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IMS Will Transform Telecom

by Ellen Daley, Lisa Pierce, Michelle de Lussanet, and Lars Godell

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Carriers Must Alter Market Approach To Profit

by **Ellen Daley, Lisa Pierce, Michelle de Lussanet, and Lars Godell**

with Charles S. Golvin, Brownlee Thomas, Ph.D., and Benjamin Gray

EXECUTIVE SUMMARY

Vendors and carriers herald the IP multimedia subsystem (IMS) network architecture as the trigger for the next telecom boom. They promote its ability to deliver new applications that combine voice and data, enable fixed-mobile convergence (FMC), and reduce carrier opex and capex. It's no surprise that vendors hype the technology while standards and products are emergent, but carriers are excited as well. The reality? IMS is over-hyped today — with immature standards and no way to prove product interoperability — but will deliver on its promise by 2009. While the IMS architecture lets the network operator control applications and content initially, the open technologies used by IMS will ultimately enable application providers to bypass carrier controls and exploit the underlying network.

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Forrester interviewed carriers and vendors including Alcatel, Apertio, AT&T, BT, Cingular Wireless, Ericsson, IBM, Lucent Technologies, Motorola, Nokia, Nortel Networks, Sprint, Telcordia Technologies, Veraz Networks, and Verizon. We also spoke with industry trade group, the Fixed-Mobile Convergence Alliance (FMCA).

Related Research Documents

["Telcos Must Restructure The Way They Innovate"](#)
October 6, 2005, Best Practices

["Surviving In The New US Communications Market"](#)
March 31, 2004, Trends

["Convergence Strategy Counters Substitution Threats"](#)
December 11, 2003, Report

IMS BLURS THE LINES BETWEEN FIXED AND MOBILE, VOICE AND DATA

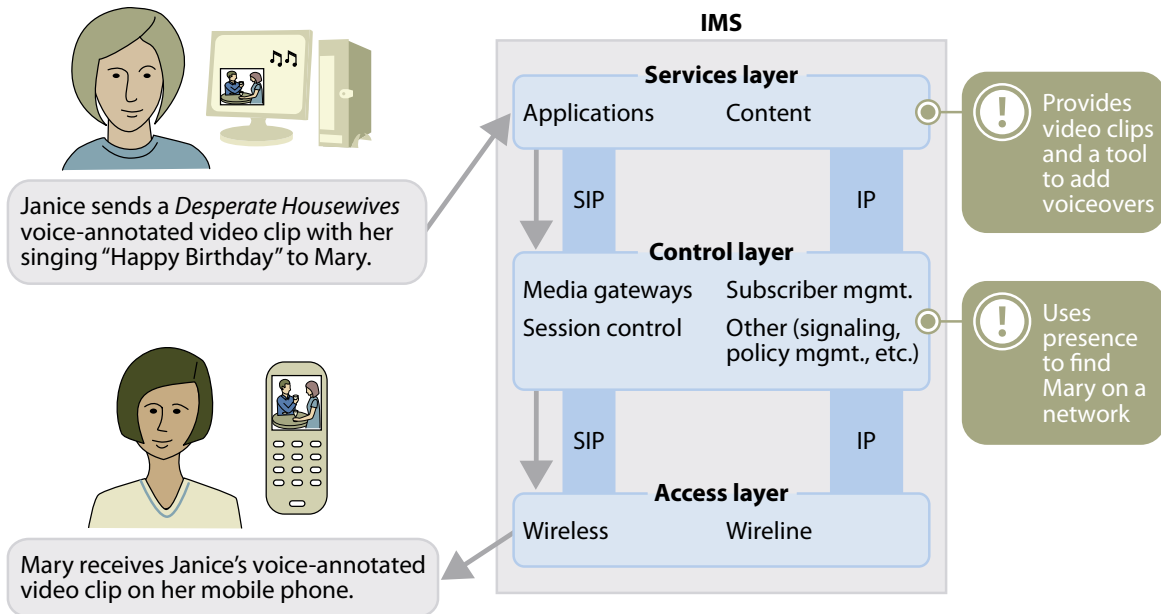
IMS is an emerging architecture standard that defines how network elements interoperate to provide voice, data, and video services and applications in any combination, on any network (fixed or mobile). Initially created by the GSM 3rd Generation Partnership Project (3GPP), IMS now enjoys broad support from mobile carriers like Cingular and Vodafone, fixed-line operators like Verizon, and many vendors, including Lucent, Motorola, Nokia, and Nortel.¹

