



Aalto University
School of Electrical
Engineering

Mobile Handset Population in Finland 2005-2011

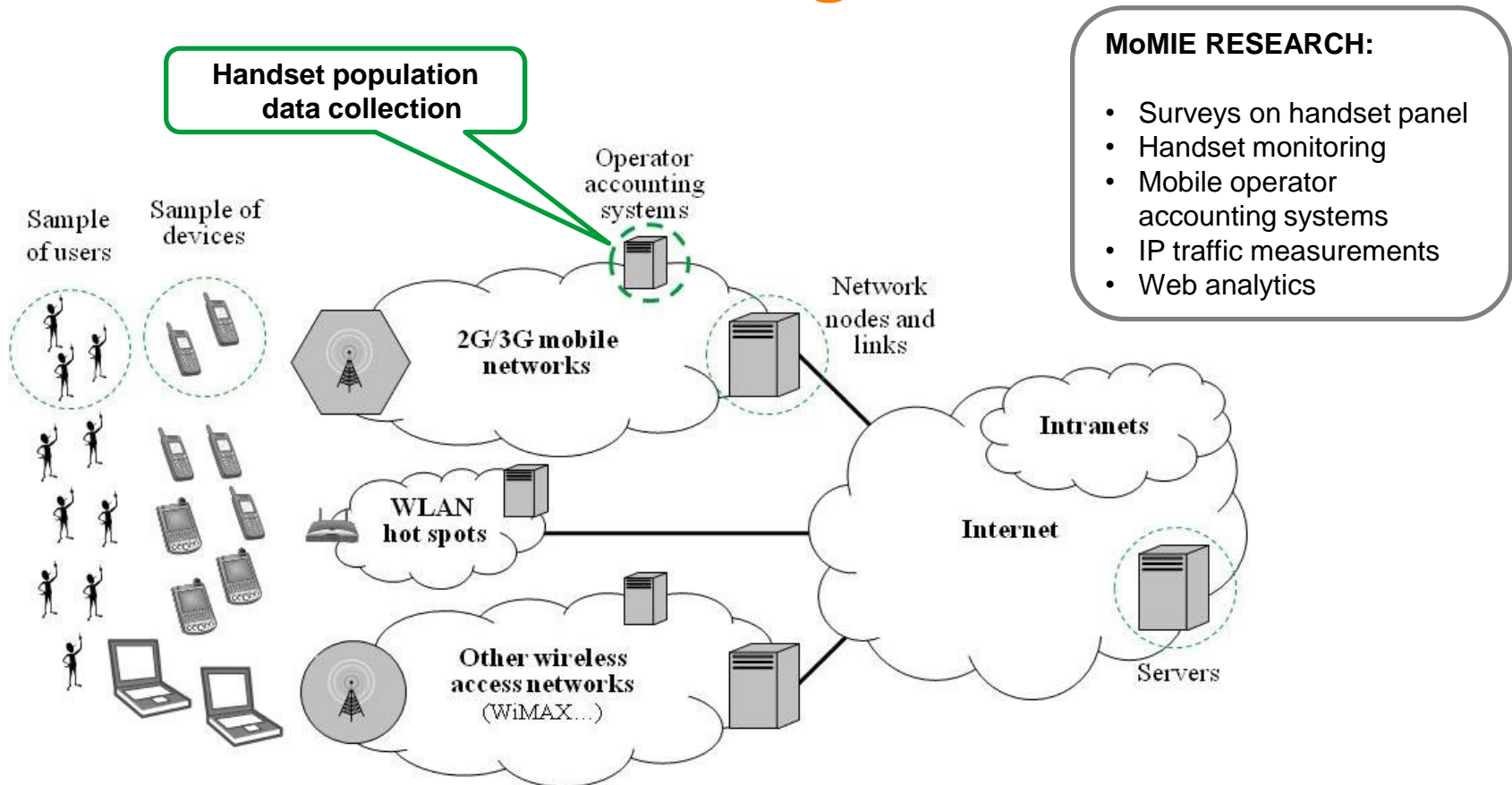
MoMIE project report

May 15th, 2012

Network Economics
Research Group

Antti Riikonen
Timo Smura

MoMIE project: Comprehensive view on mobile service usage



MoMIE RESEARCH:

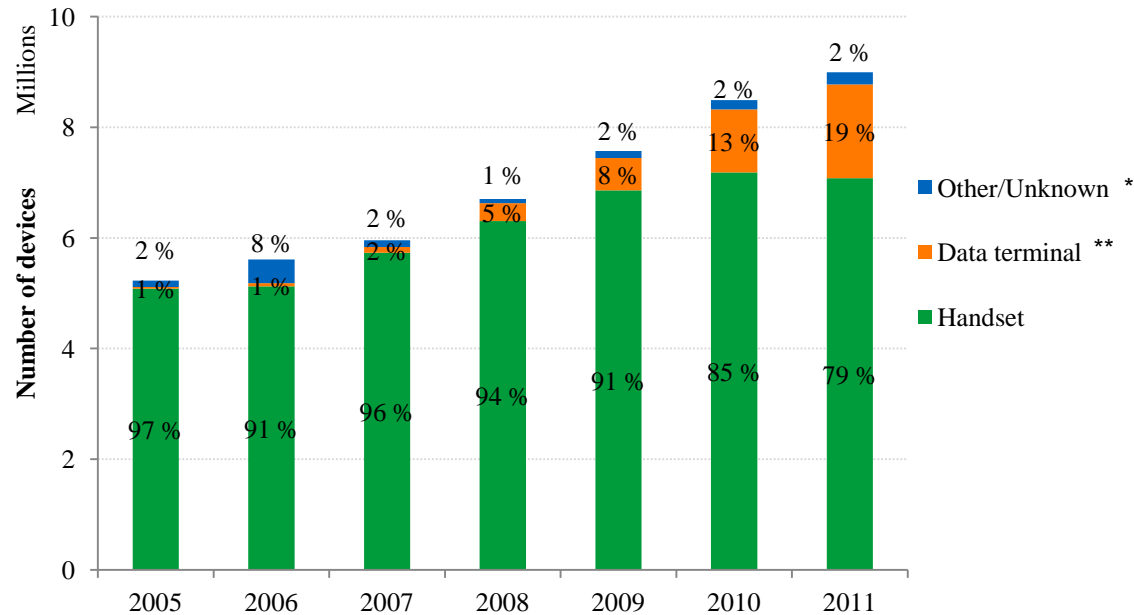
- Surveys on handset panel
- Handset monitoring
- Mobile operator accounting systems
- IP traffic measurements
- Web analytics

Source: Modified from Kivi, 2009

Data collection: handset population

- Mobile operators' accounting systems
 - Data from end of Q3, annually 2005–2011
 - Feature information: GfK and public sources
- Represents 80-99% of devices in use in Finnish mobile networks (~98% in 2011)
 - Data from DNA, Elisa, and TeliaSonera
 - Includes devices observed at operators' network
 - Some error due to
 - No full data on Apple iPhone from 2005-2010 >> available in 2011
 - Mobile subscriber churn during observation period
 - Differences in operator-specific data sets
 - Unidentified devices and missing feature-data of handset models

Growth in data terminals continues

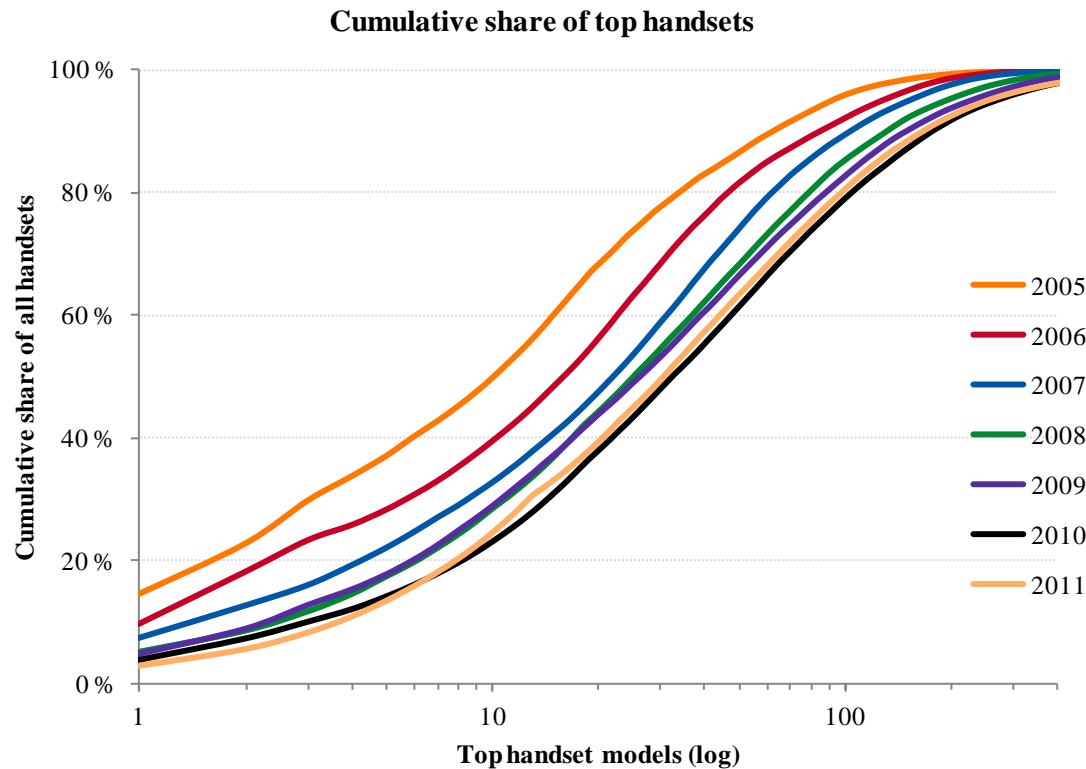


* Other device types (e.g. desktop phones) excluded from the rest of the analysis. Unknown devices included in estimation of error margins.

