FMC Market View

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Executive Summary

Fixed-Mobile Convergence (FMC) is gaining momentum in the marketplace as operators are realizing the market opportunities in enhancing existing services and creating new revenue-generating services. FMC provides operators with more flexibility in how they develop their overall network and service strategies. Depending on an operator's existing asset and market position, the operator may adopt different FMC strategies to best fit their specific market segment. This paper will provide an overview of FMC and its enablers as well as highlight how FMC can create value for operators while benefiting their customer base.

[1] What is Fixed-Mobile Convergence (FMC)

Fixed-Mobile Convergence (FMC) may have many different definitions. FMC is more than bundling services and billing solutions, and generally involves the convergence of networks, devices and services. Many view service bundling as the first step toward network and service convergence. Subsequently, various forms of convergence may arise in the marketplace such as:

- ***Hybrid Networks -*** Convergence of hybrid networks provides a seamless user experience across fixed and mobile networks. Existing Unlicensed Mobile Access (UMA) solutions are considered Hybrid Networks in that they allow end users to seamlessly roam between WLAN and cellular networks. In the future, the IP Multimedia Subsystem (IMS) takes network convergence to the next level by delivering rich services and multimedia applications over hybrid networks.

- ***Converged Devices -*** The strong trend for the mobile phone to replace other computing and consumer electronics devices by integrating the functionalities of these aforementioned devices into the phone platform.

- ***Service interoperability on the same device -*** Ability for users to access converged services from fixed and mobile environments on a single device.

- ***Multiple Screen Strategy -*** Offering a ubiquitous user experience on multiple screens by seamlessly delivering converged services

to multiple devices. For example, in a converged services environment, video content can be delivered to a mobile handset, PC and large-screen TV in a consistent manner.

[2] Benefits of FMC

2.1 Benefits to Operators

FMC provides operators with significant opportunities for cost savings and revenue growth:

- ***FMC Reduces Customer Churn -*** Bundled services reduce customer churn and allow operators to have a close relationship with customers and accurately predict consumer demands.

- ***Cost Savings from Unified Networks and Economy of Scope -*** Network convergence allows operators to replace multiple networks with a single IP core network thereby reducing the complexity of integrating and maintaining equipment from different suppliers. Unified networks enable operators to reduce both their CAPEX and OPEX. An operator's CAPEX is reduced due to the increase in its bargaining power with its vendors and OPEX reductions are realized as a result of maintaining one network instead of multiple ones.

- ***Revenue Growth from New Services -*** IMS and IP network convergence enable service providers to easily roll out new applications and services for revenue growth.

2.2 Benefits to Customers

Fixed-Mobile Convergence benefits customers in numerous ways. For instance, service bundling creates cost savings, while providing customers with the convenience of one bill and a single point of contact. FMC solutions allow customers to use their mobile phone everywhere and enjoy the convenience of a single address book and single voicemail service. FMC also improves the quality of life of many customers by allowing them to ubiquitously access any of their existing services or personal information on-the-go. Finally, FMC creates new converged services for customers, such as being able to remotely monitor their home from the web or from their cell phone.

[3] Enablers of FMC

3.1 Convergence of Networks

FMC is made possible by continuous mobile network enhancements that enable mobile broadband networks to offer complementary services and compelling alternatives to fixed networks.

3.1.1 QoS

QoS (Quality of Service) is a critical factor in delivering rich applications and services over converged networks. It improves service quality over wireless networks by ensuring prioritization of different traffic flows and efficiently allocating resources for both delay-sensitive and delay-tolerant applications. This allows operators to deliver both fixed and mobile services over wireless networks without sacrificing service quality. QoS enables operators to offer the same set of services over a range of access media while maintaining a seamless user experience across hybrid networks.

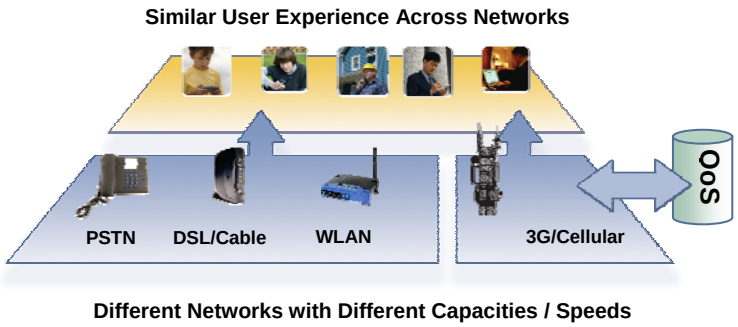

Figure 1. QoS

3.1.2 High-Speed Wireless Networks

Networks are better suited to deliver real-time converged services as they achieve higher speeds and throughput. As wireless technology evolves, advanced mobile networks, such as EV-DO and HSPA, are closing the data rate gap with that of the fixed networks. Looking further ahead into the future, next-generation wireless networks (i.e., LTE and UMB) will deliver even higher speeds up to 288 Mbps. High-speed wireless networks enable operators to deliver new revenue-generating services and allow convergence of user experience and services.

3.1.3 IMS

IMS plays a crucial role in network convergence as it provides a framework for delivering rich applications over IP, including Voice over IP (VoIP), Push to Talk (PTT), video sharing and other multimedia services for the fixed or mobile networks. IMS framework allows for easier application development through the use of standardized architecture and open interface APIs. Additionally, it leverages the same IP core for fixed and mobile services to maintain the same user experience across hybrid networks. This allows operators to leverage network CAPEX and OPEX, and support a number of services from different networks (e.g., DSL, Cable, Cellular, WLAN).

