Mobile Lifestreams.com
the mobile data.com

# NEXT MESSAGING

## An Introduction to SMS, EMS and MMS

www.NextMessaging.com

# CONTENTS

"Next Messaging: An Introduction to SMS, EMS and MMS" is divided into the following sections:

# PART 1

# SHORT MESSAGE SERVICE (SMS)

## 1. MESSAGING ORIENTATION

Mobile messaging is evolving beyond text by taking a development path from SMS (Short Message Service) to EMS (Enhanced Messaging Service) to MMS (Multimedia Messaging Service). Mobile Lifestreams already publishes its renowned 320 page SMS report called "Success 4 SMS" and its new report "Next Messaging: From SMS to EMS to MMS" of which this white paper is a summary. This white paper has a related Internet site at http://www.NextMessaging.com plus sub-sites at www.mobileSMS.com, www.mobileEMS.com and www.mobileMMS.com to keep readers up-to-date with the very latest developments.

The Short Message Service (SMS) is the ability to send and receive text messages to and from mobile telephones. The text can comprise of words or numbers or an alphanumeric combination. SMS was created when it was incorporated into the Global System for Mobiles (GSM) digital mobile phone standard. The first short message was sent in December 1992 from a Personal Computer (PC) to a mobile phone on the Vodafone GSM network in the UK.

The Enhanced Messaging Service (EMS) is the ability to send a combination of simple melodies, pictures, sounds, animations, modified text and standard text as an integrated message for display on an EMS compliant handset. There are many different potential combinations of these media. For example, when an exclamation mark appears in the enhanced message, a melody could be played. A simple black and white image could be displayed along with some text and this sound effect. EMS is an enhancement to SMS but is very similar to SMS in terms of using the store and forward SMS Centers, the signaling channel and the like to realize EMS. The first EMS compliant handsets are due by mid-2001, whilst no new network infrastructure is needed to handle EMS.

The Multimedia Messaging Service (MMS) is as its name suggests the ability to send and receive messages comprising a combination of text, sounds, images and video to MMS capable handsets. The Multimedia Messaging Service (MMS) confers the ability to send still images such as mobile postcards, mobile pictures, mobile screensavers, mobile greeting cards, mobile maps and business cards. Additionally, moving images, cartoons and interactive video will also be supported by Multimedia Messaging (MMS).

New mobile network infrastructure is needed for Multimedia Messaging (MMS)- in addition to implementing the new bearer services such as 3G, new network elements

such as Multimedia Messaging Relays and Stores will be needed. The first trials of Multimedia Messaging (MMS) infrastructure will take place in mid 2001 and the first MMS terminals are expected to be announced in early 2002 and shipped for Christmas 2002.

MMS uses WAP (Wireless Application Protocol, see www.yes2wap.com) and MExE (Mobile Station Application Execution Environment, see www.mobilemexe.com) as protocols to enable a smooth migration path for messaging applications as mobile networks and handsets improve.

## 2. EVOLUTION FROM TEXT TO MULTIMEDIA

Over time, the nature and form of mobile communication is getting less textual and more visual. The wireless industry is moving from text messages to icons and picture messages to photographs and blueprints to video messages and movie previews being downloaded and on to full blown movie watching via data streaming on a mobile device. The key technologies underlying these new services and applications are EMS and MMS.

The main features of this transformation are shown in the table below:

| TYPE | CHARACTERISTICS | CONTENT REFORMATTING FOR MOBILE NECESSARY? | APPLICATIONS | SUPPORT | TIMEFRAME FOR AVAILABILITY |
|---|---|---|---|---|---|
| Text Messaging | 100-200 characters | Yes | Simple person to person messaging | All phones | 1990s |
| Picture Messaging | Simple rudimentary images | Yes | Simple person to person messaging with a visual feel | Some networks and Nokia phones only. | 2000- 2001 |
| Enhanced Messaging | Text messages plus sound, animation, picture, text formatting enhancements | Yes | Simple person to person messaging with a visual feel | EMS standards expected to be widely adopted | 2001 onwards |
| Multimedia Messaging | Messages in multiple rich media formats e.g. video, audio plus text | No | Simple person to person messaging with a visual feel | MMS standards expected to be widely adopted | 2002 onwards |

**SOURCE MOBILE LIFESTREAMS**

Let us now look briefly at today's most successful messaging technology- the Short Message Service.

## 3. SMS INTRODUCTION

Text messaging uses the Short Message Service and is just that- it is short (100- 200 characters in length), and involves sending text only messages between phones. Examples include "C U L8ER" AND "OK. AT FLAT OR OFFICE". It is quick and dirty, hard to use the keypad, abrupt, punctuation challenged and incredibly useful and popular. Text messaging also has a lot of advantages such as that fact that is convenient, available on all phones and discrete.

Text messaging is something that is most prevalent in the youth market, and especially teenagers who are able to manipulate the difficult to use Man Machine Interface (it is difficult to enter short messages using the keypad on a mobile phone). In fact, we suspect that this steep learning curve and the necessary insider knowledge is one of the things that appeals to the youngsters. Older people interested in content- completing the communication as quickly and easily as possible, whereas younger people are as interested in context- being seen to be doing something interesting and killing time.

