

Mobile imaging - the bigger picture

New business opportunities for mobile service providers

Introduction to mobile and digital imaging

In the context of this document, *mobile imaging* refers to the ability that people can take photos with their mobile phone, and use photo-related services, such as:

- Exchange and share photos with camera phone or PC users by using MMS, e-mail or galleries
- Enrich photos with personal or commercial content, such as text, frames or sound
- Order photographic products, such as photo paper prints or photo merchandise

As an analogy, *digital imaging* comprises of a number of different devices and services associated with digital still cameras and digitised photos. Users can have silver-halide film cameras, scanning films or photos, or digital still image cameras that use memory cards and connect to the PC. As for mobile imaging, digital imaging includes exchanging photos over e-mail, uploading them to photo galleries, and ordering photo prints or merchandise products. In addition, photo printing at home represents an important area of digital imaging today.

With the recent successful launch of camera phones and MMS offerings, mobile imaging has become an area of key importance for the wireless industry. This whitepaper investigates how mobile imaging and digital imaging will meet, and what business opportunities this brings for mobile service providers.

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About Northstream

Northstream provides strategic technology and business advice to the global wireless industry. Northstream has assembled a multinational team with some of the world's best experts and analysts on wireless communication business and technology.

Northstream's list of clients include several of the world's leading operators and system suppliers, e.g. Vodafone, AT&T, NTT DoCoMo, Orange, Sonera, Telia, Mitsubishi, Ericsson, Nokia and Microsoft, as well as some of the leading investment banks and financial institutions. Northstream is established in Stockholm (Sweden), Sophia Antipolis (France), and Tokyo (Japan).

For more information please visit us at: www.northstream.se

The services – online albums and photofinishing

For several years, Internet portals and start-up companies have offered online photo services, including photo storage and printing with home delivery. However many of these companies have already exited the market, having learnt that such an offer does not allow them to reach profitability: charging for online storage is not accepted by the general public, and online print service revenues are negligible compared to the orders taken in the retail stores.

In the meantime, traditional photo industry players (such as Kodak, Fuji Film and CeWe Color) have increased their focus on digital imaging, now regarding it as their key future business area. Today, digital imaging has annual revenue growth rates of several hundred percent – compared to well below five percent for traditional imaging. For 2003, photofinishers like CeWe Color expect to generate more than 10 percent of their business from digital imaging.

Services such as online storage, galleries and print order have also started to appear in the mobile world - Club Nokia is a well-known example of a mobile service provider offering this full portfolio. Northstream expects other mobile portals and network operators to move into the same direction.

Different to PC-based usage, the lion's share of mobile imaging service revenues is expected to come from network traffic – mainly exchanging photo messages and browsing galleries. Photo sharing, where people can invite friends and family to browse albums should contribute to this and further widen the user base.

The devices - camera phones and digital cameras

Since their launch, mobile phones with an integrated or an attachable camera have been a huge success in many European markets in 2002. The most prominent example is Vodafone's 'live!' offering, with reported sales of 380.000 camera phones between October and December 2002. This suggests that a similar success as in Japan can be achieved – alone at J-Phone already more than fifty percent of subscribers use "Sha-Mail" camera handsets.

Such figures indicate that consumers show high interest in camera phones – also MMS usage figures from several operators give encouraging signs, showing that people not only buy the device because of the camera, but also use it to take pictures and send them to other people. Of course these first impressions have to be validated once operators have all charging schemes in place, and the novelty factor that camera phones bring starts to fade away.

Industry expectations are that during 2003 more than 40 M digital still cameras will be sold – up from below 30 M in 2002. Worldwide sales of mobile phones are projected above 400 M units for 2003. We believe that more than five percent will feature an embedded camera, leading to camera phone shipments of well above 20 M units in 2003. The higher growth of camera phone sales compared to digital cameras will mean that in 2004, and likely already in 4Q2003, more camera phones than digital still cameras will be sold. Even though the usage of camera phones will differ from "traditional" cameras, their mere volumes will not leave the photo industry un-impacted.

