



Capital Market Days

Competitive Advantages from Mastering Mobile Technologies

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Agenda



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Leading in 3G cellular & multimode technologies for mobile devices

Exploiting new opportunities in multi-radio and complementary access

Pioneering promising new applications for mobile users

Improving electro-mechanics in mobile devices

Capitalizing on easy to use user interfaces and flexible software platforms for operator customization

Competitive advantage from mastering 3G technology in handsets



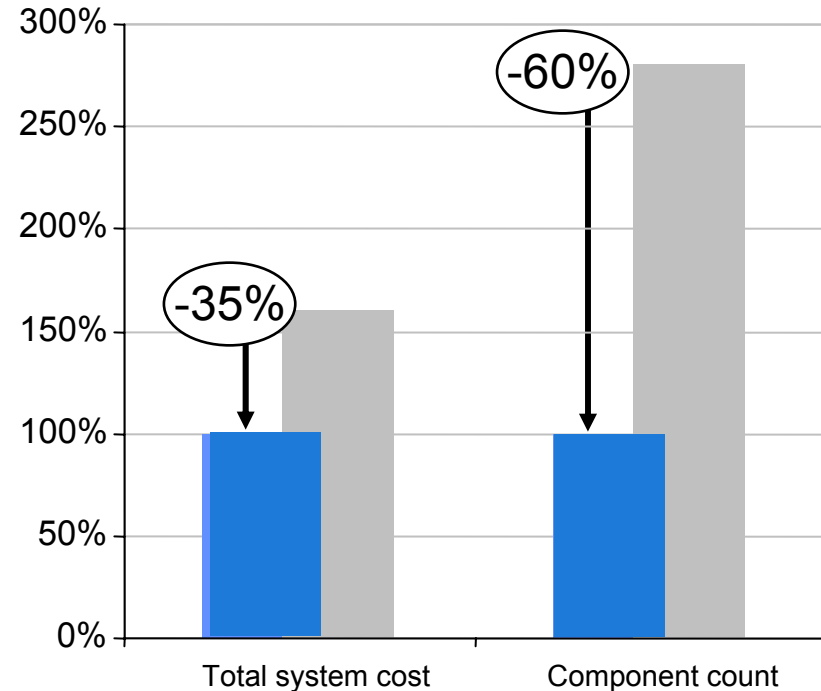
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- Recognized leadership in 3G device radio know-how, system architecture and chip integration
- Competitive edge in 3G handset design
 - Smaller size
 - Lower cost
 - Lower power consumption
- Business impact of Nokia's WCDMA technology advantages will only increase as 3G market accelerates and scales up



~35% competitive cost advantage in total 3G system cost

3G HANDSET TOTAL SYSTEM SYSTEM COST AND COMPONENT COUNT/IC INTEGRATION COMPARED



- Nokia 6630
- Competitor 2004 WCDMA handset sample

Sources: Nokia tear down analyses; Public benchmarking studies

Nokia leads in EDGE and WCDMA



- Strongest GSM/EDGE dual mode handset portfolio in the industry
 - 21 handsets launched
 - Most new GSM/GPRS/WDCMA handsets will support EDGE
- Nokia 6630 - world's 1st GSM/EDGE/WCDMA integrated multimode device – also the smallest & lightest 3G megapixel camera handset
 - No corresponding commercial multimode chip available from any vendor
- GSM/EGDE/WCDMA becoming the preferred 3G evolution step in many GSM markets
 - 38 EDGE launches in 30 countries
 - 114 operators in 67 countries committed to EDGE



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Growing advantage from EDGE and WCDMA multimode capabilities

