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Nokia code: 0507_EN_1199_1.0.Libris
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Mobile network evolution to Multimedia Messaging

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Executive Summary

Multimedia Message Service (MMS) will be a key application within the wireless messaging business, and one of the enablers of the Mobile Information Society, in which an increasing part of all personal information transmission will take place wirelessly. Nokia aims to lead the way towards the Mobile Information Society by supporting open platforms that enable wide market adoption and stimulate growth.

Nokia's approach is based on dynamic development in messaging; MMS, the most versatile messaging service, is a natural continuation of Short Message Service (SMS) and Picture Messaging. In addition to wireless voice and text transmission, visual content can be exchanged. With Multimedia Messaging it is possible to combine the conventional short messages with much richer content types – photograph, images, voice clips, and eventually also video clips. In addition to sending messages mobile-to-mobile, it is possible to send messages mobile-to-email and later also email-to-mobile. This all means new and exciting possibilities especially for person-to-person communication.

Based on Nokia's preliminary market studies and information sharing with users, network Operators as well as service providers, a very strong demand for MMS exists. Innovators, the early adopters of MMS, will mainly be the same people who are the heavy users of SMS. Other mobile phone users are also likely to be interested in MMS.

MMS will most likely be introduced in several phases; the combination of text and photo, for instance, will be adopted first followed by strong needs to combine other Multimedia Messaging elements such as video and voice clips. The price perceptions and storage possibilities for MMS will be of high importance when MMS becomes available.

Multimedia Messaging will offer extensive added value especially for person-to-person messaging and also for person-to-group messaging which will be available in the near future. As the demand for messaging between users and applications grows along with new bearers and the Wireless Application Protocol (WAP), the importance of WAP enabled Multimedia Messaging

applications will grow significantly. This will bring network Operators and third party developers wide business opportunities. It is estimated, however, that up to 80–90 % of messaging will include person-to-person and person-to-group messaging which is currently the case for SMS.

To meet the high demand for a new era of messaging, Nokia will provide complete solutions for Multimedia Messaging based on mobile device and infrastructure expertise. Nokia's end-to-end solution will include mobile devices supporting Mobile Multimedia, and a comprehensive solution for network Operators to offer Multimedia Messaging. General Packet Radio Service (GPRS) network will be ideal for mobile data networking services. In addition, Nokia will work together with 3rd party developers and other parties to develop and deliver MMS. The Nokia Artus product family will offer network Operators viable possibilities to make an early move in offering attractive MMS.

Moving toward the Mobile Information Society

Multimedia Messaging will mean enhanced personal communication for users, facilitating the new communication styles and needs of the Mobile Information Society. Mobile communication and connectivity are important elements of the Mobile Information Society, especially when enhanced with visual content. Multimedia Messaging will bring richer content to mobile communication and messaging. New forms of communication and a wide range of value-added services will play a dominant role in the Mobile Information Society in which mobile users will be able to access a variety of information and services easily and for their specific, personal needs.

Multimedia Messaging will increase wireless data usage which already now is doubling every year in advanced markets. Many mobile Operators already earn over 5 percent of their revenues from data traffic.

Introduction to Multimedia Messaging

Recently, Short Message Service (SMS) has proven to be a tremendous success in many countries. Operators in these countries have often also provided their subscribers with possibilities to personalize their mobile phones with ringing tones and graphical icons which have proven extremely popular. The growth in this area will serve as a valuable path to new and interesting ways for using the mobile phone, in ways yet unseen in the history of wireless communication. As users become accustomed to the easy use of SMS, the opportunity to send multimedia messages will mean new and easy ways for personal communication.

Along with this evolution it is important to realize that users will not care about the new technologies they will be using; they will be interested in applications and services. Nokia's Multimedia Messaging applications can be used for various purposes, which will deliver a broad range of user benefits, from emotional sharing and fun to rational utility. Multimedia Message Service (MMS) will be able to utilize picture messages, electronic postcards, audio messages, instant images and video clips. MMS does not require users to learn a new technology. It is a natural consequence of the messaging evolution.

