3GSM™

WORLD CONGRESS 04

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Business experiences and network requirements in launching WCDMA & EDGE worldwide

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Success factors for 3G take off

- Networks
- Terminals - applications
- Unique user experience - competitive differentiator

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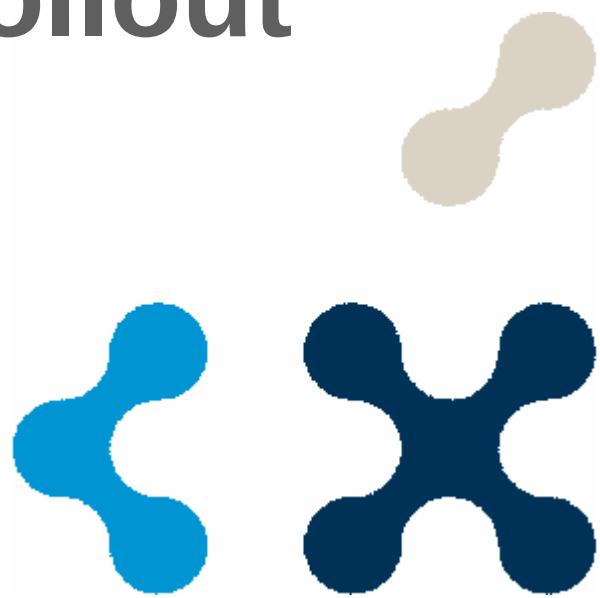
Key Findings
WCDMA Network Rollout



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WCDMA worldwide launch status

January 2004	
NTT DoCoMo (Japan)	
Vodafone (Japan)	
3 (Italy)	
3 (UK)	
3 (Australia)	
3 (Sweden)	
3 (Austria)	
3 (Denmark)	
3 (Hong Kong)	
Mobilkom (Austria)	
MTC-Vodafone (Bahrain)	
Stet-Helles (Greece)	
Tango (Luxembourg)	
Total subscribers	2.9 Million

WCDMA selected by 120 operators

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WCDMA Worldwide Launch Status

January 2004	Layered architecture	WCDMA only
NTT DoCoMo (Japan)		✕
Vodafone (Japan)		✕
3 (Italy)	✕	✕
3 (UK)		
3 (Australia)	✕	✕
3 (Sweden)	✕	✕
3 (Austria)		
3 (Denmark)	✕	✕
3 (Hong Kong)		
Mobilkom (Austria)	✕	
MTC-Vodafone (Bahrain)		
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Total subscribers 2.9 Million		

WCDMA selected by 120 operators

Focus areas for WCDMA network launch

- Network planning and optimization
- Antenna tilts
- Coverage phases
- Multi-vendor & terminal integration
- Geographical aspects
- Configuration management including software & hardware status
- Network monitoring

Network planning and optimization

1st priority	• Cell planning, coverage • Cell planning, interference • Neighbor definitions	• Parameter consistency • End-to-end testing
2nd priority	• Location area & routing area planning • Up/down link power balancing	• Feeder deployment on site
3rd priority	• Code planning • Parameter tuning	

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Network planning and optimization

1st priority	• Cell planning, coverage • Cell planning, interference • Neighbor definitions	• Parameter consistency • End-to-end testing
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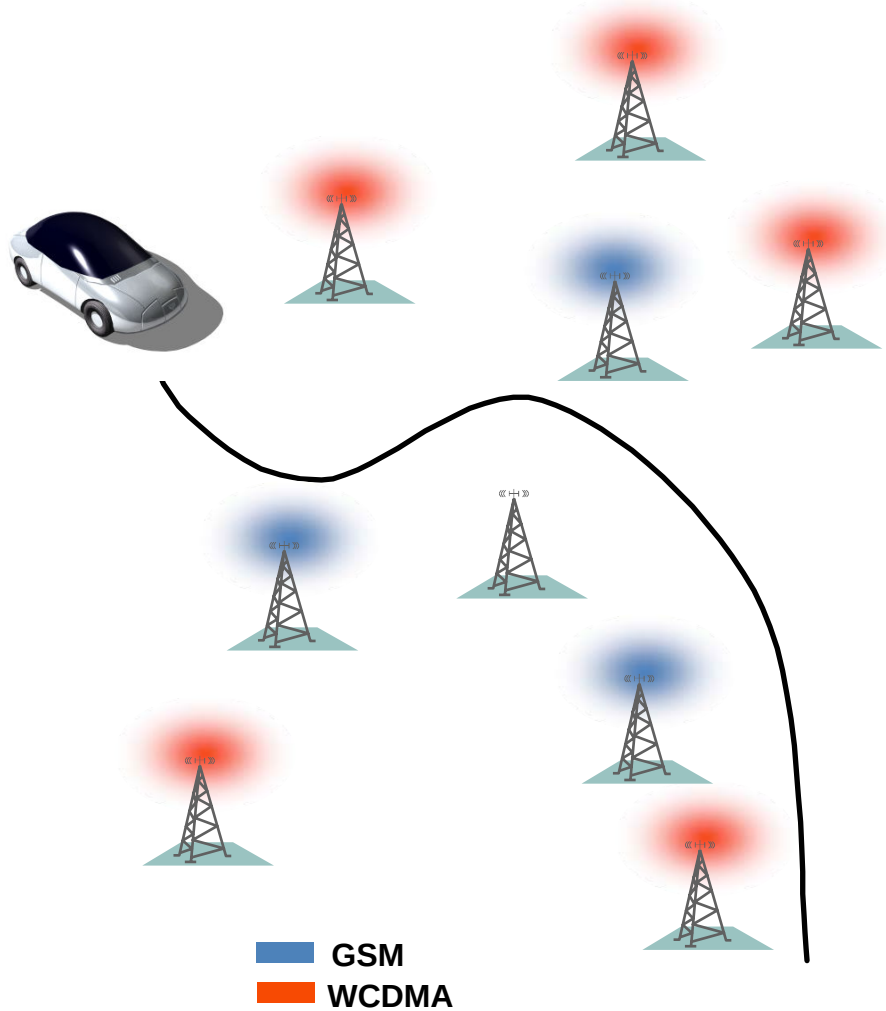
Neighbor definition issues