** USB modems, data cards, tablets, embedded data modules

- Size of the active device population depends on definition
 - Relative shares of handsets and data terminals based on MoMIE measurements
 - Here, active device population assumed to equal the total number of subscriptions in Finland, as reported by the operators in public
- USB modems major data terminal category
 - large scale introduction during fall 2007

Fragmentation of handset population



- Early signs of slowdown in fragmentation visible
 - Amount of available models has remained rather stable since 2008

- Cumulative share of
 - Top 1 model
 - 14% (2005)
 - 3% (2011)
 - Top 10 models
 - 50% (2005)
 - 24% (2011)

Top handset models in use in Finland

All mobile handsets:

Rank	Model name	Share of all handsets	Change from 2010	Packet data*
1	Nokia 2760	2,8%	→	Yes (2G)
2	Nokia 5230	2,7%	↑	Yes (3G)
3	Nokia 2730 Classic	2,7%	↑	Yes (3G)
4	Nokia 3720 Classic	2,6%	↑	Yes (2G)
5	Nokia 7230	2,6%	↑	Yes (3G)
6	Nokia 3120 Classic	2,4%	↓	Yes (3G)
7	Nokia 3710 Fold	2,3%	↑	Yes (3G)
8	Nokia 1100	2,2%	↓	No
9	Nokia C5-00	2,1%	↑	Yes (2G)
10	Nokia 2330 Classic	2,1%	→	Yes (2G)
11	Apple iPhone 4	2,1%	- **	Yes (3G)
12	Nokia C2-01	2,0%	↑	Yes (3G)
13	Nokia 2720 Fold	2,0%	↑	Yes (2G)
14	Samsung GT-S5230	1,3%	↑	Yes (2G)
15	Nokia E7-00	1,3%	↑	Yes (3G)

* All 2G devices have GPRS/EDGE capability,

all 3G devices have GPRS/EDGE/WCDMA capability

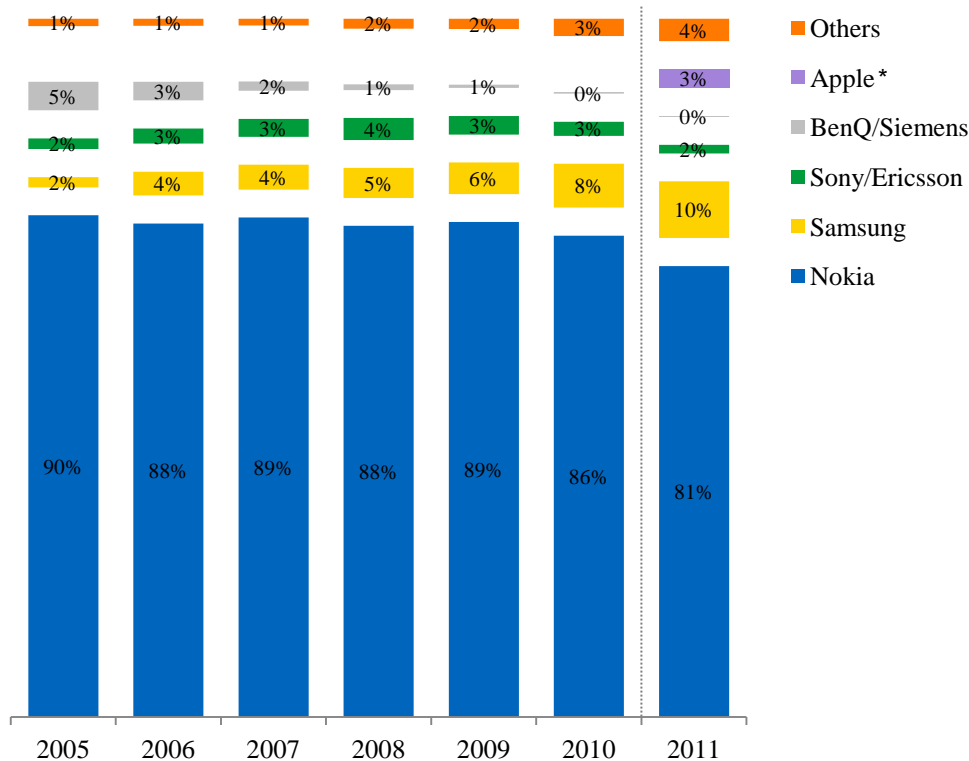
** No data on Apple iPhone in 2010

Smartphones:

Rank	Model name	Share of all handsets	Change from 2010
1 (2)	Nokia 5230	2,7%	↑
2 (9)	Nokia C5-00	2,1%	↑
3 (11)	Apple iPhone 4	2,1%	-
4 (15)	Nokia E7-00	1,3%	↑
5 (19)	Nokia E52	1,2%	↑
6 (21)	Nokia C7-00	1,2%	↑
7 (22)	Nokia N8-00	1,2%	↑
8 (25)	Apple iPhone 3GS	1,0%	-
9 (26)	Nokia C6-00	0,9%	↑
10 (27)	Nokia E75	0,9%	↓

Nokia dominates handset population

Mobile handsets by manufacturer 2005-2011

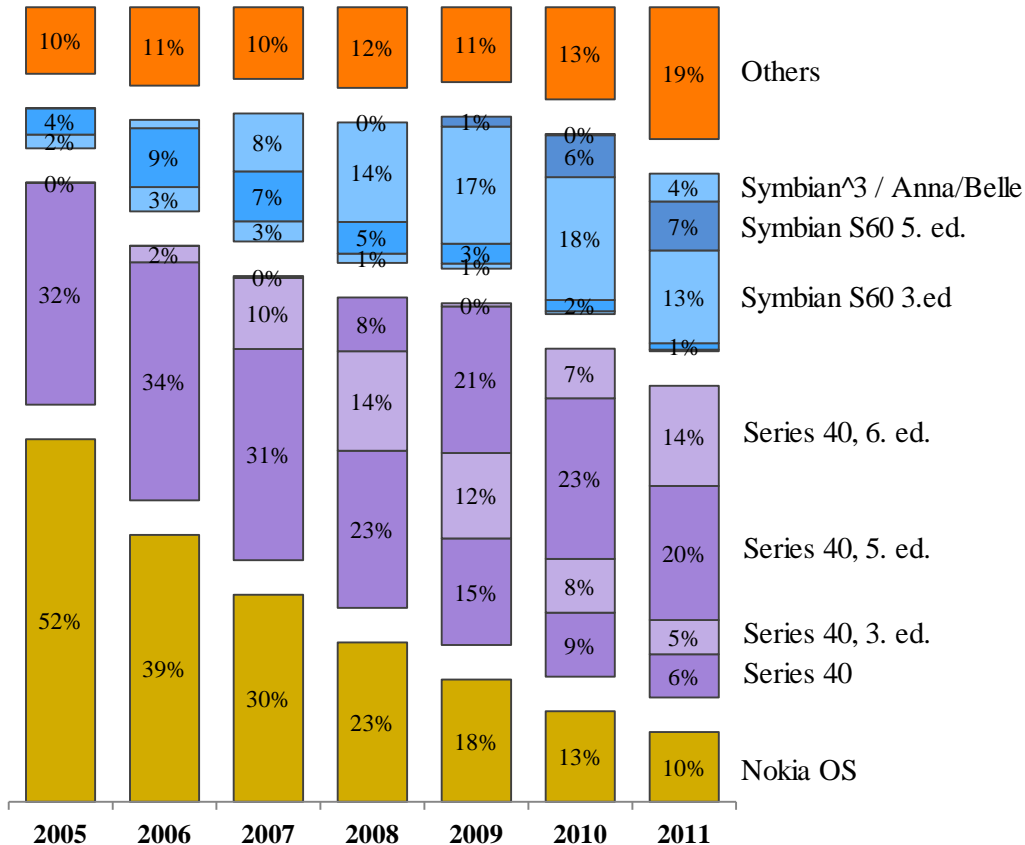


- Others
 - HTC 1%
 - ZTE 1%
- Samsung
 - Share growing
 - > 2/3 of Samsung devices with proprietary Samsung OS
- Nokia
 - Decrease of 5% points
 - Detailed analysis next

* No full data on Apple 2007-2010

No error margins available. Unidentified devices and unidentified manufacturers neglected from the analysis

Mobile handsets by operating system



- Others 2011:
 - Mobile phones 10%
 - Smartphones 9%
- Total shares 2011:
 - Symbian 26%
 - Series 40 45%

