MMS

As handset vendors push to complete MMS solutions there is an amount of variation when interpreting technical specifications. Leading handset vendors have signed an agreement to ensure interoperability, but with the focus on delivery of their own offering this remains a difficult task.

Figure 1 - A multimedia message

If users with mobile devices from different manufacturers cannot send messages to each other – or network operators discover that mobile devices will not communicate correctly with their MMS Service Centre then the adoption of new messaging technology will be seriously affected.

Points to note on MMS at present are:

- The only initial guarantee will be that a vendor's own MMS Client will communicate with the vendor's own Service Centre
- Service Centres may not communicate with each other
- MMS Clients and Service Centres may not be interoperable
- No handsets available yet

MMS is being actively promoted as the messaging standard of the future, despite the fact that at present it is not a full standard and is unlikely to be complete prior to 2003. For MMS to succeed the key proponents cannot forget why SMS has succeeded - interoperability is everything for the consumer.

I-mode

The launch of I-mode services in Europe is currently only delayed by the availability of handsets. I-mode mail has been an extremely popular service in the east regardless of the 2000 character limit (far in excess of SMS's 160 characters!). Part of this has been the ubiquity of support – but also the links to both conventional email, SMS and Instant Messaging.

Figure 2 - I-mode mail in action

This I-mode variation of the HTML mail service is a tried and tested solution that can be rolled out as easily as the WAP solution – but is potentially more multimedia orientated in the short term.

Points to note on I-mode at present are:

- I-mode mail works now & integrates with web email / instant messaging
- Based on the easy to implement and understand web mail model
- Has all the advantages of the WAP implementation
- No handsets available yet

I-mode offers a lot, especially to the content development community, but is hindered beyond Japan by network deployment issues - particularly the lack of available handsets. This offers EMS a window of opportunity to penetrate the market and establish enhanced services in the short term.

Hype

The mobile industry has a recent reputation and tendency to over promote any new technology. Recent examples include the user experience of WAP that was promoted as being the Internet on a phone and the bandwidth expected from GPRS. With this in mind, consumers are increasingly wary of any hype surrounding a

new technology. The SMS explosion is almost the result of a lack of hype. It was widely adopted as it was seen to work and addressed a user need. Hype leads to the user perception that it is good for the network operator of the handset vendor, but that does not satisfy the fundamental marketing requirement – addressing actual consumer needs and wants.

Lack of handset penetration

At present, the average user replaces their handset on a timescale of between 12 months and 2 years. However, the network operators seeking to grow their subscriber base at almost any cost largely artificially generated this churn. This has led to the widespread subsidy of terminals to users and the situation where it was more beneficial to swap networks and gain a new handset than remain. Recently, following the stock market decline and the widely publicised debt overhead of the operators, these subsidies are now being reduced and operators are apparently seeking to reduce churn and move their customer base away from a pre-pay mentality and back to a contract base. With this in mind, handset churn is likely to reduce since the cost of handset will generally increase so creating a potential barrier to adoption of new handset technology.

Obsession with technology

Despite claims to the contrary, the whole telecom industry suffers from an obsession with technology for the sake of technology. Some companies continue to exist on the basis of 'jam tomorrow' – all their problems will be resolved by the next new technology. The telecom industry is neither market focussed or market led and the mass adoption of SMS surprised the complete industry for exactly this reason – SMS only offers the ability to send a limited amount of plain text, in a technology obsessed environment it could not possibly appeal to anyone. The market thought differently. The industry is now obsessed with 3G and MMS, the risk is that the industry has again missed what the market wants now and will again be taken by surprise.

Potential to disappoint

Any eagerly awaited technology runs the risk of disappointing the market. This is especially so in the case of messaging where the users are able to experience a variety of formats for exchange of messages. Any advance of messaging technology for mobile devices will be seen as an enhancement to SMS, but will be compared with e-mail and instant messaging experiences when the user compares feature sets. If the user is promised the ability to have pictures on their device, they might expect full colour, large format JPEG images, but if their device is only capable of 256 colour 100x100 images they are likely to be disappointed and hence feel negatively to the overall technology.

Guaranteeing the user experience

Content providers wish to ensure the end user experience is consistent and provides them with a competitive advantage wherever possible. If this is not perceived to be possible with EMS, then content providers might choose alternative delivery methods.