- Neighbor relations not updated
- Terminal limitations not considered
- Antenna orientations have changed
- “One-way” neighbor relations

- GSM neighboring cell relations not considered



95% of all RBS installed before network optimization

3G coverage strategies differ from GSM

Geografical coverage

Indoor coverage

Population coverage

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Multi-vendor & terminal integration

Live WCDMA Interoperability Demo at GSM World Congress 2004

Voice Call

Video Call
Terminal to Terminal

Video Call
Terminal to PC

Content Streaming
Sports, Music, News

3G Mobile Access

Mobile Core

Service Network

MOTOROLA NEC SAMSUNG NOKIA LG Electronics SHARP SANYO Sony Ericsson

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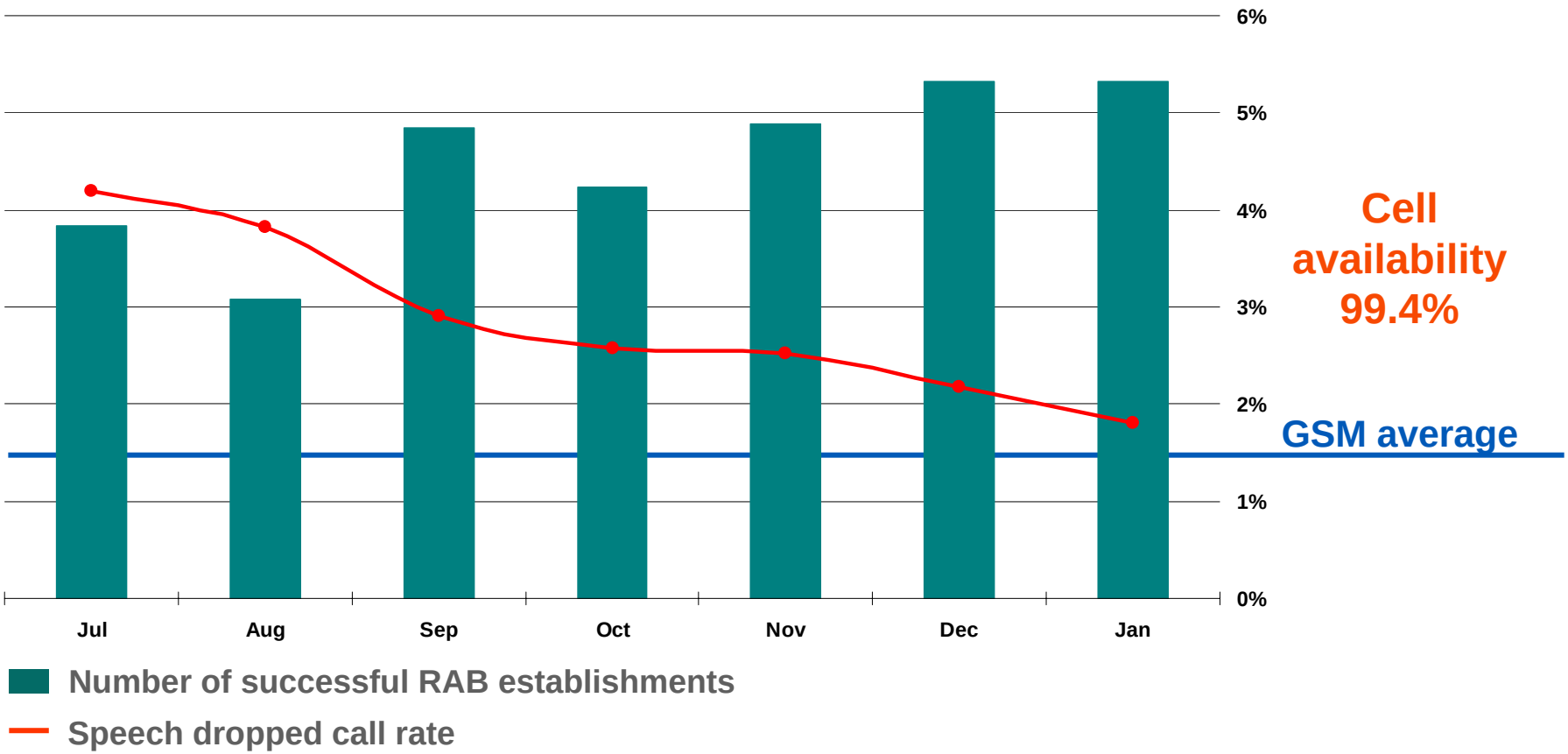
Recommendations for a successful launch of WCDMA networks

- Network planning considering service mix
- End-to-end testing
- Initial & advanced radio tuning
- Network monitoring including drive tests

Invest time to save time

Dropped call rate in radio network (speech)

Data from live customer networks



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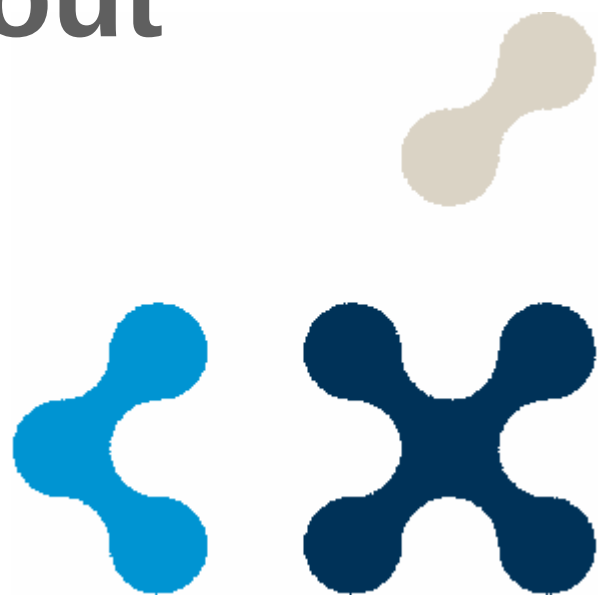
Key Findings
EDGE Network Rollout



