# WHITE PAPER

# The OMH Initiative: Enhancing CDMA Device Availability

Sponsored by: CDMA Development Group (CDG)

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## INTRODUCTION

In a very short period of time, mobile technology has managed to move from a luxurious convenience to an indispensable tool. Despite saturation in mature markets, increasingly sophisticated devices have managed to drive growth as both consumers and enterprise markets show a voracious appetite for them. At the end of 2008, even with economic challenges squeezing spending, worldwide mobile phone shipments posted a record of 1.19 billion units worldwide. Although IDC predicts that 2009 will result in a slight dip in mobile phone shipments, the remarkable resiliency of the handset market points to the importance of mobility and wireless devices across the globe. We believe the handset market will reach 1.3 billion units by 2012, the final year of our forecast period. This will make for a CAGR of 3.8% from 2008 to 2012 (see Figure 1). Part of this growth will be fueled by feature-rich "open" devices that can operate across multiple networks. A recently launched initiative called OMH will create new revenue opportunities for CDMA operators and provide a greater choice of devices for new and existing subscribers, especially in emerging markets.

## FIGURE 1

Worldwide Mobile Phone Forecast, 2008–2012
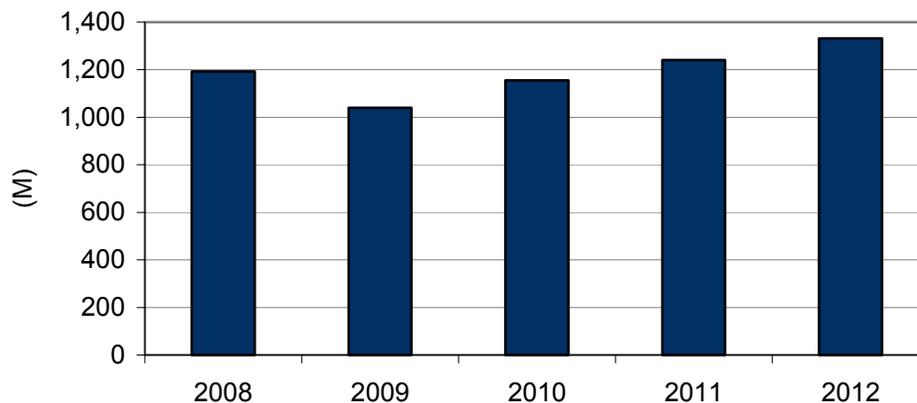


Source: IDC, 2009

## Developing/Emerging Markets: Driving Growth

Mature markets such as Western Europe, the United States, and Japan will help drive growth primarily in high-end devices such as smartphones. However, the notable growth in mobile devices will come from developing markets such as India, China, Southeast Asia, and Africa. Overall, these markets will account for 45% growth over the next five years, with India and China making up the bulk of the growth in the short term (see Figure 2).