It should not be ignored though that picture quality and photographic features of camera phones are still poor compared to standalone digital cameras. The following table explains this difference by comparing some characteristics of typical digital still cameras and camera phones:

	Digital still camera	Camera phone
Viewfinder	Optical / LCD display	Phone display
Optical / digital zoom	5x / 3x	No / 3x
Flash	Yes	No
Image sensor chip	CCD	CMOS
Colour depth / bit	16 - 36	16 - 24
Resolution / megapixel	2 - 5	0.1 - 0.3
Storage media and space	Memory card 8 - 128 MB	Shared internal memory 0.5 - 4 MB
PC connectivity	USB cable, docking station, memory card	Infrared / Bluetooth for higher-end models
Mobile network connectivity	No	GSM/GPRS
Weight / g	100 - 400	90 - 150
Price / €	250 - 600	400 - 600

Northstream believes that future digital still cameras will be characterised by further miniaturisation, feature increases and price decreases. Digital still cameras will become a commodity product, and replace silver halide film cameras over time. We expect pixel resolutions to be further enhanced, although at a lower pace than in the recent years. It is likely that resolutions of 4 - 6 megapixel will deliver sufficient quality for private usage, and present a good compromise between picture quality, camera hardware and memory cost, and file size.

The development of camera phones during 2003 will be characterised by the following trends:

- **Pixel resolutions**

While today's camera phones deliver up to VGA resolution (640 x 480, 0.3 Megapixel), we expect first models supporting up to S-XGA (1280 x 1024, 1.3 Megapixel) to be shipped during 2003.

- **Video functionality**

Even though it will be too early to talk about a mass market, more and more MMS handsets will allow recording and playing video clips and exchanging them over MMS or e-mail. We believe that once again Nokia will dominate volumes, first with their 3650 model expected to come at an aggressive price.

- **Memory increase**

Today's camera phones come with user memory between 0.5 and 1 MB, with smartphones featuring several MB. It is likely that newly launched phones will have more memory, not only to carry images of increased resolution and size, but also for polyphonic ring tones, downloaded applications and video clips.

- **Price decreases**

This is a crucial factor for mass-market take-up. Already during 2002 Christmas sales, camera phones were retailed at subsidised prices of below € 200. We expect this downward trend to continue, due to the operators' push for mobile imaging and increased production volumes leading to economies of scale in manufacturing and purchasing. Cameras will be included in more and more mid-range phones during 2003.

Northstream expects no major overlaps between digital still cameras and camera phones for the coming years. More camera phones will have PC connectivity, and digital camera wireless connectivity will improve at the same time. Still, future devices will be optimised for one purpose, mobile communications or digital imaging. This means that we do not see chances for “Swiss Army Knife”, all-purpose devices in the mass market. It should also be noted that the usage patterns of both device types will remain different, at least for still some time.

The performance gap between camera phones and digital still cameras in terms of photography functions will however decrease in the future, at least when it comes to pixel resolution, memory and software support. Many traditional camera features, such as optical zoom, exchangeable objectives or flash will be restricted to standalone cameras. On the other hand, we see an increased number of digital cameras coming with wireless connectivity over Bluetooth, enabling easy connectivity to laptops, printers and mobile phones.

New business opportunities for mobile players

The reflections above show that there are indeed areas where MMS and digital imaging will meet – what does this mean for mobile service providers?

Service providers and network operators should consider enriching their mobile imaging offering with services that from today’s digital imaging, such as

- Online photo albums and galleries, accessible over the phone and the PC and offered as an integrated service
- Order of photo prints and merchandise
- Photo sharing: Inviting other people to visit photo galleries, and order prints and merchandise

When doing so, it is important to bear in mind some of the lessons learnt from the Internet. For example, experience has shown that online-only photo services are not what most customers are looking for. Instead, mobile service providers have to understand the photo industry’s rules and market conditions. Like the mobile industry, it has always relied on strong partnerships with retail chains, which today can deliver photo products within the hour.

