White Paper

Nokia Multimedia Messaging

As SMS evolves to Mobile Multimedia, profitable opportunities abound

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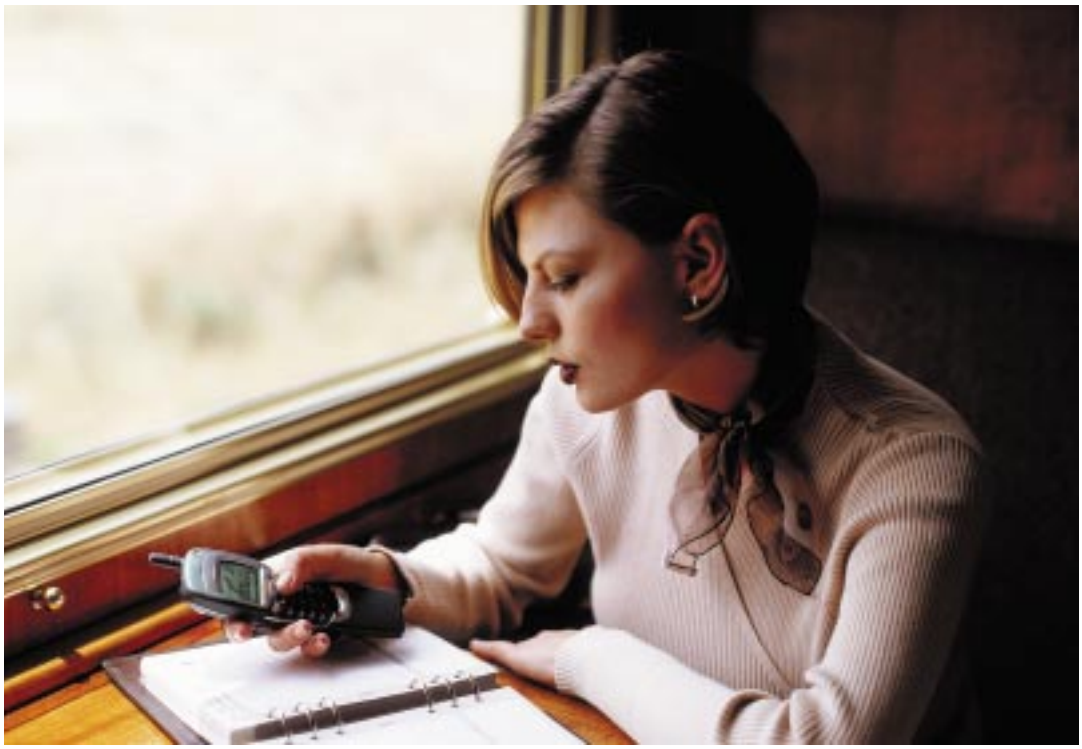
Inside this brochure

Multimedia messaging at a glance



Executive Summary

The Nokia Multimedia Messaging Solution facilitates new styles of communication that respond to the needs of the Mobile Information Society — a society in which wireless-literate consumers are more mobile than ever while the division between their personal and business lives becomes increasingly blurred.

Nokia's approach is based upon a series of evolutionary steps: SMS (text), Picture Messaging (text and graphics), MMS - Multimedia Message Service (digital image input) and Mobile Multimedia (new content types). MMS is the most versatile messaging service, including all the features and content types of the preceding services. It is likely that MMS will be introduced in several phases, each adding successively more functionality.

The Nokia Multimedia Messaging Solution delivers tangible benefits to consumers and network operators alike. For the consumer, it offers every category of wireless imaging consumer benefit: simple utility, straightforward sharing of information and experience, and sheer fun. Adaptable to a wide range of purposes, it will meet the needs of all user segments.

For network operators and service providers, multimedia messaging applications are the essential drivers of continuous growth in new services beyond voice. They promise significant increases in airtime, revenue, service differentiation and customer loyalty. Early adopters will secure a strong position and accumulate the required competencies to be the leaders in the personal multimedia era.

An "instant" culture with new communication styles and needs is emerging. The Internet is going mobile. The popularity of SMS, the emergence of "the new mobile phone generation", the popularity of sending traditional postcards, growing internet and email penetration and usage — all suggest huge market potential for multimedia messaging.