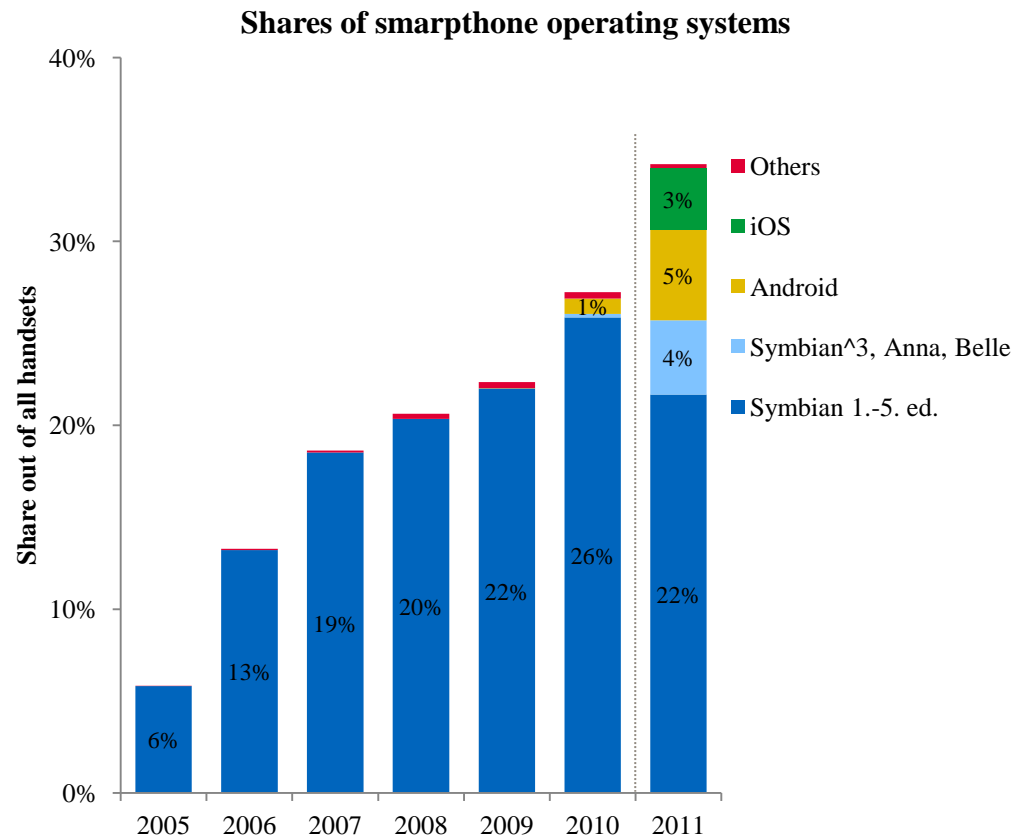
No error margins available. Unidentified devices and unidentified operating systems neglected from the analysis

Share of smartphones increasing

- Smartphone definition:
 - Possibility to install native applications
 - e.g. Symbian, iOS, Android, Windows Phone, Maemo, MeeGo
- Share of smartphones from 6% ('05) to 33% ('11)
 - Smartphone share in sales ~56% in September 2011

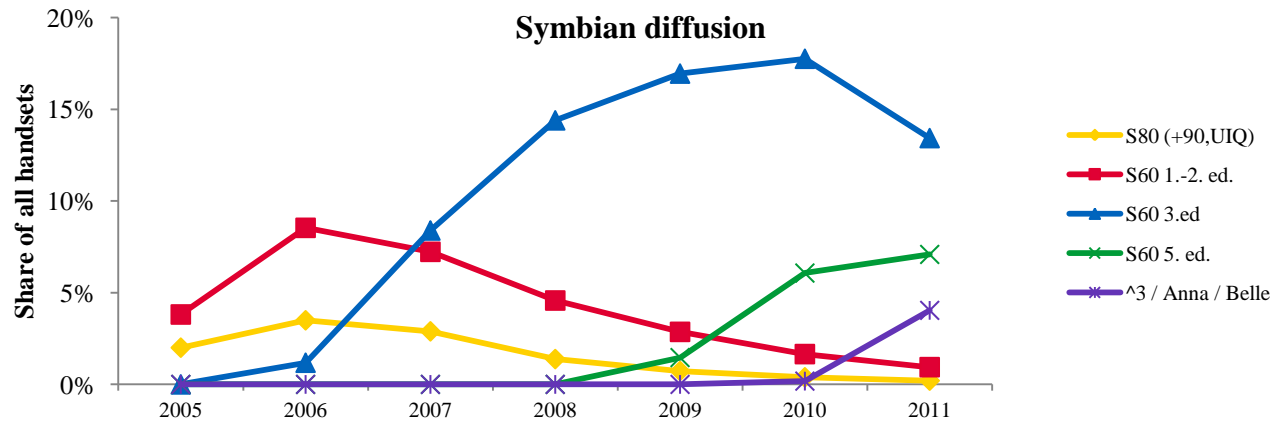
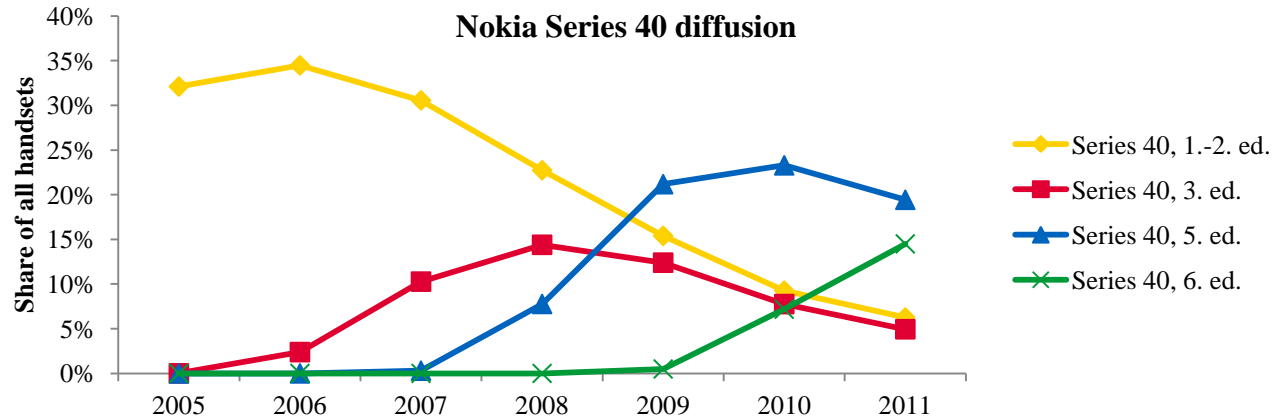
Note:

- No data on iOS from 2007-2010
- Nokia Windows Phone not yet available in Finland during 2011



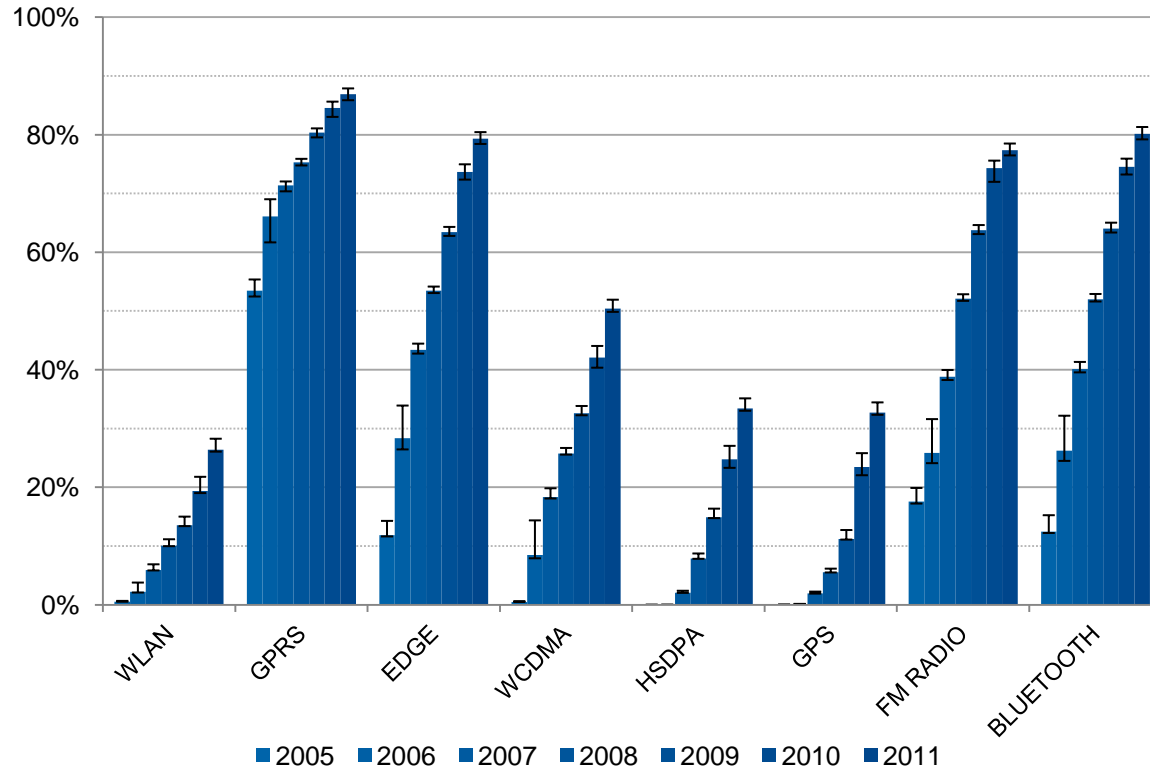
No error margins available. Unidentified devices and unidentified operating systems neglected from the analysis

Nokia Series 40 and Symbian diffusion: Substitution between OS generations



Diffusion of radio interfaces stable

Penetration of handset features in Finland 2005-2011 (1)



