



inCode Announces Top10 Wireless Predictions for 2008

Key trends expected to drive the wireless world in 2008 include Google's foray into the market, the rise of mobile advertising and the battle between WiMAX and LTE

Mountain View, Calif., Dec. 19, 2007 – inCode today announced its Top 10 predictions for the game changing events that will shape the wireless industry in 2008. The predictions cover major trends ranging from who will win the communication standard wars, what role Google will play in the wireless world after January's spectrum auction and whether or not consumers will finally open up to digital content and mobile advertising.

The predictions, first created in 2003 by inCode, a global business and technology consultancy acquired by VeriSign in November 2006, are designed to help wireless industry players, partners and consumers better plan for the coming year.

"The coming year is going to be incredibly important for the wireless industry as new business models begin to take shape," said Jorge Fuenzalida, vice president of communications consulting for inCode, a VeriSign company. "Beginning with the spectrum auction in January, to the continuing battle between fourth-generation (4G) technologies LTE and WiMAX, to what it's going to take to make converged wireless a reality, wireless will look significantly different in several critical ways one year from today."

2008 Predictions Highlights (full text follows):

- **The WiMAX/LTE wars will end with a whimper.**
The long-awaited "take-off-the-gloves" battle between next-generation wireless technologies LTE, HSPA and WiMAX will not occur since they are in different stages of maturity, with HSPA already enjoying widespread adoption and a flourishing device market.

- **A new wholesale carrier will emerge.**
The 700MHz spectrum auction presents a large opportunity for the emergence of a new wholesale carrier (i.e., no retail operations or direct customer) that focuses on being the most cost-effective player in the market and avoids the retail game. The wholesale carrier model will be driven by companies such as Google – but the question remains: How much control will Google be able to garner?
- **Peer-to-peer (P2P) technology goes mainstream.**
Long used for pirating files, US distributors follow the UK's lead and begin to utilize next-generation, secure and DRM protected P2P for mobile content distribution.
- **For the eighth year in a row, mobile service quality will continue to deteriorate.**
The combination of new technology (3G), multi-band, multi-access technology, advanced and complex handsets, least-cost routing and under investments in network coverage have made mobile services less reliable than they were before the introduction of 3G.

inCode 2008 Top 10 Predictions for the Global Wireless Market

1. RF Technology Convergence Will Finally Start to Materialize

Prediction: The likelihood for global harmony is greater than ever; HSPA will continue to grow rapidly and the elements around LTE will be OFDM-based. The long-awaited "take-off-the-gloves" battle between LTE, HSPA, and WiMAX will not occur since the three technologies are in very different stages of maturity, HSPA is a mature technology with more than 10 million users around the world today and with a flourishing device market. WiMAX is still a technology in a very early stage with trial networks around the world and most likely with one to two more years before commercial volumes are reached. LTE is even further away, and with normal technology maturity timelines it will not be a commercial technology until 2012. With increasing development cost and vendor consolidation it is likely that it is in all parties' interest to allow LTE be the first time ever we experience full global harmonization RF technology.

2. A New Wholesale Carrier Will be Born

Prediction: The 700MHz spectrum auction in the US presents a large opportunity for the emergence of a new wholesale carrier (i.e., no retail operations or direct customer) that focuses on being the most cost-effective player while avoiding the retail game. The wholesale carrier model will be driven by companies such as Google and will operate at a lower cost per minute, leverage technologies such as software-defined radios to support multiple standards and utilize offload techniques such as WiFi/femtocells that reduce spectrum requirements. This will also gain traction from MVNOs that want to move away from relationships with traditional carriers. Carriers have always had both retail and wholesale sides, and that duality has never allowed the MVNOs sufficient margin on which to thrive. The debate will consist of how much control Google and other potential bidders will want in the end.

3. Device Proliferation: Open Access as an Emerging Business Model

Prediction: Open access and strong competition in the chipset industry will push device and handset vendors to bypass carriers and build closer ties with the end user. Given the diversity and increased data usage of devices, we will see a great effect on open access rules and how subsidies are determined – including the use of advertising options, certification and even security models. For instance, the move from traditional cellular, where there is a somewhat closed system with high security, creates a need for security on the fly with devices that just "appear." All told, the open access model is an opportunity to provide more differentiated services, but the downside is the elimination of subsidies by carriers for devices. This will be supplanted by advertising support subsidies, and customers will therefore have to trade carrier contracts in exchange for dealing with advertising in order to receive low-cost or free phones.

4. Quality of Service Differentiation – The Road Begins This Year

Prediction: Service stacking and quality will become very important, especially after the 700MHz auction and consolidation chapters close. When the number of players decrease, options on offerings increase – and carriers will change focus from expanding the network to optimizing the customer experience. The shift to IP networks and open access will create greater motivation and opportunity to look at real quality of service distinctions for carriers selling to customers. On the low end, end users can use a pure open access network, where one brings his or her own device without subsidies and receives services that are offered on a best-efforts basis. On the high end, users can get very high reliability, priority access, and QoS guarantees that provide consistent experiences on VoIP and other applications. There are also multiple levels in-between. Customers will self-select service based on the performance they want and the price they are willing to pay. Carriers will also be able to match costs of service much closer to the prices paid, rather than the situation today in which all minutes generated by all customers are essentially equal. There may be differences at the customer care or sales support level, but not in the actual provision of services or overall policies. In summary, when the real estate is bought up and you can't build out, you build up.