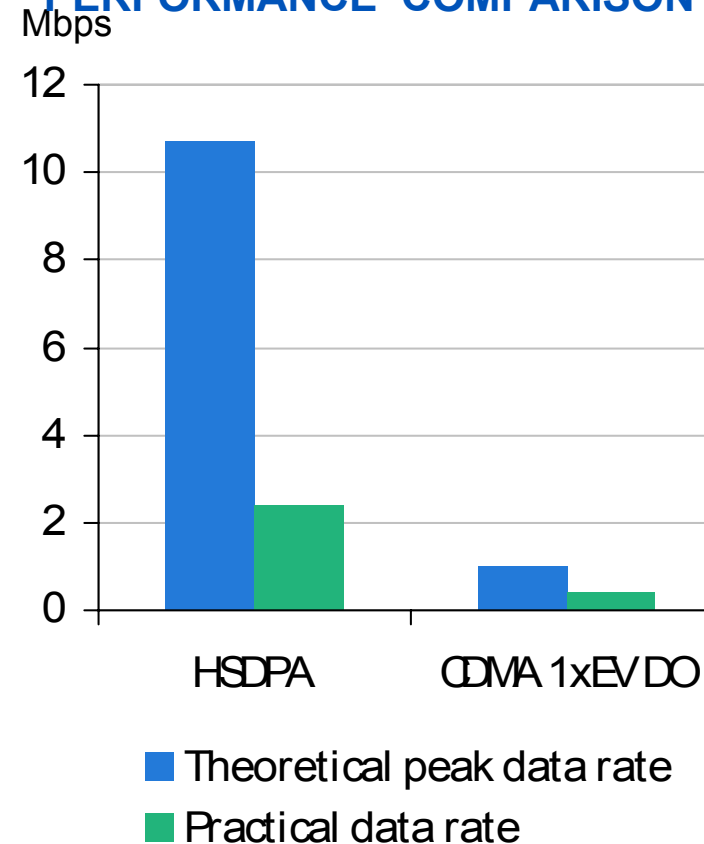
Nokia is well positioned to exploit the next growth wave of 3G: HSDPA



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- High Speed Downlink Packet Access is the natural evolution step in the GSM continuum of GSM/GPRS/EDGE/ WCDMA
 - Increased data speeds
 - Attractive business case due to spectral efficiency
- HSDPA will be the highest performing 3G technology on market
 - eg. 2-4 times higher data rates than CDMA 1xEV-DO
 - full integration of voice and data supported
- Nokia's approach is to bring integrated GSM/EDGE/WCDMA/HSDPA multimode for fully featured mobile devices – not data cards only
- End-to-end capability with Nokia Networks

DOWNLINK DATA RATE PERFORMANCE COMPARISON



Sources: Nokia

Nokia's multi-radio strategy with complementary access brings new functionality to mobile users



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CONNECTIVITY: Hot Spot Access



- 1st integrated Wi-Fi/ Cellular convergence device certified by the Wi-Fi Alliance

PROXIMITY: Local services/PAN



- Pioneer in RF ID in mobile devices
- Founding member of NFC Forum
- 1st to bring out Near Field Communication devices

BROADCASTING: Radio & TV



- 1st to bring Visual Radio
- Pioneer in Mobile Phone TV – 1st in DVB-H

Nokia brings Visual Radio... See what you hear



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EXISTING FM BROADCAST

Existing Content Mgmt/Playout System



Radio station



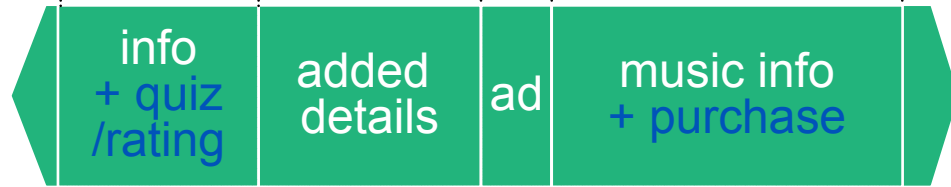
Existing FM Tuner



Visual Radio Application



Visual Radio Server by HP



PARALLEL CHANNEL IN OPERATOR'S DATA NETWORK

Promising feedback on Visual Radio from users and industry



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- ~10 Nokia models by end-2005, estimated 100 million devices by the end-2006
- First Visual Radio stations in Finland, UK and Singapore; Scandinavia and major European markets to follow; USA in H2/2005
- Excited mobile users*:
 - 2/3 used visual radio daily, most >15 minutes per session
 - Willingness to pay ~\$6 fixed fee/month



Potential to offer new and exciting experiences eg. for mobile music lovers

"It was almost too easy to buy ring tones"

"It was so easy to vote – I never normally participate in a quiz or voting!"

* Source: Nokia; Visual Radio User Study in Helsinki July 2004

Mobile TV ... Nokia pioneer in DVB-H



- Combining two killer applications, TV and mobile connectivity
- 2 pilots in Finland and Germany with broadcasters, media & operators
 - Digital TV networks with IP Data cast over DVB-H
 - Cellular networks for interactivity
- Excited mobile users*
 - >80% willing to pay, on average >€12/month
- Standards to be finalized in 2004
- Commercial solutions 2005

Mobile TV: Wherever, Whenever



Potential for Nokia to offer new easy-to-understand multimedia experiences for mobile users

**Source: Nokia; bmco test research, July 2004 Berlin*

Nokia's Push-to-Talk solution is unlocking a global mass market



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- To date 6 market-leading Push-to-Talk devices*
- Current Nokia implementation has a global base of >100 million subscribers
 - >18 public commercial network contracts
 - >30 trials ongoing
- Most new Nokia phones will support Push-to-Talk
 - Hi-quality performance over GPRS, EDGE and WCDMA
 - Ease to use & flexible UI
 - Commitment to OMA PoC standard
- Nokia demonstrates new IMS service 1st in the world: Video sharing !