Messaging evolution

Nokia's migration path to Multimedia Messaging builds on the well-established SMS paradigm by adding new functionalities and new content step by step, along with the introduction of new technologies such as Wireless Application Protocol (WAP) and General Packet Radio Service (GPRS). After SMS, the application migration path comprises Picture Messaging and MMS. Wireless communication is rapidly expanding from ears to eyes. In addition to wireless voice and text transmission, visual content can be exchanged between mobile devices.

SMS has already proven extremely successful, for instance, in the Nordic countries and in many Asia Pacific countries. Teenagers in these markets often send over 100 SMSs per month and even more. In Finland, more than half of a teenager's mobile phone bill is made up of charges for short messages.

Picture Messaging, already introduced with phones such as Nokia 3210, Nokia 8850 and Nokia 8210, comprises a capability of sending a simple picture message from device to device or from a web site to device via SMS. Sending and receiving a picture message is

similar to that of an SMS. Nokia provides Operators the Picture Messaging Application, a feature of the Nokia Artus Messaging Platform.

MMS with Digital Image Input is the next step towards visual mobile communication. It is a simple, easy-to-use way to send a photograph with text from device to device or from device to email. Creating, sending and forwarding image messages is as simple as with SMS and Picture Messaging today. To enable Image Messaging, a mobile device with an integrated or connected camera and sufficient image display capabilities are needed. In addition, a MMS Center is required to perform store and forward operations.

Audio and video clips provide richer content to Multimedia Messaging further along the messaging evolution path. Consumers are starting to demand easier and faster use of shared images, independent of location and time. In the MMS, there is an emerging need for instant communication, such as SMS. It involves both content creation and content consumption where the user is both the content developer and the consumer. For example, when taking a photo, adding text to it and sending it to another person with a supporting mobile device.

