White Paper

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Nokia Multimedia Messaging

As SMS evolves to Mobile Multimedia,
profitable opportunities abound

NOKIA
CONNECTING PEOPLE

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Executive Summary

The Nokia Multimedia Messaging Solution facilitates new styles of communication that respond to the needs of the Mobile Information Society —a society where business and personal lifestyles are changing and evolving ever faster.
This calls for flexible products and services that facilitate and support our new routines, and provide delightful experiences.
Communication is at the heart of people's lives – and as a result, the mobile phone is infused with rich new meaning.

Nokia's approach is based upon a series of evolutionary steps: SMS (text), Picture Messaging (text and graphics), MMS –Multimedia Messaging 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.

SMS has been the pioneer leading the path in wireless data applications and SMS services were the first mobile data services that had serious financial impact to the operator's revenue. The industry has seen tremendous growth and clearly, messaging will lead the way to profits in 3G as well. Inevitably the current split of total revenues from mobile applications will change and become much more versatile.

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.

Multimedia Messaging will increase wireless data usage that is already now doubling every year in most markets. MMS requires high-speed networks for transmitting messages that consist of notably more data than the current messages. Here the solution is General Packet Radio Service (GPRS), which creates an ideal platform for mobile data applications and services. And, since MMS is based on Wireless Application Protocol (WAP), this service is bearer and network technology independent, enabling multimedia messages from a GSM/GPRS network to be sent to, for example, a TDMA or WCDMA network.

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 e-mail penetration and usage —all suggest huge market potential for Multimedia Messaging.
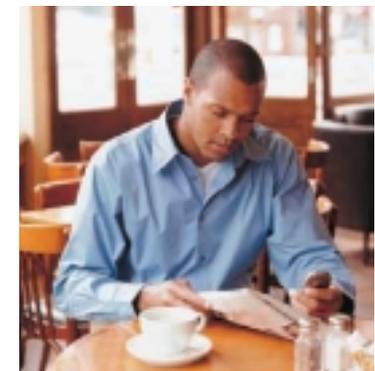
Addressing the
Mobile Information Society's demands

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 utilise infrastructure and terminals in different combinations.

In order to capitalise 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.

Creating new communication styles

In this instant communication world, we value easy access to services and have learnt to take timely information for granted. The new mobile phone generation has started to favour messaging and visual content over the more traditional voice calls. So, in the Mobile Information Society messaging is the natural way to communicate; it's instant, location independent and most of all, it's personal. MMS complements all these elements when it facilitates new communication styles and needs. And this is exactly what MMS has been created for to be used by anyone and anywhere.

The mobile phone is becoming a personal trusted device, a life management tool for business, work and leisure in the Mobile Information Society. The 3G terminal will take on many roles, becoming an anchor point, a digital navigator and an extension of self for the consumer; becoming a 'virtual me' that is both an enabler and a node for its owner's social life. This focal lifestyle accessory will also be a tool for storing and sharing personal information and experiences. In other words, it will deliver practical and rational benefits but, equally importantly, the sharing of experiences and emotions, as well as being sheer fun.

MMS takes phone personalization even further with its versatile message content. Not only will the content be produced by the consumer and become much richer

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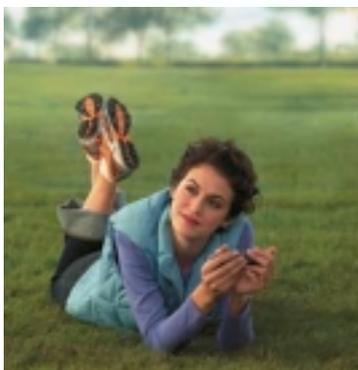
with MMS, but in addition to the usual message sending from mobile to mobile, it will also be possible to send messages from mobile to Internet, and eventually from Internet to mobile. With wireless data the mobile users can also benefit from the efficiency of Internet. For person-to-person communication this brings even more possibilities

Multimedia Messaging Service

Nokia is a trend-setter 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 Messaging Service (MMS) comprises a complete end-to- end solution for person-to-person mobile messaging, from terminal to terminal, from terminal to e-mail, or e-mail 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.