3.1.4 Broadcast/Multicast Technologies

Broadcast and multicast technologies, including MBMS, BCMCS, MediaFLO™, DVB-H and DMB also enable fixed-mobile convergence. These technologies bring a living room entertainment experience to the mobile environment and provide customers with a compelling user experience across fixed and mobile networks. Broadcast and multicast technologies provide operators with the ability to leverage the same content on multiple platforms and consequently amortize content acquisition cost across different services.

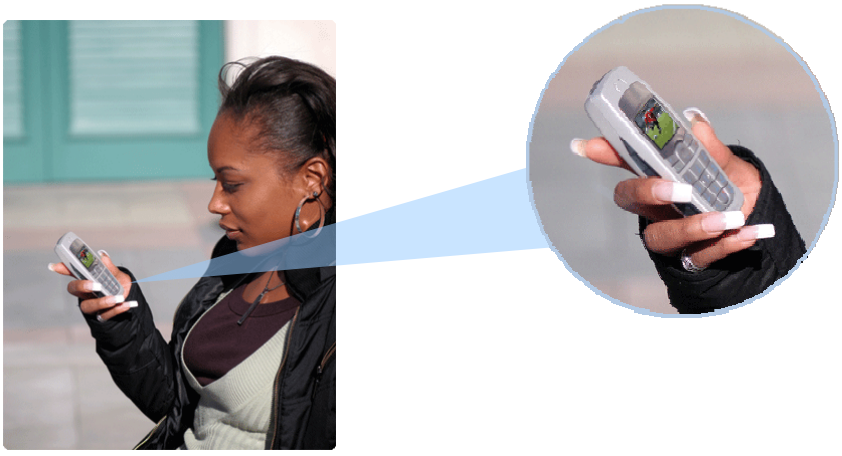

Figure 2. Broadcast/Multicast User Experience

3.1.5 Femtocells

Femtocells are low-cost solutions that increase indoor coverage for existing voice and high-speed data services as well as provide a basis for next-generation converged services. They offer a seamless transition to the fixed environment and excellent indoor coverage. Femtocells enable converged services, as they offer a ubiquitous user experience across all environments with existing personalized wireless devices.

3.2 Convergence of Devices

FMC is enabled by various mobile device enhancements including:

3.2.1 Multimode Devices

Due to the availability of a number of access technologies including GSM, CDMA, UMTS/HSPA and 1X/EV-DO, multimode phones with more than one radio technology are becoming increasingly popular. Multimode devices enable a seamless user experience across hybrid networks, allowing access to personalized services anywhere, anytime.

3.2.2 Phone with Multiple Interfaces

Mobile phones are also being equipped with various short-range technologies including infrared, WLAN, UWB, Bluetooth®, RFID and NFC. These technologies enable the phone to become a personal data hub interacting with fixed networks in numerous ways. For example, users can buy tickets at the train station or upload movies to their flat screen TV with their multimode phones.

3.2.3 Processing Power

Exponential growth in processing power enables mobile phones to replicate the applications currently employed in computers and handle both fixed and mobile applications effectively.

3.2.4 Memory Capacity

Explosive growth in mobile phone storage capacity facilitates data transfer between fixed and mobile services. For instance, users can access their personal files and presentations on-the-go from their mobile phone.

3.2.5 Convergence of Services on the Same Device

With the integration of consumer electronics functionalities into their platform, mobile phones are becoming more than a communication device. As technology advances, users will be more reliant than ever on mobile phones as dedicated terminals for multiple critical tasks.

3.3 Convergence of Services

FMC is enabled by various converged services, including:

3.3.1 Service Bundling

Service bundling is the first step toward convergence that allows operators to offer two or more services bundled together. For example, operators can provide voice, video and broadband access over both fixed and mobile networks.

3.3.2 Fixed-Mobile Roaming

Fixed-mobile roaming allows the use of the same personalized devices in fixed and mobile environments. It enables users to automatically roam to the best network performance at home, office and on the road, while enjoying access to their personalized services.

3.3.3 VoIP

VoIP offers the same quality voice as circuit switched networks at a lower cost. It also allows an easier integration of voice with other rich applications and services on hybrid networks. For example, a voice call can be enriched with a video stream, or a live voice conversation can be added to a multiplayer gaming session.

3.3.4 IPTV

IPTV enables multiple screen strategy that combines computer, mobile phone and TV services. For example, in a converged services environment, video content can be delivered to a mobile handset, PC and large screen TV in a consistent manner. Additionally, a PC and TV may support telephony services from a mobile phone. For instance, a user can initiate a voice call from the PC or check the caller ID displayed on a TV screen when he receives a call.

3.3.5 Access to Home Devices/Storage

Converged services allow users to access fixed networks, including their home devices and storage systems from everywhere. As a result, they can play their favorite music on-the-go, as well as remotely program their DVR or other home appliances, via their mobile phone from a remote location.

3.3.6 Web 2.0 Service

Many web 2.0 services started on PC and then migrated to mobile and TV environments. For example, user generated applications, such as YouTube™ currently allow users to broadcast content on any of the three screens.

[4] Conclusion

FMC promises exciting opportunities for end users to consume services anytime, anywhere and on any device, while maintaining the same personalized rich user experience. It also allows operators to reduce their cost and generate revenue from existing and new services. As the networks, devices and services continue to evolve, FMC is rapidly realizing the significant benefits of the ubiquitous wireless lifestyle.