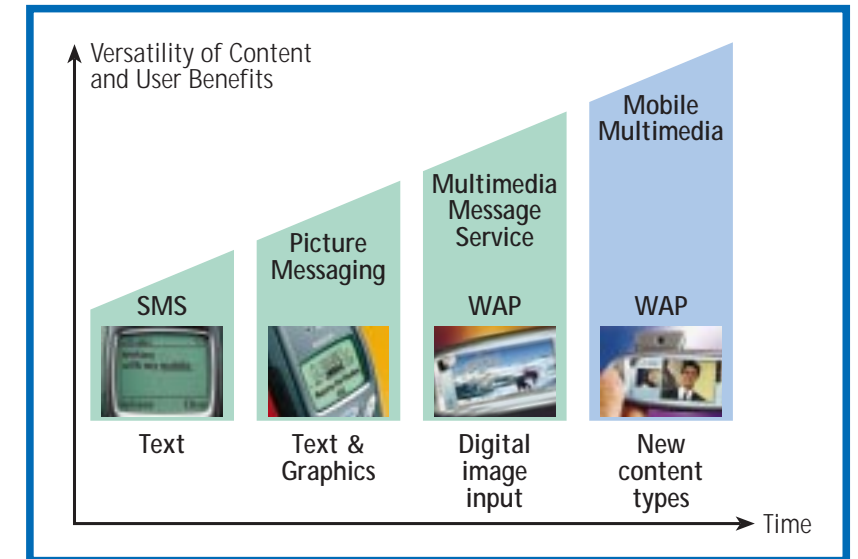


Figure 1. Multimedia Messaging migration path

Figure 2. Evolution of messaging content versatility

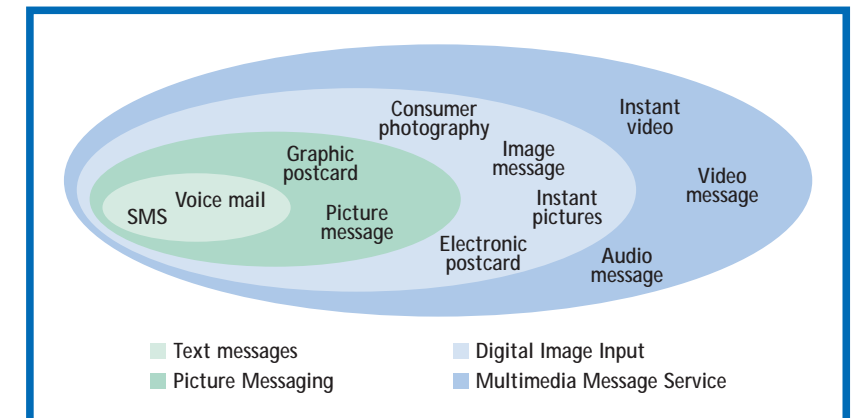
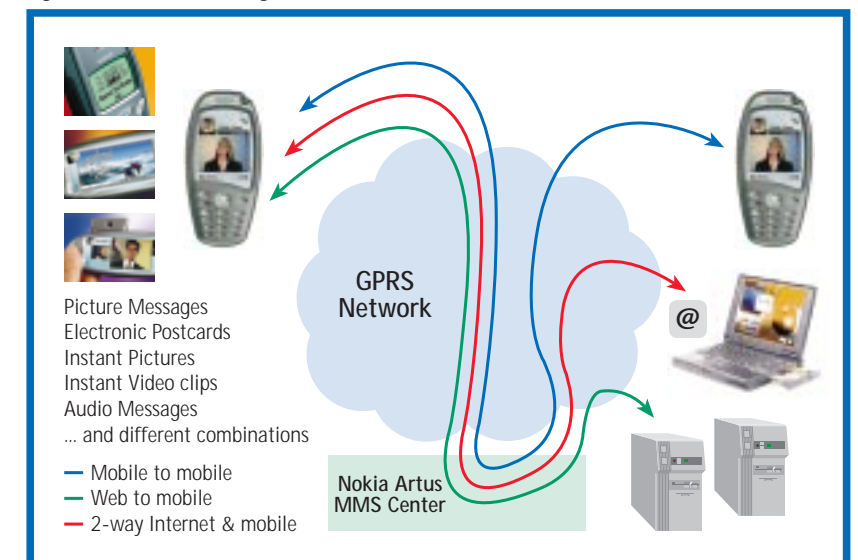


Figure 3. Multimedia Message Service (MMS)



Operators seeking growth in new services beyond voice

Multimedia Messaging applications deliver a broad range of user benefits, from the emotional – entertainment and the sharing of important moments – to the rational factors of utility and ease of use. The Nokia Multimedia Messaging solution offers tangible advantages to users and network Operators alike. For the Operators, Multimedia Messaging applications are important drivers for continuous growth in new services beyond voice.

MMS offers Operators new business opportunities since value-added services and personalized applications for data are estimated to be important revenue creators in the next few years. MMS helps Operators differentiate from competition. Differentiation will be possible by implementing a clear messaging strategy that includes the offering of rich content services. MMS is seen as a messaging service for person-to-person communication where the network Operator plays a major role in the business.

Early demand for MMS

An “instant” culture with new communications styles and needs is emerging. The popularity of SMS, the emergence of the new mobile phone generation, the popularity of sending traditional postcards, and the rising Internet and E-mail penetration and usage suggest a huge market potential for Multimedia Messaging. For this reason it is important to understand who the early adopters are, the innovators of MMS, since without the innovators the diffusion of MMS to mass markets and thus the standardization of new technology will not take place so easily.

Innovators for MMS

Strong demand exists for Multimedia Message Service (MMS). This is true especially for markets where the mobile phone penetration is high enough, and users are acquainted with SMS.

According to preliminary market studies, the innovators mainly appear to be the same people that are heavy users of SMS. That is, people 15 to 35 years old, and who live in an urban area. The target group for MMS is broader than for SMS. Users that are most interested in MMS are likely to be high educated, have a relatively high income, they are mobile, and often use the ringing tone service. They also use the Internet more often compared to users that are less interested in MMS.

The innovators tend to own more advanced mobile phones, and they send more SMSs. The innovators are extroverts, pleasure-loving, interested in the latest technology, and are more likely to think that mobile phones are fun. Generally, younger users seem to be more interested in MMS.