And as an evolutionary step from SMS, MMS is also a shift from 2G to 3G as well as a globally standardised service and the only 3GPP standardised 3G service today.
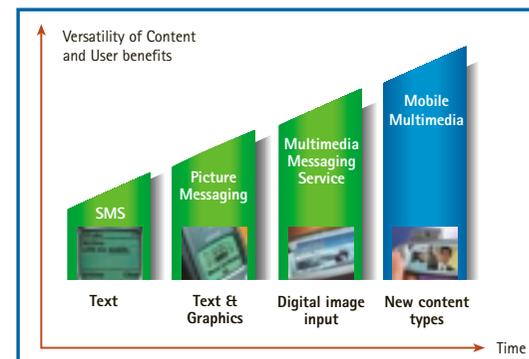

Figure 1. Multimedia Messaging migration path

This mass-market application leads the continuous expansion on services beyond voice.

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 figure 1.

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 primarily performed by consumers themselves. He or she becomes both developer and consumer of content, for example by creating a multimedia message from a snapshot and text before sending it to a friend or a colleague or even to a group of people. 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. Although, the sending of printed cards has been impressively popular and even quite simple, one might face some hindering factors such as finding a post office, or a mailbox, correct stamps, the time etc. While, if someone is on a holiday or business trip, the sending of a greeting is truly effortless with MMS as it can be done location independently. Not to

mention, how unique greetings will be created as the sender has full creative control over the content.

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. Now, people receiving messages can be expected to genuinely react: with big surprise, laughter, tears or even with the wildest excitement.

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 seeking for an easier way, independent of location and time.

Mobile messaging made easy

The number of Internet subscriptions is growing rapidly and subscribers rank e-mail high in the lists of applications they find most useful. However, current e-mail systems have some 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 e-mail benefits more easily.

In addition to using the Multimedia Messaging Service Center (MMSC) application interface for connecting

to a service, such as Unified Messaging or e-mail, it can be used for creating value-added services on top of MMS in a somewhat similar manner than with Short Message Service Centers (SMSC) today. By combining the capabilities of the MMS with existing network capabilities a highly advanced service portfolio can be offered to the end-users. For example, the consumer may ask for a location-based service, such as a map of a certain region by utilising USSD (Unstructured Supplementary Services Data) and receiving the result as a MMS. Similarly, a consumer without a MMS capable phone may want to greet a friend by sending a MMS and do this by the means of SMS.

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.

The key element in MMS network architecture is the 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 e-mail. MSISDN addressing offers ease of use by the consumer and control of the business by the operator. In the Nokia solution, similar pricing models to SMS are used and operators can use iniator-based billing. Furthermore, one of the pricing principles is that this service should be a mass market oriented i.e. mass market pricing levels should be applied from the start.

Short Message Service (SMS)

Originally launched in 1992, SMS has become the most successful wireless data service. Although, SMS has mainly been used for person-to-person messaging also services from application to person are highly popular, and with MMS they can become much richer content wise. For instance, getting a weather

forecast with maps and images adds notably to the value of the service.

By April 1999 there were approximately 1 billion SMS's sent every month in Europe alone. And the growth has been tremendous, since worldwide over 15 billion SMS's were sent per month by December 2000. Messaging as a concept and as a data service has been extremely well received by consumers and it has become a very profitable business for network operators. Therefore, as a follower of the massive success and development path of SMS also MMS is expected to be a major attraction.

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 Artuse™ 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 personalised content creation at the terminal, the Internet or PC.

Multimedia Messaging 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 e-mail. Creating, sending, receiving and forwarding such multimedia 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 Multimedia Messaging, a terminal with an integrated or connected camera and sufficient image-display capabilities is needed. In addition, the Multimedia Messaging Service Center is required to perform the required store and forward operations.

