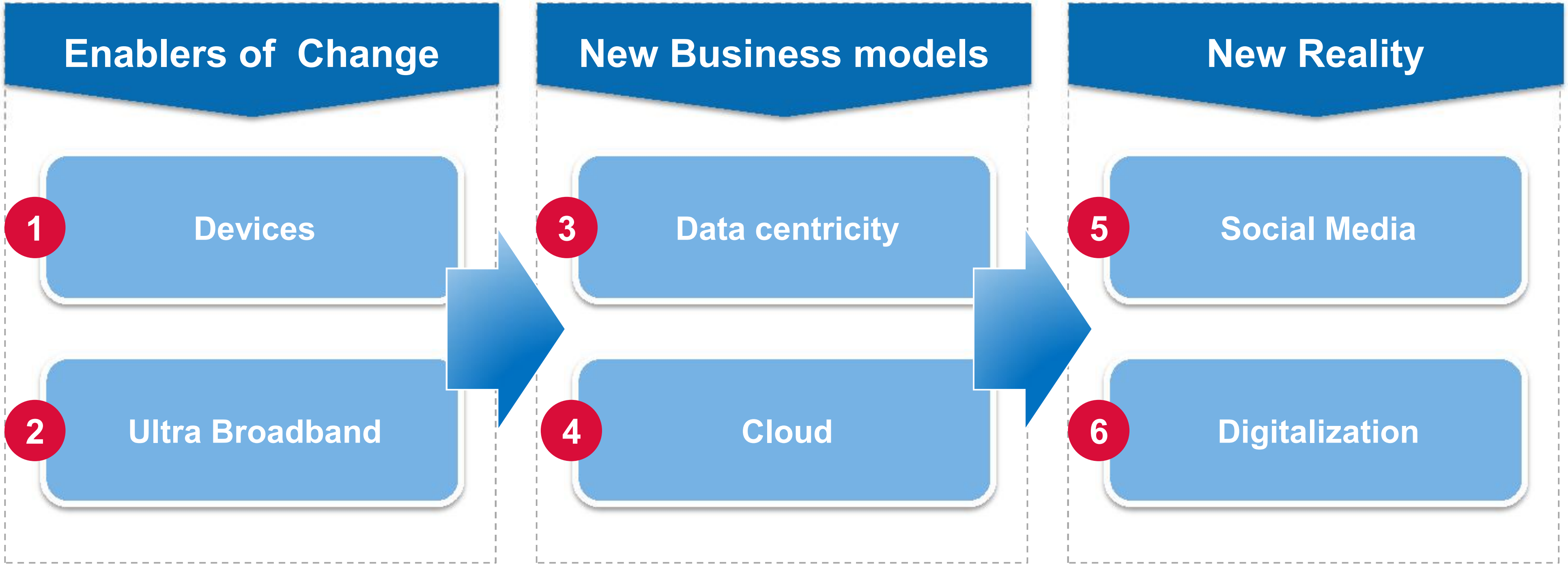
booz&co.

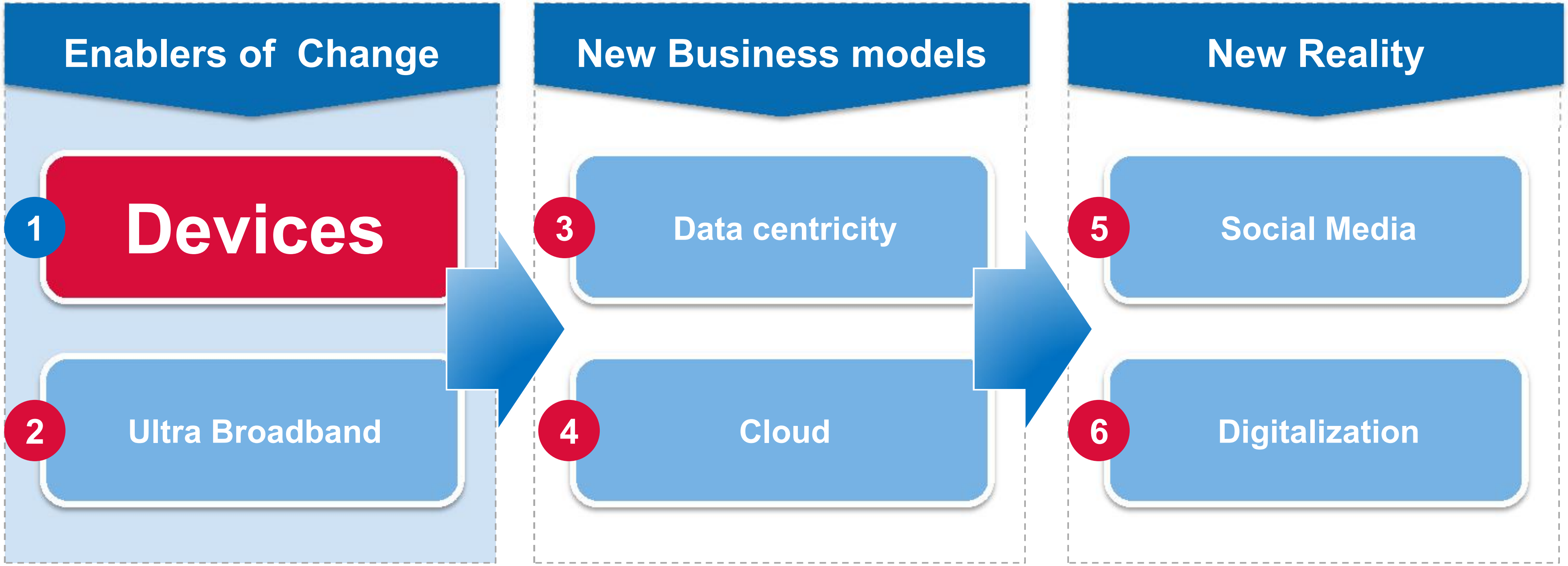
Booz & Company World Telecommunications Outlook 2012+

February 2012

In 2011 we have observed how certain Communication and Technology trends became a massive reality, opening a new world of opportunities...