Nature and extent of MMS demand

Notable is the amount of potential users for Multimedia Messaging. It is very likely that MMS will eventually be adopted by all segments meaning that it will bring value to all users; business people, youngsters, men and women alike. This is mainly due to the fact that MMS offers not only fun and sharing, but also utility. Numerous usage possibilities make it extremely exciting, interesting, personal and also very useful.

Multimedia Messaging will be popular, for instance, when sending an electronic postcard, an invitation, a shopping list, or when showing one’s boss how the job is proceeding. A wide range of usage situations exists as the following list indicates.

Possible usage situations for Multimedia Messaging:

- travelling abroad
- a person you are trying to reach is busy
- shopping list or memo
- no time to write
- communicating with blind people
- sending a Happy Birthday song
- sending a love song
- calling up a meeting
- substitute for postcards
- getting to know someone
- getting a quick response for medical extract
- substitute for a fax
- when shopping and needing someone’s opinion
- when something extraordinary happens and needs to be perpetuated
- describing the beach on vacation
- keeping project members or customers up-to-date
- inviting friends to a party
- sending “new address” cards
- sending Christmas cards.

Users that have adopted SMS are likely to find added value especially in Photo Message Service, meaning text and photo combined. Photo Message Service would be used the same way people use E-mail, or as a substitute for postcards. A digital camera, a scanner, and a fax in a mobile phone would be very useful.

Apparently, SMS is the only service that succeeds by itself, all the other services, meaning Photo, Audio and Video Message Service, will require each other to be successful. Strong demand exists for the combination of SMS and Photo Message Service, whereas Audio Message Service is likely to be useful when combined with Video Message Service or Photo Message Service.

Older users or business people, are likely to adopt to different combinations of MMS since they find the combinations extremely useful. Younger users, in particular, like the continuance from SMS to the combination of SMS and Photo Message Service. The demand for SMS will remain high also when MMS becomes popular.

Additionally, the demand for group messaging will increase fast when MMS is introduced. This means that in certain situations users will want to send a message to several recipients at once.

The question of pricing and storing Multimedia Messages should not be ignored. It will be important to know how much users value different services. Viable pricing may take the following shape, for example:

- pricing is transaction based, the user pays according to service and transaction made
- pricing is based on content
- conducted as with SMS, that is, the sender pays.

It will be important to offer users the possibility to store Multimedia Messages. Not only in the mobile device but also in a “Multimedia Message library” offered by an Operator.

Demand for person-to-person Multimedia Messaging

The Nokia Multimedia Messaging solution facilitates new styles of communication. The emerging “instant” culture demands immediate connections, involving both content creation and content consumption. Messaging is becoming the most natural area of personal communication. With advanced digital technologies as enablers, user emphasis is shifting from ears to eyes.

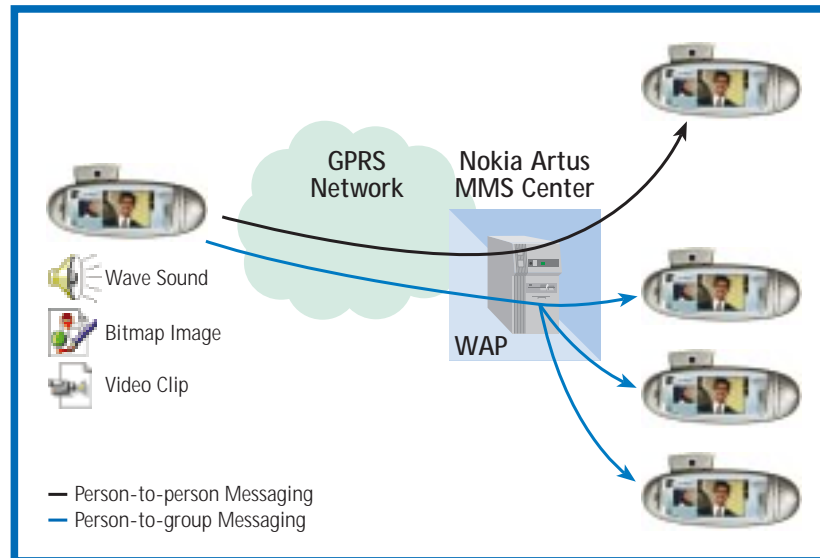
Person-to-person messaging will continue its success as a popular means for communication between mobile users. SMS has already proven its strength; it has been widely adopted and is extremely popular especially among young mobile phone users who often send more than 100 short messages per month. Picture Messaging is making person-to-person messaging even more attractive by offering mobile phone users the possibility to send both text and graphics to another user. Now, Multimedia Messaging will bring new and exciting opportunities to messaging by offering even richer content.