Clever use of characters such as the "*" and other characters can be used with simple the Short Message Service (SMS) to create rudimentary messages such as:

.+.'*.'+'*'.+.'*.' .+.'*.' .+.'*.' .+.'*.' .+.'*
.+.'*.'.+.'*.'MERRY .+.'*.' .+.'*.' .+.'*.'
.+.'*.'CHRISTMAS .+.'*.' .+.'*.' ' .+.'*.'
.+.'*.'+'*'.+.'*.' .+.'*.' .+.'*.' .+.'*.' .+.'*

Some other more graphical messages using the "<", ">", "(" and ")" characters have also been designed.

It is a valid question to ask whether the Short Message Service (SMS) has a prosperous future ahead of it given that messaging is evolving to EMS and MMS.

## 4. SMS ADVANTAGES

Today's SMS has several advantages inherent in its fundamental features:

**STORE AND FORWARD**

This means that in the case that the recipient is not available, the short message is stored. There is no storage mechanism incorporated into GPRS.

Once the data is prepared and ready to send, SMS has advantages over packet data in that the burden of delivering the data is on the SMS Center within the mobile network

rather than the end user. The transaction costs incurred by the sender of a small amount of information using SMS are therefore likely to be lower than a GPRS transaction.

**CONFIRMATION OF DELIVERY**
This means that the user knows that the short message has arrived. In the Circuit Switched Data environment, there is an end to end connection and therefore the user has knowledge that a connection has been established and the data is being transferred. In a GPRS environment however, the concept is "always on" with terminals attached to the GPRS bearer ready to send or receive data automatically at any time transparently to the user. This places the requirement on the user to find out whether the data has been sent or received. For every packet data transaction, the associated transaction costs are higher (the busyness associated with the business in hand) compared with SMS. SMS has been designed to take the burden of message delivery and delivery verification away from the user- through features such as store and forward and confirmation of delivery.

## 5. SMS DISADVANTAGES

However, it is also true to say that today's SMS has several disadvantages:

**LIMITED MESSAGE LENGTH**
The unit short message length is currently limited to 140 octets because of limitations in the Mobile Application Part (MAP) signaling layer. It would be preferable to have a length that is several times this magnitude.

Packet data services such as GPRS simplify nonvoice transactions over mobile networks because the amount of data that can be communicated in any one session is significantly higher than one or several short messages. This means that users are less likely to be constrained by the limitations of the underlying bearer. The transaction costs incurred by the user when retrieving any sizable information via SMS are likely to be higher than GPRS because of the need to handle multiple messages.

In MMS, the fixed SMS limit of 160 characters (in the case of GSM) will be replaced by the ability to transfer much larger text content, but also graphics, and even audio, sound or video clips.

**INFLEXIBLE MESSAGE STRUCTURE**
The structure of the SMS Protocol Data Unit as defined in the GSM 03.40 standard is inflexible. The Data Coding Scheme, Origination Address, Protocol Identifier and other header fields are fixed- this has constrained the number of possible scenarios that can be indicated when developing applications. For example, use of the Protocol Identifier has sometimes been constrained because one feature will nullify others: the flags are sometimes mutually exclusive, such that software developers cannot depict two characteristics simultaneously. The attempted solution for this so far has been to

replicate the values, by, for example, stating the Message Class twice. However, this is inefficient.

Instead, it is envisaged that the 3G specifications will include a Tag Length Variable structure. Each parameter in the header such as the Data Coding Scheme would be given a tag to indicate what kind of information is being sent in that field followed by a variable amount of information followed by another tag for the next field and so on.

**RELATIVELY SLOW SIGNALING CHANNEL**

The latency- turnaround time- of services such as General Packet Radio Service (GPRS) and Unstructured Supplementary Services Data (USSD) tends to be faster than that for SMS. The signaling channel is used for several other purchases besides SMS such as locating phones and managing call completion. Indeed, as SMS traffic volumes have grown, network operators have expressed some concern about potential service outages due to over use of and corresponding degradation in scarce signaling resources.

Rather than using the signalling channel, MMS will use appropriate data channels and will be able to deliver much larger messages in a reasonable time.

**ALWAYS STORE AND FORWARD**

Today's SMS is designed such that every short message always passes through the SMS Center. Variations on this have been discussed at UMTS committee level such as forward messages and optionally store them: immediately attempt delivery and if the message cannot be delivered, then store it. This reduces the processing power needed by the SMS Center.

It is clear that in cases such as requests from the phone for information (either directly using SMS Mobile Originate or indirectly using the Wireless Application Protocol (WAP)), the requesting terminal is highly likely to be available to receive the response. As such, the possibility has been discussed of a mobile to mobile Short Message Service without an SMS Center.

**SUMMARY**

As such, the current Short Message Service has some unique advantages that other nonvoice services do not have such as store and forward and confirmation of message delivery. However, SMS also has some disadvantages such as limited message length, inflexible message addressing structures and signaling channel slowness.

Some of the more useful mobile aspects of SMS will be incorporated into MMS. For example, the mobile network infrastructure knows when a mobile becomes available for SMS and can deliver waiting messages as soon as the phone is switched on. This concept will be delivered also with MMS.

Mobile Lifestreams is predicting that SMS usage will continue to grow until the year 2005 at least, since the mobile phones, infrastructure, specifications, market development and awareness are in place today. (See the "Success 4 SMS" report for more information). Over time, as users connect to networks that offer more advanced data services such as the General Packet Radio Service (GPRS) and buy mobile terminals that support them, they will use these new bearers for new and existing applications.