## FIGURE 2

India, China, Southeast Asia, and Africa Drive Mobile Phone Growth, 2008–2012



■ All mobile phones
□ India, China, Southeast Asia, and Africa
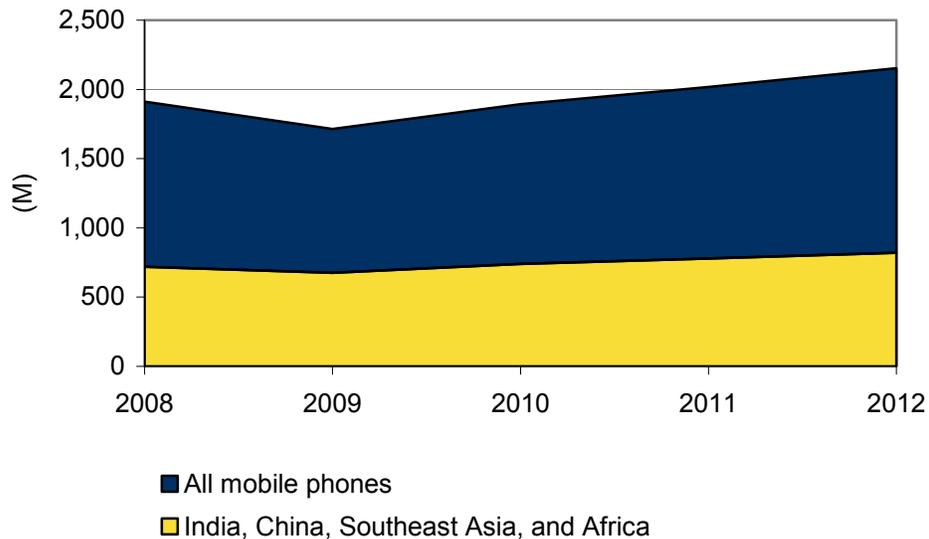
Note: Figure includes Australia, Hong Kong, India, Indonesia, Malaysia, New Zealand, Nigeria, Philippines, PRC, Rest of Asia/Pacific, Rest of Middle East and Africa, Singapore, Taiwan, and Thailand.

Source: IDC, 2007

## CDMA TECHNOLOGY

CDMA2000® delivers the advantages of mobile technology to a growing base of nearly half a billion subscribers throughout the world. In mature markets, operators have successfully sold devices that support services for voice, SMS, and mobile broadband data. In developing markets, the story thus far is somewhat different. Although many subscribers are looking for new and differentiated handsets that enable access to data services, current CDMA2000 handset portfolios offer limited variety in these countries.

The CDMA ecosystem in both mature and developing markets has always allowed for operator differentiation, and CDMA handset distribution has traditionally been operator controlled or "closed." Over time, as operator-specific custom requirements emerged to support differentiation, handset implementations started to become fragmented. In some cases, this has resulted in operator-specific network and "locked" or "closed" handset configurations, which may even diverge slightly from standards limiting harmonization. This has resulted in limited economies of scale, slower time to market, and the limited availability of "open" handsets across the CDMA ecosystem.

To foster a more diverse selection of CDMA2000 handsets worldwide, the CDMA Development Group (CDG) created the Open Market Handsets (OMH) initiative. This paper explores OMH as a catalyst for enhancing CDMA2000 handset selection and availability through open distribution of handsets as a means to address device preferences for both operators and consumers in emerging markets.

## Summary of CDMA Technology

Field-tested in 1991 and first deployed in 1995, CDMA technology enables mobile operators and handset vendors to deliver a superior mobile communications experience to millions of users throughout the world. Benefits provided by CDMA technology include:

☑ Voice capacity and clarity. CDMA2000 1X supports the most number of voice calls per sector with the highest quality of service.

☑ Enhanced privacy and security. Due to the inherent radio transmission design of CDMA, subscriber privacy and security are better protected than other technologies.

☑ Optimal coverage. Spectrum allocations can vary from country to country. To better serve their subscribers, operators select the most optimum spectrum available. For instance, if available, the 450MHz and 800MHz bands (used by CDMA) are better suited for covering rural areas than other higher frequency bands. This is especially important in emerging markets where a large percentage of the population resides in rural areas.

☑ Reduced power consumption. Energy efficiency is especially important in developing markets where the power grid may be unreliable or nonexistent in rural areas. Through power control techniques, CDMA is uniquely capable of dynamically throttling a mobile phone's transmission power (to enhance battery life) and offer better link quality.

☑ Advantages of CDMA2000 EV-DO technology for mobile broadband data.

☑ Minimal hardware upgrades for mobile broadband connectivity enable faster deployment of advanced broadband data services.

☑ Backward and forward capability. CDMA's commitment to compatibility between legacy and next-generation technologies enables operators to continue to offer legacy services without having to operate two separate networks. For instance, CDMA2000 1xEV-DO Rev. A and Multicarrier EV-DO (Rev. B) devices and services can both be deployed on the same network.