Addressing the Mobile Information Society's de

Nokia Multimedia Messaging delivers the benefits of solutions that integrate growing demands for enhanced mobile communication with our proven capabilities in developing and delivering complete end-to-end solutions. In the Mobile Information Society, one such demand is for instant communication – creating and consuming content on the fly. Fortunately, multimedia messaging can deliver.

The global mobile communications industry is currently evolving from voice-driven communication to personal multimedia via text- and imaging-driven intermediate stages. Mobile communication and connectivity are essential elements of the Mobile Information Society, especially when enhanced with visual content. At the same time, the focus of the mobile communications industry is shifting from technology-led applications to application-led solutions where applications drive both infrastructure and terminal evolution.

The 1st and 2nd generation systems of mobile communications were to a large extent technology-led. The latest developments in 2nd generation and more especially 3rd generation systems will introduce the industry to a new paradigm where applications utilize infrastructure and terminals in different combinations.

In order to capitalize on this increasingly application-led marketplace, Nokia intends to be firmly proactive. We are identifying natural migration paths that will boost the adoption of new products and services, thus expanding the addressable market.

Multimedia Message Service

Nokia is a trendsetter in wireless solutions for the personal messaging market. We are committed to developing core applications for multimedia messaging services while providing compatibility with other non-core messaging areas.

Nokia's Multimedia Message Service (MMS) comprises a complete end-to-end solution for person-to-person mobile messaging, from terminal to terminal, from terminal to Internet, or Internet to terminal. It allows full content versatility, including images, audio, video, data and text, in any combination. MMS delivers a location-independent, total communication experience.

Nokia is actively participating in the development of WAP to support MMS and, within 3GPP (3rd Generation Partnership Program), a bearer service including optimal support for multimedia messaging. As a global, bearer-independent solution, WAP allows multimedia messaging in all product categories.

For consumers, MMS delivers easy-to-use fun and utility. For network operators it offers a future-proof, evolutionary migration path and thus profitable business - see figures 1 and 2.

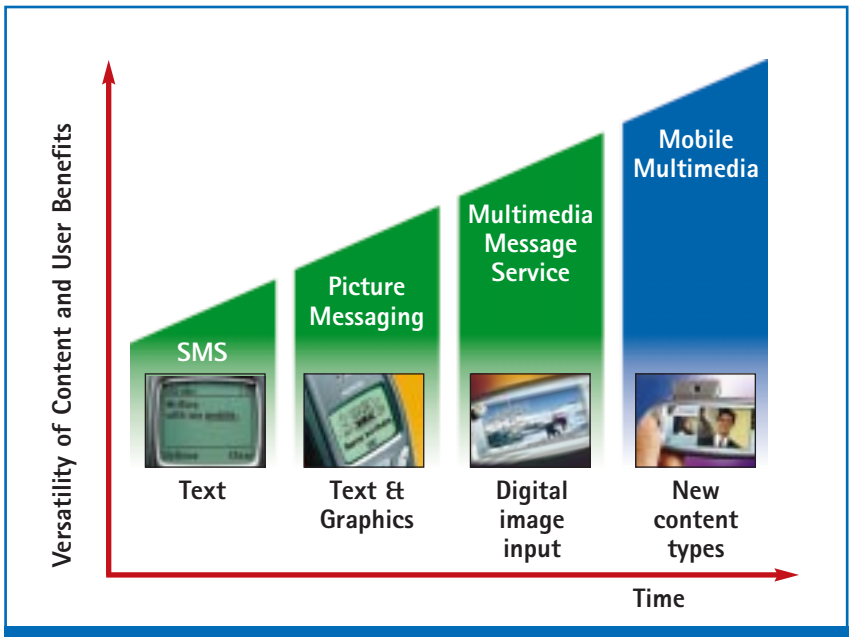


Fig. 1 The multimedia messaging migration path

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New generation, new market drivers

The new mobile phone generation is behaving differently and developing entirely new usage patterns.
In Finland, global laboratory of the Mobile Information Society, more than half a typical teenager's mobile phone bill is made up of charges for short messages. For these young people, the average number of messages per month can be more than one hundred - and that figure is growing fast. Messaging represents a flexible, easy-to-use and highly personal communication style for the new mobile phone generation.