Nokia well positioned in the growing global Push-to-Talk & IMS service markets

*) Excluding Nokia Symbian devices with add on client



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Nokia accelerates introduction of high quality displays and cameras



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Res: 128/128
Colors: 4K



Res: 128/160
Colors: 65K



CIF



VGA/MegaPix



Today*:
20 models
with 65K colors

By end-2005 most of
mid/high-range devices
will have
65/262k colors

Today*:
5 models with
MPix camera

>20 models
with MPix cameras
during 05

Higher resolution means sharper images and improved user experience...



176 x 208



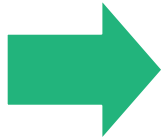
352 x 416



... gained by resolution improvements in Nokia platforms...

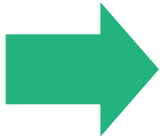
Examples

SERIES 60
176x 208



640 x 320

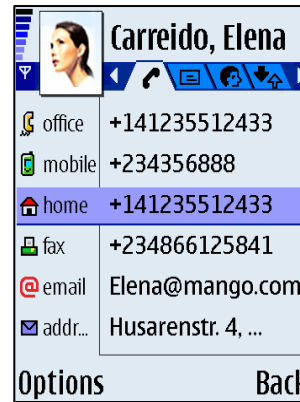
SERIES 40
128x128



208 x 208

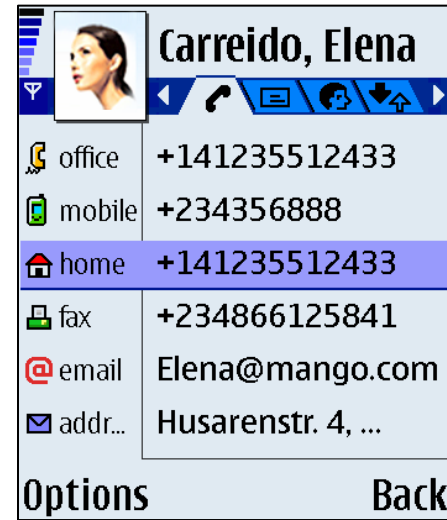


128 x 160



240 x 320
(QVGA)

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352 x 416
or/and
640 x 480
(full VGA)

... and further enabled by automatic scaling with Scalable Vector Graphics



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August							
	Mo	Tu	We	Th	Fr	Sa	Su
31	29	30	31	1	2	3	4
32	5	6	7	8	9	10	11
33	12	13	14	15	16	17	18
34	19	20	21	22	23	24	25
35	26	27	28	29	30	31	1
36	2	3	4	5	6	7	8

Options Exit



August							
	Mo	Tu	We	Th	Fr	Sa	Su
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Options Exit

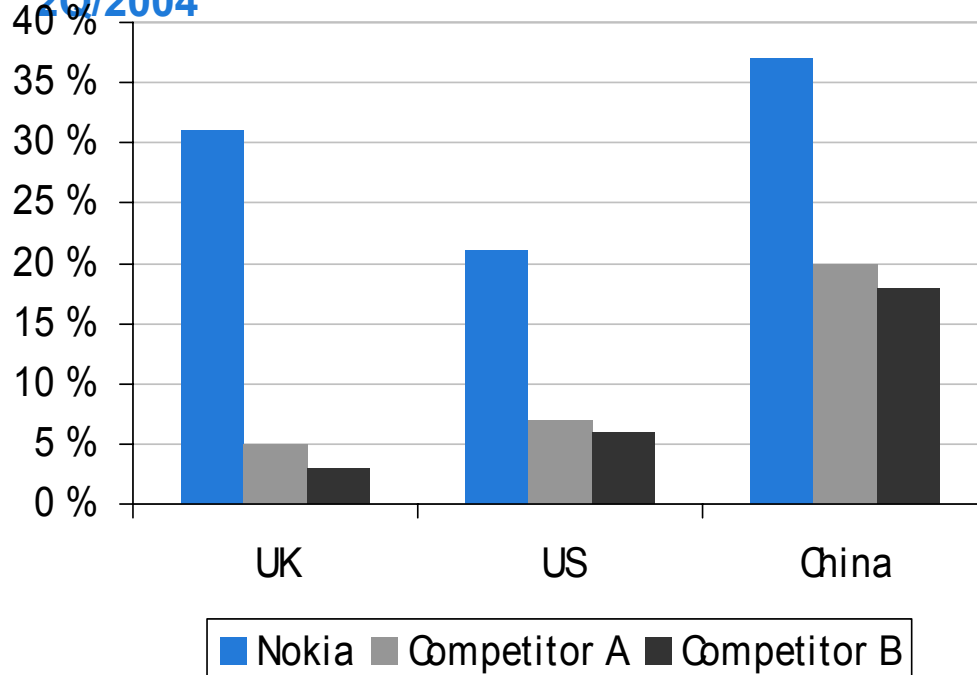
Nokia will exploit and maintain ease of use leadership in User Interfaces