Although applications are becoming more and more popular and attractive, about 80 to 90 % of personal messaging will most likely continue to include person-to-person or person-to-group messaging. This will mean a huge challenge for Operators, content providers and manufacturers to meet the user demands for messaging. A major driver for the high share of person-to-person messaging is due to the fact that MMS will become a mass-market service.

Strong demand for Multimedia Messaging exists, but at the same time, SMS will stay extremely popular, and will most likely remain the most popular single form of messaging compared to other messaging, such as Photo, Audio and Video Message Service.

For SMS, up to 80 % or often even 90 % of messaging consists of person-to-person messaging, and approximately 10 to 20 % of messaging is covered by communication between users and applications. There are strong indications that Multimedia Messaging will continue this path with the only difference being that the major share of messaging will most likely consist of both person-to-person and person-to-group messaging. Person-to-person communication will remain a ‘killer application’, and Multimedia will enhance messaging.

Figure 4. Person-to-person and person-to-group messaging



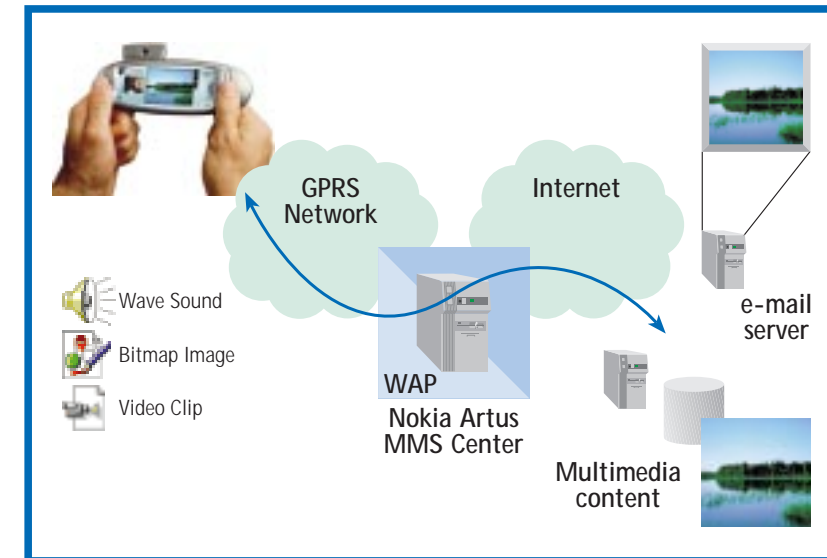
Demand for applications

Although Multimedia Messaging will mainly be person-to-person messaging, communication between users and applications should not be underestimated.

Currently, about 10 % of messaging is related to Internet based applications, for example, ringing tones. The demand for Internet based applications is growing fast along with new bearers and WAP. Since Multimedia is based on WAP, the WAP enabled Multimedia Messaging applications will be of great demand in the future bringing a huge opportunity especially to 3rd party developers and Operators.

Notable is that MMS will require high speed networks that will provide the bandwidth necessary for transmitting messages that include significantly more data compared to current messages. GPRS will be an essential stepping stone to personal multimedia services, and an ideal platform for mobile data networking services. GPRS can be viewed as an enabler of new wireless data services and an optimizer of the radio interface for bursty packet mode traffic. GPRS creates a platform for new applications and provides the ability to stay “online” for long periods of time, which is not possible with circuit switched data. What also highlights the importance of GPRS is the fact that MMS will most likely become a mass-market service, and definitely involve transmission of large amounts of data.

