

**Report No. 27**  
**Report from the UMTS Forum**

# ***Strategic Considerations for IMS – the 3G Evolution***

This report has been produced by the UMTS Forum, an association of telecommunications operators, manufacturers and regulators who are active both in Europe and other parts of the world and who share the vision of the Universal Mobile Telecommunications System (UMTS). UMTS is a modular concept, which takes full regard of the trend of convergence of existing and future information networks, devices and services, and the potential synergies that can be derived from such convergence. UMTS will move mobile communications forward from where we are today into the Information Society of third generation (3G) services, and will deliver speech, data, pictures, graphics, video communication and other wideband information direct to people on the move. The study was carried out by the consulting company Telecompetition, Inc. under the guidance of and with contributions from the IMS Project Team of the UMTS Forum.

This report follows on from other outputs which have dealt with: a regulatory framework and spectrum and technical aspects, impact of licence cost levels, licensing conditions, minimum spectrum requirements, an extended vision, market forecasts, and other issues. Reports on these and other topics are listed in the Bibliography and can be found on the UMTS Forum Web site, [www.ums-forum.org/reports.html](http://www.ums-forum.org/reports.html).

Many statements in this report represent the views of the original author, Telecompetition, Inc., and have been subject to formal approval in the UMTS Forum. Thus, most operators and manufacturers within the UMTS Forum support the main conclusions and key findings in the report. The National Administrations that are members of the UMTS Forum have supported the development of the report. However, the views and conclusions expressed in this report do not necessarily represent the views of the National Administrations. Therefore, the Administrations cannot be bound by the detailed recommendations contained in the report.

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# 1 Introduction

The market and technological momentum for the use of the Internet is unstoppable. In addition, the Internet is entering into its second phase of development. During the first ten years after the introduction of the World Wide Web, the Internet has been dominated by non real-time, person-to-machine communications (information services). The next major development will incorporate real-time person-to-person communications, including toll quality voice and video telecommunications along with extensive use of machine-to-machine interactions to simplify and enhance the user experience.

The Internet provides network interoperability on a global scale: across company and national borders. Initially used solely to interconnect computer networks, IP-compatibility is being added to many types of devices: from set-top boxes to automotive and home electronics. The large-scale deployment of IP-based networks creates significant economies of scale thereby reducing the acquisition costs of the associated devices. The ability to deliver content and services, and to re-use application code creates significant economies of scope and scale.

The quality of Voice-over-IP (VoIP) services is constantly improving and the use of VoIP in wireline and enterprise networks is increasing, albeit slowly. In any case, IP-based networks will eventually provide the same level of ubiquity and interoperability for voice services as they do now for data services.

The UMTS Service Architecture should enable the machine-to-machine interactions that promise to handle much of the complexity involved in delivering new services. From domain names to digital rights to protocol conversion, network-based inter-machine negotiations will simplify service delivery and enhance service offerings. A key question that the mobile industry must address is to what extent mobile services will interoperate with fixed Internet services.

The IMS (IP Multimedia Subsystem) vision is to integrate mobile voice communications and Internet technologies, bringing the power and wealth of Internet services to mobile users. IMS provides for person-to-person real-time services (such as voice) over the packet-switched domain. It allows the creation and deployment of IP-based multimedia services in 3G networks.

As described in UMTS Forum Report 20, IMS could enable IP interoperability for real-time services between fixed and mobile networks and so holds the promise of seamless converged voice/data services. Service transparency and integration are key features for accelerating end-user adoption. Two aspects of IMS are of fundamental importance to deliver these features:

- IP-based transport for both real-time and non-real-time services.
- Introduction of a multimedia call model based on the Session Initiation Protocol (SIP).

Both these aspects have implications for deployment options available to operators.

## The “IP Question” for Mobile Operators

This vision of seamless interoperability, however, must now be evaluated against an increasingly complex set of technology and deployment options and financial constraints.

Based upon the economies of scope derived from the fixed Internet, the clear direction from the mobile standards community, and evidence that all current development work in the fixed environment is IP-based, it would appear that an “all-IP” network is inevitable.<sup>1</sup> Therefore, it would seem that the

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<sup>1</sup> A significant development in 3G mobile is the cooperation between 3GPP (GSM-focused) and 3GPP2 (CDMA2000-focused) to “harmonize” their IP Multimedia Core Networks to enable application level roaming. This includes the creation of a single IMS reference model and consistent terminology to describe common IMS functional entities. Such cooperation is a demonstration of the industry’s recognition of users’ needs for the capabilities that IMS offers.

critical deployment question for mobile operators is when and how to deploy IP and IMS, not whether or not it is financially justified to deploy it at all. This is a stark conclusion given the current difficult economic climate. Market forces demonstrate that IMS functionality is desirable and necessary. However, current market reality makes deciding when to deploy problematic for a number of reasons:

- Uncertainty regarding service adoption: End user adoption of new mobile data services has been slow.
- Standards: Some of the required IMS standards are still being developed or finalized.
- Investment costs: Cost of deploying IMS or upgrading an existing mobile network to IMS.
- Strategic considerations: The interoperability of IMS may be viewed as a competitive threat (e.g. third party application providers and VoIP).

Even for mobile operators committed to deployment of an IMS-based, IP network, the timing and scale of such deployment must be determined and the additional cost of IMS will have to be carefully considered. However, It should be noted that IMS is an incremental network investment and existing infrastructure can be reused to a large extent.<sup>2</sup>

### Report Structure and Goals

The purpose of this study is to provide clarity of thinking on the critical investment questions facing mobile operators: The study approaches this as follows:

- Develop a flexible cost analysis methodology that can be used to study a range of networks with different architecture, size and configuration.
- Use this methodology to assess high-level relationships between different IMS deployment strategies.
- Analyse the 3G revenues associated with IMS based on the UMTS Forum's 3G service categories and the same bounded revenue forecasting methodology used for the UMTS 3G revenue and subscriber forecasts.
- Use this methodology to assess different contributions to IMS service revenue and their timing.
- Identify scenarios that represent clear deployment choices that an operator might consider in terms of level of deployment investment and timing of market entry.
- Discuss the relative service, cost, revenue, and strategic implications for these options.

Given the unique market, regulatory, and technology issues faced by each operator, this report cannot definitively answer the IMS deployment question. Instead, it illuminates many of the critical macro factors associated with IMS deployment and provides an approach for further individual operator evaluation.

Section 2 presents a description of the scenarios, study assumptions and market context for IMS. Section 3 frames the strategic issues related to IMS addressed in this report. In Sections 4, 5 and 6 the network architecture, costs and revenues are explored. And finally, in Section 7, the scenarios are compared and the implications inherent in each are analysed in the light of a range of potential industry situations.

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<sup>2</sup> IMS puts no requirements on the infrastructure that transports the IP packets. An installed base using ATM transport is as capable of supporting IMS as an installed base using all IP transport. A feasible migration path for an operator is to introduce all IP when it is justified for other reasons than IMS. E.g., network expansion should be done with IP transport whilst keeping the installed ATM transport. The overall business case should decide when the ATM transport network should be replaced by all-IP.