⊠ Faster return on investment. Mobile operators that have deployed CDMA2000 technology can leverage their current investment to deploy new services without having to make expensive "forklift" upgrades. Preserving their current infrastructure investments helps operators reduce their operating costs while bringing new revenue-generating services to market in less time.

The advantages of CDMA2000 technology can be witnessed in terms of its worldwide adoption. CDMA2000 is the platform of choice of 312 operators in 109 countries and territories throughout the world, including operators in the United States, South Korea, Japan, and Canada and in developing markets such as China, India, Indonesia, Nigeria, Thailand, and Vietnam. CDMA2000 operators and a variety of CDMA devices will play critical roles in helping to attract the next billion users, 70% of whom are in emerging markets.

## Impact of Technology and Current Economic Conditions

Emerging markets are the dynamic engines for subscriber growth, but considerations such as dramatic population growth, limited capital funding, and unreliable infrastructure have hampered how quickly these countries establish their place in the world economy. As technology improves and becomes more efficient, access to products and services such as mobile handsets becomes less expensive and more pervasive. Many emerging markets need access to affordable telecommunications technology sooner rather than later. Mobile technologies can enable subscribers to quickly find the nearest health clinic, find a job, or discover the best price for their harvest crops, which can have enormous ramifications when considering the vast populations who live in rural areas. Thus, giving subscribers the freedom and flexibility to choose their operator and their device is critical to grow these economies.

Although emerging markets are leapfrogging mature markets in technology deployments, their plans to quickly migrate toward next-generation mobile technologies such as LTE and mobile WiMAX are unlikely due to limited spectrum availability and access to capital as a result of the 2008–2009 recession. For instance, India's economy grew at 6.5% in 2008, its slowest pace in six years, and is expected to grow between 6% and 6.5% in 2009. Although many mobile operators in India are reporting record growth in new subscribers, their ARPU, a key measure of profitability, is falling. These operators will be looking to create new revenue-generating services on existing infrastructure while facing the continuing decline in revenue from legacy services such as voice and SMS.

We believe that operators in mature markets have also been affected by the global recession and are facing many of the same challenges as original equipment manufacturers (OEMs) and distributors in developing markets. Given the difficult economic conditions, operators in mature markets are looking to reduce capital expenditures and "sweat" their assets until the economy begins to show signs of a recovery.

# NEW DEVICES AND NEW SERVICES: MEETING DEMAND AND ENABLING THE PROMISE OF MOBILITY

CDMA2000 technology is delivering mobile services to hundreds of millions of subscribers around the world. However, the current processes that enable the creation, manufacture, and distribution of exciting new devices need to respond quicker to the ever changing demand in the marketplace. This is especially true of subscribers requesting more features (Internet access, digital radio, mobile online payments) from low-end handsets. It is also true of converged mobile devices such as 3G netbooks and smartphones, which are known for reducing subscriber churn due to a more satisfying end-user experience. Subscribers are already demanding a better mobile experience that will require sophisticated devices to access multimedia content and mobile commerce via the Web. In India, the first GSM service was deployed in 1994, while CDMA arrived in 2003. To quickly grow their subscriber base, Indian CDMA2000 operators focused on providing entry-level handsets with lower tariffs. As a result, these operators were able to build a base of over 100 million CDMA subscribers very quickly. However, because the strategy focused on subscriber acquisition, it highlighted CDMA voice capacity advantages over CDMA high-speed data service benefits.

In addition, the lack of CDMA open handset distribution meant that CDMA operators relied only on their own handset portfolios. These handset choices were limited, especially in the mid- to high-tier range as the CDMA operators had initially focused their efforts on entry-level devices and subscribers. At the same time, the mobile phone was becoming a fashion statement, and as the India economy began to grow, subscribers became interested in acquiring the latest devices. The result was that otherwise satisfied CDMA2000 subscribers who were interested in upgrading to more sophisticated handsets left their CDMA operator in favor of a GSM operator's more diverse, openly distributed handset portfolio, even if that meant losing some data capability or suffering greater dropped call rates.