IMS Puts IT Technologies In The Network

IMS is comprised of (see Figure 1):

- **Standards for network-controlled multimedia services . . .** IMS defines three broad layers — transport, control, and service — that each use a common language for communications and control. This common language allows a core group of network elements to support a wide variety of media (voice, data, and video) applications. For example, IMS defines the infrastructure to entwine voice and data, such as transmitting a voiceover on a video clip. This use of common elements is in stark contrast to past implementations, in which carriers deployed infrastructure independently for each new service — such as voicemail or conference calling — with little reuse.²
- **. . . across fixed and mobile networks.** IMS was originally intended for mobile operators to offer Internet applications. Today, initiatives on IMS standards are underway for all manner of fixed and mobile networks, working in concert toward interoperability.³ A consistent standard will enable an operator to link disparate networks, like Wi-Fi, cellular, and wireline, into a single logical entity to easily deliver applications to users, regardless of network type. For example, with IMS, a user may have only one phone number on a single device that works across cellular, Wi-Fi, and landline networks.
- **Technologies that are rooted in IT and the Internet.** The modularization of the network is not a new concept — IN and AIN attempted it for voice with varying success.⁴ What makes IMS different? Internet technologies, like IP and SIP. With IMS, even non-IP networks like cellular can interweave voice and data in the same IP session.⁵ IMS promises to open telecom networks to a wide range of innovative vendors and application developers that already use IP and SIP for Internet development.

Figure 1 IMS Introduces A Standard Architecture For A Host Of Apps And Services



Note: Many additional applications like locator games, active phone book, and IPTV will be available.

Source: Forrester Research, Inc.

IMS Promises A Rapid Flow Of New Applications At Lower Costs

What does this new IMS technology mean for telcos? The vendors' story is clear: IMS will unleash myriad new revenue-generating applications, all deployed more quickly and at lower costs than today. And operators all over the world — including O2 in the UK, Saunalahti in Finland, Rogers Wireless in Canada, and Cingular in the US — have bought in, having either publicly endorsed the technology or signed contracts for IMS equipment and software (see Figure 2).⁶ Operators see IMS as a way to enable:

- **New types of applications.** Wireline providers want new applications like IPTV to stave off competition from cable companies like Comcast and from Internet pure-plays like Vonage and eBay/Skype.⁷ In the face of declining voice revenue, mobile operators want IMS to link voice and data to create new ARPU-increasing applications, like TMN's "share the moment" video offering.⁸ Converged operators hope to create customer demand for applications that bridge the gap between different networks, like seamless voice roaming across Wi-Fi, cellular, and fixed networks.⁹ Cable companies see IMS as a way to ultimately connect their voice, video, and broadband offerings to their wireless partner's network.¹⁰

- **Increasing and accelerating innovation.** It takes carriers well more than a year to introduce a new service, especially one that requires modifications to operational or billing support systems. This forces providers to bet only on “sure things,” stifling creativity. Because IMS leverages modular layers to abstract multimedia services, it enables the rapid creation of applications via reusable modules like the serving call state control function (SCSCF) that performs overall session management. For carriers, this makes product experimentation less risky — with less investment than today, they can easily try new products and discard those that aren’t profitable. For example, O2 could quickly test the impact of a music sharing service that allows subscribers to “gift” songs to other users.
- **Lower operational and capital costs.** Carriers’ current services and network infrastructure are contained in silos, which makes new product introduction and maintenance costly. IMS can reduce new product capex by leveraging common elements, such as a home subscriber server (HSS) that consolidates subscriber profile information across all new products.¹¹ The ability to reuse common elements across products suggests that opex costs, too, will plummet.¹²

Figure 2 Motivations For IMS Run The Gamut

	Who	Motivation
Wireless operators	Cingular Portugal's TMN	<ul style="list-style-type: none"> • Increase data ARPU • Build up attractiveness as an MVNO partner • Reduce operational cost • Expedite deployment of new apps
Converged operators	France Telecom Telecom Italia	<ul style="list-style-type: none"> • Emerge as telco leaders offering integrated applications across fixed and mobile networks • Reduce churn • Reduce operational cost • Expedite deployment of new apps
Wireline operators	BT SBC Finland's Saunalahti	<ul style="list-style-type: none"> • Reduce churn and fixed mobile substitution • Increase revenue • Stave off competition from MSOs and Internet plays like MSN • Reduce operational cost • Expedite deployment of new apps

Source: Forrester Research, Inc.

