



Capital Market Days

Creating Value Through Focus and Renewal

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Chief Technology Officer

Agenda



Capital Market Days



- Calibrating Nokia's R&D Expenditure
- Focused Technology Leadership
- Product Creation Renewal
- Key Messages

Business Environment Implications to R&D



Capital Market Days

Changing market dynamics

Calibrate
R&D investment level
and focus

3G and smartphone markets take off

3G and software
investment value
starts to materialize

Product attractiveness determined by
increasing variety of technologies

Focus on
fast technology access,
modularization and
productization

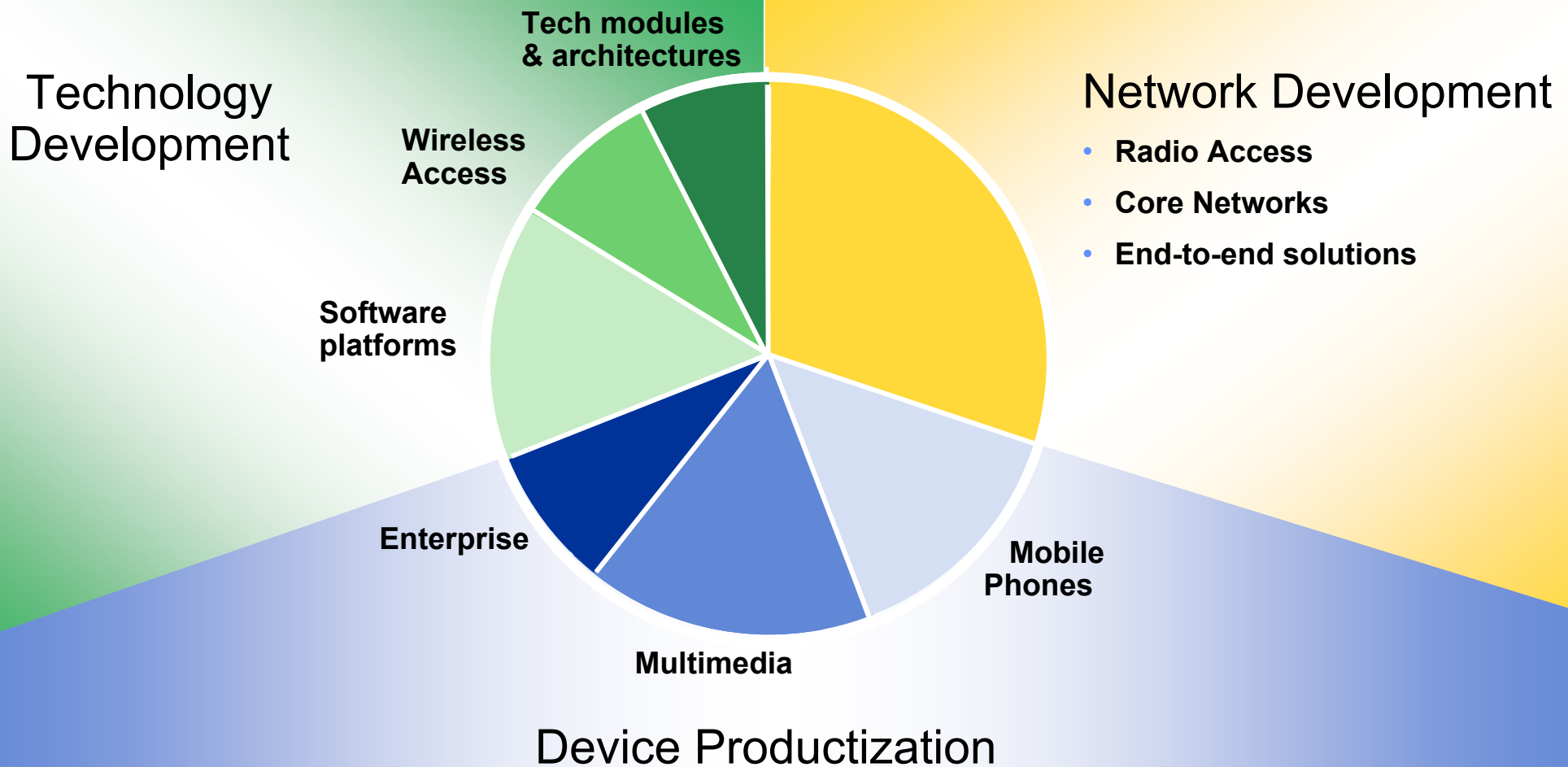
Shortening product life-cycles and
expanding portfolio