EMS Market

The market for enhanced messaging is far broader than that for simple messaging. Simple messaging technology allows people to communicate using mobile terminals in the way that people historically used the telegraph – short, often cryptic, messages for a specific point. Enhanced messaging opens the market potentially in a way similar to the arrival of email. Users can now send long messages that incorporate a variety of media. It is this ability that makes the new format appealing to a wider market.

What is the market

The market for enhanced messaging can now reasonably be compared to the current market for the Internet. The internet started as a means of exchanging information person to person and grew to a medium where large corporate companies can communicate with their employees and suppliers alongside small interest groups exchanging information and ideas alongside other groups advertising their products and services. The market is no longer a purely consumer market, nor is it a purely corporate market, rather it provides enhancements and opportunities for both.

The following points highlight a few areas of untapped potential that might be expected to benefit from EMS

Consumer

At the simplest level the consumer is able to access services that allow them to customise their handset. Given that person to person messaging currently dominates the market for SMS, the ability for someone to create media and send to a friend and then for the recipient to extract this attractive piece of media to customise their device is significant. It provides a compelling reason for a large portion of the market to consider moving to an EMS handset.

As a standard, EMS removes the limitation of being tied to a single handset provider and should allow the consumer to freely choose the most suitable device for their wider needs.

EMS users simply sending one another messages will also significantly increase SMS traffic in the near term. Data services to consumers will be expanded by the ability of a wider range of owners to now download ring tones and logos to their devices.

Data services

True data services can be supplied to both consumer and business markets. Currently, SMS is regarded as a data service, on the basis that it is non-voice communication. A true data service should allow media elements to be mixed according to the content provider or recipient's requirements. EMS takes the next step along this road by allowing data other than text to be included in a message.

Future data services could be as simple as providing stock market movement charts or as complex as providing location-specific information on a push basis. EMS enables these services, the market is only limited by the imagination of content providers to combine media elements supported in a meaningful way. The key to

success is in developing not only compelling services, but also services that are appropriate to the mobile device. In this way, EMS opens up not only the market for data services, but also the enterprise market for these services that SMS has largely left untouched.

Vertical markets

EMS provides the opportunity to deliver a service independent of the SIM card, and hence the operator. This allows a potential provider to offer enhanced services to existing owners of mobile devices by simply replacing the device. In this way, any provider of a service could elect to offer a new device in order to provide an enhanced user experience that appeals to their market. For example, any organisation using a mobile workforce could use the EMS system, with magic4 forms extensions, to exchange work orders without needing to equip the whole workforce with either laptop computers or custom terminals. Similarly, a bank might decide to offer its customers an interactive service, this could be enabled by offering customers new terminals, the customer would be able to retain their SIM card (and hence payment plan and phone number) and access services from whichever network they are on.

Market size

Without doubt the market for SMS is huge. Similarly, without doubt, the market will continue to grow through 2002 and 2003. In the short term this will continue to be driven by plain text SMS, but gradually the growth will come from an increased usage of EMS. EMS will lead to an increase in the growth rate of SMS simply due to the fact that any single ‘message’ will be made up of several packets. This is not to say that the market will automatically double or treble since during this period there will also be a migration of users to newer bearer services. However, the growth of EMS will most likely offset this migration and serve to maintain steady growth for a longer period than would otherwise have been the case.

The figures below simply serve to illustrate the reality of the current situation for the number of messages that are currently being sent through the system. SMS serves as the most popular real and profitable data service that is in the market place now. The fact that the growth of SMS surprised the industry also serves to illustrate not only the difficulty of forecasting the future, but also that the industry can not dictate what future application will be the killer. The industry should focus on providing technology in a usable form so the market can generate the applications.