IMS SUFFERS FROM OVER-HYPE

Industry participants are in harmony that IMS makes sense: Few argue with the logic of an open modular network. But equipment vendors and system integrators exaggerate IMS' near-term impact: They see gold in the massive transformation work. In contrast to their claims of its robustness, IMS is immature. Why?

- **The standards are nascent and the technology is not yet proven.** The IMS standard today focuses only on wireless networks — the fixed network IMS standard is still a work in progress.¹³ Some of the technologies on which IMS relies are still evolving: for example, end-to-end quality of service (QoS) for IP and SIP network interconnection. Most equipment has not yet been tested in a real-world setting, to prove that it meets operators' stringent requirements for reliability.¹⁴
- **Only some vendors' products are ready for prime time.** Large equipment vendors like Lucent, Nokia, and Nortel promise to make all network components IMS-compliant, yet only some are ready and proven today. It will take between 12 and 24 months for vendors — other than current leader Lucent — to have comprehensive IMS product suites. Today, carriers like Sprint, that are public about strategic IMS commitments, must deploy non-IMS services until products exist and are proven.¹⁵ Some of the more mature products are coming out of best-of-breed vendors, like Apertio's HSS.
- **Interoperability is a distant promise.** IMS only defines a reference architecture — vendors decide on how to implement IMS components. Thus, one vendor can decide to aggregate multiple components into a single piece of hardware — like combining multiple types of gateways — while another vendor may dedicate a piece of hardware for each gateway. This complexity introduces risk to carriers, that will avoid the headache of interoperability testing and commit to a single vendor for initial deployments.
- **No single governing body exists.** Unlike other network standards like Parlay and GSM, IMS has no single governing body to ensure vendor compliance and interoperability. FMCA is working toward this, but widespread industry support has put too many cooks in the kitchen and will prolong the time necessary to arrive at a consensus. Without a governing body to oversee standards and ensure interoperability, small best-of-breed vendors will have limited success proving interoperability to carriers.

MATURE STANDARDS DRIVE IMS ADOPTION

Sparked by mature standards and proven interoperability between vendors' products, IMS adoption will accelerate from 2005 to 2009. Mobile carriers will be on the forefront of adoption, followed closely by converged carriers on their march toward FMC. Wireline carriers will bring up the rear, as they await finalization of the relevant standards.

The Gap Closes Between Hype And Reality

Carriers, vendors, system integrators, and standards bodies will all help remove the barriers to achieving what IMS promises. In the next four years:

- **Mobile standards will mature more quickly than fixed.** By late 2006, the mobile standards represented by 3GPP will be stable and include full support for QoS and emergency calling. But fixed IMS specifications, based on TISPAN standards, will not be ready for deployment until 2007.¹⁶
- **Carriers and leading vendors will drive interoperability.** Lured by superior point solutions, carriers will drive for an IMS compliance body to be in place by late 2007, derived from 3GPP with support from TISPAN. Best-of-breed vendors will join in quickly, as they will benefit most from proven interoperability. Major telecom vendors, that see a risk of market share loss from the decomposition of their product suite, will also join as carriers force their hand.
- **System integrators will rise in importance.** New, complex supplier ecosystems, comprised of multiple vendors, will force carriers to focus on integration. The old-boy telecom gear providers like Ericsson will make a play for this work, but system integrators, like Accenture, will build practices to act as the neutral party that optimizes a mix of different vendor products.