EDGE worldwide launch status

January 2004
Cingular Wireless (USA)
CSL (Hong Kong)
AIS (Thailand)
Telefónica Móvil (Chile)
AT&T Wireless Services (USA)
AT&T Wireless Services (Puerto Rico)
AT&T Rogers Wireless (Canada)
Telecom/AT&T Wireless (Bermuda)
Westel (Hungary)
Bite GSM (Lithuania)
TeliaSonera (Finland)
AT&T Wireless (Barbados)
Potential EDGE subscribers: ~71 Million

EDGE officially selected by 65 operators

EDGE worldwide launch status

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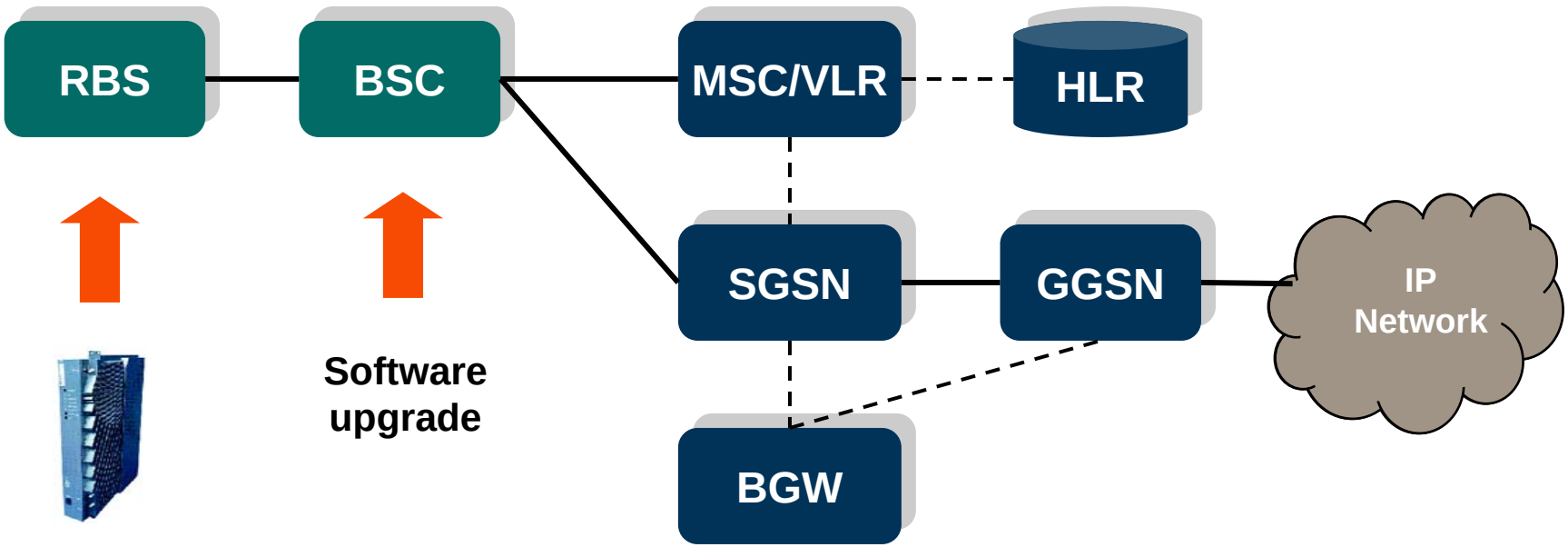
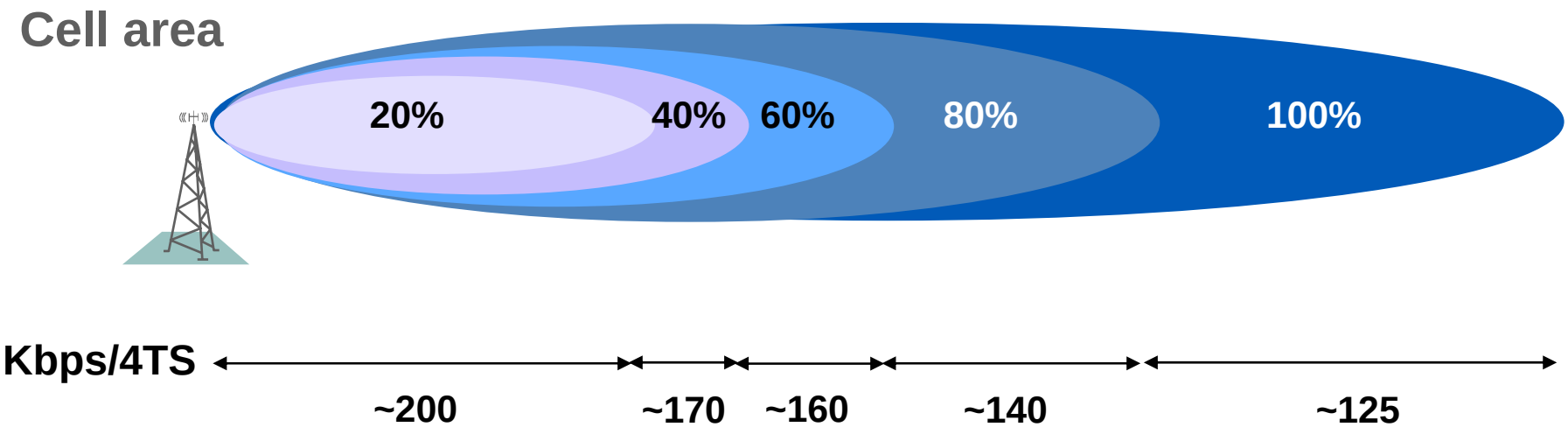
EDGE system upgrade only in radio network