Mobile service providers can hence consider forming partnerships with photofinishers or retailers, or even offering photo services in their own retail outlets. But while introducing such services and testing their market acceptance, it is essential not to lose focus on the mobile services – the main revenue source will still lie in browsing and messaging traffic that photo messaging generates.

Mobile imaging success criteria

Before launching advanced mobile imaging services, service providers should do their homework and meet the success criteria that Northstream sees for mobile imaging:

- Handset penetration and service availability
Camera phones and MMS/GPRS need to be available in the pre-paid segments, and service usage must be possible without registration.
- Interconnection agreements
Network operators need to achieve MMS interconnection as fast as possible – the SMS experience has shown that only once ubiquitous interconnection agreements are in place, usage growth can really start.

- Content and handset interoperability
Different handsets display MMS content in different ways, and have no aligned set of supported features. With improved picture resolutions and video clients entering the market in 2003, content adaptation and format conversion will become a more important underlying service.
- Communication and consumer education
Communication services spread quickly by word-of-mouth, and it has to be the service providers' goal that every customer receiving a photo message for the first time becomes a new, regular user. And, the earlier in the chain this education takes place the more likely the growth.
- Ease of use
Handset manufacturers, service providers and application developers need to analyse all usage steps necessary to take, send and/or upload a picture, create an album and invite others to visit it. If those developing the service improve the ease of these steps the greater a chance for a strong up-take.

Established photo players - partners or competitors in mobile imaging?

Mobile service providers need to analyse whether the partial convergence of mobile and digital imaging brings new competition to their business, and how to position themselves in this new value web. Companies that could enter the mobile arena include:

- Camera manufacturers
- Photofinishers
- Photo retailers
- Online photo service providers

It is clear that the competition will not be centred in their core business, nor in network operation. We rather expect a fight for market shares and customers when it comes to photo storage and customer ownership, and the subsequent revenues for traffic, messaging and photofinishing.

Northstream believes that the entry of these new players will make the value web for mobile imaging more complicated and challenging. The strategic and tactical issues mobile service providers will face include:

- Target groups and customer proposition
Mobile imaging for camera phone owners, and formulation of value proposition for digital camera users in private and business life
- Business models and commercial agreements
Charging for online photo services, revenue sharing agreements
- Photo albums
Integration or separation of photos and associated services from digital still cameras and camera phones
- Retail strategy
Inclusion of photo products into the own retail offering, or partnering with an established photo player. Partners may need to be selected on a country basis

Summary

Northstream believes that the following trends will influence the mobile imaging market in the coming years:

- Mobile service providers will focus on handset penetration, interoperability, content conversion and ease of use to allow mass-market take-up
- Companies from the mobile and the imaging industry will start forming partnerships: Operators, device manufacturers, photofinishers and platform providers
- Services known from digital imaging will become available to mobile users: galleries, online storage, photofinishing, retail ordering
- Camera phones will improve in quality, but the gap to digital still cameras is here to stay

Service providers from the mobile industry as well as from the photo industry should carefully analyse the associated opportunities and risks that these new developments bring.

As Northstream has been engaged with all players of the wireless world in both business and technology strategy work, we can assist the parties discussed in this white paper from strategic support over market analysis to concrete service implementation projects.

Acronym list

CCD	Charge Coupled Device
CMOS	Complementary Metal Oxide Semiconductor
GSM	Global System for Mobile Communications
GPRS	General Packet Radio Service
LCD	Liquid Crystal Display
MB	Megabyte
MMS	Multimedia Message Service
PC	Personal Computer
SMS	Short Message Service
S-XGA	Super Extended Graphics Array
USB	Universal Serial Bus
VGA	Video Graphics Array

Contact

Northstream has studied all aspects of **Mobile Imaging Services**. Please contact us if you would like to find out more about this or about our company and the services we provide.

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