The combination of handset design, features, and functions has become an important part of an operator's business and ecosystem. Though network quality and service are important attributes, sophisticated, mid- to high-tier handsets tend to drive higher ARPU and increase customer satisfaction and loyalty. Figure 3 illustrates the growing demand for smartphones.

## FIGURE 3

Worldwide Converged Mobile Device Forecast, 2008–2012
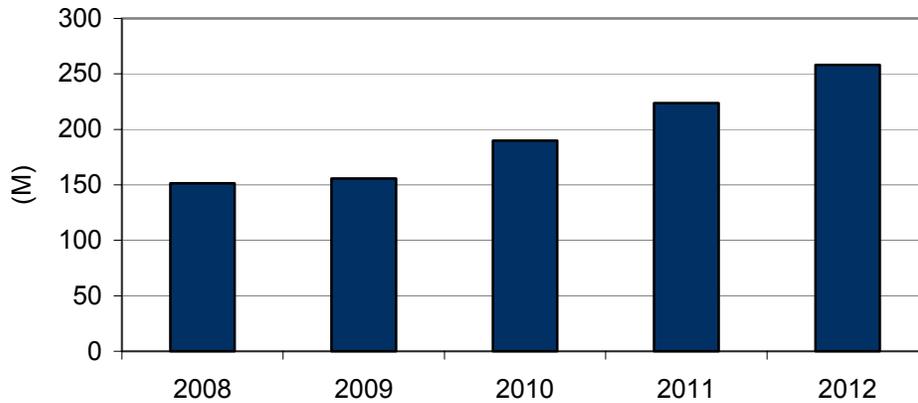


Source: IDC, 2009

Subscribers in India and in other emerging markets are looking to make use of these more sophisticated handsets; it is incumbent upon CDMA2000 operators and handset vendors to rise to the challenge of creating an ecosystem that can streamline the procurement and distribution of such high-end devices so as to benefit all parties. To meet this challenge, operators and handset vendors need not only a richer handset portfolio but also a leaner distribution model that incorporates open standards and practices that can quickly and more efficiently deliver the desired handsets and services to the subscriber. We believe the OMH initiative meets this need and provides a framework to enable CDMA2000 operators and their handset vendor partners to enhance their value proposition to the end user.

## OMH: WHAT IS IT?

To enable operators to offer a more diverse selection of CDMA2000 handsets, the CDG created the OMH initiative (originally called the Open Market Handsets initiative, it is now commonly referred to as OMH) as part of its Global Handset Requirements for CDMA (GHRC) program. This initiative creates a framework that enables vendors to create handsets that can be offered across many different markets, resulting in increased economies of scale for vendors and a broader, more diverse portfolio of CDMA2000 handsets for subscribers. Portfolio diversity provides subscribers with access to a broader range of handsets and creates more opportunities for subscribers to utilize data services that increase operator ARPU. With OMH, subscribers have the freedom to choose the device that is right for them and the ability to use that device on their favorite CDMA2000 operator's network. In addition to the subscriber benefits, OMH helps make more handsets available in more places by optimizing distribution and lessening inventory risk for device vendors and operators.

The OMH initiative began in early 2008 with the formation of a CDG Special Interest Group consisting of dozens of participating companies, including handset vendors, operators, and distributors. By the end of 2008, eight successful trials had been completed with prototype handsets. In 2009, OMH commercial rollouts have focused on fast-growing, developing markets, such as India, Indonesia, and Nigeria, that already use removable user identity modules (R-UIM) — or SIM cards — in their CDMA devices. Furthermore, OMH SIM cards can be configured to support:

☑ Subscriber identity data

☑ Network configuration data of each operator

☑ 3G data service provisioning offered by OMH operators

Having more than just voice and SMS available on the OMH SIM card makes upgrading the handset seamless for subscribers. With the largest installed base of SIM-enabled CDMA2000 handsets in the world, India was the first market to commercially deploy OMH handsets and OMH SIM cards (August 2009).