... and thus forcing the ICT sector and other industries to rethink their future reality


Enablers of Change
New Business models
New Reality
1
Devices
2
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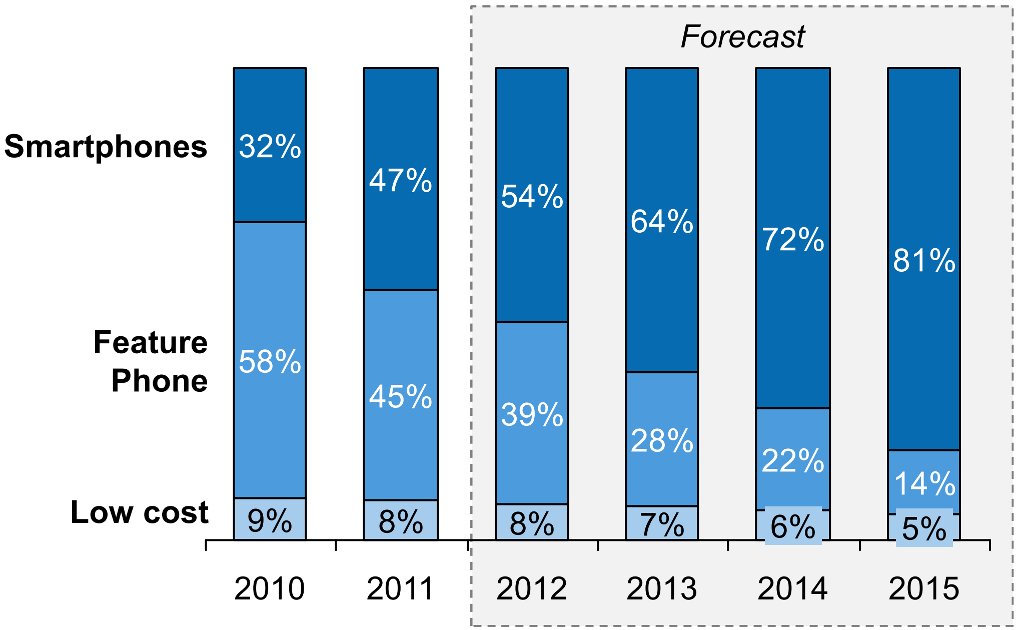
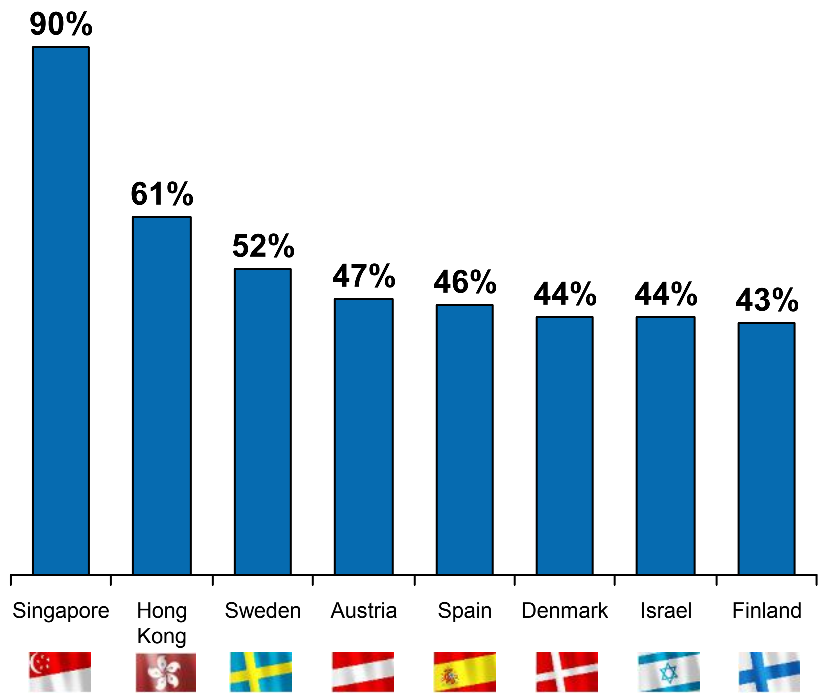
The mobile arena is undergoing a radical change of its handsets towards smartphones

Handsets sales mix
(Western Europe)



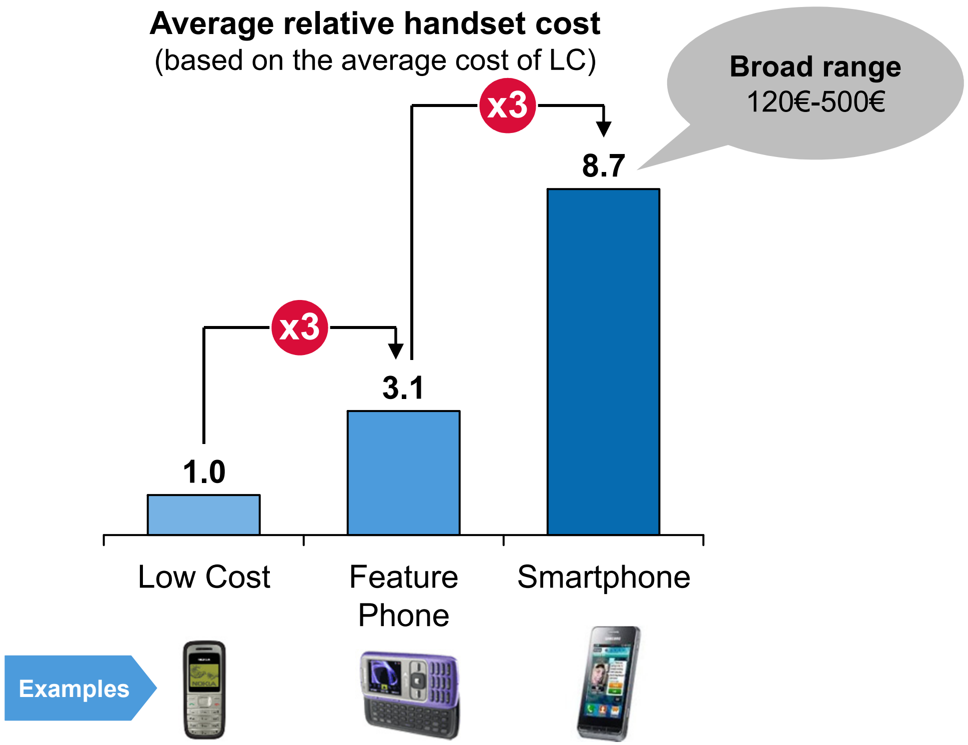
Smartphones per capita
(Dic '11)



Source: Pyramid Research Smartphone Forecast Pack 2Q11, Booz & Company analysis

The decrease on cost of smartphones has proven critical, however current subsidy policies are becoming non-sustainable