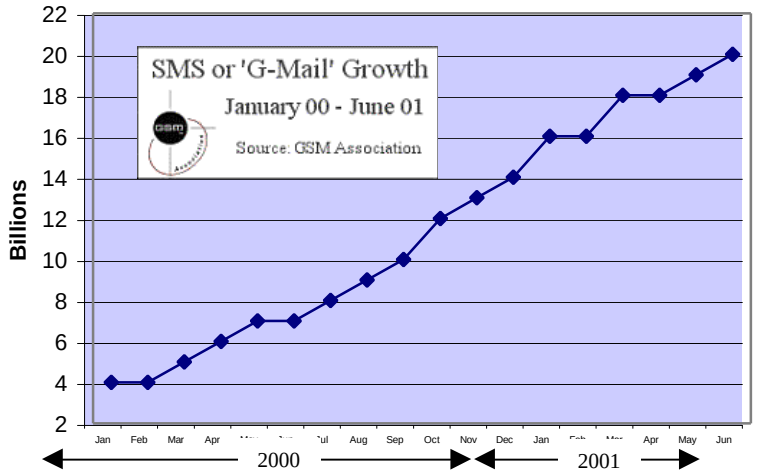

Figure 3 - SMS Market Growth

magic4 solutions

magic4 produces messaging client software suitable for embedding inside mobile phone handsets. The client is fully compatible with the 3GPP EMS Release 5 specifications and will include 3GPP MMS support in Q2 2002. The messaging client acts as a single inbox on the mobile phone for SMS, EMS and MMS. The client can both receive and send messages using any of these formats. Other, non-GSM, bearers can be supported due to the bearer-independent nature of the software. Any existing applications on the phone that can be integrated with are supported, e.g. the address book or predictive text input.

The diagrams below show the position of the magic4 offerings in a live system:

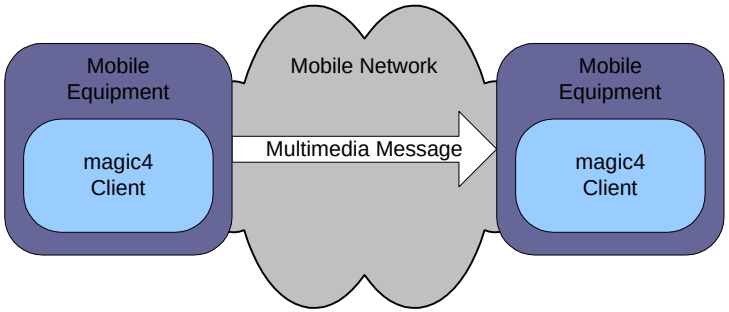

Figure 4 – magic4 Client can originate messages

In addition, the magic4 Development Kit (MDK) can be used to encode and decode messages. A content or service provider could integrate the MDK into their software to provide EMS or MMS support.

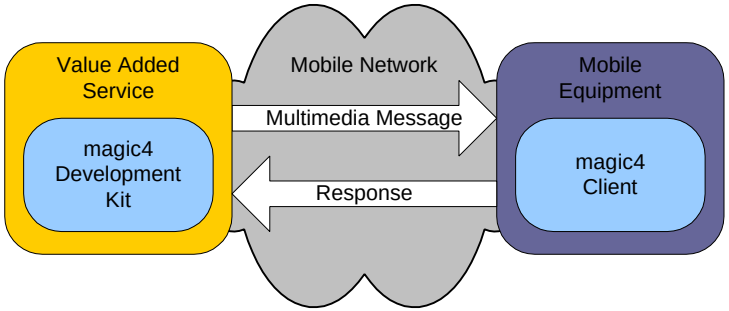

Figure 5 – magic4 Development Kit

magic4 client

Overview

The magic4 client is an implementation of mobile originated and mobile terminated SMS, EMS Release 5 and, in Q2 2002, MMS. The client software is written in ANSI C and fits in around 35KBytes depending on the configuration of the target mobile phone.

The software can be integrated into any mobile phone platform and is written to be bearer independent. It can therefore be used on CDMA, TDMA, and other non-GSM systems.

The underlying magic4 core can scale from basic SMS through to MMS on GPRS or other "always-available" bearers.

The modular nature of the magic4 client means that a handset manufacturer can take only the components of the software that they need. This keeps both code size and cost to a minimum.

magic4 client features

The magic4 client supports a number of standard messaging features and formats. These are listed in detail below.

General features

The magic4 client supports a number of generic handset requirements, including:

Feature	Description
Keyboard & softkey	The magic4 client supports a number of standard keyboard & softkey layouts including OK, cancel & menu keys, 0, 1 or 2 softkeys, up/down scroll keys, left / right scroll keys, and a select key.
Predictive text	Any area of text entry can use the regular handset text entry scheme – including predictive text if supported by the mobile device.

