

# 1 Overview

The introduction of multimedia elements into mobile voice telephony dramatically changes the technology, industry, and market dynamics of a previously “all voice” mobile world. New network and handset technical capabilities, additional licence areas, and partnership opportunities are creating new challenges for mobile operators in a potentially \$322 billion market.<sup>1</sup> The marriage of mobility with Internet content and voice with multimedia services introduces requirements for interoperability between mobile networks and Internet networks and higher levels of service integration. The concept of the IP Multimedia Subsystem (IMS) was developed to address the resulting network and end-user requirements.

The understanding of the term IMS has changed over time as the standardisation process has evolved.<sup>2</sup> Although there is no widely agreed definition of IMS today, the vision of what the ‘IMS approach’ is designed to achieve remains. It adds significant new dimensions to the communications process. To facilitate understanding of this report, the UMTS Forum has agreed on the following definition of IMS:

IMS is understood to be an evolution of IMT-2000 technology, which brings:

- *the ability to deliver person-to-person real-time IP-based multimedia communications (e.g., voice),*
- *the ability to fully integrate real-time with non-real-time multimedia and person-to-machine communications,*
- *the ability for different services and applications to interact, and*
- *the ability for the user to very easily set up multiple services in a single session or multiple simultaneous synchronised sessions.*

IMS provides a vision of robust, highly valuable services that integrate multimedia activities and allow services to interact with each other, thus enhancing the natural, intuitive process of the end user, in whatever network he is operating, whether fixed, mobile, or roaming. The resultant integration and interaction of media types opens up new possibilities for far richer services than are available today.

The power of this interaction and integration is significant. It is the integration and interaction of services that can turn a frustrated user attempting to manage multiple activities on a small device into a satisfied customer using mobile services involving multimedia activities in a seamless fashion, following a natural, intuitive process. This is the experience that end users want from mobile data services and for which they will be willing to pay.

Still, qualitative differences in user experiences are difficult to quantify. Since IMS deployment is an option for operators, the need for IMS is a subject of debate amongst industry players, especially since many services can be emulated to some extent without IMS. However, consumers have clearly demonstrated a willingness to pay for integration of services.<sup>3</sup> In the mobile environment, ease-of-use has always been highly valued, and

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<sup>1</sup> See UMTS Forum worldwide estimates for 3G revenue in Report 17.

<sup>2</sup> The term IMS was at one stage synonymous with an “all-IP” solution but now more often just refers to the provision of IP in the core network.

<sup>3</sup> For example, consumers buy second dial-up lines and subscribe to cable modem service in part so that they do not need to suspend one activity (making and receiving phone calls) to begin another (accessing the Internet).

users will expect mobile data services that offer comparable convenience. To obtain high adoption levels, the mobile industry must also make mobile data services natural, intuitive, convenient, and easy-to-use.

For the mobile operator, IMS provides the potential for interoperability of mobile and fixed networks and a robust service creation platform, which in turn can be used to increase competitive advantage. Although the UMTS Forum has forecast 3G service revenue at \$322 billion in 2010, this potential will only be fully achieved with the robustness and high end-user satisfaction that IMS can provide.

This report explains the IMS concept and illustrates the benefits of IMS to the end-user experience as well as to the mobile operator. It illustrates that IMS provides a standardised solution for enhancing the end-user experience that cannot be easily duplicated by any known technology today. In addition, a vision of IMS is portrayed that includes interoperability between fixed and mobile IP networks that will further the possibility of a common satisfactory end-user experience across services, networks, and devices.

## 5 Conclusions

The marriage of multimedia content with mobility represents revenue opportunities to the mobile operator estimated at \$322 billion worldwide by 2010. However, past experience has shown that end users will resist adopting new technology services that are either too complex or too cumbersome. At a minimum, most mobile data users will demand the same quality, ease-of-use and ubiquity that they currently experience in mobile voice services. The end-user experience counts. The quality of the end-user experience will ultimately determine the end-user willingness to adopt, pay for, and continue to use a service. Seemingly subtle differences do matter in using a service at all, and can be the deciding factor for the end user in making competitive choices.

Several factors contribute significantly to the quality of the user experience and therefore significantly affect user adoption and operator revenues:

- **Service Transparency:** *the result of seamless integration and interaction of services that allows users to perform their desired tasks easily and naturally*
- **Service Customisation:** *allows users to choose the service to more closely match their individual needs and work style from a wide selection of service possibilities, and to customise that service through an easy-to-use Web-like interface*
- **Global Roaming:** *allows users to use their advanced services anywhere, across multiple operator networks*

Fundamentally, IMS is about service creation. Though the technical feasibility exists to create innovative services using a proprietary, non-IMS platform, the ability of the operator to continually satisfy user expectations, over time, in these areas is limited. IMS enables mobile operators and other industry participants to quickly and successfully address user needs in each of these areas.

- **Service Delivery:** *IMS allows mobile operators to create and deliver more services more quickly*
- **Service Customisation:** *IMS increases the operator ability to provide services to end users more quickly and with a greater degree of customisation to smaller segments*
- **Service Ubiquity:** *IMS increases the operator ability to offer a consistent experience between mobile and other IP networks*

In order for the projected \$322 billion revenue opportunity to be realised, mobile operators must utilise the power of IMS to create well integrated, easy-to-use services that enhance rather than frustrate the end-user experience.

The IMS platform provides that enhanced experience and is the gateway to future 3G revenue opportunities.

### 5.1 Operator Challenges

IMS represents a challenge and opportunity to operators. The evolution of mobile networks to 3G/UMTS IMS-based platforms has profound implications for the mobile industry as well as the individual mobile operator. Technology and adoption issues aside, the adoption of IMS has the potential to dramatically alter the value chain of the industry as a whole. While this report has focused on the enhancements to the end-user experience, the following observations should be noted and considered for further evaluation. In addition, a technical annex, "Technology Enablers" is also available for this report.

- IMS-based voice quality must be at least comparable to 2G mobile voice and be as spectrum efficient as 2G. Some of these technical issues are still being resolved.
- The interoperability of IP networks and the rapid service creation enabled by IMS effectively reduce the market entry barriers for new or additional service providers. Incumbent mobile operators will face new competitive threats as well as find new opportunities for partnership and service innovation. The existing industry structure and value chain will change.
- Service ubiquity and global roaming may not be achieved in the short-term because operators have varying deployment strategies and timetables. The issue of how much ubiquity, by customer segment and by market, is needed to prompt market adoption requires further analysis.
- Acceptable quality of service and security are critical functions for user adoption of any IMS services.
- There are some technology enablers for which the industry has to decide upon a deployment policy, either collectively or as individual operators. These issues are addressed more fully in the Technology Enablers Annex to this report. These include:
  - *IP transport in the RAN (backhaul links).*
  - *"IP based RAN" (efficient IP over the air including techniques such as Robust Header Compression).*
  - *RAN capacity enhancing techniques such as High Speed Packet Downlink Access.*
  - *SIP Proxies in the core network.*