## Key Benefits of OMH

OMH creates value across the CDMA ecosystem by providing benefits to the following groups:

### *Operators*

☑ Under the current model, every operator requires a new handset to undergo separate acceptance testing in its labs before it can be offered to subscribers. The OMH initiative utilizes standard testing requirements and third-party testing laboratories to eliminate the delay and cost incurred under the current model. With OMH, handset vendors use OMH testing requirements to test a device one time, alleviating the need for each operator to perform separate acceptance testing. This streamlined process reduces testing expenses for both operators and handset vendors and, according to one distributor based in India, improves time to market by up to 35%. OMH handsets are distributed with "out of the box" capability to deliver advanced, revenue-generating services such as location-based services, games, multimedia messaging, instant messaging, browser-based services, and IP-enabled communications using operator configuration data provided by the OMH SIM card.

☑ Currently, non-OMH CDMA handsets make use of R-UIM cards provisioned for basic services including voice and SMS. Advanced data services such as WAP, MMS, or LBS require additional provisioning by the operator. OMH SIM cards enable a CDMA2000 operator ensure that any subscriber with an OMH device is able to access their operator's advanced services, regardless of whether the subscriber purchased that device directly from the operator, at a retail outlet, from the Web, or while on vacation in another market.

- ☑ Opening up the channel and allowing the sale of CDMA2000 handsets through a variety of distribution channels reduces handset inventory costs for the operators, allowing them to carry, if they choose, only the OMH SIMs and focus on their core competency: delivering superior service to their subscribers.

- ☑ The OMH model creates a new distribution conduit that complements the existing operator model. Creating additional retail venues outside the traditional operator channel broadens the sales opportunity while reducing the operator's exposure to inventory risk.

### Handset Vendors

- ☑ Technical harmonization provided by OMH allows vendors to leverage a single OMH device across multiple OMH operators and markets worldwide, providing better economies of scale and enabling them to amortize development costs across a much larger aggregate addressable market. Vendors can leverage the new distribution options enabled by OMH to build brand recognition and create new revenue opportunities through vendor managed services and application stores.

### Distributors

- ☑ The nature of the handset business often requires various players in the ecosystem to absorb risk. For instance, if a certain operator-specific handset design fails to attract subscribers, distributors and operators are stuck with the unsold inventory. OMH mitigates this risk by allowing distributors to sell the same device across multiple OMH channels, operators, and markets. If an OMH has the potential of selling better in other markets, a distributor has the option of selling the same handset in a different region where the capabilities of that handset may have greater market appeal. The OMH model means that CDMA handset distribution is operator independent, allowing distributors the choice on how and where the handsets are sold. Alignment with operator marketing strategies is especially important for distributors that purchase large quantities of handsets.

### Subscribers

- ☑ As one handset vendor stated, OMH's biggest advantage is "freedom" — enabling subscribers to choose a service provider and handset that is right for them. With OMH, subscribers can choose their devices, their operators, and the services they want to access. They can take full advantage of CDMA2000's superior performance and have the flexibility to change and upgrade their handsets.

## CHALLENGES AND OPPORTUNITIES

The CDG's OMH initiative expands the opportunity for CDMA2000 operators, in both emerging and mature markets, to offer devices and services that will benefit their subscribers as well as improve their ARPU. Handset vendors will be able to improve their time to market while efficiently expanding into new markets.

## Challenges

☒ For the OMH initiative to be effective, the number of participants across all categories — especially handset vendors and operators — will need to continue to grow. Today, approximately 65 CDMA2000 operators offer R-UIM/SIM-enabled devices. Additional participation by other members of the CDMA ecosystem, especially tier 1 handset vendors, will increase the value proposition of OMH.