Make product creation
a competitive advantage

Nokia's R&D Portfolio Focus in 2004



Capital Market Days



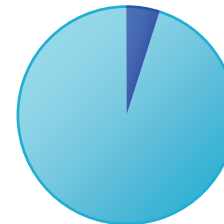
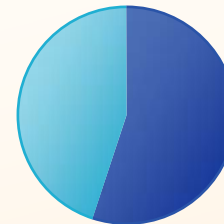
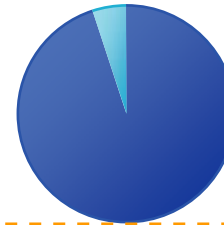
Industry Peers Invest 7-12% to R&D



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Company type	Typical R&D/sales ratio	Benchmark companies
Product integrator	1-6%	Dell, LG
Technology based product business	7-12%	Apple, Motorola, Samsung, Sony
Technology business	13-20%	Microsoft, STM, TI, Qualcomm

Product vs Technology Investment
(Illustrative only)



Nokia Peer Group



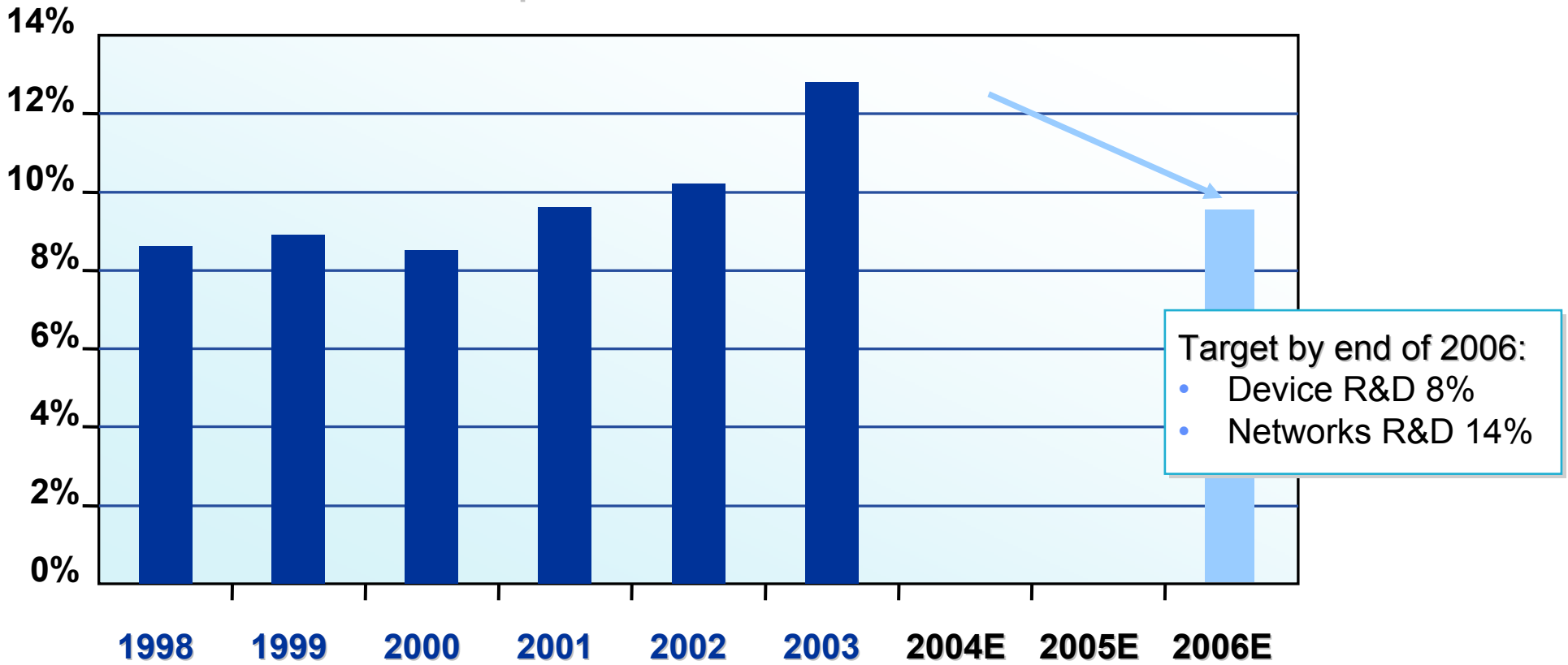
Source: Company and analyst reports

Nokia Targets R&D Expenditure of 9-10% of Net Sales by End of 2006



Capital Market Days

R&D expenditure / Net sales



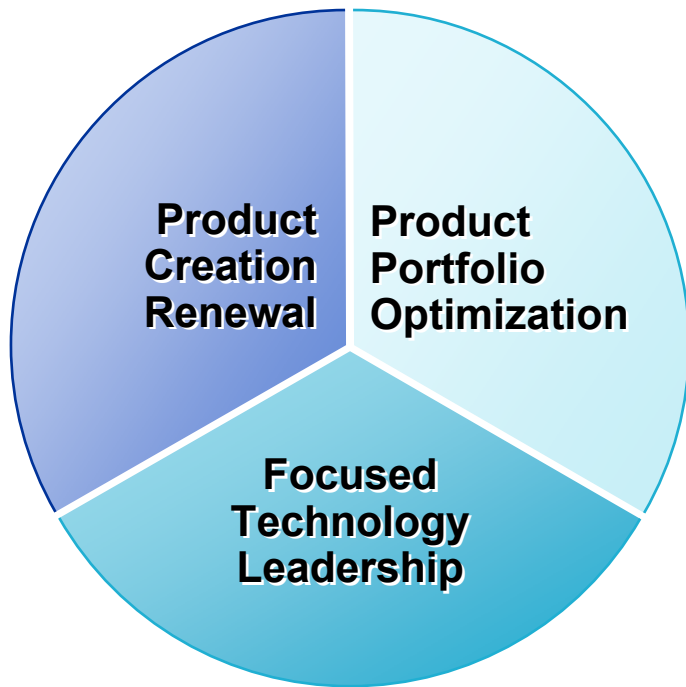
NOTE: 2003 reported R&D expenses include EUR 470 million restructuring charge. If excluded the R&D costs of Nokia Group would have represented 11.2% of net sales in 2003.



Towards 8% in Device R&D/Net Sales end 2006



Capital Market Days



1. **Product Portfolio Optimization**
 - Right products at right time to meet market demand
2. **Focused Technology Leadership**
 - Invest where Nokia adds unique value
 - Utilize external innovation
3. **Product Creation Renewal**
 - Fast & efficient productization
 - Leverage standard platform elements

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Capital Market Days

Investment in Wireless Access Creates Value



Capital Market Days

Market share

Time-to-market advantage

Sales price

Device performance differentiation

COGS

COGS cost advantage through superior design

COGS & Royalty revenue

IPR assets



**NOKIA
6630**

- World's 1st GSM/EDGE/WCDMA multimode device
- No corresponding commercial multimode chip available from any vendor

