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Reality Check: Challenges at the inflection point

GROWING DEMAND FOR MOBILE DATA STRAINS SMARTPHONE PERFORMANCE

November 10 2009 - 6:00 am ET | Rob Rovetta, VP of Products, Quantance Inc. | RCR Wireless News

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Rob Rovetta, VP of Products, Quantance Inc.

Editor's Note: Welcome to our weekly Reality Check column. We've gathered a group of visionaries and veterans in the mobile industry to give their insights into the marketplace.

The wireless industry is at a critical inflection point for smartphones. According to Gartner Inc., smartphone sales increased 27% in the second quarter of 2009 compared to the same period in

2008, making it the fastest growing segment of the mobile devices market. Consumer demand for smartphones is exploding and a visit to any wireless phone store offers clear evidence that there are more models available than ever before. To fully realize the data potential of smartphones, wireless carriers are making 3G data plans attractive. Further, recent public announcements suggest that 3G support will continue to improve as 4G plans are solidifying.

This growth trend has been fueled in part by the high-profile launch of the iPhone, and developed serious momentum with accelerating consumer interest in multifunctional handsets that can be used on-the-go for Internet access, music, photos, e-mail and social networking. And growth is clearly expected to continue. Smartphones will account for more than 20% of the mobile phone market by 2013, according to an early 2009 In-Stat report, "Smartphones: Heading to the Mainstream." The report indicated that more than 33% of surveyed individuals planned to buy a smartphone when they were ready to replace their current phone.

But is the industry really ready for significant growth in the device market and the technological challenges that come with it?

Growing pains

To support the increase in wireless data expected to accompany this explosion of smartphone use, action is being considered at the Federal Communications Commission to make more airwaves available for next-generation wireless networks. FCC Chairman Julius Genachowski told the audience at the CTIA convention in October 2009 that the lack of spectrum for advanced 4G networks may make it difficult for consumers to use their smartphones, data

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Anthony Melone, CTO, Verizon Wireless, Part 1



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cards or other wireless devices to their full extent. In fact, he noted that while the FCC has approved a three-fold increase in available spectrum in recent years, projections show that the growth in data traffic is expected to increase 10 times that amount.

This projected shortfall in the wireless network should be of great concern. Certainly, the move from 2G to 3G took longer than expected, but it did happen after lots of attention by the wireless carriers and their supply chain. The hope is that the same holds true in the move from 3G to 4G. While network evolution is a high-profile concern, there is a lesser known problem lurking that should be equally alarming. It's the strain that this type of popularity puts on the smartphone itself – a problem that consumers *already* are experiencing, though they may not be aware of the root cause.

High-speed data strains the handset

Unknown to most consumers, accessing high-speed data wirelessly requires that their smartphone use significantly more transmit power during its connection to the cell tower. This pushes the transmit circuit of the smartphone to operate at higher powers and for longer times than the circuits are designed to easily support. Users will notice this strain when:

--their phones become hot to the touch as a result of overworked components;

--their battery life is unacceptably short because stronger signals for high-speed data access require more battery current; or

--they experience slower data rates and reduced coverage because the smartphone cannot produce the needed power.

These problems are widespread, as they are mentioned as common complaints on many consumer product Web sites and credible blogs that rate smartphone performance.

To ensure a truly rich mobile data experience, the industry needs to keep driving toward support for both adequate network capacity *and* smartphone designs that can effectively handle high-speed data without overheating, reducing battery life or slowing data speeds to far below the capabilities of 3G and 4G networks.

Handset design for data services

The industry is already devising plans to ensure adequate network capacity. But more attention needs to be given to improving smartphones' ability to optimize performance of high-speed data on the device. It's pretty simple, really, because the problem is containable.

Today, mobile devices have transmit circuits that use power amplifiers (PAs) sized for voice communications. These PAs, however, cannot efficiently produce the maximum signal strength required to support high-speed data in all conditions, resulting in the aforementioned problems. The solution is not as simple as using

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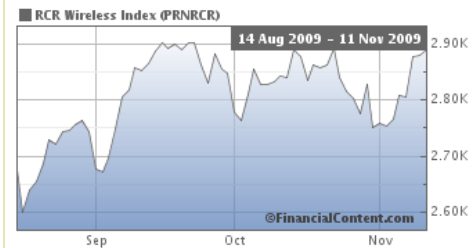
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a “bigger” PA that can produce more power, because this negatively affects battery consumption during normal voice communications and does little to fix the thermal problems. Instead, the focus should be on making the existing PA more efficient while being used for high-speed data. By doing so, the PA system becomes capable of producing the needed signal strength without overheating or excessively draining the battery.

There are some new, innovative technologies available to handset designers that do exactly this. They enable smartphone designers to overcome the handset problems by making the radio frequency (RF) front end of mobile devices operate more efficiently, resulting in more signal power for high-speed data usage.

This type of technology is important today, since OEMs already face the challenges outlined above. But it will become increasingly critical in the future because new communication standards necessary to enhance 3G and to support 4G use more complicated signals that actually require even more power to operate effectively. To ensure that these performance issues do not adversely impact consumer satisfaction with smartphones and stifle demand for these products, manufacturers must fix the problems today, with a solution that can be extended into the future.

If done correctly, next-generation smartphones will be able to keep pace with ever-evolving wireless networks, while ensuring optimal voice and data performance and increasing consumer satisfaction. But, if manufactures do nothing about the strain being put on smartphone transmit circuits, consumers will continue to be disappointed and frustrated by the lackluster performance across all generations of mobile devices and wireless networks, even as these devices become a more integral part of everyday life.

Rob Rovetta, VP of Products for Quantance Inc., has over 25 years of experience in wireless communications, GPS and digital processing systems in both business and engineering roles. Prior to Quantance, he was senior director of Product Management at Qualcomm's chip division, QCT, responsible for defining strategic opportunities, marketing, licensing and launching assisted-GPS (AGPS) and Qualcomm's gpsOne technology in location-based services worldwide. Rob came to Qualcomm from SnapTrack Inc., the start-up that pioneered AGPS, where he was responsible for licensing AGPS silicon and software to chip manufacturers and handset OEMs. Prior to SnapTrack, Rob held leadership positions for Magellan Corp. and Trimble Navigation, where he led business development and product management for GPS-enabled enterprise and consumer products. Before the GPS and communication industries, Rob worked for ROLM Corp., where he had product management, program management, and system engineering responsibilities for digital processing systems. Rob started his career as a member of the development engineering staff at ESL/TRW, where he designed and produced VHF, UHF and microwave antenna systems for strategic and tactical reconnaissance. Rob earned a B.S. degree in Electrical Engineering from the University of California at Davis.

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