☒ Time is of the essence. Subscribers are demanding a more exciting selection of handsets that allow them access to new mobile services. Unless CDMA operators can meet this demand, their subscribers will likely turn to an operator that is able to meet these expectations. The CDG will work closely with all stakeholders to leverage the growth of mid- to higher-tiered devices (e.g., smartphones) and to quickly deploy OMH in order to fully realize the global advantages of OMH.

☒ The OMH standards will need to be enforced to ensure compatibility but allow vendors and operators sufficient creative flexibility.

## Opportunities

☒ Although emerging markets are an important growth engine for mobility, CDMA2000 operators and handset vendors in mature markets can also benefit from the OMH initiative.

☒ The form factor and the use case of the mobile handset have thus far been the focus of OMH. We believe the lessons learned from deploying OMH handsets can be applied to other mobile form factors such as smartbooks and data cards as they come to market.

☒ Increasing the number of partners that can add new capabilities to handsets can help differentiate both the handset vendor and the operator. Thus far, OMH has increased the portfolio of CDMA2000 phones by bringing new feature-rich handsets to market faster. We believe that portfolio differentiation is in its infancy. Using OMH to augment subscriber personalization with special handset features or innovative applications will help drive not only handset sales but also ARPU.

## CONCLUSION

The OMH initiative will enable mobile operators to build a rich and diverse portfolio of devices that will help operators drive revenue and retain subscribers. By adopting a standards-based approach to handset testing and SIM-based service creation, operators can offer new handsets to their subscribers faster and at less cost, thanks to a wider distribution network. The OMH initiative creates more handset options for subscribers, giving them the freedom and flexibility to choose the device and the operator that best suits their needs, which we believe will be critical in driving increased usage of advanced applications and services.

For OMH to prosper, the goal of the initiative should include not only increasing the variety of devices and easing the ability for CDMA upgrades but also promoting the adoption of higher-end devices and useful data services that drive ARPU. Research indicates that mobile applications are becoming an important new source of revenue and value creation. Still, without the introduction of fresh new handset designs, even the most exciting new application can fail to gain traction in the market. Allowing subscribers the flexibility to choose the operator that offers the best service and useful applications will help bring healthy competition, which in turn breeds more innovation in terms of handsets and services.

OMH allows a handset vendor to leverage a single OMH device across multiple CDMA operators and markets worldwide. In doing so, OMH will leverage existing and new handset distribution networks in these markets. We also believe that OMH can help create a "virtuous circle" of standards-driven efficiencies while providing a flexible platform for dispensing the benefits of mobility to millions of subscribers around the world.

For more information on OMH, visit www.cdg.org/omh.

## METHODOLOGY

In reaching the conclusions referenced earlier in the document, IDC relied upon on the following:

☑ Interviews with industry. IDC conducted interviews with handset vendors, mobile operators, and component suppliers.

☑ Primary research. This paper also utilized IDC primary research, which includes end-user surveys in consumer and enterprise markets as well as proprietary market data and forecasts. These quantitative sources are used to formulate IDC market opinions and advice.

☑ IDC's ongoing research on mobile devices worldwide.

## DEFINITIONS

☑ **2G.** Second generation, or 2G, refers to wireless networks based on digital technology. 2G systems offer increased voice quality and capacity over 1G systems. Historically, 2G systems provided voice and 9.6Kbps to 14.4Kbps circuit-switched data service.

☑ **2.5G.** 2.5G refers to technology that is more advanced than 2G but does not meet the requirements for 3G. 2.5G technology is added to a 2G network to provide packet data service and data rates that range from 20Kbps to 40Kbps; 2.5G is often synonymous with GPRS and cdmaOne IS-95B networks.

☑ **3G.** Third generation, or 3G, refers to wireless networks designed to increase voice capacity and provide high-speed data over 2G and 2.5G networks. According to the official ITU definition, a 3G network must provide a minimum of 144Kbps.

- ☒ **4G.** Fourth generation, or 4G, refers to wireless networks designed to deliver faster data rates than 3G technologies. Voice service is provided using a special form of VoIP.