5. Wireless Broadband is More About Speed Than Mobility

Prediction: We will finally have an answer for why European operators invested so heavily in 3G seven years ago, given a positive outlook for consolidated carrier markets for the next 3-5 years. Wireless broadband will continue to be the fastest-growing service since prepaid and SMS. Customers love it, but since it is priced and sold as a DSL service, there is very little focus on the strength of the cellular technology (i.e., mobility). Significant implications will revolve around the usage model, transport network and, equally important, revenues. Operator differentiation is more about a personalized service that best leverages a simplified user experience and customer support. 2008 will be a breakthrough year for broadband – HSPA will be the dominant technology in this space until LTE is commercially viable, and it will be increasingly embedded in laptops while WiMAX will be embedded in certain consumer devices. This trend will also boost the laptop market as it they will be better connected than ever before.

6. P2P – From Theft Model to Business Model

Prediction: P2P becomes mainstream as a technology. Long used for pirating files, US distributors follow the UK's lead (e.g., BBC, Channel 4, Sky) and begin to utilize next-generation, secure and DRM-protected P2P for content distribution. Media delivered via IP/Internet/broadband will completely blow apart the "walled garden" relationships created over the years. In addition, there will be major impact on services such as Slingbox/Echostar. Major studios and broadcasters will increase the rollout of over-the-top services (a la NBC Direct, Hulu), following fast on the heels of what BBC and others have already done. As "over-the-top" media takes hold for legitimate services, and the best of download services are using P2P, ISPs move from blocking and tackling (traffic shaping, etc.) to building strategic relationships with providers and media distributors. Again, the consumer wins!

7. In-building and Femtocells – Show Me The ROI

Prediction: In-building will play a large part in carriers' strategy to fill in coverage gaps, driving increased ROI for enterprises and average revenue per user (ARPU) for carriers. Carriers will follow an "inside out" strategy, enabling coverage that focus on where the most lucrative customers are (e.g., enterprise, in-building) instead of blindly blanketing a city with coverage. Carriers will be looking at low-cost, low-power femtocells as a way of increasing coverage and capacity, fostering customer loyalty, investigating offloading strategies, and reducing operating costs. However, unresolved technical and business issues such as wireless interference problems, what devices caused them, what channels are impacted, lack of a good managed service/business model, closed access, and competition from WiFi will make 2008 the year of heavy buzz with little actualization.

8. Backhaul Makes a Haul – A Move From Wireline to Wireless

Prediction: As the carriers roll out 3G infrastructure and continue to introduce bandwidth-intensive data service offerings, the backhaul portion of their networks must be optimized and/or upgraded to ensure that the service quality is not compromised. Most backhaul is comprised of leased TDM facilities provided by the fixed line carrier. As a result, backhaul will represent a significant operational expense, in many cases totaling as much as 30 percent of a carrier's annual network operating expense budget. Carriers cannot continue to scale their backhaul using leased TDM facilities when data traffic is growing exponentially and will begin to explore other options for backhaul including fixed wireless, HFC, Carrier Ethernet, DSL, and fiber. In addition, the high cost of real estate to mount antennas and high costs per megabit will impact microwave deployments in North America. One trend that will help reduce microwave cost significantly is a move away from point-to-point architectures toward point-to-multipoint designs.

9. Mobile Advertising Gains Steam – Will it Stick or Get Stuck?

Prediction: Mobile advertising will become a significant event, sponsoring content and driving innovation – so much so that carriers will no longer look at their business cases on a strictly subscription basis. In fact, subscription-based models will lose again to advertising-based models, replicating what happened on the Internet. It is not just the carriers who are building advertising steam. Google, for example, is a \$200 billion market value “advertising” company, and the carriers are sitting on precious assets – the wireless networks – that should be leveraged and monetized. By addressing services such as intelligent search, location-based search, and other tie-ins with a variety of content and product partnerships, carriers who understand this fact will begin generating sizeable advertising revenues in 2008. Why do you think Google launched Android?

10. Mobile Device Security – The Internet Brings its Security Baggage On the Road

Prediction: Not only does the popularity and number of iPhones continue to increase (and make way into enterprise organizations), the significance and sensitivity of data on these devices also continues to rise. A major iPhone security incident will raise the awareness of and need for mobile device security. This will therefore create and drive a new market for mobile device security software as well as mobile device management software and services. Finally, as a bonus prediction, the wireless industry has a tremendous opportunity go back to basics in response to consumer demand for more reliable phone service:

Back to Basics, Please!

Prediction: Mobile service quality will continue to deteriorate for the eighth year in a row. The combination of new technology (3G), multi-band, multi-radio access technology, advanced and complex handsets, least-cost routing and outdated roaming solutions have made mobile services less reliable than they were before the introduction of 3G. This means more dropped calls, poorer quality calls, and more failed call set-ups for the user. There will be a growing market for morerobust phones with a single band, fewer features and longer battery life for people that are really dependent on a reliable phone service.