Messaging formats

The following messaging formats will be supported in both Mobile Terminated (MT) and Mobile Originated (MO) guises.

Feature	Description
SMS	Basic text-only SMS as described in 3GPP TS 23.040 v4.2.0 including UCS2 and concatenation.
EMS	3GPP Enhanced Message Service Release 5 (EMS r5) as described in the document 3GPP TS 23.040 v4.2.0 and the Change Request 028. As the change request will not be accepted until the T#14 meeting in December additional features could yet be required. This includes images, sounds, animations & text formatting. The full list is shown below.
EMS Forms Plug-in	The most popular magic4 extension is essential for both business applications and m-commerce. In addition, advertising and other consumer applications are greatly enhanced by this feature. It is expected that the forms plug-in will be ratified in the EMS standard in the next release.
MMS	The magic4 MMS client will be capable of sending and receiving 3GPP Multimedia Message Service Release 4 (MMS r4) messages as described in the document 3GPP TS 23.140 v4.3.0 as well as messages containing "MMS SMIL" specified by Nokia & Ericsson. This ensures interoperability with all current MMS implementations. As the next release of the MMS specification is due for standardisation soon, any changes will be included as required.

Messaging features

A number of standard features must be present in any messaging client. These are listed below:

Feature	Description
Inbox	Show a list of received messages either from (U)SIM or phone memory.
Draft Folder	Show a list of saved messages either from (U)SIM or phone memory.
Sent Folder	Show a list of recently sent messages from phone memory. Once the box is full, older messages are deleted to make ways for newer messages. This folder is optional and can be removed at the time of integration.
Write Message	Send the user to message editor with a blank message. The message editor will support predictive text if this is present in the handset.
Erase	Delete a message.
Forward / Edit	Send the user to the message editor with the existing message.
Reply	Send the user to the message editor with a blank message. The recipient phone number is pre-filled.
Send	User can enter a phone number, email address (if allowed) or get an address from the address book. As the message is sent, the user is shown a visible indication, such as a progress bar, to represent the message being sent.
Save	From the message editor the user can save the current message to the Draft folder.
Details	Show the message details such as sender, time, etc.

SMS features

All regular SMS features are implemented, a summary of which are shown below.

Feature	Description
GSM7	GSM 7-bit alphabet plain text. The text will automatically wrap to the screen size. The text can contain carriage-returns.
UCS2	16-bit plain text. The text will automatically wrap to the screen size. The text can contain carriage-returns.
Concatenation	Up to 255 short messages can be concatenated together. In practical terms, a handset would generally only allow around 4 concatenated messages though.

EMS features

The full EMS r5 proposal is implemented within the `magic4` client. A summary of the features described in 3GPP TS 23.040 is listed below. An EMS message can be displayed, created from scratch or edited in the message editor.

Feature	Description
Plain Text	
GSM7	GSM 7-bit alphabet plain text. The text will automatically wrap to the screen size. The text can contain carriage-returns.
UCS2	16-bit plain text. The text will automatically wrap to the screen size. The text can contain carriage-returns.
Text Formatting	
Text Style	Normal, **Bold**, *Italic*, Underlined, ~~Strikethrough~~
Text Alignment	Left, Right, Centre – default should be language default.
Text Size	Normal, Large, Small
Images	
1-bit Small	16x16 pixels black and white user-defined bitmap.
1-bit Large	32x32 pixels black and white user-defined bitmap.
1-bit Variable	Variable size black and white user-defined bitmap up to 255x255 pixels.
Extended 2-bit	Variable size 4-level greyscale user-defined bitmap up to 255x255 pixels. If the mobile device does not support this level of colour then the image will be dithered.
Extended 6-bit	Variable size 64-colour user-defined bitmap up to 255x255 pixels. If the mobile device does not support this level of colour then the image will be dithered.
Animations	
Predefined	Predefined animation. Size and colour depth determined at the time of integration.
User-defined small	8x8 pixel 4-frame black and white user-defined bitmap animation.
User-defined large	16x16 pixel 4-frame black and white user-defined bitmap animation.
Extended 1-bit	Variable size black and white user-defined bitmap animation. Up to 255 frames of 255x255 pixels.