*The "Success 4 SMS" report from Mobile Lifestreams is all about text messaging/ the Short Message Service. See also www.mobileSMS.com*

## 6. SMS MARKET GROWTH

There is no doubting the success of the Short Message Service- by August 2000, nine billion SMS messages were being sent each MONTH, including 6 billion in EUROPE alone! This growth is predicted by Mobile Lifestreams to continue growing until 2004 at least. (See the "Success 4 SMS" report for more information).

## 7. SMS SUMMARY

For a relatively simple messaging service, there certainly are a lot of elements that need to be taken into account when developing and deploying SMS! However operators who take the time and trouble to invest in SMS will find appreciative customers and appreciating revenues. As such, please say "Yes to SMS"!

This guide is a cut down version of a report called "Success 4 SMS" which is 360 pages long and contain detailed SMS Center vendor profiles, profiles of major SMS software suppliers, SMS statistics and so on. To find out more about SMS and the report and to order your copy, visit https://www.mobileSMS.com/ordering.htm or visit www.mobilesms.com for more information.

# PART 2

# ENHANCED MESSAGING SERVICE (EMS)

## 1. EMS INTRODUCTION

The Enhanced Messaging Service (EMS) is the ability to send a combination of simple melodies, pictures, sounds, animations, modified text and standard text as an integrated message for display on an EMS compliant handset. There are many different potential combinations of these media. For example, when an exclamation mark appears in the enhanced message, a melody could be played. A simple black and white image could be displayed along with some text and this sound effect. EMS is an enhancement to SMS but is very similar to SMS in terms of using the store and forward SMS Centers, the signaling channel and the like to realize EMS.

## 2. EMS MEDIA

EMS supports several media in standardized formats. Let us take a closer look at these different media:

- Text formatting. EMS supports not just plain text but left, center or right alignments of text, normal, large or small font sizes and normal, bold, italic, underlined or strikethrough text. SMS is regularly used to end relationships, and text with a line through it could be used for this in the EMS world! This example also illustrates the need for an intelligent converter that helps to represent a message with enhanced text formatting in a way suitable for legacy, non-EMS handsets.

- Pictures. EMS supports three picture formats- small (16 by 16 pixels), large (32 by 32 pixels) or variable sized pictures- the standards recommend a maximum picture size of 96 by 64 pixels- but this depends upon the handset vendor's implementation. Multiple pictures can be received and will appear on the phone screen as seamlessly integrated. Pictures are plain black and white- there is no gray scale for shading.

- Sounds. Within EMS, there are 10 different predefined sounds including low and high chimes and chords, Ding, TaDa, Claps, Drum and Notify. Additionally, user defined sounds are possible which can be transferred over the air and take up to 128 bytes. Within EMS, iMelody is used as the standard for defining sounds. An iMelody ringtone is basically a text-based melody representation. The format used with iMelody objects is already used with Ericsson's handsets. The iMelody standard is available for free download from the standards body that standardized it- IrDa. (www.irda.org).

- Animations. Moving pictures will be supported by EMS, in two sizes, small (8 by 8 pixels) and large (16 by 16 pixels). Handset vendors may implement methods for repeating these animations. The standards define a number of predefined animations- relating to sadness, flirtatiousness, gladness, skepticism and grief. User defined animations are also possible in both large and small formats. The pre-defined animations are stored on the individual handset- they are NOT sent over the air. The user defined animations can however be sent over the air.

## 3. EMS BACKGROUND

The Enhanced Messaging Service (EMS) came about as a submission to the standards committees by Ericsson. Ericsson presented the outline structure of EMS to the relevant ETSI/ 3GPP committees and stated that they would only commit more resource to propagating EMS if the handset vendors all committed to supporting it. All of the major handset vendors with the exception of Nokia who reserved their position did commit to supported the concept of EMS, hence the EMS standards have evolved and are now stable and complete as part of the 3rd Generation Partnership Project (3GPP) technical specification: 3G TS 23.040, "Technical realization of the Short Message Service (SMS)".

## 4. EMS HANDSETS

As in many other "non-voice" mobile services, wide availability of EMS compliant handsets will ultimately decide the success of EMS. Many EMS uses will involved person to person messaging, like SMS. Early indications are that the likes of Ericsson, Panasonic, Sony and Samsung will be the first to announce EMS compliant terminals in quarter 1 or quarter 2 of 2001 (most probably at the annual CeBIT trade fair). Both Siemens and Alcatel have recently been involved in the EMS standard work. Siemens are committed to including Nokia has also finally been involved in the standards work, but they are waiting to see.

When large volumes of stable EMS compliant handsets will be available is however not yet clear. Ericsson has now implemented (Nokia's) Smart Messaging protocol for over the air (OTA) WAP service configuration, but will clearly be using EMS and not Smart Messaging for picture messaging purposes. The joint Ericsson/Nokia OTA protocol specification can be seen more as an extension to the WAP Push over an SMS bearer than a smart messaging application; but the two have much in common anyway.

The sender of an enhanced message would compose the message on their EMS compliant device. Text can be entered by the EMS user who decides when or where to insert other media such as pictures or sounds. In practice, it may be very difficult to construct an intuitive user interface from a handset which may only be able to store a few basic images. Composition of enhanced messages is likely to therefore be principally something that is driven from Internet sites. However, Ericsson believes that the majority of the enhanced messages will be created directly in the phones because nowadays, even the low-end phones have relatively large displays.