Commercial costs increase driven by Smartphone subsidies



Sprint losses hit $1.3 billon over iPhone costs

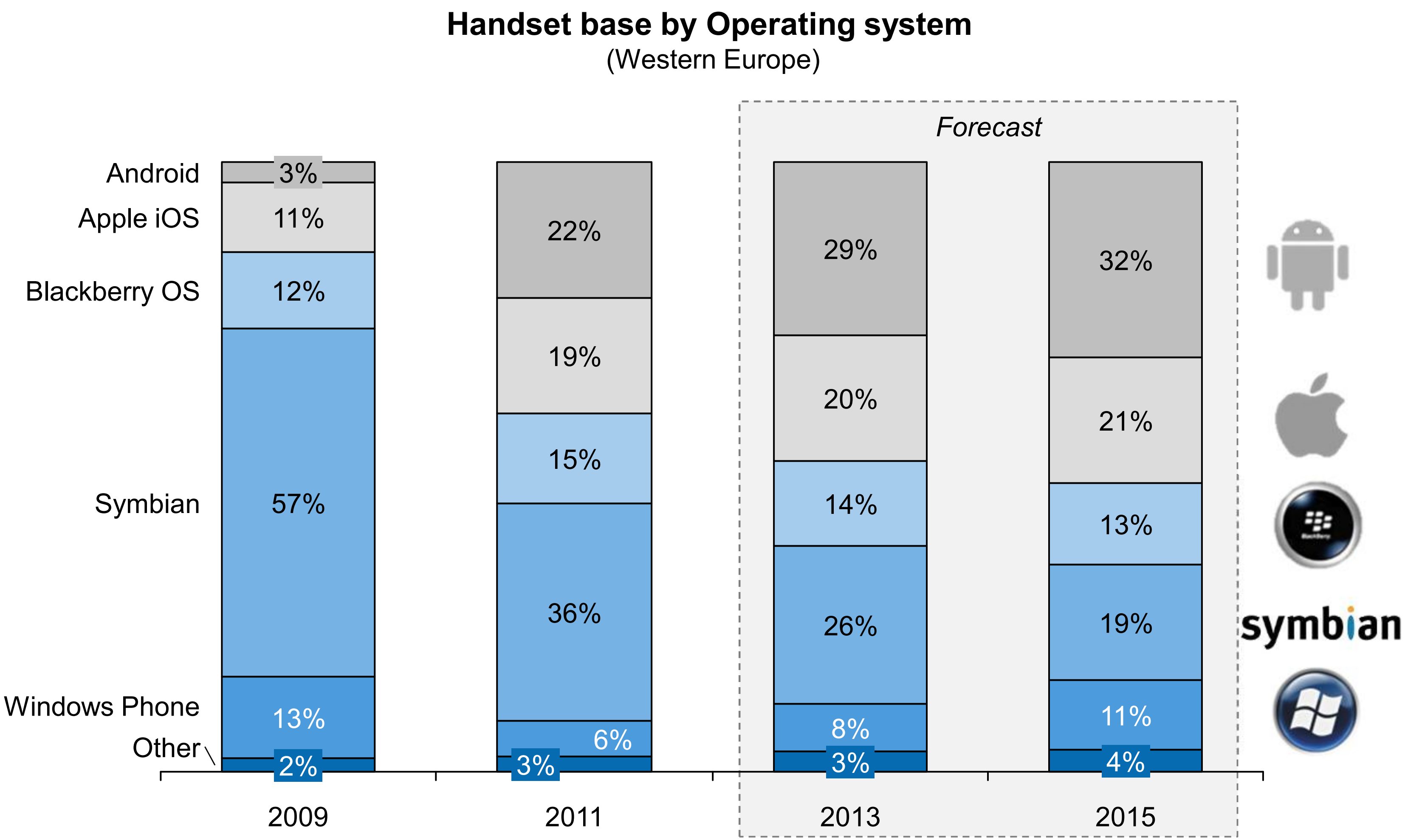
by [Matt Peckham](), [PCWorld]()

Sprint says it sold 1.8 million iPhones between October and December 2011, of which roughly 720,000 were new customers, but **the cost of subsidizing Apple's smartphone raised the company's losses to $1.3 billion** (43 cents a share), compared with $929 million (31 cents a share) year-on-year. The losses after excluding one-time costs were 35 cents a share—lower than the 38 cents analysts had forecast.

January 2012

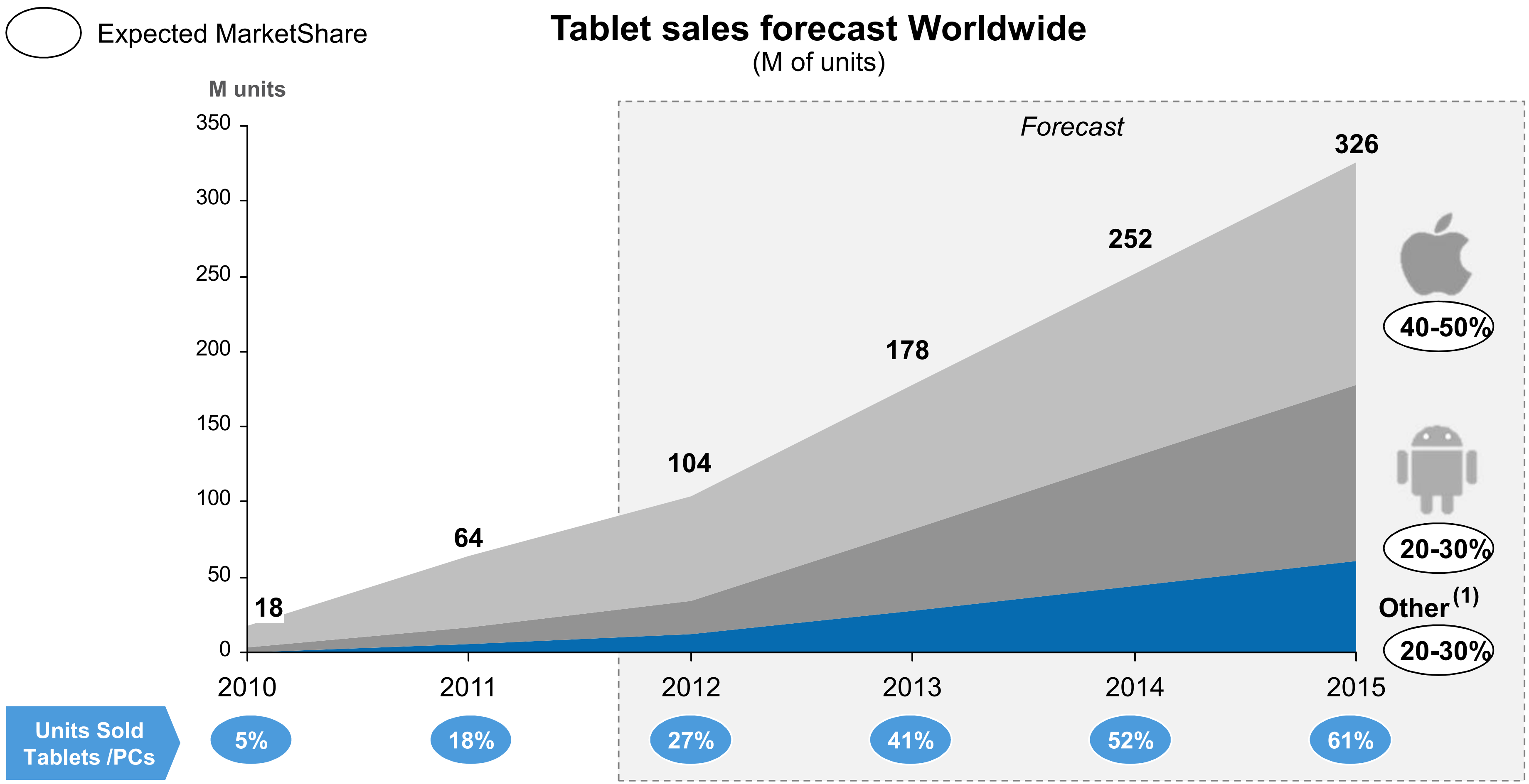
Source: KPN, JP Morgan, Pyramid Research Smartphone Forecast Pack 2Q11, Booz & Company Analysis
(1) Most common smartphones by sales – Western Europe