As these figures suggest, in addition to content ready-made by terminal manufacturers and network operators, content creation and distribution is often performed by consumers themselves. He or she becomes both developer and consumer of content, for example by creating an image message from a snapshot and text before sending it to a friend or a colleague. The same user can also employ terminal defaults or network operator services in their message creation.

Get the picture?

Creating and sending instant photographs with text can be seen as a substitute for mailing physical postcards. The traditional postcard market has always been highly seasonal, dominated by printed greeting cards. Market statistics are impressive: in 1997, Americans dispatched more than 7 billion cards, while the Japanese send almost 5 billion New Year cards every year. The estimated value of these markets in 1998 was US$5.5 billion in the US and US$1.6 billion in Japan.

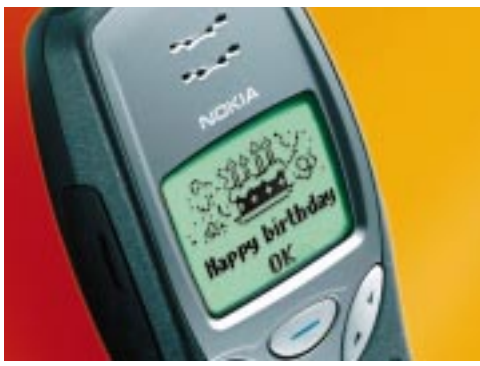
There is huge potential for different content types, such as graphics, still images, animations and video clips combined with at least one of the other types. The emphasis in personal communication is shifting from ears to eyes.

Meanwhile rapid growth in digital imaging businesses, especially in digital cameras, is offering new means of instant photography – point, shoot and the picture is ready to be transmitted. Sharing the experience by transmitting pictures is the most important driver of instant photography. And although photo-processing players drive the digital imaging industry and still want to print the images, consumers are starting to demand an easier way, independent of location and time.

Mobile messaging made easy

The number of internet subscriptions is growing rapidly and subscribers rank email high in the lists of applications they find most useful. However, current email systems have their limitations: software takes time to load and access to the inbox is limited outside corporate premises.

These factors point to a clear market opportunity for a complementary, easy-to-use, mobile messaging solution that can be accessed virtually anywhere, any time. Multimedia messaging delivers these email benefits more easily.



Smoothing the path to a new messaging world

Nokia's migration path in multimedia messaging builds on the well-established SMS paradigm by adding new functionality and new content types in user-understandable steps. Because consumers can relate to the new messaging services as "enhanced SMS", the barriers for adopting them will be significantly reduced, leading to rapid take-up and high penetration, and paving the way towards personal mobile multimedia.

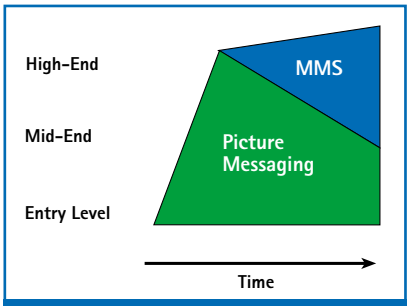


Fig. 2 Multimedia messaging migration in Nokia terminals

The application migration path comprises three evolutionary steps: Picture Messaging, Digital Image Input and Multimedia Message Service (MMS).

Short Message Service (SMS)

Originally launched in 1992, SMS has become the most successful wireless data service. By late 1998 there were approximately 30 million active SMS users worldwide. Messaging as a concept and as a data service has been very well received by consumers and it has become a very profitable business for network operators.

Picture Messaging

Picture Messaging is capable of sending a simple picture message from terminal to terminal or from a web site to a terminal via SMSC. Sending and receiving a picture message is a similar operation to that of an SMS, so consumers do not have to learn a completely new service and user interface - clearly a boost towards adoption. Picture Messaging combines the ease of use of SMS with the enjoyment of expressing oneself with pictures.

Additional advantages include familiar phone numbers as the addressing technique and instant delivery to the receiving terminal.

Picture Messaging content consists of the following elements:

- A black-and-white picture, up to 72 x 28 pixels (W x H)
- A short greeting displayed after (below) the picture. Maximum size of the greeting is 120 characters in standard GSM alphabet or 60 Unicode characters.