EDGE radio performance

Live customer measurements



Average data rate 140 – 160 kbps

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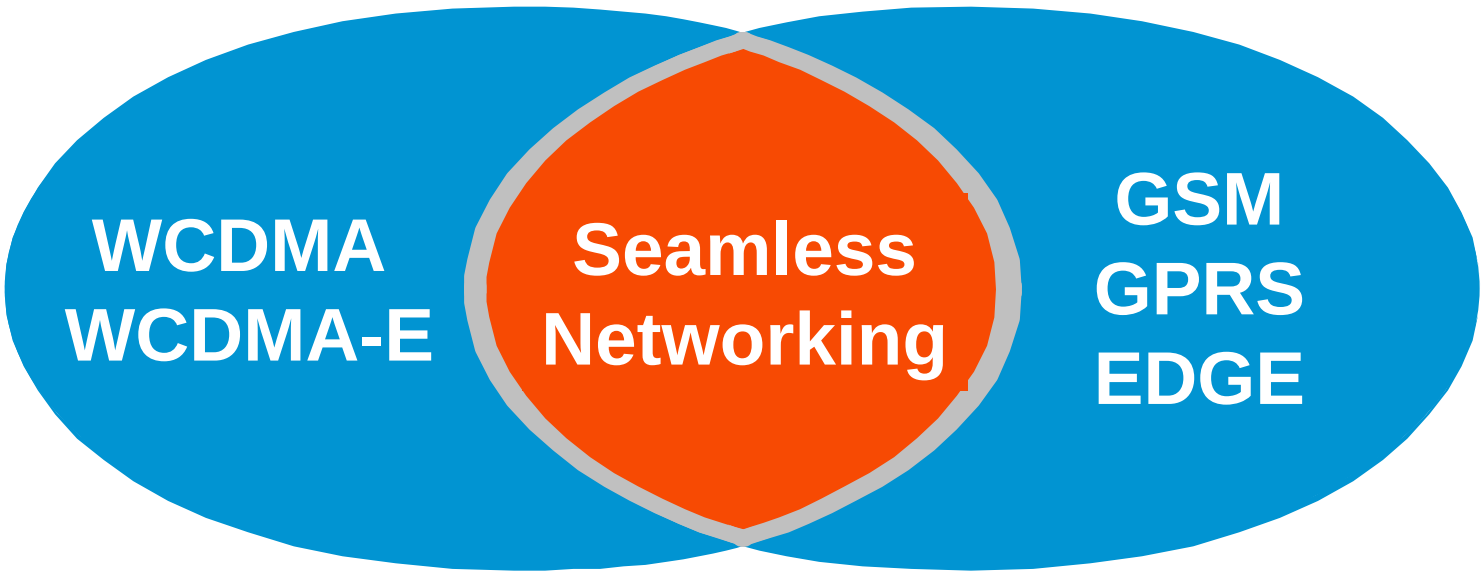
Recommendations for a successful launch of EDGE networks

- Focus on end-to-end application testing
- Network planning & optimization not needed

DO IT!

WCDMA and EDGE: complementing technologies



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User Experience

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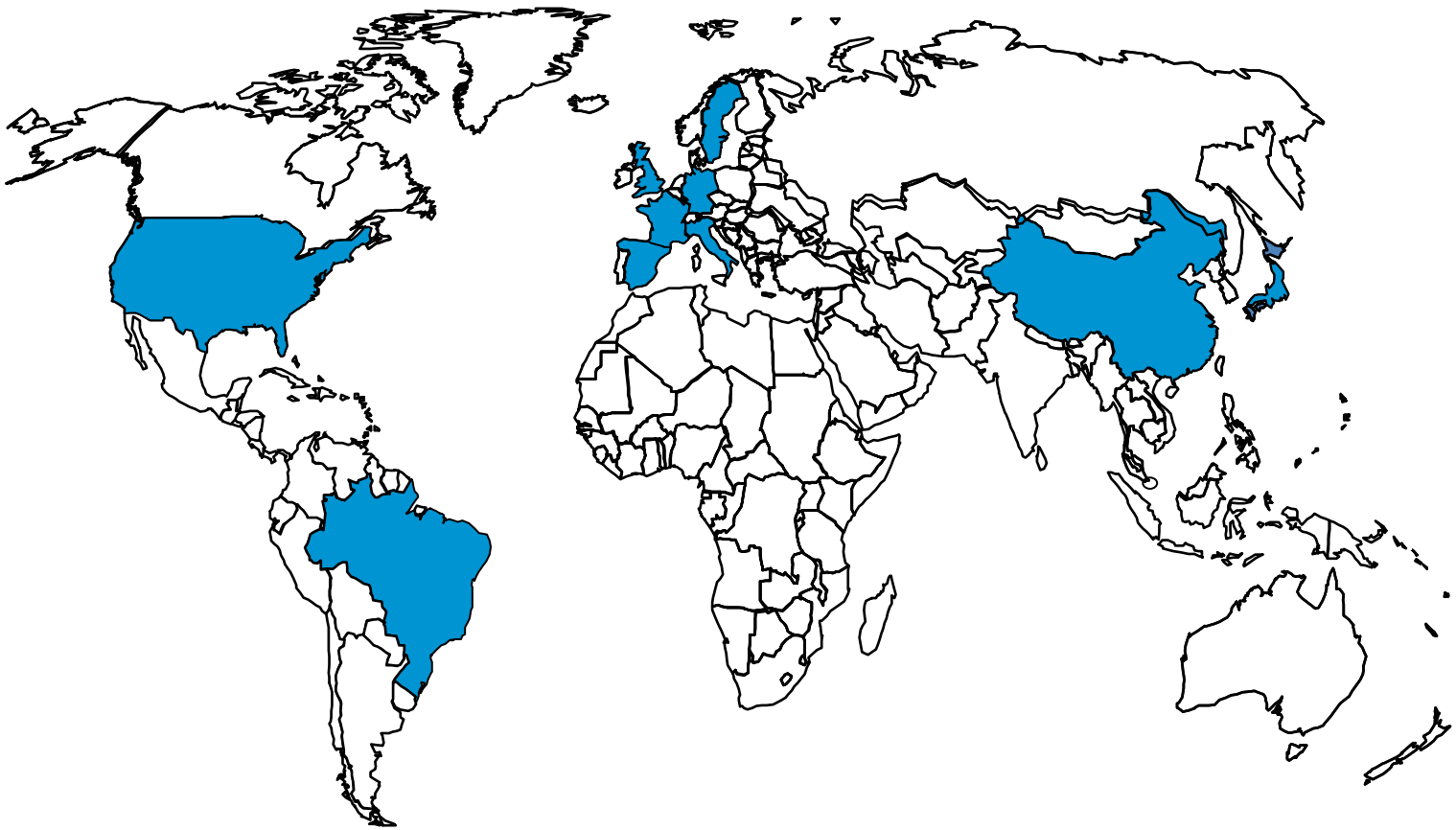
Advanced Mobile Services Study 2003