Among smartphones, Android will capture the biggest market share, while Apple stabilizes around its core customer segment



Source: Strategy Analytics 2011
Nota: Windows evolution remains a big question mark

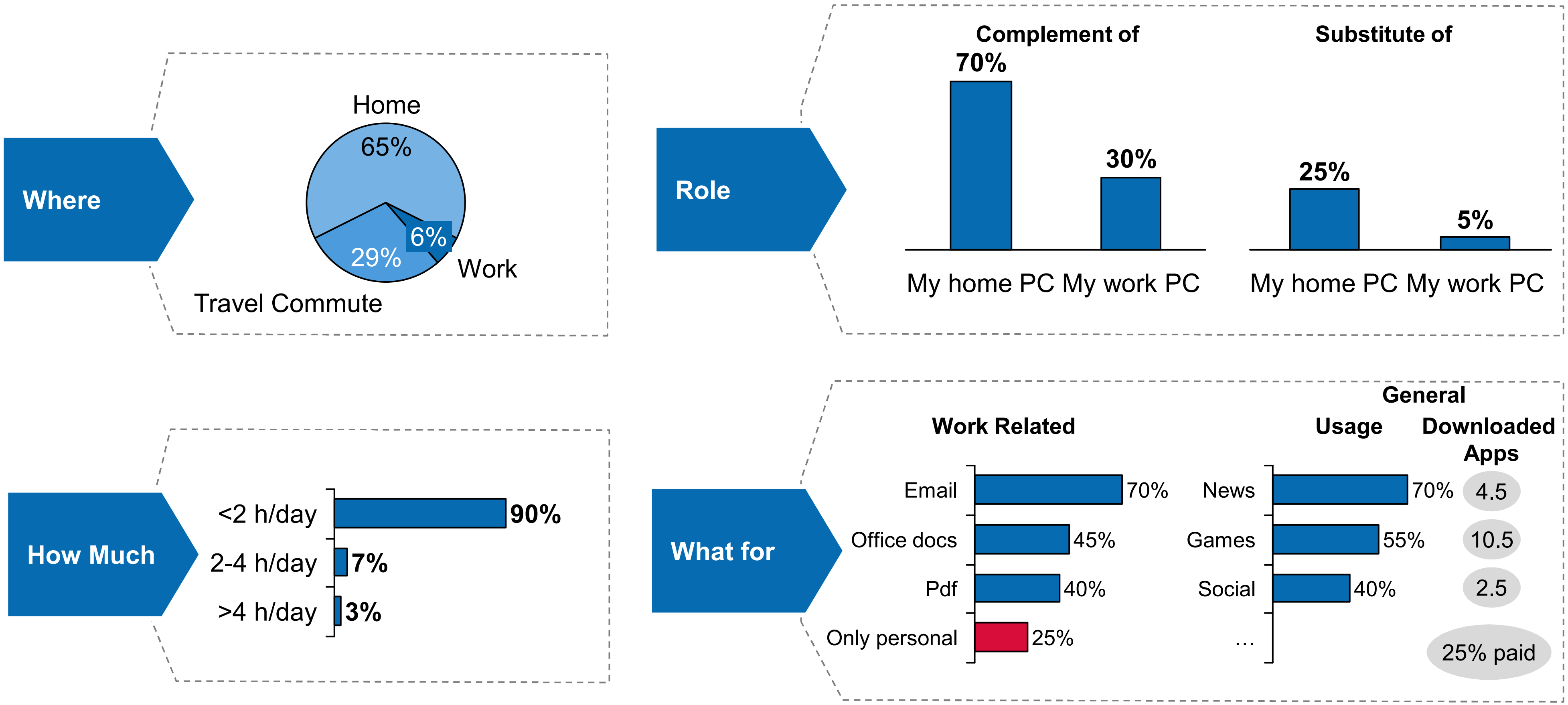
Tablet sales are expected to reach 252M units by 2014… half of PCs units expected to be sold that year



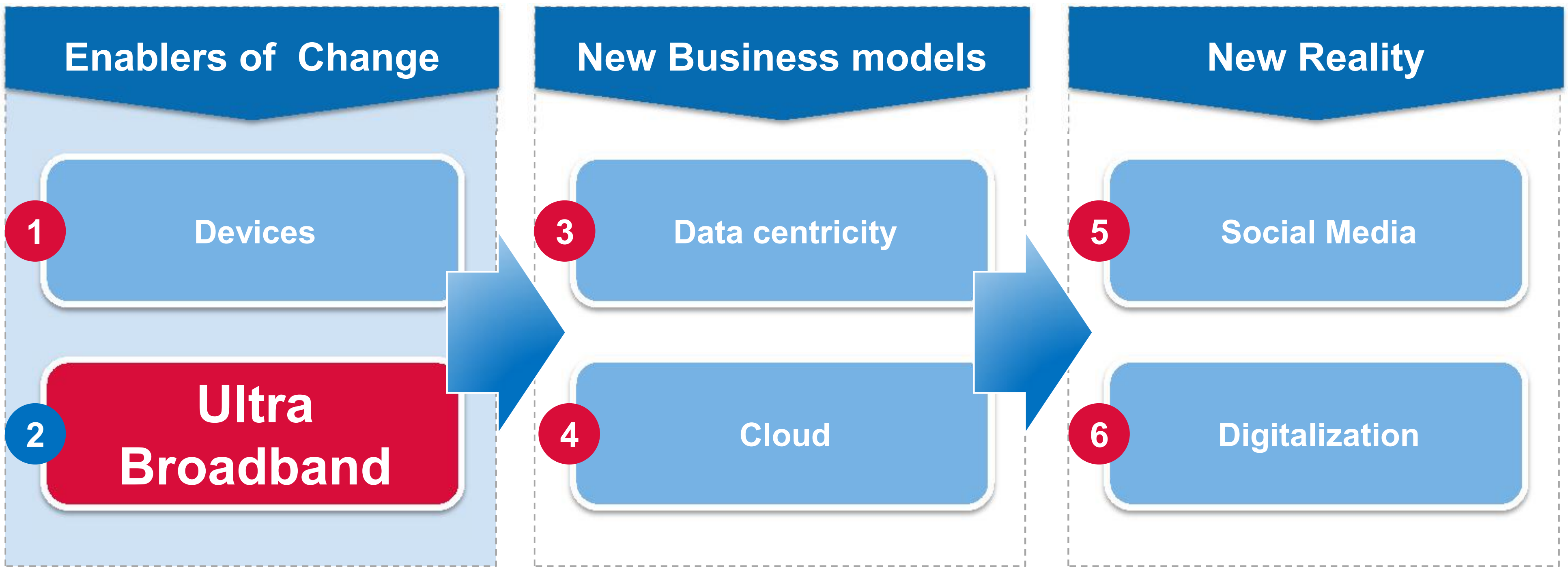
Source: Gartner
(1) Windows evolution remains a big question mark