Nokia offers operators its Picture Messaging Application, a content-creation tool based on the Nokia Artus Messaging Platform. Picture Messaging Application includes a download of ready-made pictures, plus the possibility of drawing pictures and writing a personal greeting. Users will be supported by Nokia services, enabling personalized content creation at the terminal, the internet or PC.

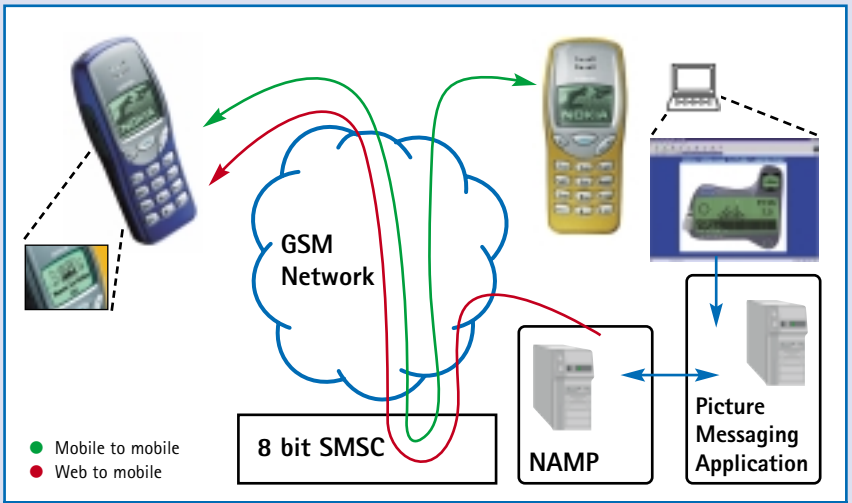


Fig. 4 Picture Messaging

The key element in MMS network architecture is the Multimedia Message Service Center (MMSC), based on WAP technology. MMSC enables multimedia messages to be sent with various content types from terminal to terminal, with instant delivery. It supports flexible addressing - to both familiar phone numbers (MSISDN) and email. MSISDN addressing offers ease of use by the consumer and control of the business by the operator. In the Nokia solution, operators can use transaction-based billing.

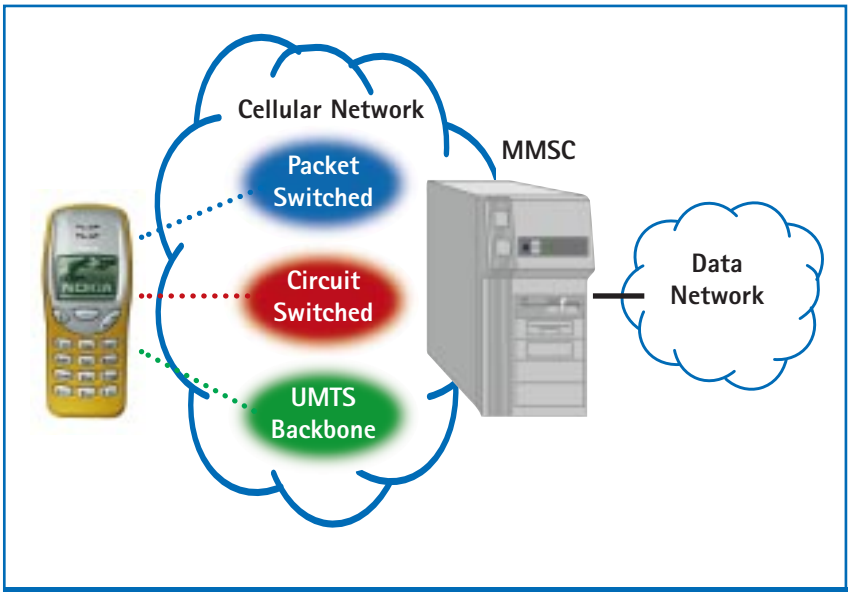


Fig. 3 Nokia Multimedia Messaging network architecture

Multimedia Message Service — introducing digital image input

Digital Image Input is the next step towards visual mobile communication — personal multimedia. It is a simple, easy-to-use method of sending a photograph with a short message from terminal to terminal or from terminal to email. Creating, sending, receiving and forwarding image messages is similar to SMS and Picture Messaging.