If an enhanced message is sent to a handset that does not support EMS there might be a problem because EMS messages may be binary encoded and legacy phones might fail to display those EMS messages at all. In the case of an alternate textual representation of EMS data and corresponding user data headers, the message would show garbage text fragments making no sense to the recipient. This is exactly what happens when you send a Nokia 3210 picture message to a non-Nokia handset today. Non binary EMS messages sent to a non EMS handset (e.g. EMS messages containing text formatting but not pictures or animations) may well be displayed as plain text, depending on handset vendor implementations.

The current 3GPP standards do not currently require non-EMS handsets to implement filters that help render incoming EMS as normal text messages.

## 5. EMS TECHNICAL BACKGROUND

Support for the Enhanced Messaging Service (EMS) has been standardized by extending the use of the long established and widely used User Data Header (UDH) common in SMS. In SMS, the UDH makes it possible to include binary data in a short message prior to the text message itself. EMS has little or no impact on today's SMS Centers. The introduction of EMS should be totally transparent to SMS Centers since they already support the User Data Header.

As we have seen, the burden of composing the enhanced message will be handled away from the SMS Center, using either a user interface on the handset itself or more likely on an Internet site.

The principal modification to existing SMS Centers would be in the case that mobile network operators wanted to charge differently for EMS- in such a case, the SMS Center would have to record the relevant technical values and generate Call Detail Records accordingly. Some network operators have indeed started investigating whether they can change their charging policy for EMS compared with SMS. They would like to charge for one enhanced message, instead of several SMS.

SMS concatenation- stringing several short messages together- will be key technical feature to enable the Enhanced Messaging Service for the simple reason that complicated enhanced message designs such as sending every alternate character in bold format would occupy a large number of octets in the User Data Header and concatenation would be needed. So too with sending complicated pictures- it will be possible with EMS to send for example two large pictures and a couple of small ones too in one enhanced message!

## 6. EMS ASSOCIATED TECHNOLOGIES

Currently, the only EMS like technologies are proprietary in their nature and not therefore standardized, such as:

- Nokia Smart Messaging. This pre-WAP protocol is a proprietary format for some Nokia phones that is used to deliver ringtones, picture messages, operator logos, group graphics, business cards and other services to and from certain Nokia only phones. See www.ringtones.com and www.picturemessaging.com as examples of professional end user sites delivering Smart Messaging based content to Nokia phones.

  Nokia seems to favor continued support for its proprietary smart messaging based formats for ringtones and picture messaging and has not yet stated either way whether it will support EMS. However, Nokia seems as inclined as ever to implement its own formats such as the proprietary Nokia chat service incorporated into the new Nokia 3310 consumer phone. This service features a clever user interface for sending SMS (incorporating the sender's nickname) to a group of people. All proprietary services cause problems for users in that they are unable to send messages to non-Nokia and non-feature supporting phones. Mobile Lifestreams feels that the success of EMS is heavily dependent on de facto support across ALL handsets and handset vendors and would encourage Nokia to join with the rest of the industry and support EMS to ensure the success of this new service.

- M@gic4 is a UK based company that has developed an advanced messaging standard for the delivery of rich media and content using SMS as a bearer. Their technology is similar to EMS and also uses the SMS User Data Header to enhance SMS. Additionally, unlike EMS but like Nokia Smart Messaging, M@gic4's technology supports operator logo replacement and downloadable ringtones. M@gic4 is attempting to license its technology- called g@te- to handset vendors and work with the 3GPP standards committees to try to have its enhancements incorporated into the EMS standards. (www.magic4.com)

## 7. EMS SUMMARY

Messaging will certainly develop beyond SMS. It is clear that an elegant solution like EMS that builds on simple text messaging and adds sound and simple images is a useful and powerful development that takes us beyond the limited reach of Smart Messaging services to some Nokia phones currently.

It is clear that Multimedia Messaging Service provides an ideal migration path to take advantage of the capacity and bandwidth that Third Generation/ UMTS networks supply. Multimedia Messaging Service (MMS) will however be delayed because MMS will not be compatible with existing terminals. This means that before it can be widely used, MMS terminals must reach a certain penetration. Also, MMS requires new servers as well as new WAP gateways. This will also delay MMS. As such, EMS is an important interim service that bridges the gap between SMS and MMS and has a clear window of opportunity.

But what will realize this theoretical potential for the Enhanced Messaging Service in practice will depend upon the availability of EMS compliant handsets and the support by manufacturers such as Nokia. Awareness amongst potential users of EMS and availability of compelling content will of course also be critical to EMS' success.

## PART 3

# MULTIMEDIA MESSAGING (MMS)

## 1. MMS INTRODUCTION

The Multimedia Messaging Service (MMS) is as its name suggests the ability to send and received messages comprising a combination of text, sounds, images and video to MMS capable handsets.

The trends for the growth in MMS have their roots in the changes that are taking place at all levels within GSM. Enabling bearers such as GPRS, EDGE and 3G are becoming available. Enabling technologies such as Bluetooth, WAP, MExE and SyncML are all initiatives that support this new direction toward the Mobile Internet. The most interesting aspect of these new technologies is the shift in the attitudes of the companies involved from competition to co-operation for the greater good of the industry. In addition to the trends above we are also seeing new categories of multifunctional devices such as MP3 phones being implemented now.

The Multimedia Messaging Service (MMS) is according to the 3GPP standards "a new service which has no direct equivalent in the previous ETSI/GSM world or in the fixed network world." Lets introduce the features of this innovative new service:

1. MMS is a service environment that allows different kinds of services to be offered, especially messaging services that can any exploit different media, multimedia and multiple media.