Representing 615 million people world-wide

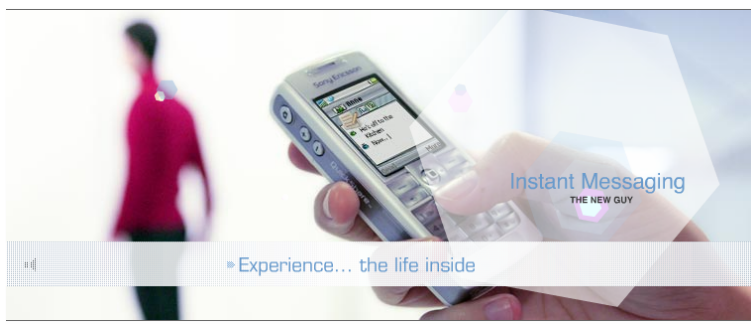


10% of all mobile users are potential 3G early adopters

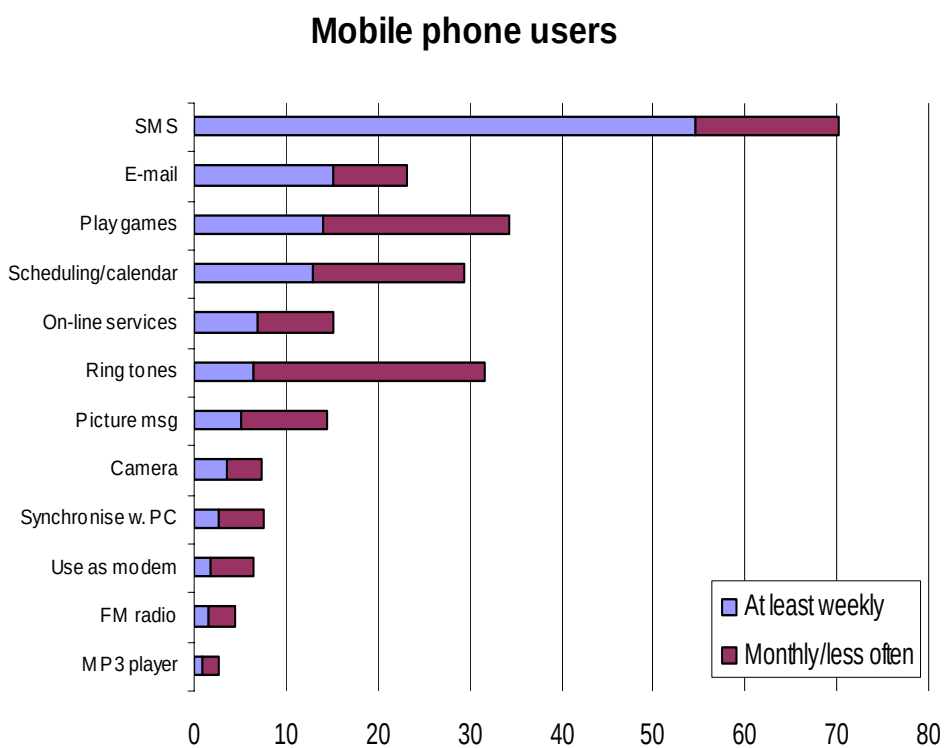
Users have high expectations of 3G

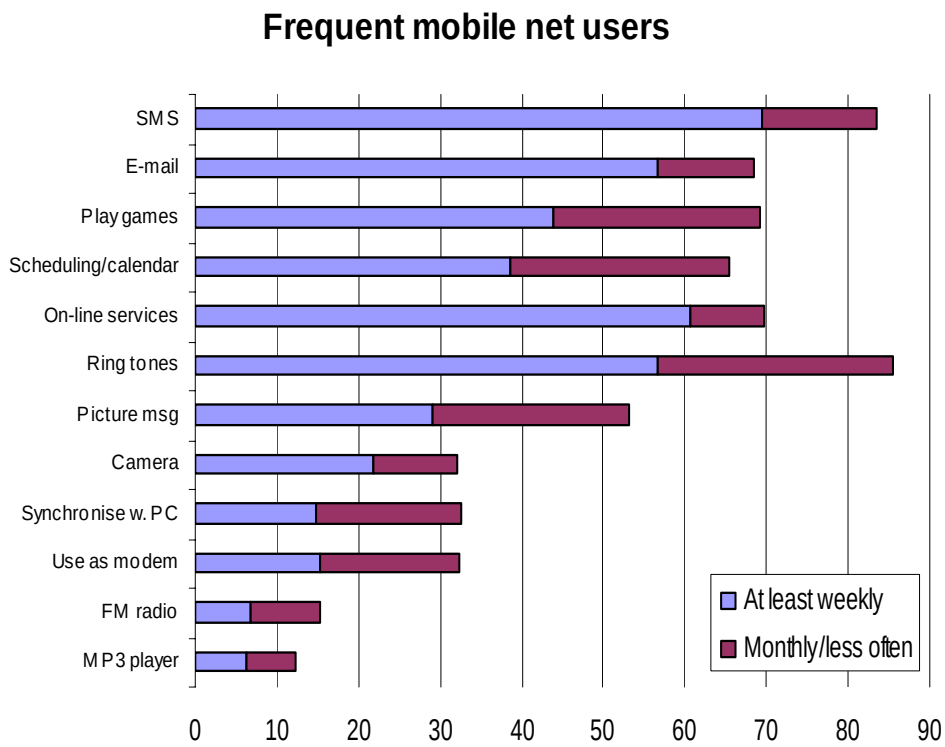
- Terminal size and weight
- Long stand-by and talk time
- Existing services
- Coverage

