# White Paper

# Multimedia Messaging

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# 1 Introduction

***Meet Multimedia Messaging***

To meet Ericsson's Multimedia Messaging Service (MMS) is to know complete communication. With virtually no limit to the content that can be transmitted to and from handheld wireless devices, MMS affords total freedom to convey ideas, exchange information and express oneself.

Multimedia Messaging technology represents the pinnacle of the Ericsson mobile messaging evolution. Beginning with the enormously popular Short Message Service (SMS) for simple text messages, and currently moving toward the exciting Enhanced Message Service (EMS) for illustrated text messages, the evolution fosters steady expansion of the marketplace for network operators and service providers and facilitates ease-of-use and a logical transition for end users.

Ushering in the new generation of mobile telephony by paving the way for an array of groundbreaking applications, Multimedia Messaging technology will result in users expecting more from their applications and developers continuing to meet these demands. MMS and the "face to face" contact it provides will simply become synonymous with mobile communication.

Using the Wireless Application Protocol (WAP) as bearer technology and powered by the high-speed transmission technologies EDGE, GPRS, and UMTS, Multimedia Messaging allows users to send and receive formatted text and graphics, photographic images, PowerPoint-style presentations, speech and music clips and video sequences. MMS will ultimately serve as the default mode of messaging on all terminals, making total content exchange second nature. From utility to sheer fun, it offers benefits at every level and to every kind of user.

# 2 The Messaging Market

***Building on proven success, Ericsson paves the way to a complete communication experience***

The messaging market is characterized by an intentional evolution of progressively advanced services. The goal of the evolution is to ease the transition to total multimedia communication for users, operators and content providers alike. Driving the market is a steadily growing, enthusiastic consumer demand that gives content and service providers the confidence to embrace third generation systems.

## 2.1 Evolution

As the foremost provider of end-to-end telecommunications solutions, Ericsson remains committed to fostering a timely and seamless evolution of the messaging market. This approach is both user and operator friendly, as it leads the market towards full mobile multimedia with logic and ease-of-use as guiding principles. The key stages of the evolution entail the sequential release of the following value-added services:

- Short Messaging Services (SMS) – text messaging

- Enhanced Messaging Services (EMS) – illustrated text messaging

- Multimedia Messaging Services – (MMS) full digital content exchange

### 2.1.1 SMS

The Short Messaging Service (SMS) was launched in 1992 and has become the most successful wireless data service to date. SMS allows mobile terminal users to send and receive text messages of up to 160 characters in a cost and time efficient manner. SMS is a "store and forward" service, which means messages are sent not directly between users but rather via an SMS center. This aspect allows for a number of key SMS attributes, such as instant delivery, nominal tariffing, simultaneous SMS and voice capability, international "roaming" without international fees and message delivery unhindered by network traffic. Users also use SMS to alert them of incoming e-mail, voice mail or faxes as well as to inform them about weather forecasts, news headlines, stock quotes, lottery results and other events.

### 2.1.2 EMS

Messages sent with Ericsson's Enhanced Message Service (EMS), currently being implemented, contain a combination of text and simple pixel-image and/or melody. Users may download images and melodies from the Internet, or for even greater self-expression, create their own content. Unlike SMS messages, the text of an EMS message can be formatted using a variety of fonts, sizes, type styles, etc. Ericsson's EMS is a backwards compatible service, meaning that the text portion of its messages can be received by terminals not supporting EMS. EMS is expected to become as popular as SMS and to pave the way for the introduction of MMS.

### 2.1.3 MMS

Currently being defined and specified by 3GPP, as a standard for third generation implementation, the Multimedia Messaging Service (MMS) completes the messaging evolution. MMS is ultimately expected to become the preferred communications method of mobile terminal users. There are virtually no limits to the content of an MMS transmission: formatted text, graphics, data, animations, audio clips, voice transmissions and video sequences all can be part of a multimedia message. Sending digital postcards and PowerPoint-style presentations is expected to be among the most popular user applications of MMS. Eagerly awaited by young users in particular, MMS is projected to fuel the growth of related market segments by as much as forty percent.