- ☒ **Average revenue per user (ARPU).** ARPU refers to the average monthly revenue produced per subscriber.

- ☒ **Base station.** Often referred to as a cell site, a base station is a transmitter/receiver location through which radio links are established between the wireless system and the wireless device. The cell site comprises an antenna tower, transmission radios, and radio controllers. Each cell in a cellular network requires a base station.

- ☒ **CDG.** Founded in December 1993, the CDMA Development Group is an international consortium of companies that have joined together to lead the adoption and evolution of 3G and 4G CDMA wireless systems around the world. The CDG comprises CDMA service providers and manufacturers, application developers, and content providers.

- ☒ **CDMA.** Code Division Multiple Access is a digital wireless technology that works by converting speech into digital information, which is then transmitted as a radio signal over a wireless network. Using a unique code to distinguish each call, CDMA uses spectrum efficiently, enabling more people to share the airwaves simultaneously without static, crosstalk, or interference.

- ☒ **CDMA2000.** A standard for mobile communications and a direct evolution from cdmaOne technology, CDMA2000 provides a set of specifications that offer enhanced voice and broadband data capacity. The CDMA2000 family currently includes CDMA2000 1X and CDMA2000 1xEV-DO Rel. 0, Rev. A, and Rev. B.

- ☒ **GSM.** GSM is a standard for mobile communications. This 2G wireless telecommunications standard for digital cellular services was deployed first in Europe. GSM is based on TDMA technology and provides circuit-switched data connections at 9.6Kbps.

- ☒ **IP.** Internet Protocol is the most important of the protocols on which the Internet was based and is part of the TCP/IP protocol.

- ☒ **Location-based services (LBS).** These services are defined as applications that incorporate GPS and other network-based location-determining technology. Subscription types include:

  - ❑ Navigation/mapping/directions

  - ❑ Fleet management

  - ❑ Field service automation

  - ❑ Sales force management

- ☒ **MMS.** Multimedia messaging service allows wireless device users to send multimedia, such as video or digital photos, from one device to another.

- ☑ **OEM.** The term original equipment manufacturer refers to those companies that manufacture or brand handsets and mobile devices.

- ☑ **OMH.** The Open Market Handsets initiative is a strategic effort to benefit the CDMA ecosystem by enabling open distribution of handsets across networks and regions by expanding OMH SIM card capabilities to support a full set of competitive features beyond voice and SMS. OMH devices are tested to ensure compatibility with OMH networks.

- ☑ **R-UIM.** Also known as a SIM card for CDMA devices, the removable user identity module refers to a removable card built into certain CDMA phones, "smart cards," and other devices that makes global roaming possible across CDMA and GSM networks. The SIM can identify the user as well as the services to which the individual subscribes. It can also store data, such as telephone numbers and addresses.

- ☑ **SIM.** A removable card built into all GSM phones as well as certain "smart cards" and other devices, the subscriber identity module can identify the user as well as the services to which the individual subscribes. It can also store data, such as telephone numbers, roaming lists, and addresses.

- ☑ **Smartphones.** These mobile devices are either voice centric or data centric and are capable of synchronizing personal information and/or email with server, desktop, or laptop computers. Positioned to solve the "multiple device question" and replace the need to carry several devices, smartphones include an expanding list of features such as email, navigation, instant messaging, multimedia capabilities, productivity tools, and Web browsers. These devices utilize evolved operating systems or application environments such as the BlackBerry OS, Palm OS, Mac OS X, Microsoft operating systems, Linux, and the Symbian platform. Smartphones also have the ability to download data and applications to a local hard drive, run the applications, and store both user data and data generated by a user application.

- ☑ **SMS.** Short Messaging Service is a store-and-forward message service available on many 2G and all 3G wireless networks. It allows users to send short text messages (usually 160 characters or less) to and receive short text messages from wireless handsets.

- ☑ **WAP.** The Wireless Application Protocol is a standardized set of protocols that allow mobile phones to access Web content.