2. MMS will enable messages to be sent and received using lots of different media including text, images, audio and video.

3. As new more advanced media become available, more content rich applications and services can be offered using the MMS service environment.

4. The Multimedia Messaging Service (MMS) introduces new messaging platforms to mobile networks in order to enable MMS. These platforms are the MMS Relay, MMS Server, MMS User Databases and new WAP Gateways.

5. MMS will require not only new network infrastructure but new MMS compliant terminals. MMS will not be compatible with old terminals, which means, that before it can be widely used, MMS terminals must reach a certain penetration, and that will take at least a couple of years.

6. MMS is like SMS a non-real time service- a relay platform routes multimedia messages to MMS Servers.

7. The Multimedia Messaging Service (MMS) is designed to be future proof. As evolves and new media become available, the aim is to make the standards as backwards and forwards compatible as possible. This sensible approach will be a refreshing change to something like WAP where every time a new version of the protocol is announced, a new terminal is needed to take advantage of that functionality.

8. Access to MMS services should be independent of access point- multimedia messages should be accessible through 3G and 2G mobile networks, fixed networks, the Internet etc. This is where common message stores will be an important enabling technology. To facilitate interoperability and universal messaging access, MMS will comply with Virtual Home Environment (VHE). VHE is a 3G service that simply lets customers have seamless access with a common look and feel to their services from home, office or on the move and in any city as if they were at home. The Virtual Home Environment (VHE) permits the user to manage his services (including non-realtime multimedia messaging handling) via a user profile, permitting, for example, all different types of messaging to be presented to the user in a unified and consistent manner. See www.VirtualHomeEnvironment.com or www.mobileVHE.com from Mobile Lifestreams for more information.)

9. MMS supports multiple rich media and it is therefore important that the concept of a user profile has been included. This user profile is stored in the mobile network and is user defined and managed and determines which multimedia messages are downloaded immediately to the user and which are left on the server for later collection. The user may also choose to receive notifications of certain multimedia message types.

10. Although MMS is being standardized by the 3GPP, in fact MMS services can be offered on GPRS (General Packet Radio Service, so called 2.5G) networks. See the section on GPRS below for more information.

In sum, the Multimedia Message Service (MMS) provides an intelligent environment for multimedia mobile messaging.

## 2. COMPARISON BETWEEN SMS AND MMS

Having looked at the features of SMS in section 9 above, and now introduced at the features of the Multimedia Messaging Service (MMS), it would be a good idea to compare the two. SMS and MMS share some similarities and have some discontinuities, as detailed in the table below:

| FEATURE | SMS | MMS |
|---|---|---|
| Store and Forward (non real time) | Yes | Yes |
| Confirmation of message delivery | Yes | Yes |
| Communications Type | Person to person | Person to person |
| Media supported | Text plus binary | Multiple- Text, voice, video |
| Delivery mechanism | Signalling channel | Data traffic channel |
| Protocols | SMS specific e.g. SMPP | General Internet e.g. MIME, SMTP |
| Platforms | SMS Center | MMS Relay plus others |
| Applications | Simple person to person | Still images |

**SOURCE: MOBILE LIFESTREAMS**

Both SMS and MMS are non-real time services- this means that there is an intermediate platform such as the SMS Center of the MMS Relay or Store that the short or multimedia messages pass through. Another characteristic that SMS and MMS hold in common is the fact that both include confirmation of message delivery- the sender of the message can find out whether or not the message they sent was successfully delivered.

The communications type is also likely to be similar in SMS and MMS in that most messages are thought to be person to person communication. The types of communication will simply be less textual and more visual. People will still be communicating with other people, often one on one, but the form of this communication will be multimedia with MMS rather than text with SMS.

**MEDIA SUPPORTED**

The Short Message Service (SMS) supports text and binary as media, allowing for example, rudimentary images to be sent and received. The overwhelming majority of all SMS messages are pure and plain text however. Multimedia messages on the other hand can be coded in various media from text to images to sounds to video clips to a combination of these. As such, the MMS is a much more powerful service that supports far more media and rich media. For this reason, SMS is to mobile phones what DOS was to PCs whereas MMS is to mobile phones what Windows was to the PC. This is a

revolutionary step, requiring EMS in the middle to steer an evolutionary migration path in mobile messaging.

**DELIVERY MECHANISM**

All short messages are sent and received over the signaling channel, a channel which is an additional transport mechanism on GSM networks over and above the radio channels themselves. The signaling channel is a little like the hard shoulder or on ramp on a motorway/ expressway- it runs parallel to the traffic lanes themselves. SMS can be transmitted concurrently to other data types- they can be sent and received whilst the user is also on a voice, Circuit Switched Data or Fax call.

Multimedia messages on the other hard will be transmitted over the traffic channels themselves where other data types from voice to data will also be transported. The high capacity of 3G networks will mean that all these different traffic types can share the same radio resource without the likelihood of congestion. Using the traffic channel helps to overcome the limitations of the signaling channel outlined above in the section on SMS.

**PROTOCOLS**

When SMS was standardized in the early to mid-1990s, the Internet was an obscure academic communications medium. The original ETSI specifications for SMS closely mandated some areas of SMS and left others open to competition. As a result, proprietary protocols were developed- every SMS Center vendor developed its own interface such that application developers needed to implement different interfaces when porting their applications and services to network operators that had different SMS Centers. Furthermore, an outdated protocol- X.25- remains a popular access mechanism for connecting applications to SMS Centers.