The Image Message content comprises:

- A picture (JPEG or equivalent)
- A Unicode text displayed below or beside the picture.

To enable Image Messaging, a terminal with an integrated or connected camera and sufficient image-display capabilities is needed. In addition, the Multimedia Message Service Center is required to perform the required store and forward operations.

Digital Image Input functionality opens the way to fast market entry and market development for MMS. To ensure compatibility and interoperability with digital imaging devices, Nokia is actively investigating and developing phone-camera interface technologies.

Multimedia Message Service (MMS)

Multimedia message service enables messaging with full content versatility, including images, audio, video, data and text, from terminal to terminal or from terminal to internet. MMS delivers a location-independent, total communication experience. Despite the full versatility of content the service is, from the user point of view, a simple, logical extension of Text Messaging (SMS) and Picture Messaging.

MMS content can include one or several of the following content types, with minimal restrictions to message size or format:

- Picture
- Data
- Text
- Audio
- Video

MMS is currently being defined and specified, prior to the standardization process in WAP Forum and 3GPP. Given its pivotal position in both SMS and Picture Messaging, Nokia is well positioned to establish MMS as a globally standardized open platform, pushing MMS acceptance forward and offering first-mover benefits to leading operators and consumers.

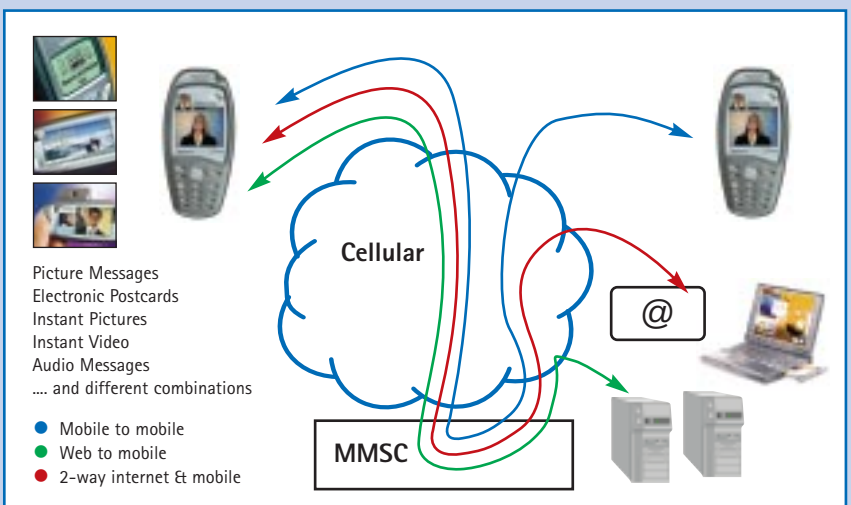


Fig. 5 Multimedia Message Service

Multimedia messaging = multiple benefits

Multimedia messaging can be used for various purposes and it will meet the needs of all user segments, especially because the business and leisure identities of users are not strictly separated. Multimedia messaging delivers all categories of wireless imaging benefits – both everyday utility and the more emotional elements of sharing and entertainment.

Advantages for consumers

Multimedia messaging promotes market development by introducing new customer benefits in user-understandable steps, starting by adding graphics capabilities to the familiar SMS, then expanding into multimedia messaging and virtual presence. What's more, Nokia Multimedia messaging services are based on familiar phone number addressing, allowing instant delivery and ease of use.

The primary consumer benefits of sending and receiving graphics-based picture messages are entertainment and sharing on the one hand, and practical utility on the other.

With many leisure-time applications, Picture Messaging extends the graphic possibilities of SMS, until now purely text-based. The content of picture messages is mostly ready-made and Nokia is participating in producing it.

Digital image input extends these benefits further. The possibility of taking a snapshot and immediately sending it gives the user an opportunity to share important moments with remote friends and colleagues. There are also more options for business use, enabling instant photographs with text annotations to be captured, selected, sent and deleted.

Finally, the full content versatility of MMS means that multimedia content, including photographs, video clips, city maps, graphs, layouts, ground plans, cartoons and animations can all be transmitted over MMS. There are also more options for business use, enabling instant photographs and video clips to be captured, selected, sent and deleted – all with text and or audio annotations – thereby boosting operational effectiveness and response times. MMS is a tool for managing work and private life. However, the sharing and fun aspects cannot be underestimated since the business and leisure identities of users are not strictly separated.