Imaging 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 Messaging Service (MMS)

Multimedia Messaging Service enables messaging with full content versatility, including images, audio, video, data and text, from terminal to terminal or from terminal to e-mail. 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 mature for implementation. Given its pivotal position in both SMS and Picture Messaging, Nokia is well positioned to establish MMS as a globally standardised open platform, pushing MMS acceptance forward and offering first-mover benefits to leading operators and consumers. Already now MMS is fully interoperable with current SMS devices, and there are application interfaces for content providers.
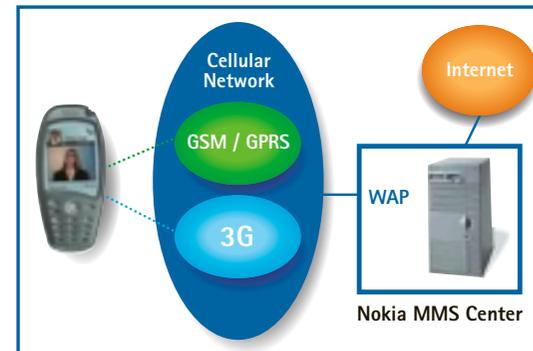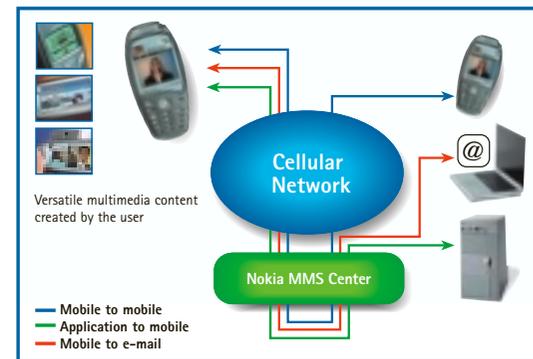
Figure 2. Nokia Multimedia Messaging network architecture

Figure 3. Multimedia Messaging Service (MMS)

Versatile multimedia content created by the user

— Mobile to mobile
— Application to mobile
— Mobile to e-mail

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.

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 can be used as 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.

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. For them, wireless data provides the chance to notably expand their customer base and to increase the number of service requests per customer.

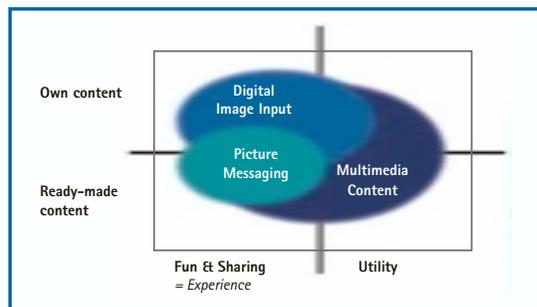Additional data traffic also enables operators to profit from personalised

Figure 4. The customer benefits of Nokia Multimedia Messaging

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.

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, operator logos. 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. For instance, a web tool for sending multimedia messages and an electrical photo album for storage purposes could be found from any operator's portal as basic applications.