Early adopters used it as a complement to the PC (at home for News and Games), but in H2 2011 already 75% use it for work

Tablet Use of early adopters (H1 2011)



Source: Booz & Company Survey. Jan 2011. 330 respondents worldwide, 35% US, 35% EU, 30% rest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Consumer behavior increases the bandwidth demand and thus adds pressure for the development of new networks

Consumer Needs / Required Bandwidth for each Need

Expected future increase of demand ↓

Needs	Size GB	1 mbps	10 mbps	30 mbps	100 mbps
Graphical website	0,001	4 sec ✗	<1 sec	<1 sec	<1 sec
Music track	0,01	40 sec ✗	4 sec	1 sec	<1 sec
Music album	0,10	13 min ✗	1 min	27 sec	8 sec
250 photos	2,00	4.5 hours ✗	27 min	9 min	2.5 min
DVD movie	4,50	10 hours ✗	1 hour ✗	20 min	6 min
1 hour of personal HD video	12	27 hours ✗	2.5 hours ✗	53 min ✗	16 min
HD movie	25	2.5 days ✗	4.5 hours ✗	1.5 hours ✗	27 min
Full online back-up	150	14 days ✗	1.5 days ✗	11 hours ✗	3.5 hours

Network that serves that bandwidth

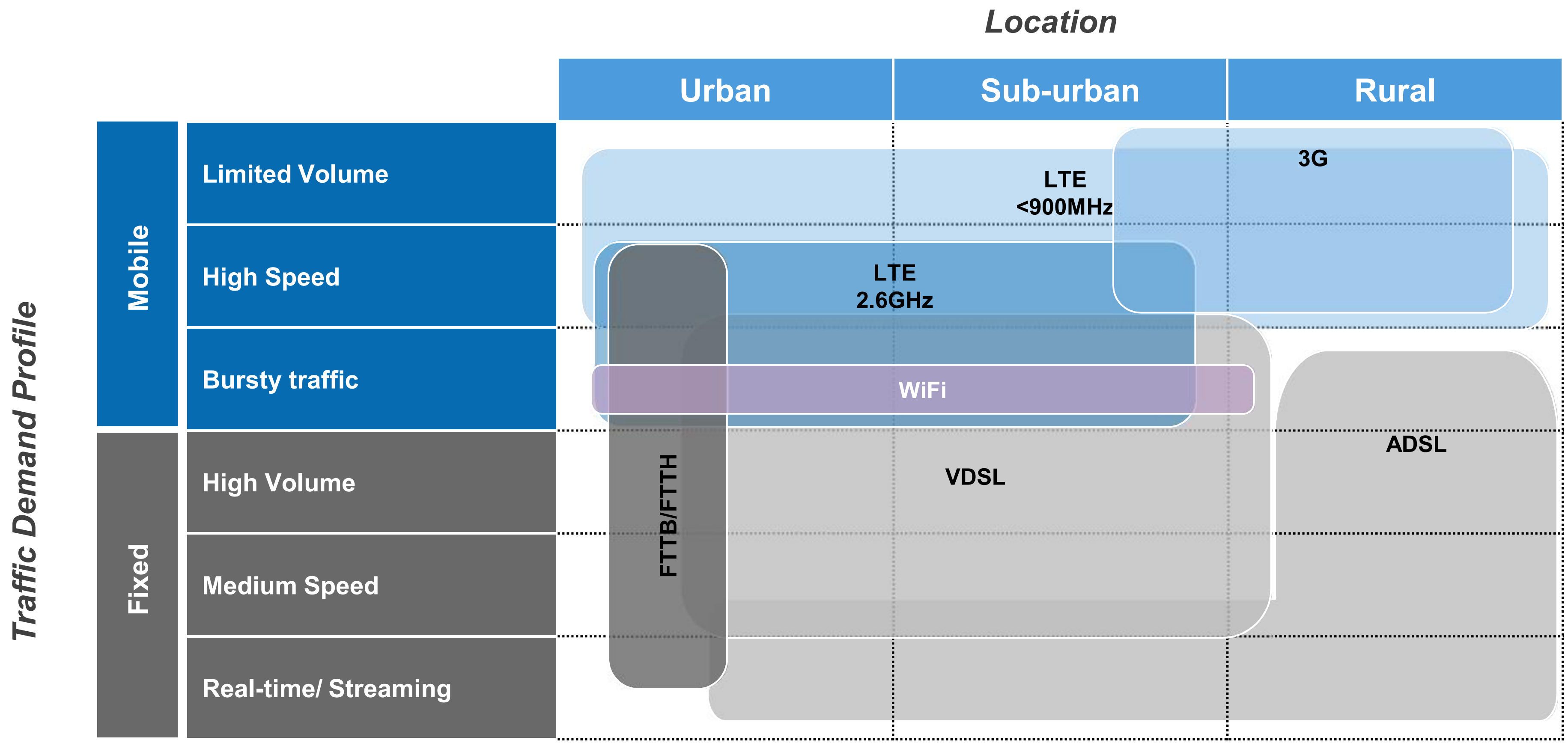
Mobile	3G UMTS	3.5G	4G LTE	4G+ LTE advanced
Fixed	xDSL: ADSL	xDSL: VDSL	Optic Fiber: FTTC / Cable	Optic Fiber: FTTB, FTTH

✗ Inacceptable by current standards

A mix of F&M Technologies will have to be deployed depending on their location and traffic profile

