEA will be there to bring you the story.■

## Stat!

### September 2002 Tokyo Game Show New Title Matrix

Participating game companies pre-announced 393 titles, while at-show surprise releases brought the total close to 500.

| Platform | Share | Genre | Share |
|---|---|---|---|
| PS2 | 21.6 | Action | 19.0 |
| PS | 14.6 | RPG | 11.1 |
| GBA | 14.2 | Shooting | 6.9 |
| PC | 12.5 | Sports | 6.7 |
| Mobile | 9.2 | Adventure | 6.2 |
| Nintendo | 8.1 | Puzzle | 6.2 |
| Xbox | 5.3 | Simulation | 5.4 |
| Dreamcast | 0.5 | Racing | 3.5 |
| Other | 14.0 | Other | 35.0 |

*Source: CESA Show Office*

## Television

*Continued from page 11*

partnerships with content providers, ReachTV could be rolled out next year. He further notes that because of cost savings derived from the ReachTV platform, the price of the service would be similar to voice calls.

Idetic's proposition leads back to the question of how much demand there is for watching live TV on a mobile device. Do people really want to watch Friends or The Sopranos on their phones or PDAs?

Scanlan answers that it is unwise to bet against Americans' appetite for TV. "People don't go out and look for clips to download," he says. "People do watch TV. It's the No. 1 American pastime."■

# Contributor Bios:

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**Cashman Andrus** left a career of slinging code and herding cats to co-found Wireless Gaming Review. Before WGR, Cashman was Director of Development at Yesmail and an award-winning application developer for the Palm platform. He earned a Bachelor of Science degree in Brain and Cognitive Science, with a concentration in Computer Science and Linguistics, from the Massachusetts Institute of Technology.

**Matthew Bellows** Matthew has worked in telecom and the Internet since 1995. Before co-founding Wireless Gaming Review, Matthew was Director of Business Development for Engage (NASDAQ:ENGA). At Engage, Matthew managed the team responsible for 4,000 advertising contracts that drove $30 million in annual revenue. He received his MBA with high honors from the Olin School of Management at Babson College. Matthew's first job in the game industry was as a tester at Infocom, where he spent the bloom of his youth playing Leather Goddesses of Phobos.

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**Amy Monaghan** (cinetrixie@yahoo.com) Amy has edited research on infrastructure and applications, as well as telecom and media, for Forrester Research Inc. (NASDAQ: FORR). Her background is in science and technology publishing: she has edited publications of the Massachusetts Medical Society, Rockefeller University Press, and Cell Press. Amy holds a Masters degree in English literature from the University of Chicago and a Bachelor of Arts in English literature from Wellesley College. She is not as boring as her career path might suggest, and she rides a black Schwinn Classic cruiser.

**Avery Score** (Avery@wirelessgamingreview.com) is a self-proclaimed otaku who constantly partakes in such involved, athletic endeavors as playing old-school RPGs. Avery has the looks of Camui Gackt and the mind of Yu Suzuki, and has been likened to several deities. When not providing content of truly extraordinary quality for WGR, Avery is an honor-roll student at Milton Academy. Avery brings youthful exuberance and valuable insight to the gaming world.