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
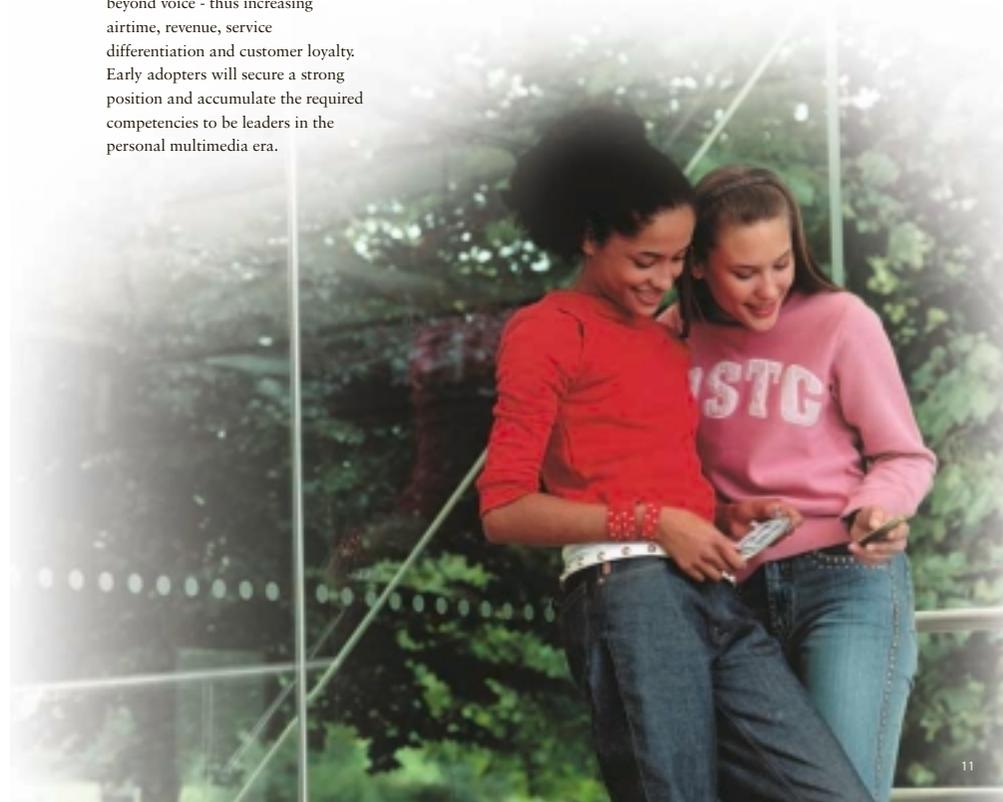
Multimedia, and a comprehensive solution for network Operators to offer Multimedia Messaging. General Packet Radio Service (GPRS) network will be ideal for mobile data networking services. In addition, Nokia works together with 3rd party developers and other parties to develop and deliver MMS. The Nokia Artuse™ product family will offer network operators viable possibilities to make an early move in offering attractive MMS.

Nokia is actively involved with operator oriented application development via globally operating Nokia Artuse™ Developers Program. The program provides an access to application development environments, tools and expertise combined with marketing support. There's a clear aim to help developers work together with network operators when creating attractive value-added services on standard technologies, such as WAP.

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 e-mail, enabled by the Multimedia Messaging Service Center.

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 digitisation, large amounts of ready-made digital content, such as images, can now be produced and consumed in the mobile multimedia environment.
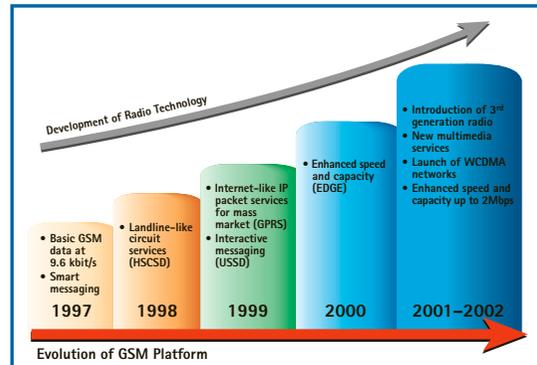
Open-terminal platforms enable the seamless integration, connectivity and interoperability of Nokia products with other data -and telecommunications applications in Multimedia Messaging.

Figure 5. The infrastructure enablers for Multimedia Messaging - in GSM domain

Case history:
Multimedia Messaging in action

Anna Eklund, 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.


Anna 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 Anna the "Dilbert of the Day". When it's funny enough, she forwards it to a like-minded colleague at another company.