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**NOKIA
6630**

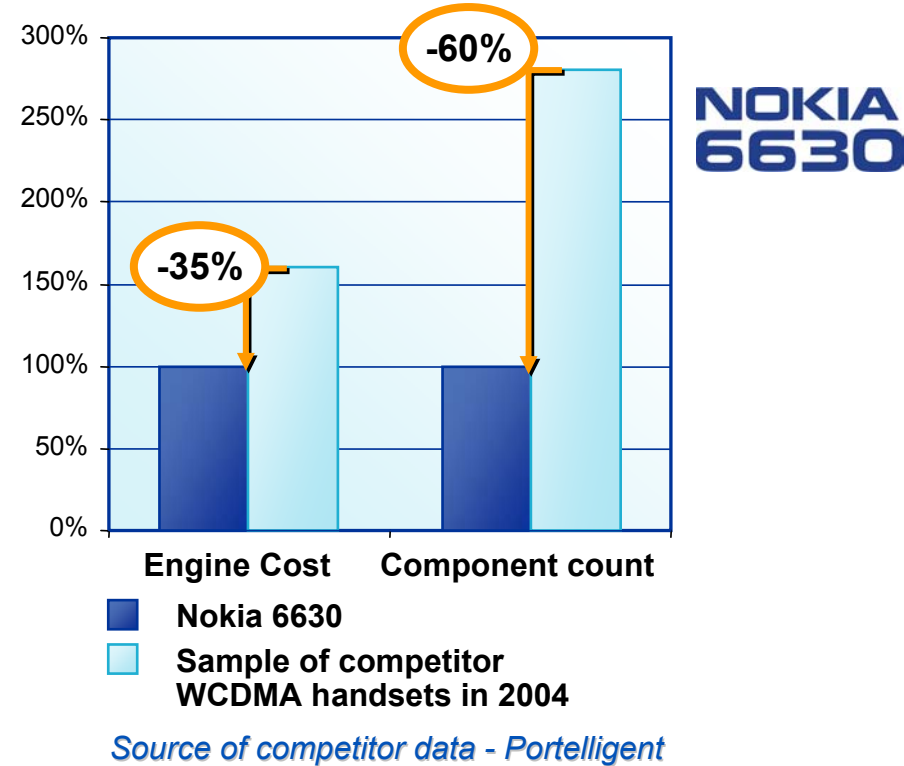
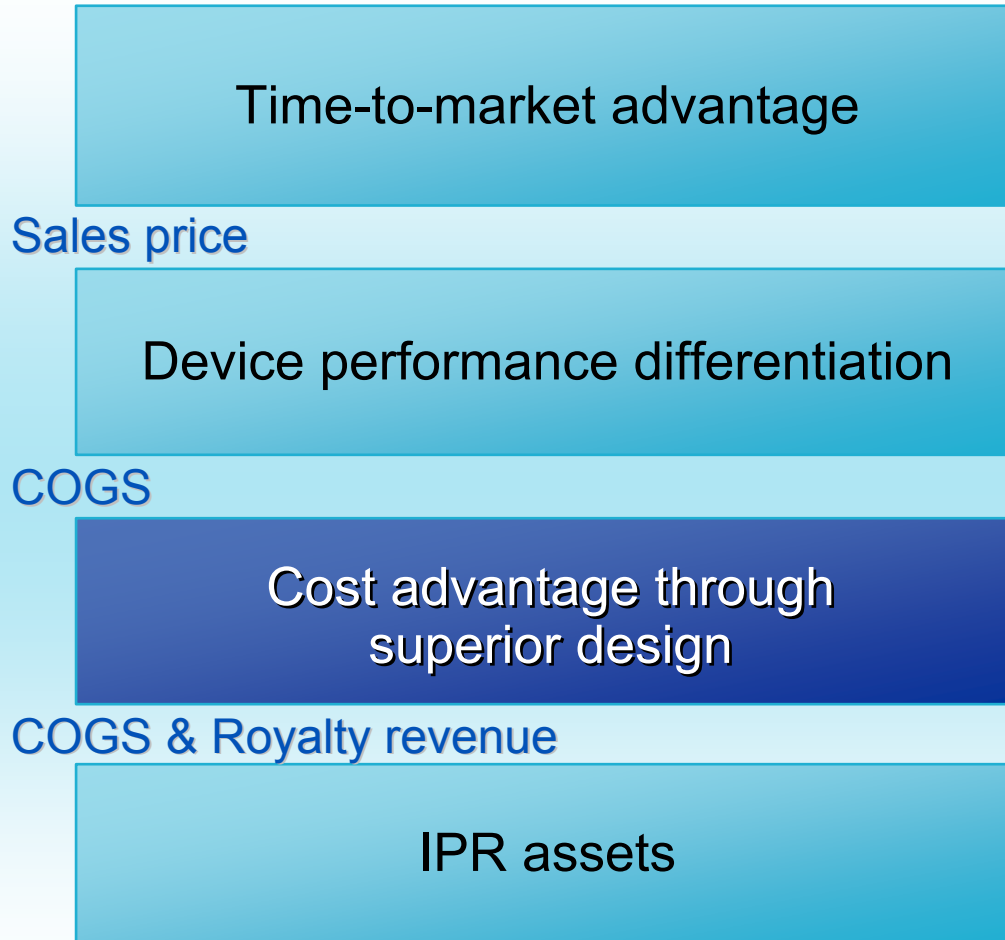
- World's smallest & lightest GSM/WCDMA megapixel camera handset
- Longest talk/standby time