IMS' Impact Varies With Carrier Type

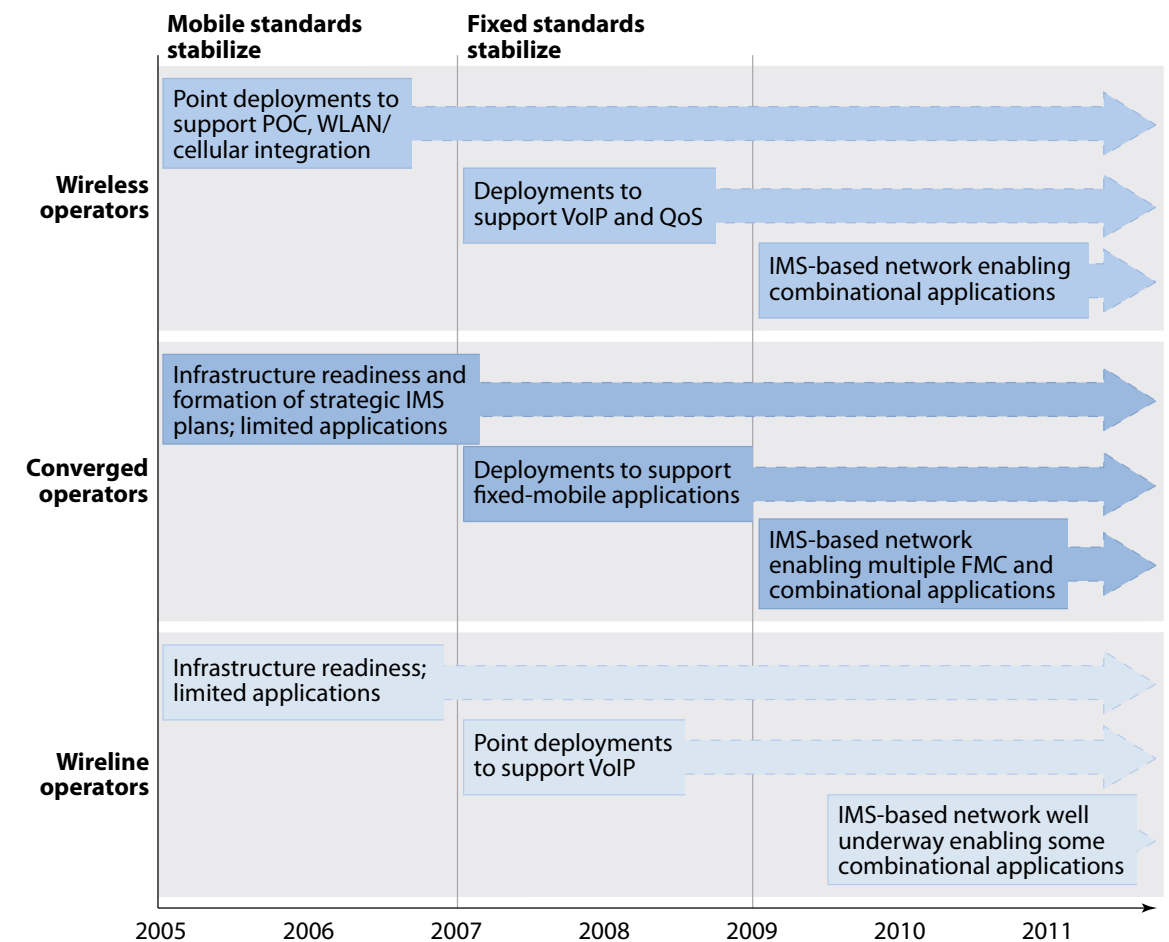
Distinct types of operators will leverage IMS differently in the coming five years (see Figure 3):

- **2005 to 2007: Point deployments for mobile operators dominate.** Wireless carriers will be the first to deploy IMS infrastructure because mobile standards will be stable. They will focus initially on revenue-generating applications, like push-to-talk over cellular (POC) and voice-activated picture sharing. Fixed operators like SBC will prepare for an IMS infrastructure upgrade (e.g., by consolidating subscriber profiles within the HSS). Converged operators that want FMC will be more aggressive than wireline providers. For example, BT's 21st Century Network plans rely on IMS, and today, BT uses IMS-compliant Unlicensed Mobile Access to tie mobile and wireline networks together in its Fusion service.¹⁷
- **2007 to 2009: Fixed carriers get serious.** As fixed standards stabilize in late 2007, fixed line rollouts will ramp up. Fixed-line carriers will use IMS to power VoIP offerings and new combinational applications like voice/Web session integration for contact centers. Mobile operators will progress to a full IMS-powered network, enabling true VoIP over cellular. As VoIP erodes mobile voice ARPU, wireless carriers will turn to new combined voice/data applications like locator games with voiceover hints, to compensate for the voice revenue decline. Converged carriers will offer applications that work seamlessly across networks, like

an active phone book that provides presence and bridges communications across all network types, whetting customers' appetites for continuous connectivity.

- 2009 and beyond: IMS becomes a core part of network architectures.** By 2009, customers will begin to expect applications to work continuously across all types of wireless and wireline networks. As a result, FMC will help generate revenue and cement customer loyalty as carriers offer single contact number and presence across multiple networks. Geographically, this plays out differently. In the US, Verizon and Verizon Wireless will use IMS to link their networks and enable them to capitalize on FMC. In Europe, converged mobile/fixed network leaders like FT and Telecom Italia will grow market share at the expense of late movers lacking a converged offering.