If Anna 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.
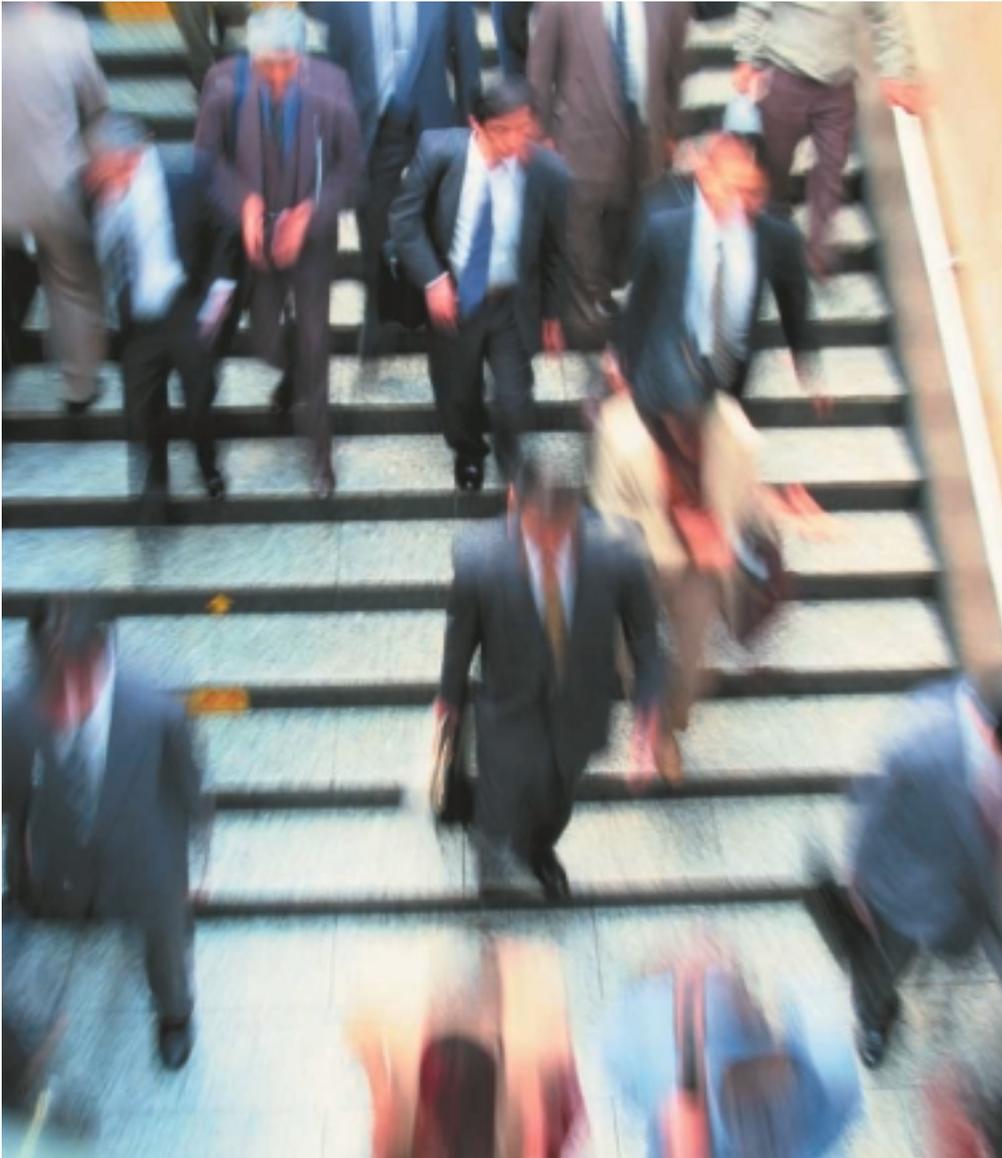
Multimedia Messaging is business today

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 Messaging Service (MMS). Natural application migration spells profitable business since value-added services and personalised 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 development of digital technologies and 3G wireless enables the creation of an extremely interesting range of new mobile multimedia terminals. Nokia believes that success is achieved by introducing terminals that simultaneously combine a selected set of services and a mobile application platform for personalisation. To support and complete a total end-to-end solution, Nokia is continuously developing the Nokia Artuse™ Messaging Platform as well as other Nokia Artuse ™ messaging products.

In addition to current products and applications, Nokia has now set a special emphasis on bringing creativity to mobile multimedia. Based on extensive mobile device and infrastructure expertise Nokia will provide complete Multimedia Messaging solutions, including MMS capable terminals and network infrastructure. The key element in an MMS network will be the Multimedia Messaging Service Center, based on WAP technology. Since the technology needed is already in place, it will be

straightforward to implement MMS to existing networks. Along with the perpetually quickening pace of development in every technological field, the right MMS strategy should be created now. With the right strategy Operators can be first to market and start gaining valuable market experience.

In other words, we're ready to show you how MMS can become a reality for your business right now.