ILLUSTRATIVE

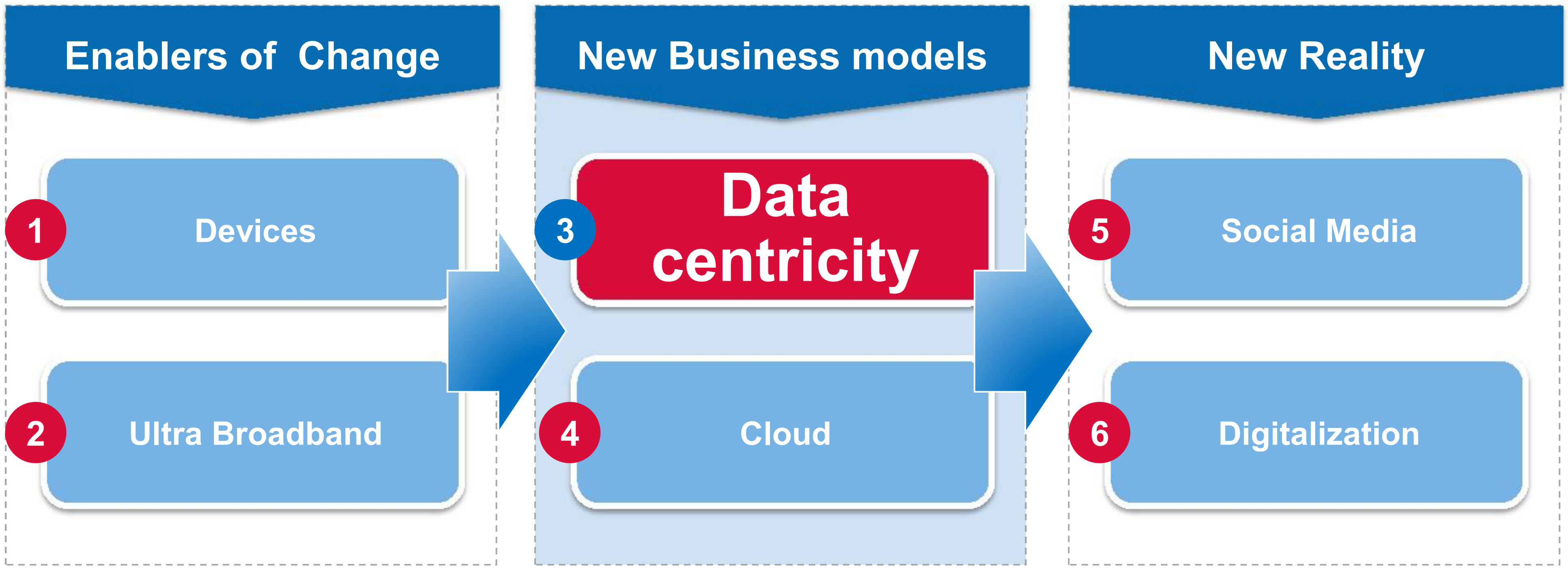
Potential Future Technology Deployment Map



However the development of the Ultra Broad Band infrastructure will depend on several factors

KSF for rapid development

FFTH (Fixed UBB infrastructure)	**LTE (Mobile UBB infrastructure)**
▪ Regulation towards investments ▪ Government moves/decisions ▪ Co-operation models – Depending on competitive and regulatory environment	▪ Regulation – Auction conditions and covenants ▪ Cooperation models – Depending on competitive and regulatory environment



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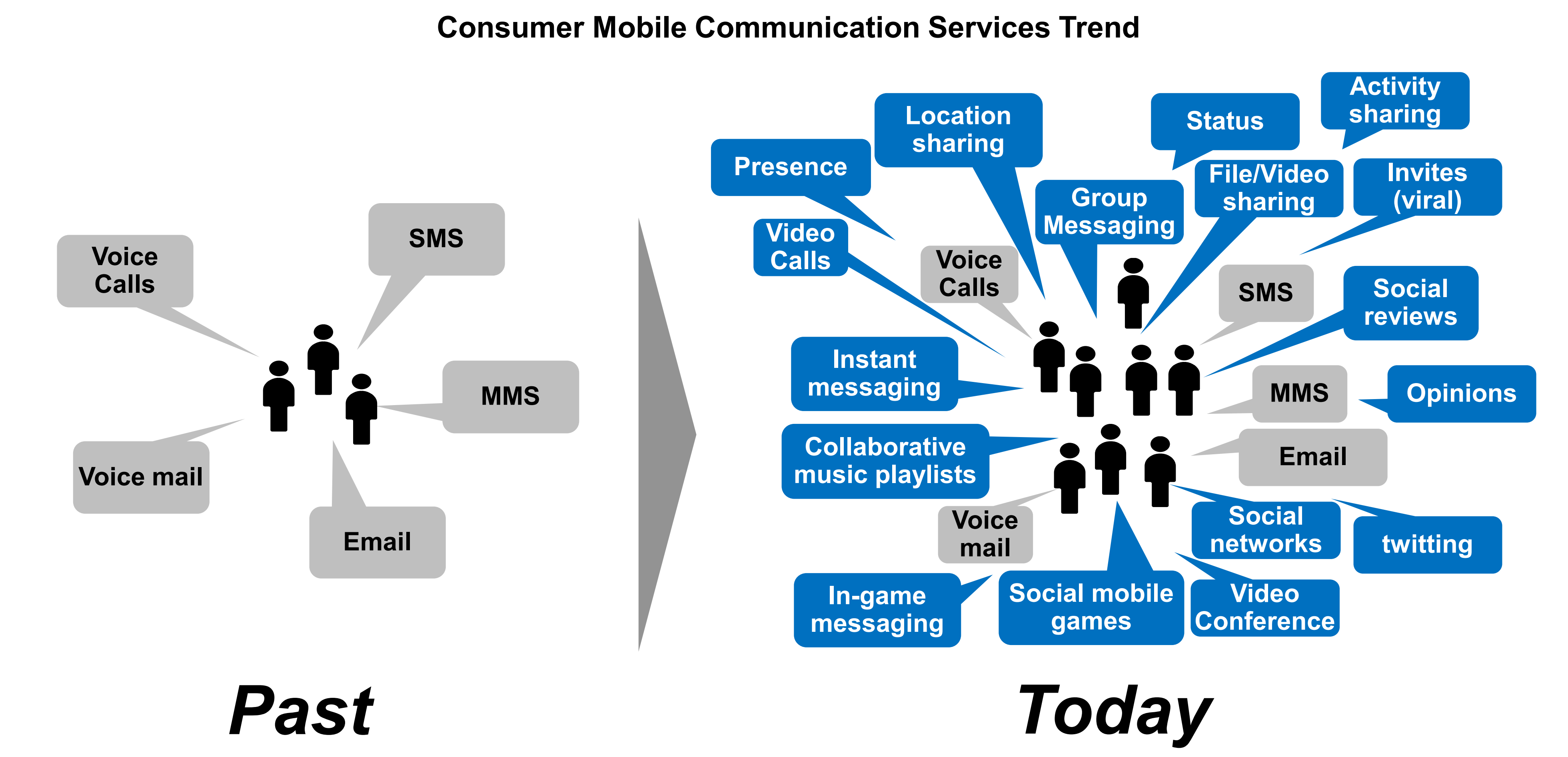
Consumers are demanding a wider range of communication services to engage with a larger group of contacts than in the past