Investment in Wireless Access Creates Value



Capital Market Days

Market share



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

Investment in Wireless Access Creates Value



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Cost advantage through superior design

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IPR assets



GSM

- Nokia has significant royalty advantage over new entrants



WCDMA

- No single company dominance
- Nokia position very strong



CDMA 2000

- Nokia position getting stronger

■ Nokia □ Ericsson ■ Motorola □ Qualcomm ■ Others

Nokia has strong IPR position

- Lower per unit royalties
- Cross-licensing opportunities

Number of patents declared in ETSI, ARIB in 2004

Nokia's Software Platform Strategy

Best UI in Every Category



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Series 30
Platform

Nokia OS



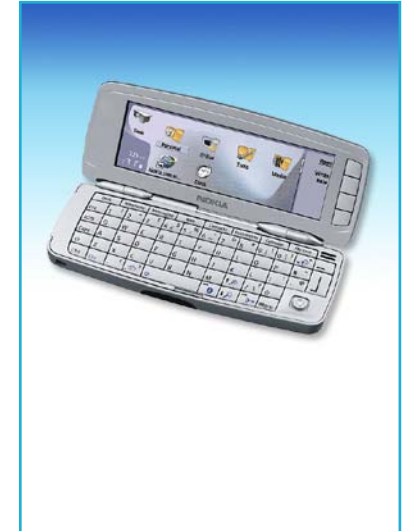
Series 40
Platform

Java
Nokia OS



Series 60
Platform

Java
Symbian OS



Series 80
Platform

Java
Symbian OS

Series 60 Expands to High-end and Mid-range



Capital Market Days

Common Developer Platform, Interoperability and Scalability



Series 60 Is a Valuable Asset for Nokia



Capital Market Days

Market size

Smartphone market expands to mid-range and high-end

Market share

Series 60 attracts developers, licensees and operators

Value

Value of software will increase over time

Cost

Platform ownership secures economies of scale



- Rich user experience
 - multimedia multitasking
 - Cost efficient customization
 - Scalability across device categories
- ➔ Smartphones up to 25% of total market in 2008

Series 60 Is a Valuable Asset for Nokia



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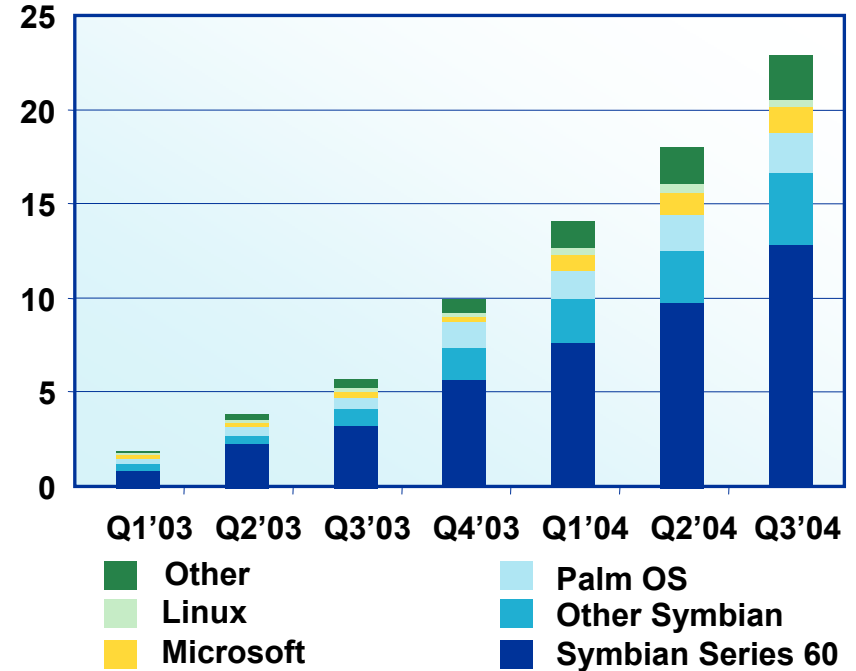
Value of software will increase over time