- New and enhanced services
- Richer personal expression
- Improved ease of use



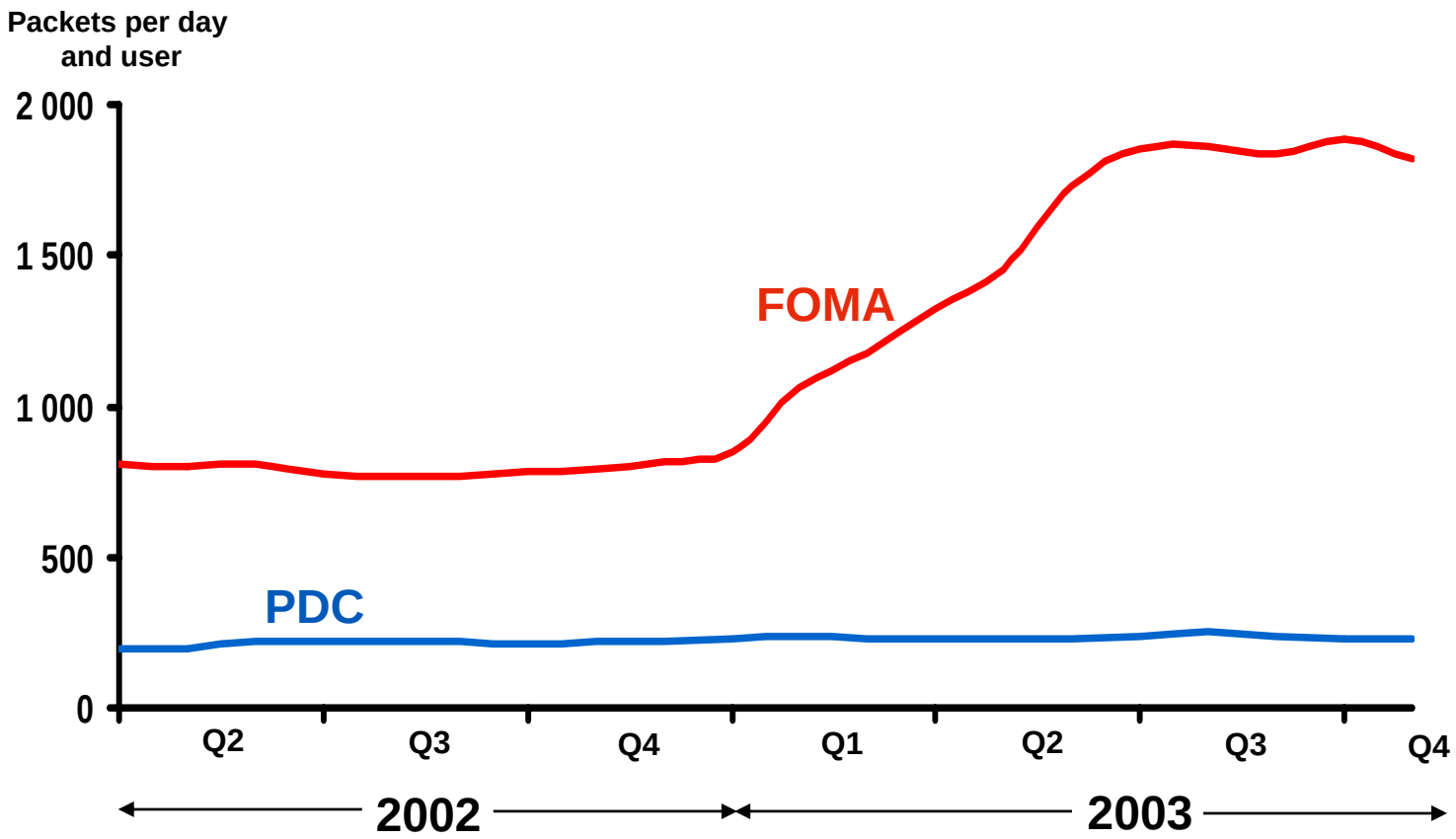
Frequent mobile net users have passed the barrier