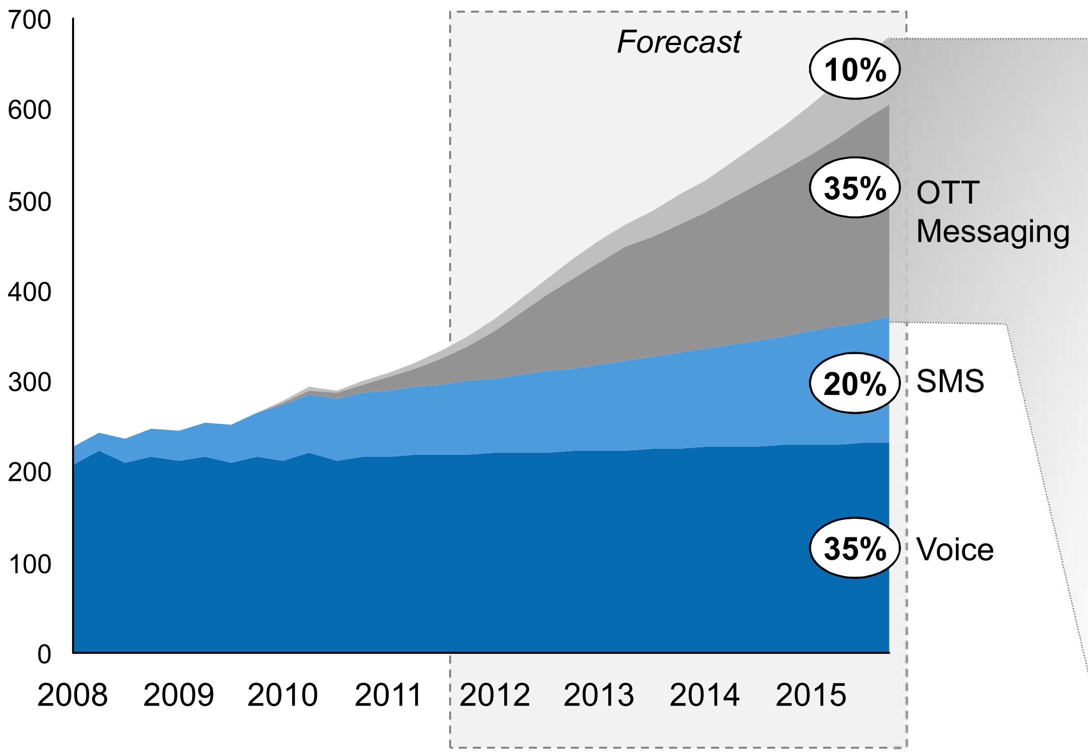


In the mid-term operators will experience Voice/SMS-to-data substitution to a much larger degree

HIGH LEVEL ESTIMATE

Forecast OTT impact in Usage

Mobile Communication Usage[1]
Minutes of use Nordic countries



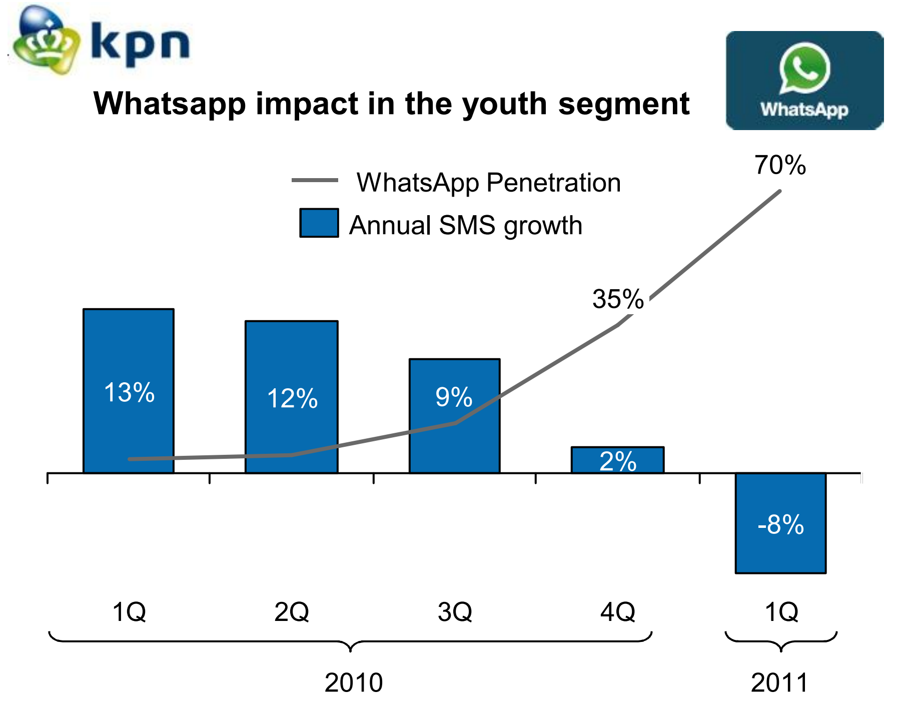
Selection of New Communication Service Apps
Voice, Messaging, Video

1) Messaging calculated in minutes of use based on average time usage per messaging type of service (including social media apps like FB, excluding usage for mobile internet surfing)
Source: Bofa/ ML wireless report Q12011, PTS, Booz & Company analysis

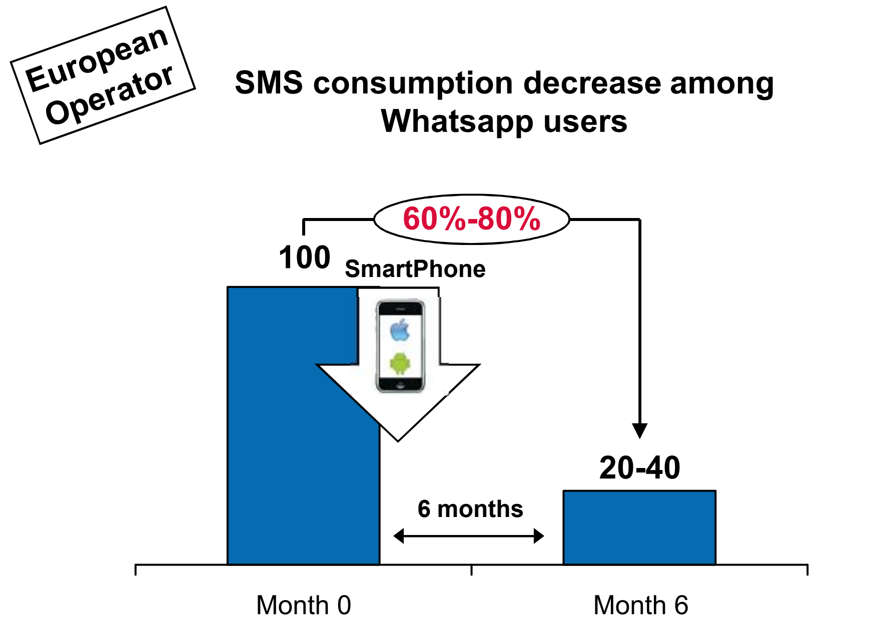
Today, this substitution is already a visible reality, which needs to be addressed by the Telcos

SMS revenues cannibalization by OTT services

SMS growth destruction by OTT services



Smartphone adoption impact on SMS revenues*



** Among What´sApp users*

Source: KPN, JP Morgan, Pyramid Research Smartphone Forecast Pack 2Q11, Análisis Booz&co

Telcos have to choose their strategic alternatives in meeting IP-based OTT communication services

Telco Operators Strategic Options

SIMPLIFIED

Value Chain Control

- "Go-to-it-alone"
- Partners with OTTs
- Pipe & Access Service Provider
- No Action

Launch own rich communication offerings

Examples

SK telecom	3	TELECOM Italia, Deutsche Telekom, Telefónica, orange, vodafone
HD Video Call Voice Blogging Video/File sharing	Roaming VoIP App	Rich Comm Serv-Europe Plattform