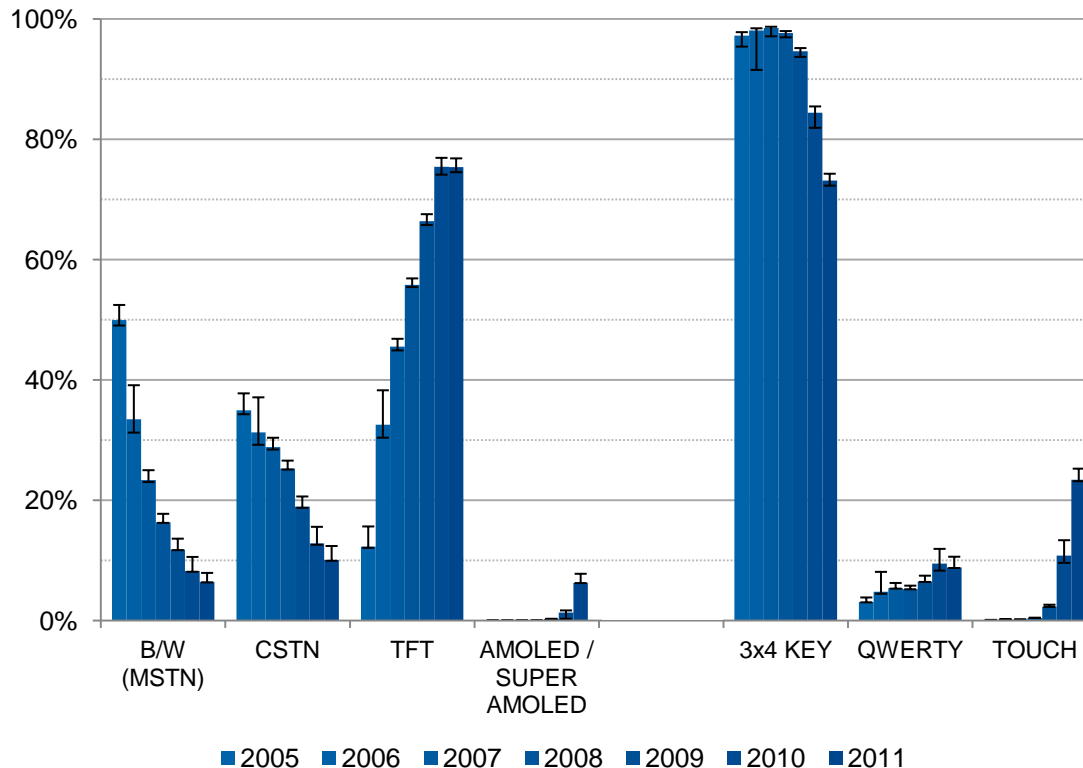
- Many features close to saturation
 - Low-end population limits penetration
 - Saturation level for FM radio?
- Some features spreading fast
 - Inclusion to mid-range?

N = 4-6.5 Millions

Upper and lower error margins presented with $\bar{\pm}$

Display technologies and input methods

Penetration of handset features in Finland 2005-2011 (2)



N = 4-6.5 Millions

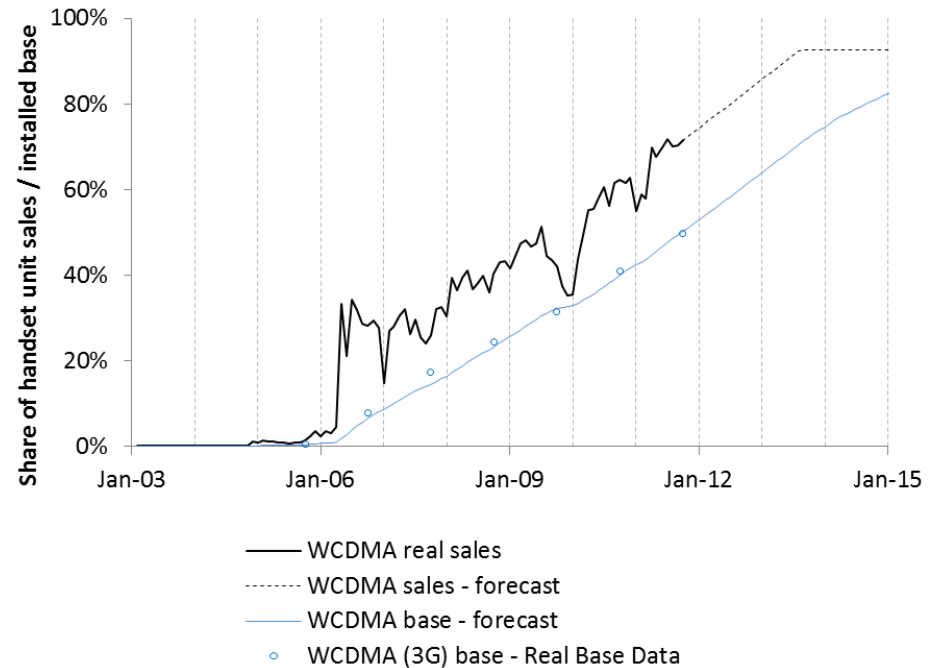
- Diffusion of TFT slowed down
 - Competition between high-end TFT and AMOLED displays
- Touch screen diffusing fast
 - One of the fastest growing features ever
 - Also in comparison to QWERTY