### 2.2 Demand

SMS has been an unqualified success for both end users and service providers. With practically no high-profile marketing undertaken by terminal manufacturers or network operators, this value-added service currently is used to send some 15 billion messages per month in the GSM market alone. By the beginning of 1999 there were approximately 30 million users of SMS worldwide.

An extremely positive indicator of the emerging market is the fact that young users in particular have driven the messaging growth. In parts of Scandinavia, for example, more than half of a young person's mobile communications bill constitutes SMS charges. These users send over 100 messages per month, and research shows that once the new high-speed technologies EDGE, GPRS, and UMTS are unveiled, the frequency of sending messages is destined to increase substantially.

A strong demand for Multimedia Messaging exists. Not surprisingly, it has been found that the younger the user, the greater the interest in Multimedia Messaging services. As clear evidence of the huge market potential for operators and service providers, studies have found that users expect and

accept that the richer the content, the more they will be charged. While users want to retain the ability to choose among the different messaging services (SMS and MMS), they consider the rich content of multimedia messages to be approximately five times more valuable than simple text messages.

# 3     MMS Content

### *Rich content to communicate the richness of our lives*

Although MMS is a direct descendent of SMS, the difference in content is dramatic. Presently, the average size of an SMS message is approximately 140 bytes, yet in its initial stages, the average size of an MMS message is expected to be approximately 30,000 bytes. That is why the key word to describe MMS content is *rich*. Complete with words, sounds and images, MMS content is endowed with the user's ideas, feelings and personality. An MMS message can contain one or more of the following:

## 3.1      Text
Both an EMS message and an MMS message can consist of plain text. In addition, the text can be formatted to achieve greater clarity in an important communiqué or provide a better sense of personal style in a whimsical note. The main difference between formatted text in EMS and MMS is that MMS formatted text can be accompanied not only by simple pixel images or melodies but by photographic images, graphics, audio clips and video sequences.

## 3.2      Graphics
Graphs, tables, charts, diagrams and layouts are just a few examples of the kinds of MMS graphic capabilities sure to have a major impact on the way we work. Maps, drawings, sketches and animations will more likely find greater usage in our personal lives, helping us to find our way, feel safe, express ourselves and have fun.

## 3.3      Audio
MMS provides the ability to add full sound to a message. Not only can users share a favorite song with a friend, but they can also use the mobile terminal to record sound and send it along with a message. Because sound includes speech as well as music, this extra dimension of an MMS message makes for tremendously enhanced immediacy of expression and communication. Rather than sending a downloaded birthday jingle, for example, a user can send a clip of his or her own personal rendition of "Happy Birthday".

## 3.4      Images
By using either a digital camera attached to the mobile terminal or a built-in digital camera, users can take a snapshot and immediately send it to a recipient. The ability to send images is one of the most exciting attributes of MMS, as it allows users to share meaningful moments with friends, family and colleagues. Mobile image transmission also offers inestimable utility in business applications, from sending on-site pictures of a construction project to capturing and storing an interesting design concept for later review. Editing an image by adding text allows users to create their own electronic postcards, an application that is expected to substantially cut into the traditional postcard-sending market.

## 3.5      SMIL Presentations

Standing for Synchronized Multimedia Integration Language and pronounced "smile", SMIL allows for the creation and transmission of PowerPoint-style presentations on the mobile device. Using a simple media editor, users can incorporate streaming audio and video along with still images and formatted text to assemble full multimedia presentations.

### 3.6 Video

The ultimate extension of MMS's digital imaging capabilities, MMS video content, once developed, will initially be comprised of 30-second streaming video clips. Instead of using, for example, the mobile device's digital camera and media editor to photograph a scene, label it with text and add appropriate audio, users will be simply be able to record the scene and transmit the clip to a recipient. The list of possible applications of this most exciting type of MMS content is virtually endless.