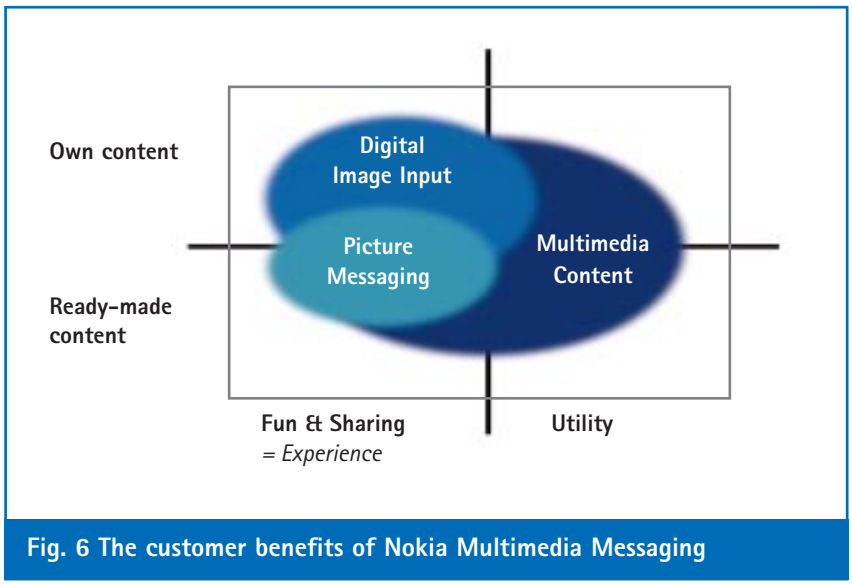


Fig. 6 The customer benefits of Nokia Multimedia Messaging

Advantages for network operators and service providers

Operators benefit from Picture Messaging in the form of increased SMS traffic. What's more, operators and service providers can offer content to users and charge for it in a similar way to the popular ringing tones in current markets.

Additional data traffic also enables operators to profit from personalized data services. MMS is a key value-adding service for both operators and service providers because it includes all messaging functionalities and full content. Investment in higher-capacity services like GPRS and WCDMA are, therefore, fully justified by the mass market attracted to MMS applications. Such investments can have a very short payback time and they result in a high level and quality of services, based on a reliable and stable messaging platform.

In sum, multimedia messaging applications are essential drivers of continuous growth in new services beyond voice - thus increasing airtime, revenue, service differentiation and customer loyalty. Early adopters will secure a strong position and accumulate the required competencies to be leaders in the personal multimedia era.

Harnessing the technology

As discussed, MMS is a complete end-to-end solution for person-to-person mobile messaging, with full content versatility, delivering a location-independent communication experience.

MMS applications build on multiple technical elements, relating to both network infrastructure and terminals. Multimedia messaging is person-to-person (client-client) communication between terminals, or from terminal to email, enabled by the Multimedia Message Service Center.

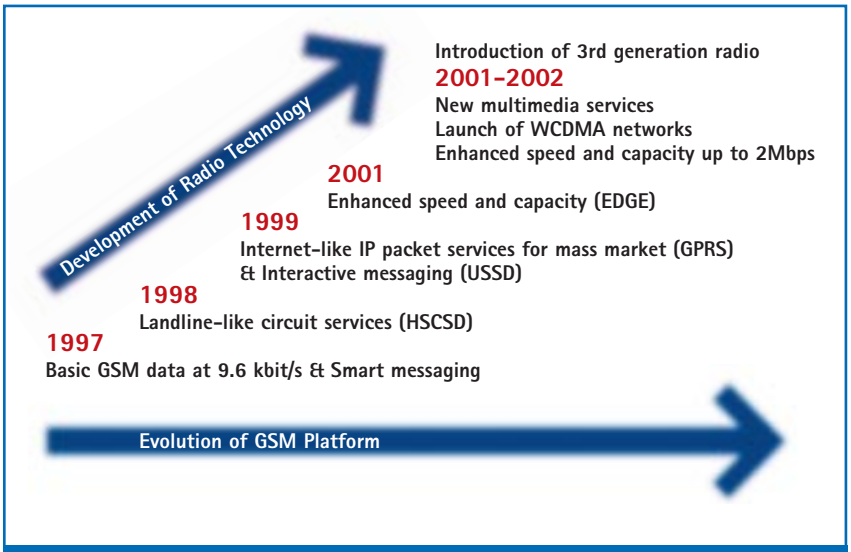


Fig. 7 The infrastructure enablers for multimedia messaging — Case GSM

High-speed cellular data services will support various wireless imaging and multimedia messaging applications, as illustrated above.