MMS on the other hand came of age in the Internet world where open systems and standard protocols reign and a wide range of these protocols exist. There is therefore no need to reinvent the wheel- existing standard protocols can be used- and MMS needs to tap into the vibrancy and innovativeness of the Internet companies if it is to maximize its full potential. MMS uses standard Internet protocols such as (Multipurpose Internet Mail Extension) and SMTP (Simple Message Transfer Protocol) for access to the Multimedia Messaging Service Environment (MMSE).

**PLATFORMS**

In SMS, the SMS Center is the heart of the service, with all short messages of any type passing through an SMS Center to and from mobile phones. As such, there is one platform type that dominates SMS. Network operators can have been 1 and 50 such SMS Centers, but there is only one platform type. Networks also tend to have other platforms such as value added services platforms, although this operating environment is expected to get more complex still with MMS.

With MMS on the other hand, there are several key platforms within the Multimedia Messaging Service Environment (MMSE)- including the MMS Relay, the MMS Store, the MMS User Database and other platforms including the existing platforms such as the SMS Center, voice mail platforms and the like. There may be several of these, and they may be distributed as components in an open environment or integrated together in a single physical place.

Thus the platforms in MMS are more complicated as is the interworking between them. The likelihood of multi-vendor environments in which one network uses different equipment from different vendors is heightened with MMS. Network operators will plug and play different components in the MMSE from different vendors.

**APPLICATIONS**

In SMS, more than 90% of the total SMS traffic volumes is accounted for by one application alone- simple person to person messaging in which people send messages such as “I’m bored” and “I’ll be 5 mins late” from phone to phone. In the MMS world however, Mobile Lifestreams is predicting that applications based on still images- such as mobile pictures, photos, postcards and the like- will be the most popular application category. See Part 6- Applications- below for more information.

**SUMMARY**

MMS takes a lot of the winning features of SMS but improves and extends those capabilities with better bandwidth and improved ways of accessing and delivering those services. The MMS standards have been designed in a very elegant way to take the best of text and improve the rest.

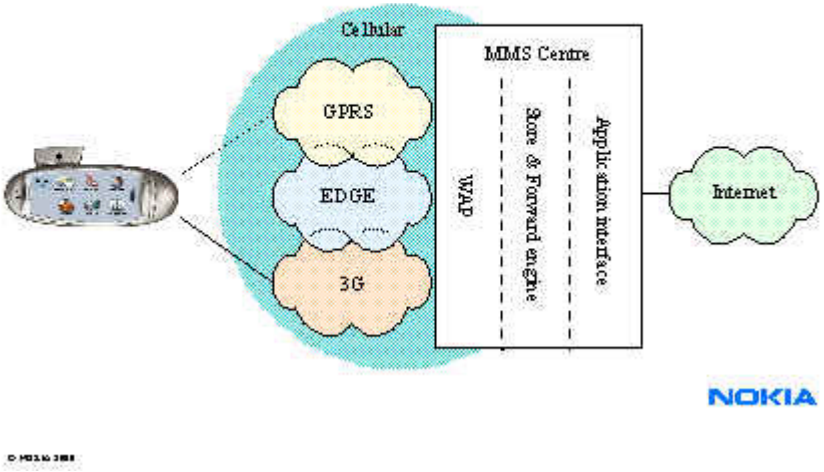
## 3. MMS TECHNOLOGY

In order to take these new messaging concepts to the "next level" a new standard, Multimedia Messaging is required. It is anticipated that these new users will require additional functionality to send media such as still images / passive video, examples of which include: mobile postcards, mobile pictures, mobile screensavers, mobile greeting cards, mobile maps and business cards. All of these applications could be delivered using GPRS and with the additional bandwidth and functionality offered by 3G, moving images, cartoons and Interactive video are only just around the corner. With the over 7 billion greeting cards sent in the USA alone with a value of over $5 billion dollars there are potentially huge revenue opportunities to be made.

To enhance messaging to this new level a standard was required. The WAP Forum and the 3GPP 3G industry groups are responsible for standardizing Multimedia Message Service (MMS). This will mean that MMS will use WAP and therefore be bearer independent- supporting either Circuit Switched Data or General Packet Radio Service (GPRS) for example. Since the 3GPP is responsible for standardizing the post-WAP protocol MExE (Mobile Station Application Execution Environment), MMS should eventually support bearers such as EDGE and 3G too. As a pivotal supporter of SMS and

developer of picture messaging, Mobile Lifestreams welcomes the standardization of MMS and multi-vendor support for it. The figure below from Nokia illustrates the network independence of MMS:

**MMS NETWORK ARCHITECTURE OVERVIEW**

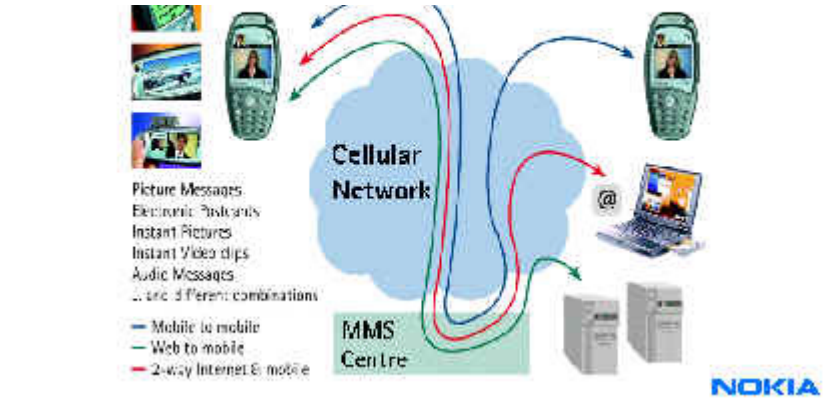



According to the 3GPP website (http://www.3gpp.org) they have been studying the limitations of SMS and the Multimedia Message Service is the answer to the new messaging market requirements. The key difference from SMS is the fact that "SMS uses signaling links which had limited spare capacity" whereas the Multimedia Message service will use the data channels to allow much larger messages to be sent in much less time as well as offering non real-time Multimedia Messaging. In terms of similarities with SMS, Multimedia Messaging does offer store and forward capability and can tell when the mobile terminal is available. An enhancement to SMS is the fact that it can use profiles to determine when content should be delivered and whether it should be stored on the server for future use. In addition it is possible with the Multimedia Message Service to undertake format conversion based on the terminal characteristics. This type of personalization of content is going to be crucial for ubiquitous service delivery and means that messages will be able to be delivered across a range of terminals dependant on their functionality.

Infrastructure vendors see Multimedia Messaging as an evolution in messages as the user moves from SMS to enhanced SMS (pictures and ringtones) on the Multimedia Message Service and eventually to Mobile Multimedia. They envisage messaging covering a multitude of different solutions with information being transferred from terminal to

terminal, terminal to the Internet and from the Internet to the terminal using phone numbers as a means of addressing as illustrated in the diagram below from Nokia:

**MULTIMEDIA MESSAGING SERVICE CONCEPT**




## 4. MMS ARCHITECTURE ELEMENTS

The Multimedia Messaging architecture has a number of key elements that have been defined and incorporated into a Multimedia Message Service Environment (MMSE). The MMS architecture contains several key platforms that interwork with each other to provide the MMS service. The key elements defined by the 3GPP are:

- MMS Relay
- MMS Server (or servers)
- MMS Store (or stores)
- MMS User Agent
- MMS User Databases

The MMS Relay is the engine of the Multimedia Messaging Service (MMS) and is responsible for the transfer of messages between different messaging systems. The MMS relay is the heart of MMS- responsible for transcoding multimedia message format, interacting and interworking with other platforms, enabling access to various servers residing in different networks and the like.

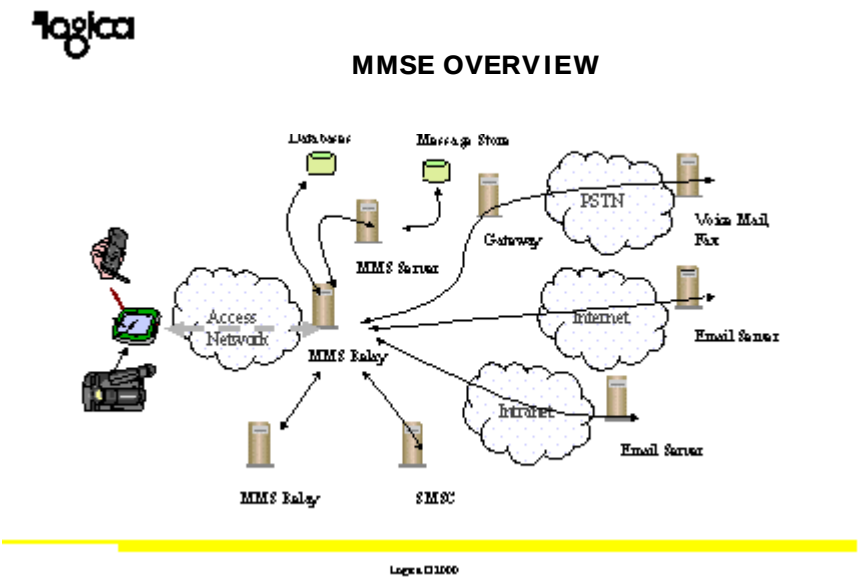
The MMS server is responsible for storage and handling of incoming and outgoing messages. Several MMS servers can be included within an MMSE, e.g. MMS server, email server, SMS center (SMSC) and fax servers.

The MMS User databases may consist of lots of different data including user profile database, subscription database, Home Location Register (HLR) information for mobility management.

The MMS User Agent is an application layer function that provides the users with the ability to view, compose and handle Multimedia Messages (MMs) (e.g. sending, receiving, deleting of Multimedia Messages (MMs)).

This architecture allows multimedia access to all types of different information with a range of servers providing access to new and legacy services. This allows operators to consolidate access to multiple applications from a single architecture. (E.g. SMS-C, Unified Messaging, Email etc.)