## 4 Use Case

### 4.1 User scenario – "On the move with MMS"

While on the train to work, Martin van Buren, a German-based Belgian account executive, chorale music enthusiast and connoisseur of frankfurters, decides to play hooky from work and visit the Hanover Expo. He wants to use his Ericsson MMS-enabled mobile terminal to call his secretary and inform her of his sudden illness, but he doesn't want her to hear the background noise in the train car. So Martin sends his secretary an EMS message, appending a pixel image of a sad face to his text message, "too sick to work today".

Although he has read that the Expo is a dismal financial failure and the queues are horrendous, Martin has also heard that the frankfurters there are really delicious. To build up an appetite, he makes his way through several of the pavilions. In the Japanese exhibit, he sees the latest model of stylish fountain pen, photographs it with the digital camera on his Ericsson terminal, and immediately sends the image to his wife with the message, "Honey, this is what I want for Christmas". In the Russian exhibit, he hears the most divine choir music he has ever heard. Using the MMS audio capabilities on his mobile terminal, he records a sample of the music and stores it for his later listening pleasure. In the Estonian exhibit, he sees the most beautiful blonde woman he has ever seen and stores her in his terminal, also.

Alas, Martin's fun is interrupted by an urgent SMS message from his secretary. The boss wants to see the layouts Martin has been working on for the past week. He knew he should have turned the #%$& phone off! Oh well, it's no problem – he has the layouts with him in his briefcase. He finds a free table, spreads out the layouts and photographs them with his mobile terminal. Then, to really dazzle the boss (and because he feels guilty now about skipping work), he uses the terminal's media editor and some of the Russian chorale music (he doesn't use the Estonian woman) to create a full multimedia slide presentation. He sends the SMIL presentation to his boss and feels much better. Martin finally reaches the frankfurter tent. The wait has been worth it. They truly are the tastiest frankfurters he has ever had. If only he could use his Ericsson MMS-enabled terminal to send one to a friend… (To be continued)

## 5 Benefits

***Multimedia Messaging represents a classic win-win scenario – if it's good for the user, it's good for service and content providers***

Essentially enabling the mobile terminal to serve as image processor and conveyor, Multimedia Messaging accommodates the exchange of important visual information as readily as it facilitates fun. Business and leisure usage of MMS will be dynamically merged, resulting in enhanced personal efficiency for users and increased network activity for operators. In short, MMS affords total usage for total communication.

Because MMS uses WAP as its bearer technology and is being standardized by 3GPP, it has wide industry support and offers full interoperability, which is a major benefit to service providers and end users. Ease-of-use resulting from both the gradual steps of the messaging evolution and the continuity of user experience gained from interoperability is assured.

The MMS server, through which MMS messages are sent, supports flexible addressing (to both telephone numbers and email accounts), which makes user interface more friendly and allows greater control for operators. The MMS server, moreover, is responsible for the instant delivery feature of MMS.

## 5.1 End users

The ability to take, edit and send a photographic image empowers users in all areas of life, enhancing personal connectivity through a more immediate sharing experience. It boosts efficiency in the workplace by serving as a powerful portable tool for both conveying and responding to ideas. Other applications, such as receiving a localized city map while on the road or a graph or layout while in a conference, enables users to "position" themselves in both their personal and business lives. With terminal-to-terminal as well as terminal-to-email functionality, MMS can also serve as a virtual email client, enabling users to circumvent many of the pitfalls of traditional email service (cumbersome software, limited access outside the workplace, etc.).

## 5.2 Network operators

Multimedia Messaging promises increased airtime, heavier all-around usage, service differentiation and customer loyalty – all key factors in increasing the revenue made from operating a network. Market studies have revealed that users are not only enthusiastic about MMS services but are willing to pay as much as five times more for such services than they are currently paying for SMS services. This cutting edge messaging platform takes full advantage of the high bandwidth technologies of GPRS and WCDMA, which will result in a high usage of MMS service. Investments in such technologies is not only warranted but wise, as they are destined to have short payback periods and enable operators to secure a strong market position early in the personal multimedia era.

