



Nokia Year End Strategy Update December 3, 2002


Dr JT Bergqvist
Executive Vice President
Nokia Networks

NOKIA

© NOKIA - 2002 Year End Strategy Update

Contents


- Capacity needs are growing
- Mobile data services delivery – the requirements for the network
- True wideband technology for future capacity, speed and quality of service



NOKIA

© NOKIA - 2002 Year End Strategy Update

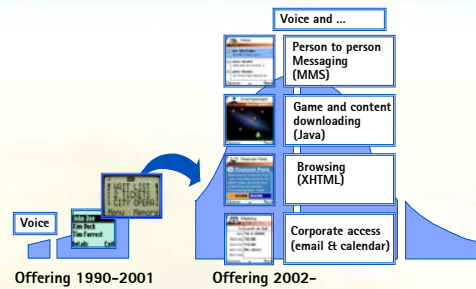
Capacity needs are growing



NOKIA

© NOKIA - 2002 Year End Strategy Update

Mobile data services are happening now – the key enablers are in place



Offering 1990–2001 Offering 2002–

NOKIA

© NOKIA - 2002 Year End Strategy Update

MMS is kick-starting mobile service success

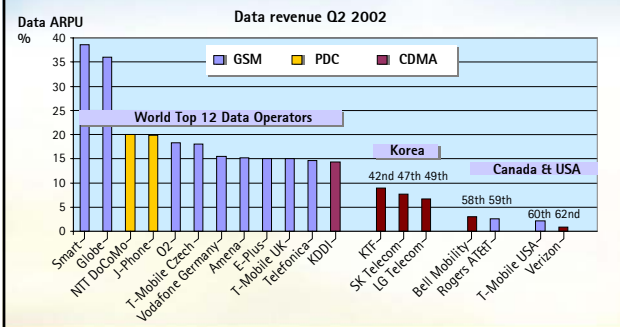
- There are over 70 networks live today in over 30 countries
 - 46 MMS Networks in EMEA
 - 23 MMS Networks in APAC
 - Strong interest in mobile messaging services in Americas
- National MMS interoperability started e.g. in Germany, Finland and Hong Kong
- Global MMS interoperability over GPRS spreading fast
- 1.5 million MMS messages sent in Italy to date
- Price-per-message business model, with free introductory offer is commonplace

NOKIA

© NOKIA - 2002 Year End Strategy Update

Data as a percentage of ARPU

Data revenue Q2 2002



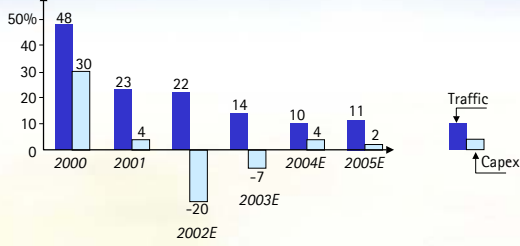
| Operator | Network Type | Rank |
|------------------|--------------|------|
| Smart | GSM | 1st |
| Global | GSM | 2nd |
| NTT DoCoMo | GSM | 3rd |
| J-Phone | GSM | 4th |
| O2 | GSM | 5th |
| T-Mobile Czech | GSM | 6th |
| Vodafone Germany | GSM | 7th |
| Artemis | GSM | 8th |
| E-Plus | GSM | 9th |
| T-Mobile UK | GSM | 10th |
| Telefonica | GSM | 11th |
| KDDI | GSM | 12th |
| KTF | CDMA | 42nd |
| SK Telecom | CDMA | 47th |
| LG Telecom | CDMA | 49th |
| Bell Mobility | CDMA | 58th |
| Rogers Airtel | CDMA | 59th |
| T-Mobile USA | GSM | 60th |
| Verizon | GSM | 62nd |

NOKIA

© NOKIA - 2002 Year End Strategy Update

Pressure to increase investments grows

Goldman Sachs Estimate November 2002



"We estimate that network traffic has increased 60%+ over the past two years, while (2002) network spend has decreased nearly 20%."
Goldman Sachs

NOKIA

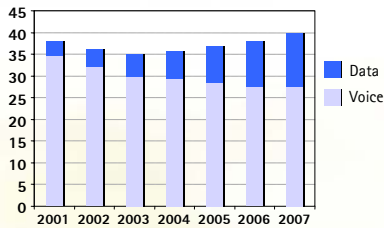
Mobile data services delivery – the requirements for the network