These new elements and their connectivity are illustrated in the diagram below from Logica:



The diagram above shows that multimedia messaging (MMS) may encompass many different network types which can be connected by standard IP messaging formats such as SMTP, MIME etc. This approach enables messaging in 2G and 3G mobile networks to be compatible with Internet messaging systems

## 5. MMS TIMESCALES

When a new service is introduced, there are a number of stages before it becomes established. MMS service developments will include standardization, infrastructure development, network trials, contracts placed, network roll out, availability of terminals, application development, and so on. These stages for MMS are shown in Table 4 below:

| DATE | MILESTONE |
|---|---|
| Throughout 1999 | 3G radio interface standardization took place, and initial 3G live technical demonstrations of infrastructure and concept terminals shown |
| 2000 | Continuing 3G and MMS standardization with network architectures, terminal requirements and detailed standards. |
| 2000 | 3G licenses for phase 1 spectrum are awarded by governments around Europe and Asia |
| 2001 | 3G licenses continued to be issued. 3G trials and integration commence |
| 2001 | 3G launched in Japan (by NTT DoCoMo and others) |
| Summer of 2001 | First commercial deployment of 3G services become available in Europe |
| Start of 2002 | Basic 3G capable terminals begin to be available in commercial quantities |
| Throughout 2002 | -Network operators launch 3G services commercially and roll out 3G.<br>-Vertical market and executive 3G early adopters begin using 3G regularly for nonvoice mobile communications |
| 2002/3 | New 3G specific applications, greater network capacity solutions, more capable terminals become available, fuelling 3G usage |
| 2004 | 3G will have arrived commercially and reached critical mass in both corporate and consumer sectors. |

**SOURCE MOBILE LIFESTREAMS**

## 6. SUMMARY

The evolution in messaging from text to full multimedia is a fundamental change and a fundamentally important change. The transition that we will see is if akin to the revolution from DOS to Windows in the computing world. It was this change that took computing from the early adopter innovator category into the early majority and onwards into the late majority mainstream status. It is the change in the services and applications brought about the upgrade in mobile networks enabled by transformation in the mobile terminals. This is what will propel nonvoice mobile services out of its current

youth market insider status into something that YOUR MOTHER will be using in a few years time. Now that really will be a revolution!

*This white paper and its 250 page full report "Next Messaging: From SMS to EMS to MMS" has a related Internet site at http://www.NextMessaging.com plus sub-sites at www.mobileSMS.com, www.mobileEMS.com and www.mobileMMS.com to keep readers up-to-date with the very latest developments. Enjoy!*

# ALSO PUBLISHED BY MOBILE LIFESTREAMS

## Success 4 SMS – Simon Buckingham

**Published: January 2001 (370 A4 pages)**

"Success 4 SMS" is the third edition of Mobile Lifestreams' renowned SMS report series, to be published. The intention of this report is to show how to maximize the use of, and therefore the revenue from, the Short Message Service. "Success 4 SMS" explains and interprets both the existing and future aspects of SMS by providing both an explanation of these developments and analysis to help interpret them. The idea is to identify the critical success factors for Service – now and in the future.

**For more information visit: http://www.mobileSMS.com**
**Price: 495$US**
**ISBN: 1929105231**

## Yes 2 GPRS – Simon Buckingham

**Published: August 2000 (218 A4 pages)**

This report shows how to make mobile data a success by maximizing the use of, and therefore the revenue from, the General Packet Radio Service (GPRS). Education is the principle means of achieving this objective- by providing the first and only single source for accurate and comprehensive information about the development and deployment of GPRS around the world. "YES 2 GPRS" explains and interprets both the existing and future aspects of GPRS. It provides both an explanation of these developments, and analysis to help interpret them. The idea is to identify the critical success factors for the General Packet Radio Service- now and in the future

**For more information visit: http://www.mobileGPRS.com**
**Price: 495$US**
**ISBN: 1929105258**

## Data on Prepaid – Gerald T. Christensen

**Published: August 2000 (370 A4 pages)**

Written by Mobile Lifestreams' Prepaid expert, Gerry Christensen, this 131 page report has been designed to help product and service providers and those investing in systems/solutions to make more informed business decisions.

**For more information visit: http://www.mobilePREPAY.com**
**Price: 250$US**
**ISBN: 1929105231**

## Success 4 WAP – Simon Buckingham

**Published: January 2001 (190 A4 pages)**

The Wireless Application Protocol (WAP) is a hot topic that has been widely hyped in the mobile industry and outside of it. Mobile Lifestreams originally produced its first WAP book, “Data on WAP”, in July 1999. Due to rapid changes and developments this book was reissued in December 1999 before being reissued as "Yes 2 WAP" in May 2000.

**For more information visit: http://www.yes2WAP.com**
**Price: 495$US**
**ISBN: 1929105215**

## Yes 2 3G – Simon Buckingham

**Published: February 2001 (245 A4 pages)**

"Data on 3G" presents an optimistic look at tremendously exciting possibilities that Third Generation/ UMTS technologies and applications enable. Timescales, profiles of all the major infrastructure vendors including the Japanese vendors, every mobile multimedia application, "At home with your futurephone"- mobile communications in the next few years, 3G Talking Points, all the 3G contracts awarded, the standards, handset alliances and partnership opportunities and much, much more are included in this report.

**For more information visit: http://www.mobile3G.com**
**Price: 250$US**
**ISBN: 1929105150**

## Mobile Positioning – Stephen M Dye and Dr Frank Baylin

**Published: November 1999 (273 A4 pages)**

"Mobile Positioning" is a book about mobile positioning systems- in particular, the Global Positioning System (GPS), non-GPS location techniques and Cell Broadcast. Although the book focuses primarily on the Global Positioning System (GPS), appendixes cover other non-GPS location schemes and Cell Broadcast in considerable detail.

**For more information visit: http://www.MobilePositioning.com**
**Price: 250$US**
**ISBN: 1929105134**

**NOTE: To order any of the above publications, please visit our secure online ordering form at https://www.mobilesms.com/ordering.asp**