Figure 3 IMS Rollouts Vary With Carrier Type



Source: Forrester Research, Inc.

IMS WILL FORCE A RADICAL CHANGE IN CARRIERS' MARKET APPROACH

Carriers' monetization of IMS will not come from customers paying for exclusive content and applications. Rather, IMS will allow operators to collect user and partner tolls for applications that leverage its SIP control layer; for example, charging multiplayer game subscribers a transactional fee to link players' sessions together.¹⁸ To maximize revenues, operators must cultivate a network of partners and make it easy for them to quickly deploy new applications with a minimum of carrier interference. How to do this? By developing:

- **Market smarts to tend their garden of products.** External application developers will help bring innovation to telcos' offerings by creating a torrent of applications for consumers and businesses. To avoid managing a plethora of applications carriers must mimic the accelerated product life cycles of new competitors like Google. They must remove heavy-handed oversight of product teams and free them to rapidly assess the success of new products and weed out unprofitable applications early.¹⁹
- **Easy-to-use partnership programs and production processes.** To woo new content providers and developers, carriers must make doing business with them easy. This means establishing an easy-to-use partnership program and a service delivery platform (SDP) that speeds application deployment and management. Wireline operators will have the most work to do here as, unlike their mobile brethren, they lack even fledgling partnership programs.
- **Innovation smarts for essential investments.** Carriers must commit their innovation dollars beyond the core network and into services, applications, and the production processes that support them. The majority of this spend should go to partners that develop systems to streamline content acquisition, billing, and mundane operational solutions — like those that test for unintended feature interactions across multiple network types.²⁰

WHAT IT MEANS

IMS IS A DOUBLE-EDGED SWORD

Forrester believes that carriers should invest in IMS to grow revenue and reduce costs. IMS will put carriers at the focal point of a host of new applications and allow them to charge for access to their IMS multimedia functions. However, in the long term, carriers' hold on this choke point — and their ability to collect the bulk of end-user revenue — is tenuous.

Initially, application providers will be lured by carriers' large customer bases and leading network-based SIP services. But when SIP hits full maturity, enterprises and Internet brands like Yahoo! will bypass carrier fees by forgoing the network-based multimedia functions that IMS provides. Instead, they will implement their own SIP control functions in their data centers, limiting providers' differentiation to just FMC. Carriers lobbying with regulators to limit this behavior will fail.

The IMS future is open season — all types of competitors can contend on the level playing field of IP and SIP. To be successful in this environment, carriers must exploit their large customer base to attract and retain application providers that commit to share revenue and use the carriers' network-based capabilities. At the same time, carriers must improve their network and business economics in order to serve do-it-yourself application providers with an efficient pipe — something with which IMS helps.

ENDNOTES

- ¹ The 3GPP is a collaboration agreement, established in December 1998. The collaboration agreement brings together a number of telecommunications standards bodies that are known as “Organizational Partners.” The current Organizational Partners are ARIB, CCSA, ETSI, ATIS, TTA, and TTC. Source: <http://www.3gpp.org/About/about.htm>.
- ² Service deployments of the past were known as “stovepipes.” This is one of the primary reasons that current carrier opex is relatively high, and that high capex often deterred new entrants from the market.
- ³ A multitude of bodies have either joined with the 3GPP effort or ensured that they are interoperable with it. Some examples are IETF, 3GPP2, CableLabs, ETSI TISPAN, and ITU-T. Source: http://img.lightreading.com/heavyreading/pdf/hr20050720_esum.pdf.
- ⁴ Wireline networks have been moderately successful in embracing IN and AIN. Their PSTN service-node architectures structured the network into discrete real-time elements (signaling, switches, customer databases, feature servers) that worked together to deliver new features and services. WIN moved this concept to the 2G environment, but stalled in the US because the large mobile carriers each concentrated on spreading their geographic reach, rather than working together to create seamless roaming across carriers.
- ⁵ IMS leverages SIP and IP for content and signaling. This means that most installed customer premises systems and devices are not part of this architecture. Two potential alternatives exist: (1) IMS only becomes a force as users adopt SIP interfaces (for instance, Forrester has forecasted that 10% of US households will be using VoIP — which uses SIP — in 2010), or (2) specifications must be written for gateways to support interoperability with preexisting protocols — this includes other VoIP protocols, such as MGCP and H.323, and older technologies, such as in-band signaling, ISDN, and SS7. These gateways exist on a proprietary basis today.
- ⁶ Dave Williams, CTO at mobile operator O2, told the conference that IMS and HSDPA are the two key technologies for O2 for the future. Then, Rogers Wireless CTO Bob Berner identified IMS as the key technology that will help service providers build applications and bridge different types of access networks, such as 3G, WiMAX, and DSL. Source: http://www.lightreading.com/insider/document.asp?doc_id=68097&print=true.