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Platform ownership secures economies of scale

Capital Market Days

Cumulative shipments Q1'03-Q3'04



- Volumes feed a virtuous cycle
 - Innovation on top of platform
 - Interoperability across devices
- ➔ **Series 60 leads with over 50% market share**

Series 60 Is a Valuable Asset for Nokia



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- UI software drives user experience
- Functionality = software
- New applications drive operator ARPU

Series 60 Is a Valuable Asset for Nokia



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Fixed R&D investment compared to

- Per unit license fee savings on Nokia level
- Per unit revenues from external licensees

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Capital Market Days



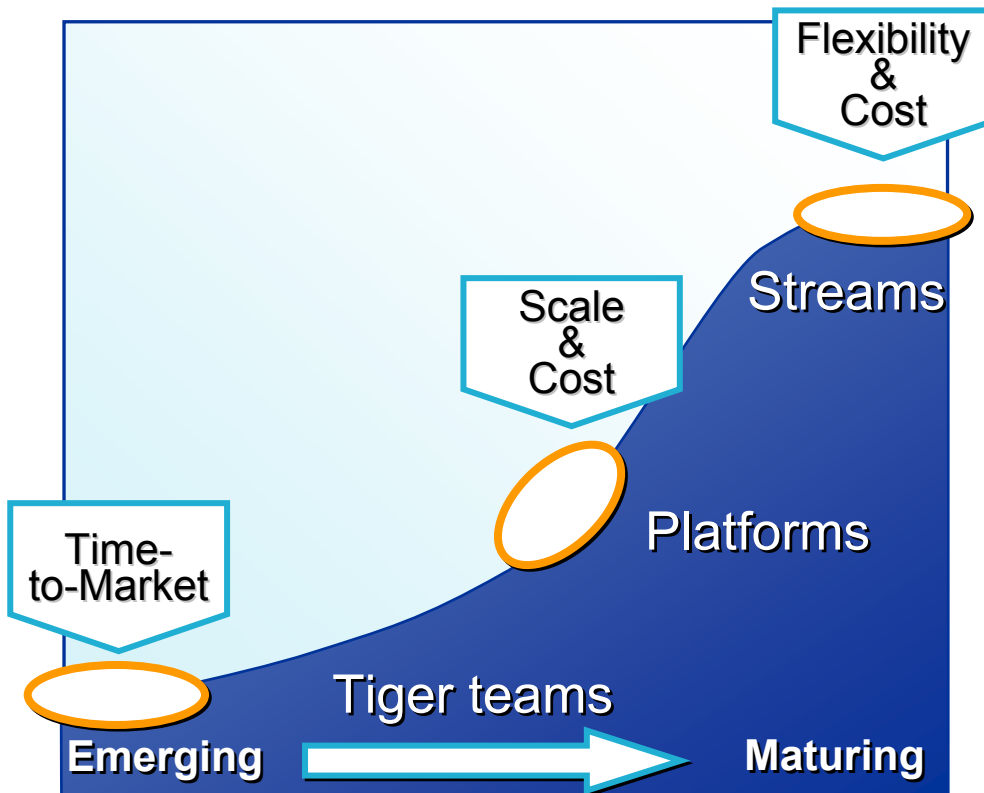
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Targeting Productivity Breakthrough in Product Creation



Capital Market Days

Business phase optimized operational mode



Targets for 2005 - 2006

1. Half the cycle times
2. Half the product integration costs
3. Best customer satisfaction

Target 1: Halve the Cycle Times First Steps Taken

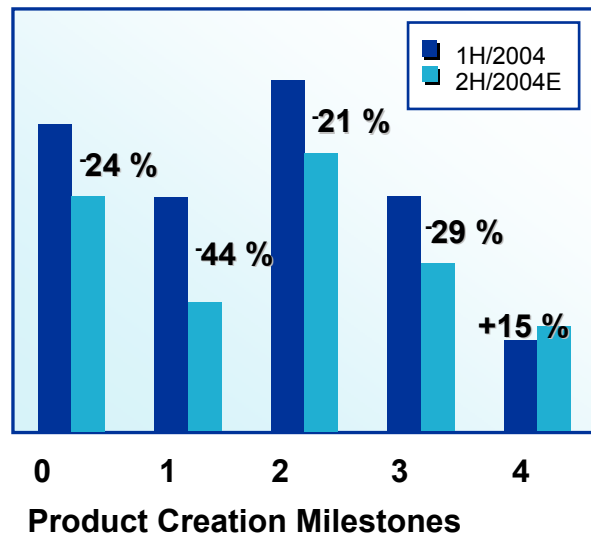


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During 2004

- High priority customer requirements addressed four times faster
- 20-40% lead-time reductions in several parts of the process