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BRAND WITH MOST USER-FRIENDLY USER INTERFACE / MENU SYSTEM

2Q/2004



“Each phone is the same and its really quick and easy to use...it’s the... menu that they have created”



“It (Nokia) is like an extension of your hand. It is not something you have to learn.”



UI ease of use leadership – despite tougher competition – brings user purchasing preference for Nokia and grows ARPU for operators

Ability to flexibly customize with software is becoming a competitive advantage for Nokia



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Example of key customisation elements in Nokia Series 60 product

- Operator branded soft key
- Operator icons and color in main menu
- Embedded download links
- Operator specific content on MMC
- Ready made settings



Example of key customisation elements in Nokia Series 40 product

- Operator branded soft key
- Operator logo & tones
- Colour Scheme
- Wallpaper
- Wake Up Graphic
- Bookmark & links
- Ready made settings

Positive operator feedback on Nokia's new UI customization offering
SW platform based customization has proven to be radically more time and cost efficient than product-by-product hard-coding

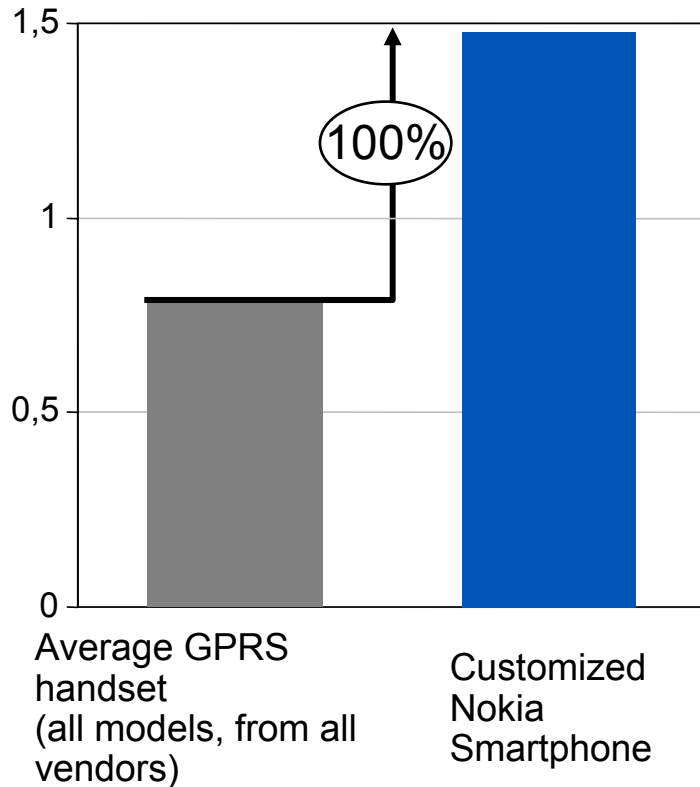
Nokia can now profitably offer more UI customization elements, in more devices, to a wider customer base, than any other device vendor

Customized, user-friendly Nokia devices boost operator traffic – and relationships



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MONTHLY DATA TRAFFIC PER USER (MB) – ALL APN



WIN-WIN

Easy-to-use, customized devices from Nokia boost operator data traffic

&

Strengthens operator preference for Nokia as a trade partner

Summary



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Exploiting leadership in 3G and multimode device technology

EDGE/WCDMA/HSDPA

Leadership: Capitalizing on ease of use assets and low software platform based customization capabilities

Gaining competitiveness in electro-mechanics by progressive improvement

Displays/Cameras etc

Embracing new opportunities in complementary access technologies with active multi-radio strategy

Wi-Fi/WLAN/NFC etc

Pioneering value added service features with promising mobile user appeal

VoIP/ Visual radio/ Mobile TV /Video sharing

Competitive Advantages and Value Capturing Opportunities for Nokia from Mastering Mobile Technologies

NOKIA



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Thank You!

Any questions ?



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CONNECTING PEOPLE