In addition to radio access technologies, developments in protocols such as WAP and TCP/IP are important technology enablers for multimedia messaging. Nokia is actively developing wireless protocols to support new messaging services, including both cellular and IP-based services.

At the same time, digital imaging technologies are developing rapidly to competitive cost levels. Digital cameras, input and output components, coding algorithms, imaging data formats and portable processing power are all becoming available for mobile multimedia use.
As a result of pervasive digitization, large amounts of ready-made digital content, such as images, can now be produced and consumed in the mobile multimedia environment.

Open-terminal platforms enable the seamless integration, connectivity and interoperability of Nokia products with other data - and telecommunications applications in multimedia messaging.

Case history: multimedia messaging in action

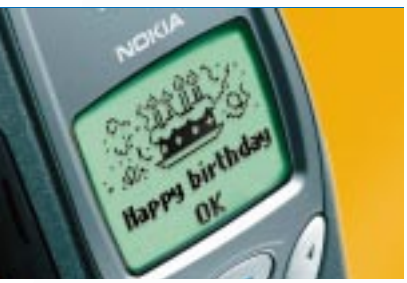
Marie von Artus, Business Development Manager with a major European company is visiting CeBIT, one of the world's biggest telecommunications exhibitions. She's scheduled meetings with her customers every day throughout the event. To be as effective as possible, she uses multimedia messaging during the meetings — receiving back-up information and concept pictures from her office assistant, writing instant memos annotated with voice and instant photos, and sending them immediately to her boss and colleagues.

Marie is also visiting competitors' booths to study their product plans, demos and latest launches. Whenever something interesting comes up, she takes snapshots and video clips, selects and edits them, annotates them with text or voice, and forwards them to her colleagues in the office for information and action. Those colleagues who do not have a fully MMS-capable terminal receive an SMS notification informing them of a downloadable message in the internet or intranet.

To add some fun to the heavy workload of meetings and visits, a colleague sends Marie the "Dilbert of the Day". When it's funny enough, she forwards it to a like-minded colleague at another company.

If Marie is lucky, she can grab some free time during which multimedia messaging again helps her to communicate. She is enjoying the fascinating city of Hanover and goes sightseeing, sharing her experiences with her family back home by sending an electronic postcard created herself by photographing some of the attractions and adding a greeting. A few minutes later, she receives a reply from home telling her that everything is OK — with a picture of her one-year-old son to prove it.

Multimedia messaging is business today



Nokia Multimedia Messaging promises enhanced personal communication for consumers, facilitating the new communication styles and needs of the Mobile Information Society. It delivers utility and ease of use, as well as sharing and fun.

For network operators, Nokia Multimedia Messaging comprises a natural application migration path from SMS via Picture Messaging and Digital Image Input to Multimedia Message Service (MMS). Natural application migration spells profitable business since value-added services and personalized applications for data will be important operator revenue creators over the next few years.

But multimedia messaging is also profitable business today. 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 in this new market is dependent on investing in the right technology, creating the right applications and starting with a multimedia messaging strategy now.

Why Nokia?

Nokia is the world's foremost mobile phone supplier and a leading provider of mobile and fixed telecom networks together with related customer services. Thanks to our pole position in the industry, we continue to create completely new product categories. The Nokia 7110 - world's first media phone. The Nokia 9110 Communicator - world's first all-in-one communicator product, now with wireless imaging. The Nokia 3210 - world's first phone capable of picture messaging.

To support and complete a total end-to-end solution, Nokia is continuously developing the Nokia Artus Messaging Platform.

We can provide complete solutions for the Mobile Information Society, based on terminal and infrastructure expertise, covering both telecommunications and data communications products and services. In other words, we're ready to show you how MMS can become a reality for your business right now.

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