NOKIA

Data ARPU growth will be slower than data traffic growth in mobile networks

€/ subscriber / month

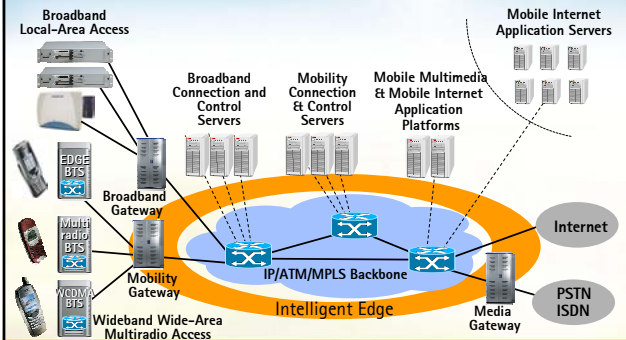


Monthly ARPU = Total Market revenues for Year / Average subscriber base for year / 12

Source: Nokia Mobile Service Forecast Nov/2002

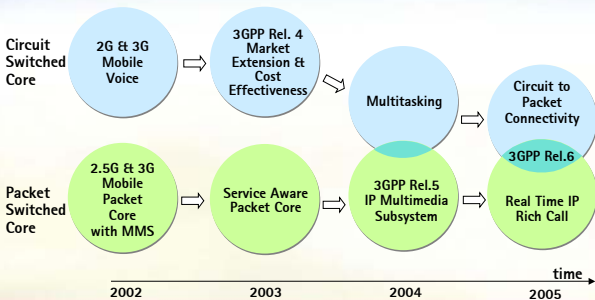
NOKIA

Vision from last year: The All-IP Network by 2005



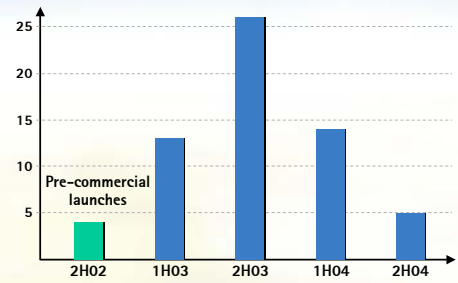
NOKIA

Development of mobile core networks on track



NOKIA

Close to 40 WCDMA launches in 2003



Source EMC Database

NOKIA

GSM/EDGE roll-out happens globally

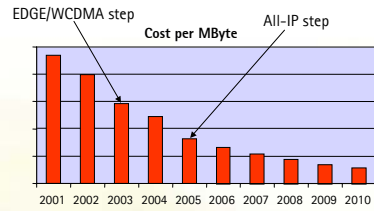
GSM/EDGE hardware volume deliveries



NOKIA

© NOKIA - 2002 Year End Strategy Update

The cost for delivering mobile data will decrease exponentially



NOKIA

© NOKIA - 2002 Year End Strategy Update

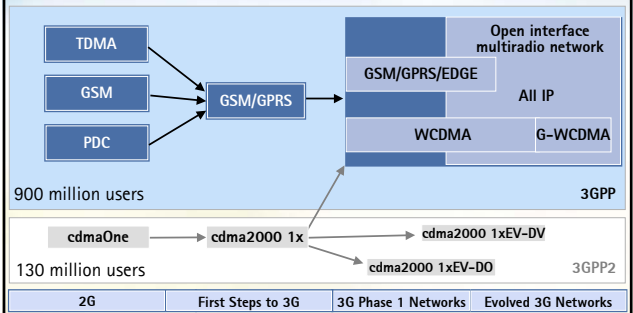
True wideband technology for future capacity, speed and quality of service



NOKIA

© NOKIA - 2002 Year End Strategy Update

Global evolution to 3G mobile technologies



NOKIA

© NOKIA - 2002 Year End Strategy Update

The Nokia G-WCDMA

- For the new 1700 and 2100 MHz frequencies in America, Nokia will offer a further developed version of WCDMA
- This new version that we call G-WCDMA will be fully backwards compatible with current WCDMA
- G-WCDMA offers far better performance and cost efficiency than any other 3G technology
- Through a common IMS core, it is a unified & efficient evolution step for GSM and cdma2000 operators.
- It will also be available in the current 1900 and 2500 MHz bands



NOKIA

© NOKIA - 2002 Year End Strategy Update

Nokia Networks - in a unique position to compete



NOKIA

© NOKIA - 2002 Year End Strategy Update

In a unique position to compete

- On track to reach long term target of 35% mobile networks market share
- Continued focussed R&D investments
- Synergies of mobile terminals, middleware and networks:
unique end-to-end capability

NOKIA

© NOKIA - 2002 Year End Strategy Update

NOKIA
CONNECTING PEOPLE

NOKIA

© NOKIA - 2002 Year End Strategy Update