## 5.3 Service and content providers

Multimedia Messaging applications will drive the continuous development of new services and content. The pure diversity of new services and demand for new content will ensure increased revenue, especially as service providers can offer content and charge for it much like they can for ringing tones today. Much like network operators, service and content providers stand to make great gains by developing for MMS functionality early, as they will secure a well established position from which to cater to the demands of both operators and the public.

# 6 Technical features

*Making the most of existent and familiar technologies and models*

Using WAP as its bearer protocol, the MMS standard builds on the existing SMS paradigm to offer store-and-forward transmission (instant delivery) of messages rather than a mailbox-type model. MMS will take advantage of the high-speed data transport technologies EDGE, GPRS and UMTS and support a variety of image, video and audio formats to enable a complete communication experience.
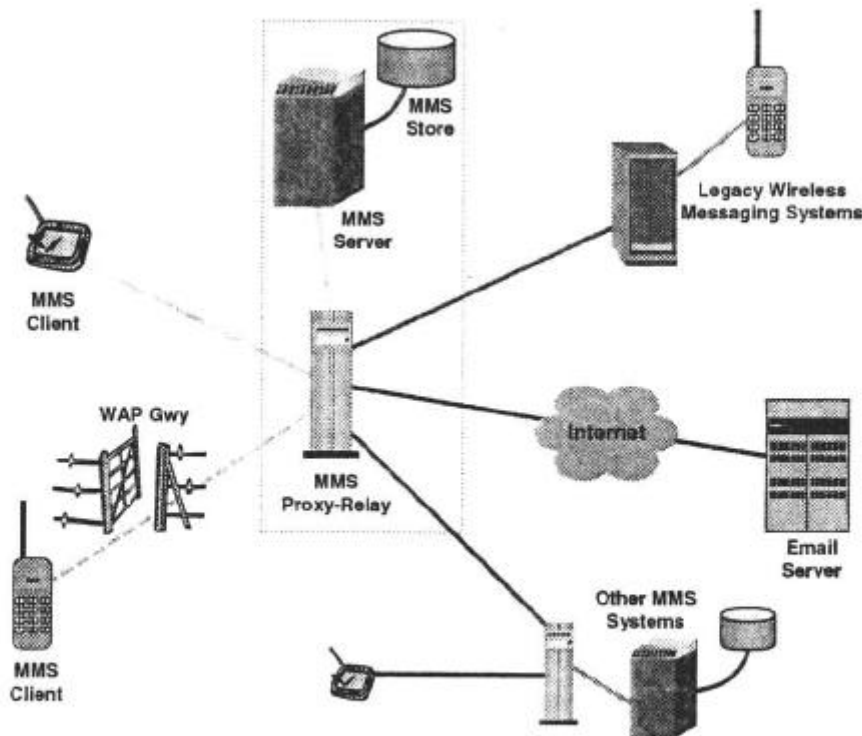


Figure 1. MMS network diagram

## 6.1 Architecture

The Multimedia Messaging Center (MMC), is comprised of the MMS Server, the MMS Proxy-Relay and the MMS Store. The MMC is the central element of the MMS network architecture, providing storage and operational support, enabling instant delivery of multimedia messages from terminal to terminal and terminal to email, and supporting flexible addressing. The center's MMS Proxy-Relay interacts with the application being run on the MMS-enabled terminal to provide various messaging services. WAP is used as bearer of an MMS message between the MMC and the MMS client (application). The WAP Gateway is used for delivery and retrieval of messages.

## 6.2 Supported formats

Currently being standardized, MMS is likely to support the following formats, when fully developed.

- Image – JPEG, GIF 89a,WBMP
- Video – ITU-T H.263, MPEG 4 (simple profile)
- Audio – MP3, MIDI, WAV, AMR/EFR (for speech)