Figure 5. Communication between user and application



Nokia Artus product family as a major driver for messaging evolution

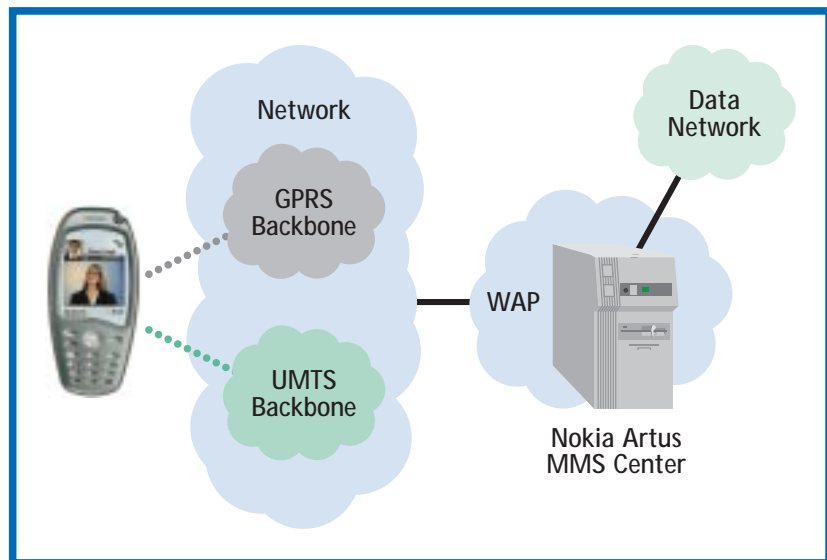
Nokia Artus product family will enable Operators to add extensive value by introducing MMS to the users. The solution will complement the current offering of Nokia Artus products for value-added services (VAS) which already include the Nokia Artus SMS Center, the Nokia Artus USSD Center and the Nokia Artus Messaging Platform, which is Nokia's WAP gateway solution for the Operator markets.

The key element in MMS network architecture will be the Nokia Artus MMS Center, based on WAP technology.

The MMS Center enables multimedia messages to be sent with various content types from device to device, with instant delivery. It will support flexible addressing – to both familiar phone numbers (MSISDN) and E-mail. MSISDN addressing offers ease of use, and helps an Operator to manage the business. In the Nokia solution, Operators can use transaction-based billing.

The Nokia Artus solution will include the interface to applications, for device-to-application and application-to-device. An Operator is able to add value on top of MMS.

Figure 6. Nokia Multimedia Messaging architecture with Nokia Artus MMS Center



Conclusions

With Multimedia Messaging it will be possible to combine the conventional short messages with much richer content types – photograph, images, voice clips, and eventually also video clips. In addition to sending messages mobile-to-mobile, it is possible to send messages mobile-to-email, and eventually also email-to-mobile. This means new and exciting possibilities especially for the person-to-person communication.

MMS is a key application within the wireless messaging business, and one of the enablers of the Mobile Information Society in which an increasing part of all personal information transmission will take place wirelessly. Nokia aims to lead the way towards the Mobile Information Society by supporting open platforms that enable wide market adoption and stimulate growth. MMS is expected to become a true mass-market service.

Nokia's MMS will comprise a complete end-to-end solution for person-to-person mobile messaging, from device to device or to the Internet. Nokia develops WAP solutions to support MMS, and within 3GPP Nokia develops a bearer service including an optimal support for Multimedia Messaging. WAP allows Multimedia Messaging in all product categories and it is a global, bearer independent solution. MMS will require high speed networks that will provide the bandwidth necessary for transmitting messages that include significantly more data compared to current messages. GPRS network is an ideal platform for offering Multimedia Messaging and other mobile data networking services.

Nokia's approach in Multimedia Messaging builds on the user experience of using SMS. One key issue is that the user experience of Multimedia Messaging is similar to that of

Short Messaging, in terms of mobile device user interface and ease of use. Markets having strong growth in person-to-person messaging are best positioned to take full advantage of the new services building established methods of communication, such as SMS. MMS helps Operators differentiate from the competition by providing richer content to messaging.

The popularity of SMS and the emergence of an instant culture suggest there is already significant demand for personal communication enhanced by visual content. Success is dependent on investing in the right technology, creating the right applications, and starting with a Multimedia Messaging strategy now.

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