Positive improvement of milestone cycle times during 2004



Case from 2004



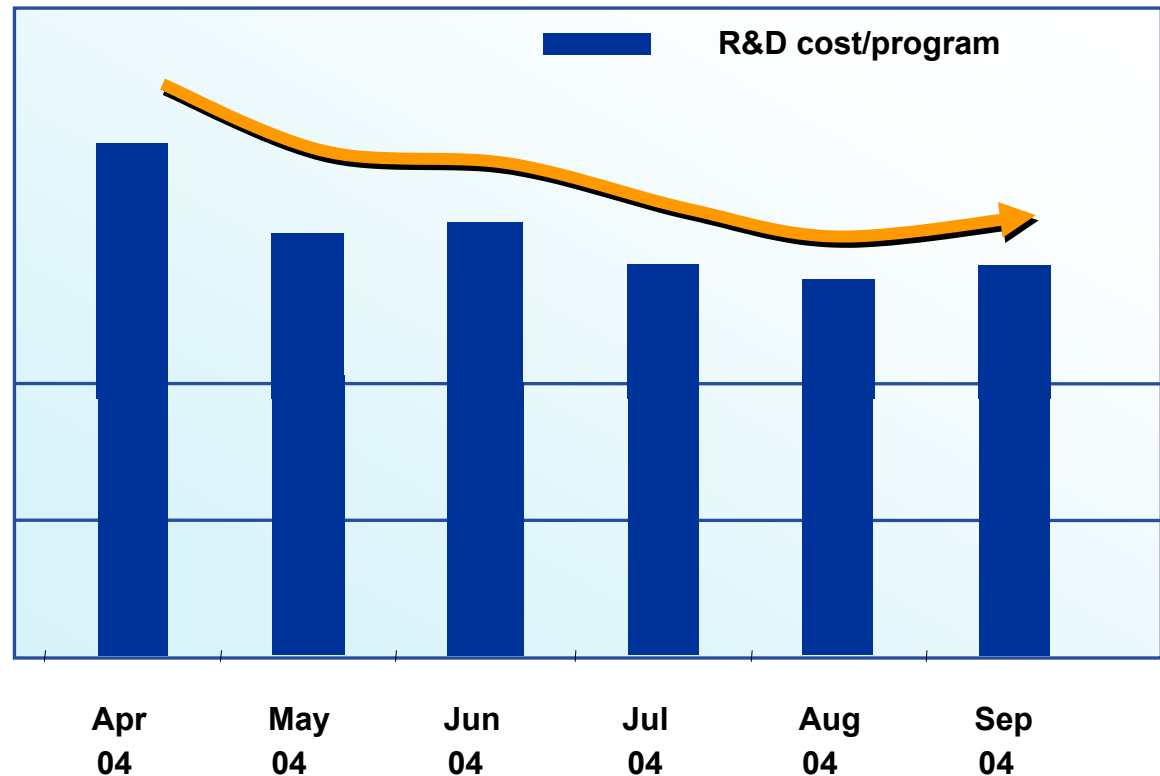
Target 2: Halve the Product Integration Cost First Steps Taken



Capital Market Days

Turnaround in R&D cost / product program

- Lower R&D cost per product
- Simultaneous improvement in product quality metrics



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Key Messages



Capital Market Days

- **R&D productivity focus**
 - Nokia group R&D target 9-10% of net sales by end of 2006
 - Device R&D target 8% of net sales by end of 2006
 - NET R&D target 14% of net sales by end of 2006
- **Technology development focus on unique value add**
 - Wireless access
 - Software platforms
- **Product creation renewal**
 - Half the cycle times
 - Half the product integration costs
 - Best customer satisfaction



Capital Market Days

Thank You.