- ⁷ Vonage is currently delivering VoIP services to consumers and only uses existing carriers' infrastructure for transport and access. Cable companies are competing toe-to-toe with telcos by starting to provide triple-play services — and will soon add wireless to the mix. Incumbent telco carriers want to create and deploy innovative applications to help combat these threats. Telcos have jumped on the TV bandwagon, but it won't be an easy ride. See the April 11, 2005, Trends "[Telcos' IPTV Reality Checks](#)."
- ⁸ TMN's "share the moment" allows users to share a live camera while speaking on the mobile. Vodafone also offers video sharing on mobile networks, but it does not leverage SIP, IP, or IMS. Source: <http://www.3gnewsroom.co.uk/phorum-3.4.8a/read.php?f=34&i=11130&t=11076>.
- ⁹ Enterprises show high interest in dual-mode Wi-Fi/cellular handsets. Converged carriers are those who offer both wireless and wireline services, like FT and Telecom Italia. See the May 24, 2005, Trends "[Companies Want Wi-Fi/Cellular Calling](#)," and see the June 13, 2005, Trends "[Will Mobile Phones Get Wi-Fi?](#)"
- ¹⁰ Sprint Nextel announced a joint venture with cable operators Comcast, Cox Communications, Time Warner, and Bright House Networks. See the November 2, 2005, Quick Take "[Sprint Arms Cable Operators With Wireless](#)."
- ¹¹ In the past, Forrester estimated that moving to a common network, supplier, product development, and operations support will bring telco capex savings of between 15% to 20% and opex saving of about 30%. See the December 11, 2003, Report "[Convergence Strategy Counters Substitution Threats](#)."
- ¹² Limited real-world cost saving studies exist because very few IMS rollouts have occurred, even though vendors are promising significant — though not yet proven — savings. For example, Ericsson has calculated that, for an assumed four services offered over five years, carriers will achieve a 43% opex reduction with IMS relative to traditional infrastructures.
- ¹³ The current IMS specifications do not contain the ability for carriers to support e911 or CALEA on a pure SIP/IP basis — they make use of the PSTN for these functions. Current standards lack elementary but critical network features — such as mid-call signaling.
- ¹⁴ Reliability must be assured both systemwide and on a component basis (such as a particular server or database). For instance, US PSTN networks, not just central office class 5 switches, operate at 99.999% or 99.9999% availability on a 24x7x364 basis.
- ¹⁵ For Sprint, the immaturity of IMS means that it cannot deploy all new services on IMS immediately. One important reason, as discussed by AT&T, is that IMS assumes a pure SIP environment on an end-to-end basis, even at the customer's premises.
- ¹⁶ 3GPP Release 7 will define most of the remaining items for IMS including end-to-end QoS, emergency calling, and integration between circuit switching and IMS. TISPAN will be rolling out its first phase of IMS standards in late 2005. It won't be until 2006/2007 that fixed IMS standards will be gelled, in even the first phase. Source: http://www.etsi.org/about_etsi/30_minutes/documents/Sem30-01.ppt#473,17, IMS Enhanced in Release 7.

- ¹⁷ While BT is not a true converged carrier in that it does not have a mobile arm, it is marching toward FMC with Bluetooth and WLAN wireless. BT announced the world's first fully integrated fixed and mobile telephony service — BT Fusion. See the June 15, 2005, Quick Take "[BT's Project Bluephone Goes Commercial](#)."
- ¹⁸ In the past 12 months, US incumbent telcos have successfully lobbied for regulatory changes that allow them to retain total control of their broadband networks: They are not legally required to make these available for use by third-party providers, including AOL, Skype, etc.
- ¹⁹ Among other activities, this necessitates that carriers develop excellent, systematized product management practices, something that they do very poorly when compared with many other industries (e.g., Procter & Gamble, General Electric, 3M).
- ²⁰ Telcos must innovate in new ways to meet the new services-based world. See the October 6, 2005, Best Practices "[Telcos Must Restructure The Way They Innovate](#)."

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