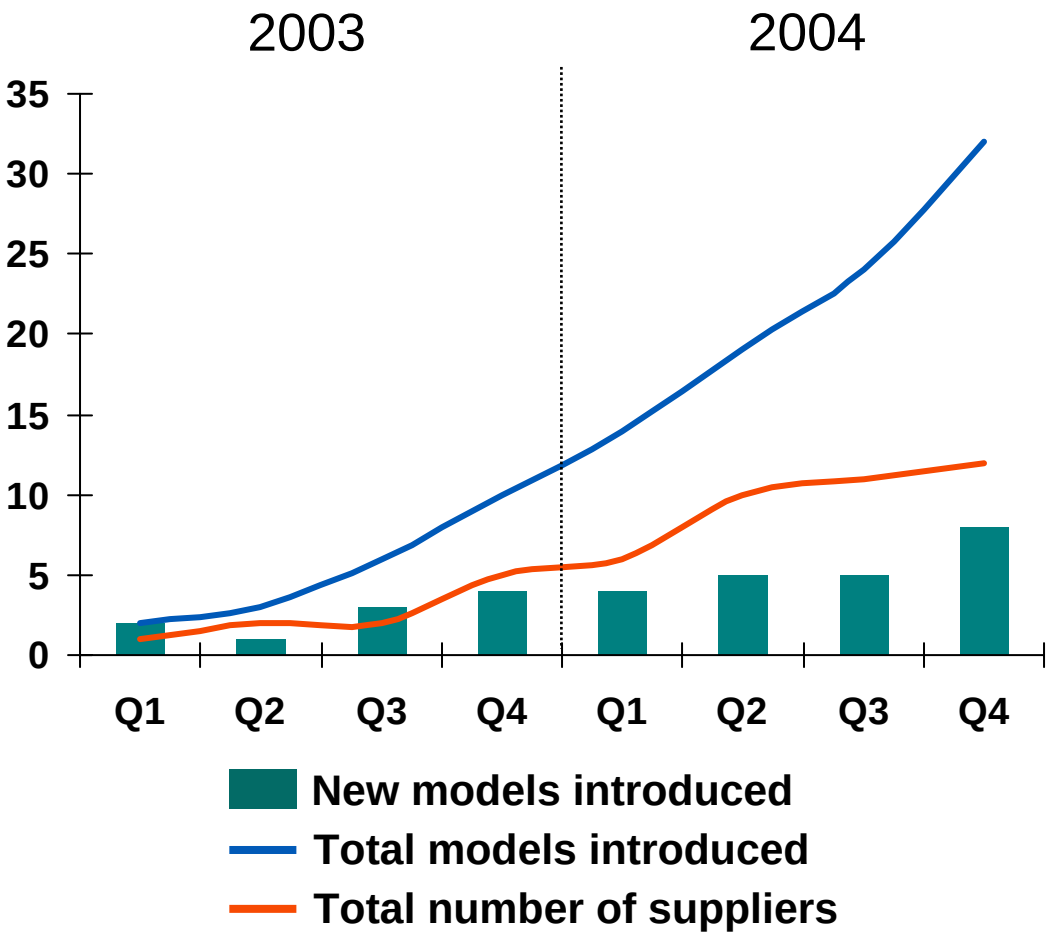
Source: Ericsson Consumer & Enterprise Lab 2003