Extended 2-bit	Variable size 4-level greyscale user-defined bitmap animation. Up to 255 frames of 255x255 pixels. If the mobile device does not support this level of colour then the animation will be dithered.
Extended 6-bit	Variable size 64-colour user-defined bitmap animation. Up to 255 frames of 255x255 pixels. If the mobile device does not support this level of colour then the animation will be dithered.
Sound	
Predefined	One of 10 predefined sounds.
User-defined iMelody	User-defined iMelody monophonic tune up to 128 bytes
Extended iMelody	User-defined iMelody monophonic tune with no maximum length.
Miscellaneous	
VCard	Extended vCard element is parsed and passed to the Address Book application on the mobile device.
VCalendar	Extended vCalendar element is passed to the Calendar application on the mobile device. If the mobile device does not have a Calendar then the vCalendar is displayed as plain text.
Extended Compression	Any extended element can be compressed using the RFC1951 DEFLATE algorithm.
Re-use Extended Object	Any extended object can be reused in the message by reference – the object does not need to be redefined.
Object Distribution	This attribute dictates whether an extended object can be forwarded or saved in the Media Library.
User Prompt Indicator	If this element is present then the following objects should be handled when the message is received. This intended for media to be saved as ringtones, operator logos or screensavers. When the message is read, the `magic4` client will display a prompt such as “Picture received” and present the user will a set of options for handling the element, such as “Show” to preview the element, “Save as Screensaver” to save the image as the default screensaver, or “Discard” to discard the element. The message is discarded after one of these options has been chosen.

EMS forms features

The forms plug-in is essential for business applications and commerce on mobile devices. It is expected that these elements will be submitted to 3GPP for inclusion in the EMS standard through the coming months.

Figure 6 – magic4 EMS form elements

Form elements are navigated in the same way as normal EMS elements. The user can only type in a text or numeric element when it is highlighted.

Feature	Description
Text Entry	Allows the entry of alphanumeric characters. The text entry box will support predictive text entry if the mobile device supports this feature.
Numeric Entry	Allows the entry of numeric digits.
Radio Buttons	Allows the selection of one element from a number of options.
Checkboxes	Allows the binary selection of an option.
Hidden	A hidden field is not displayed with the message. This element is essential to m-commerce and e-business transactions.
Submit Button	Allows the user to submit the form data.
Location	Allows the user to send their Cell ID back to the server. It is envisaged that the user would be given the option of a) proceeding and sending the location, b) proceeding without supplying the location, or c) cancelling back to the message. It is important that a user is asked before the location is sent, and that a content provider cannot dupe the user by changing the question. It is therefore up to the handset to display the question text.

MMS features

The MMS Release 4 specification with the WAP Forum Stage 3 specification will be completed within the magic4 client around Q2 2002. A summary of the features described in 3GPP TS 23.140 v4.3.0 is listed below. In addition, all features from the Nokia/Ericsson MMS Conformance documentation will be included. An MMS message can be displayed, created from scratch or edited in the message editor. Future versions of the specification may include features such as digital rights management or server-side message storage. These features will be included in the client as they are standardised.

Feature	Description
Encoding	
Multipart MIME	Messages encoded as multipart MIME can be handled by the magic4 MMS client.
MMS SMIL	A basic subset of SMIL that has been agreed by Nokia & Ericsson. This allows messages to be viewed as a slideshow.
Text	
Unicode	As well as the Unicode character set, any logical subset will be supported. This includes US-ASCII, ISO-8859-1, UTF-8, Shift_JIS.
SMS	To ensure backward compatibility, SMS 3GPP TS 24.011 RP-DATA RPDU encapsulation of SMS will be supported. The magic4 client allows the delivery of both SMS and EMS via this mechanism.
Speech	
AMR	The AMR speech codec used by handsets for voice communications.
Still Image	
WBMP	The wireless optimised bitmap format as standardised by the WAP Forum.
GIF 87/89a	The Internet standard GIF format.
JPEG	The Baseline JPEG format with JFIF exchange.
Video	
H.263	If the handset is capable of supporting streaming video, then the ITU-T H.263 profile 3, level 10, video codec shall be supported.
Network Features	
Notifications	Message arrival notifications can be received via SMS or in the future (Release 5 onwards) IP.
Remote Delete	Messages can be deleted without downloading them to the client if required.
Remote Forward	Messages can be forwarded from the server without downloading to the client if required.