3x4 KEY = numeric keypad
 QWERTY = QWERTY keyboard
 TOUCH = Touch screen

Forecasting feature diffusion: Logic

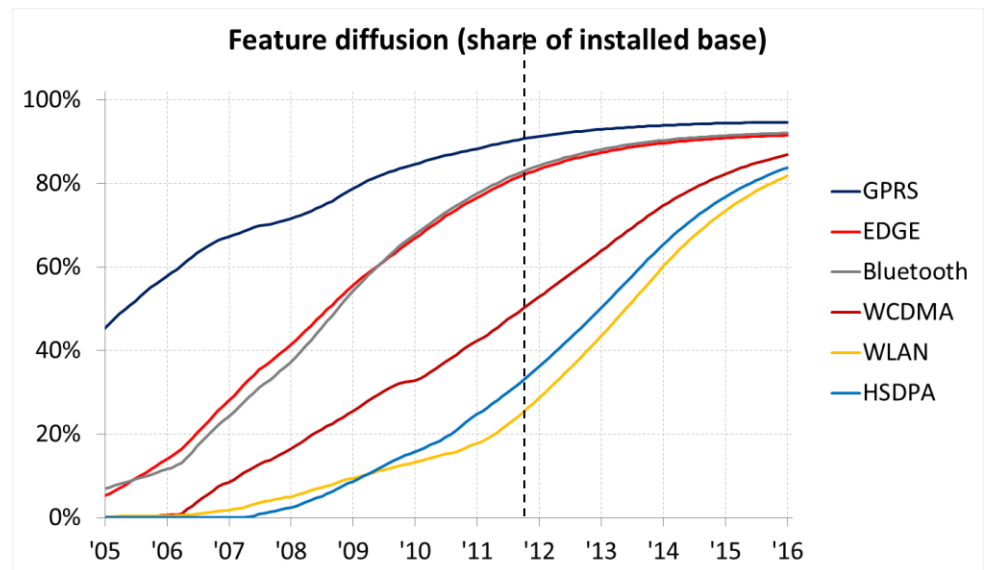
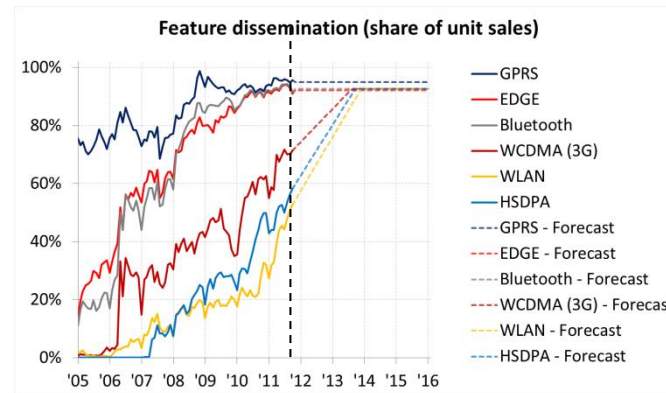
Combination of handset sales and installed base data

- Mobile handset sales data from GfK
 - Used to calculate the share of features in sales
- Unit replacement parameters calculated using sales and installed base data
- Forecast made for share of features in future sales
- Model calculates the share of features in base



Forecasting feature diffusion: First results

- Forecasts of feature shares in sales based on expert opinion
- Features diffuse in bundles
 - Certain features found together in feature phones, other features in smartphones
- Diffusion of features relatively slow
 - WCDMA will reach 80% penetration in three years, WLAN in four



Conclusions

- Typical handset manufactured by Nokia (81%)
 - Other manufacturers begun to gain market share
- Smartphones (33%) and advanced features spread fast
 - With increasing share of handsets possible to consume advanced services & content
 - Touch screen diffusing fast, substituting numeric keypad
- Forecasts predict stable growth of key features

Further information



- Contact:
 - Antti Riikonen, researcher
 - Timo Smura, project manager
 - [firstname.lastname \(at\) aalto.fi](mailto:firstname.lastname@aalto.fi)
- MoMIE project:
 - Modeling of Mobile Internet Ecosystem
 - <http://momie.comnet.aalto.fi/>