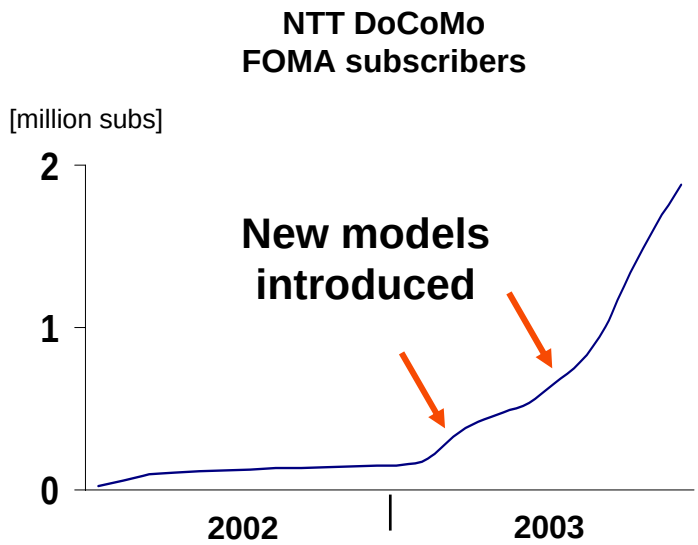
Data usage takes off with 3G



Source: NTT DoCoMo homepage

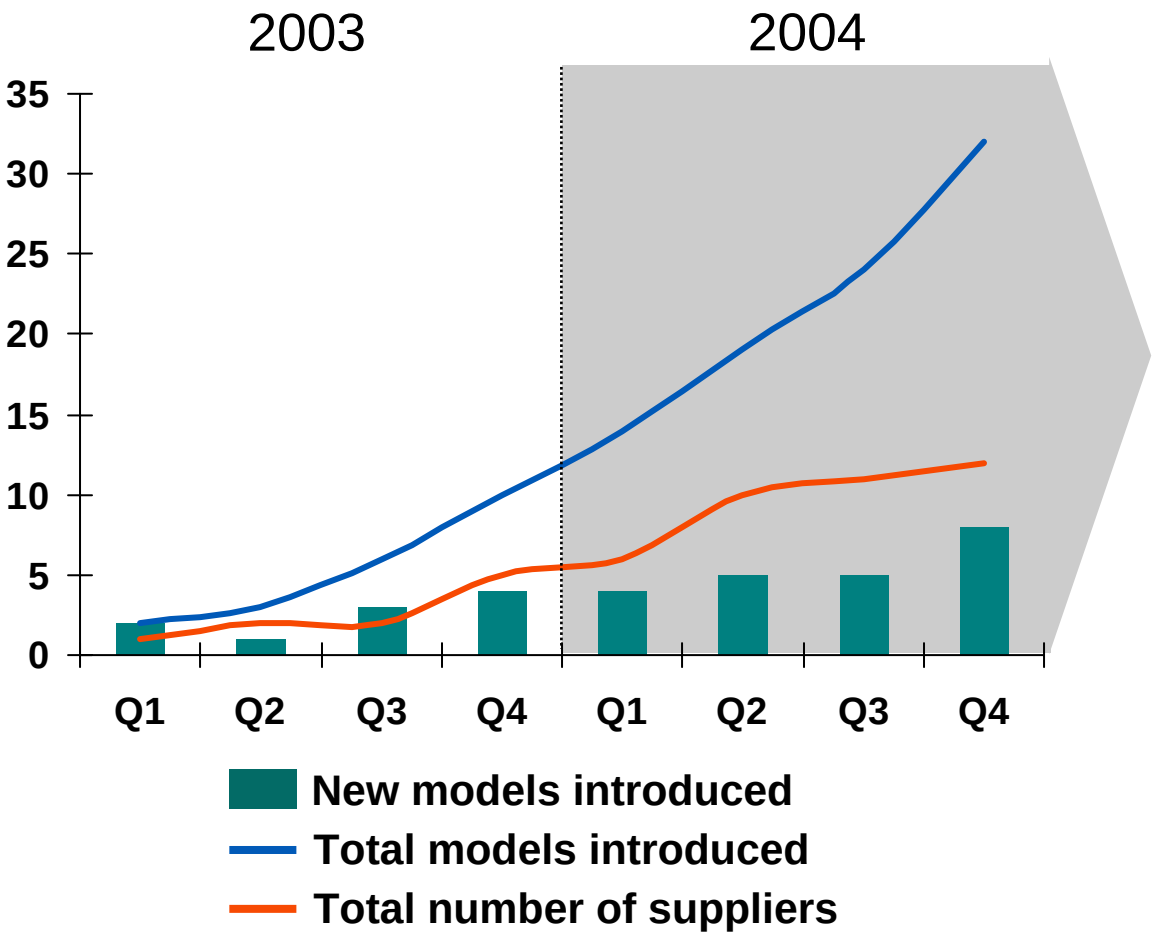
WCDMA terminal availability





Note: Chart excludes NTTDoCoMo FOMA terminals introduced in Japan

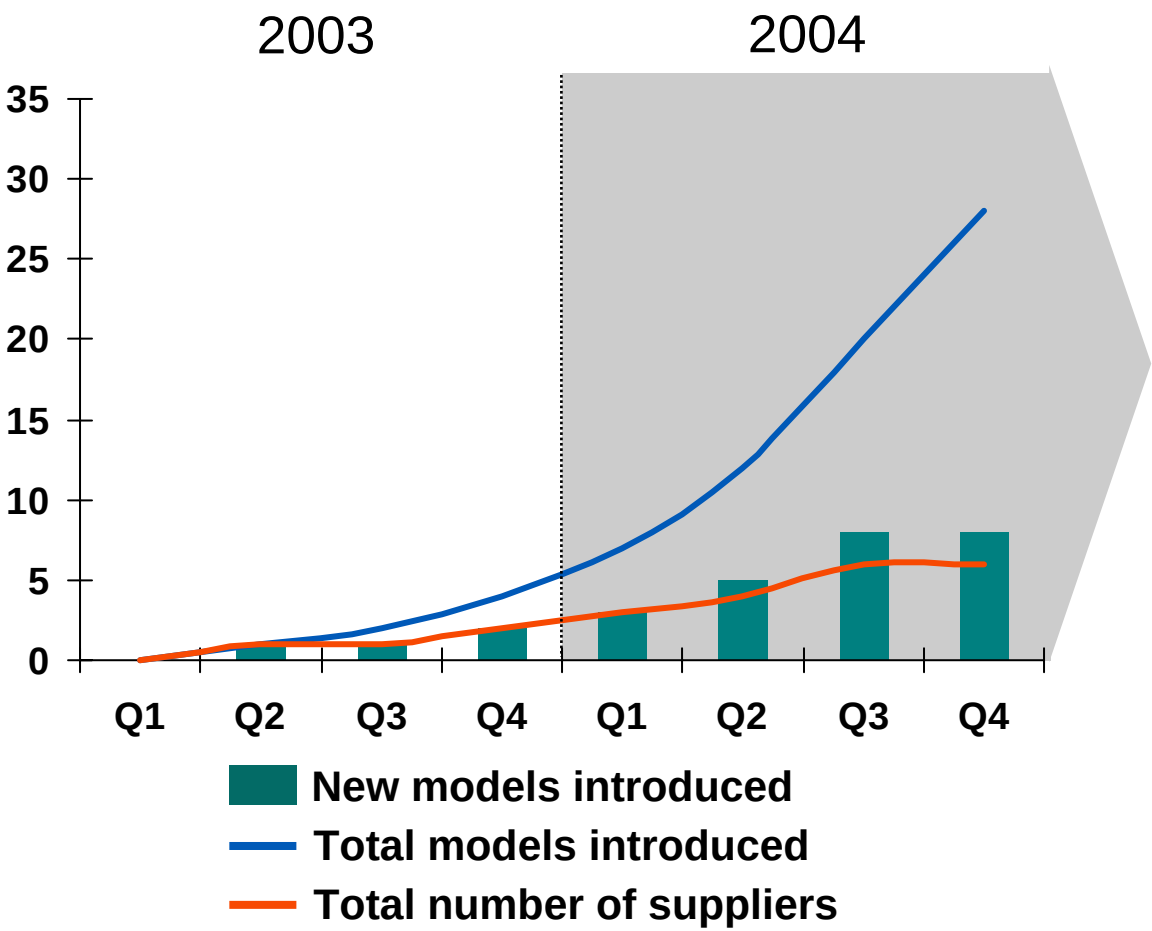
WCDMA terminal availability



- Color displays
- MegaPixel cameras
- Improved battery lifetime
- Positioning (A-GPS)
- External memory slots
- Smaller and smaller…

Note: Chart excludes NTTDoCoMo FOMA terminals introduced in Japan

EDGE terminal availability



- High-definition displays
- MegaPixel cameras
- Same battery life as GPRS
- Same size as GPRS
- External memory slots
- Low to high-tier models

Note: Includes terminals for all GSM frequencies

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Success factors for 3G take off

- Networks
- Terminals - applications
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EDGE & WCDMA takes off during 2004


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