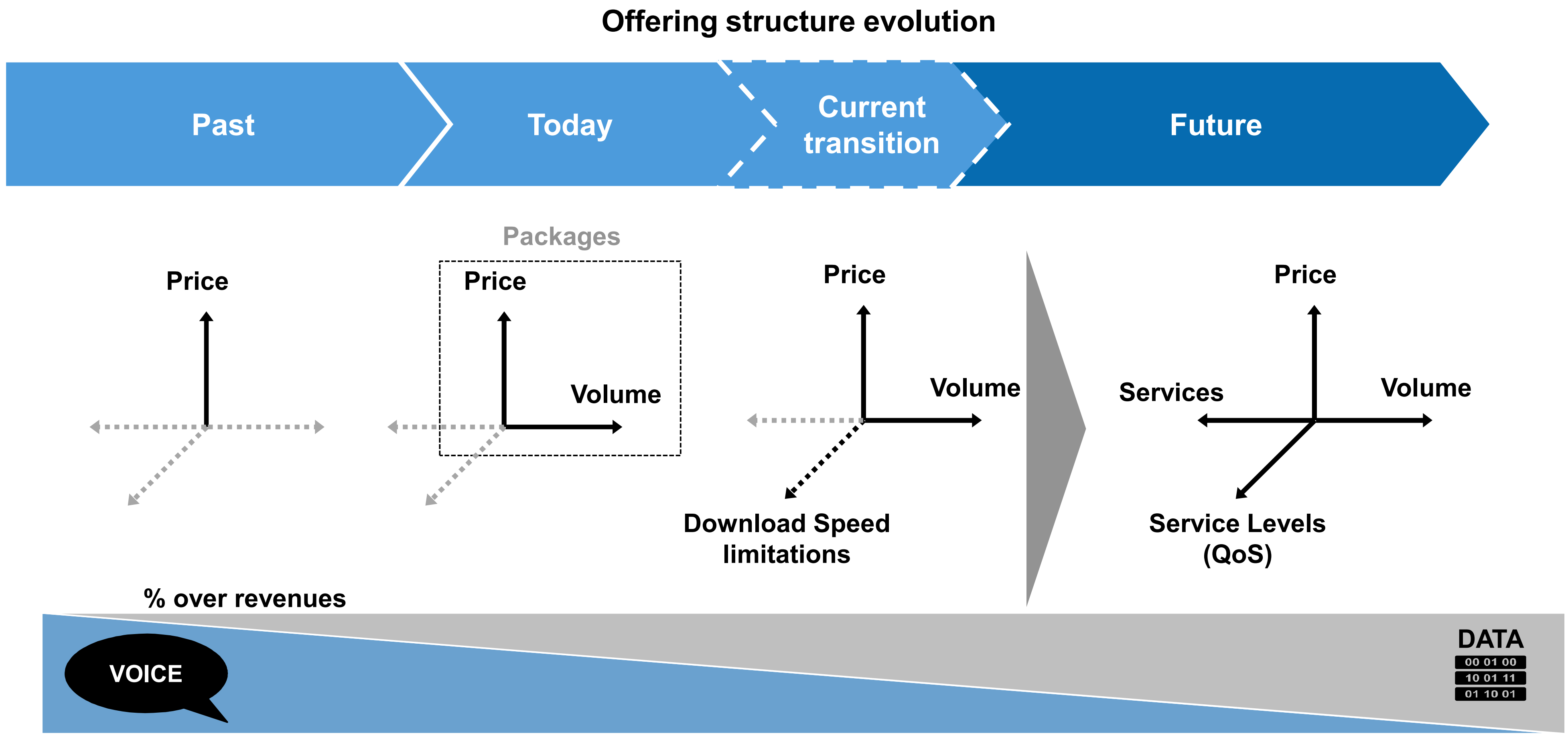
Leverage existing OTT functionality

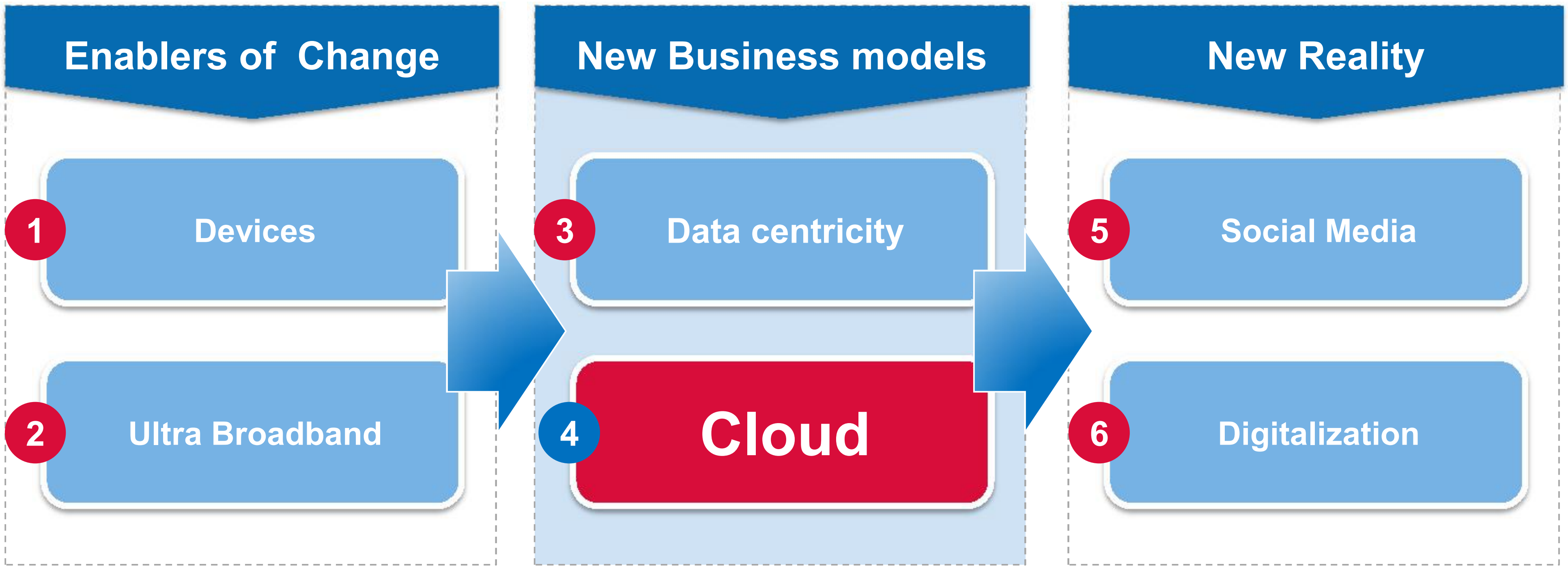
Examples

A1	3	verizon wireless	Telefónica	Sprint
+	+	+	+	+
fring	skype	skype	jajah	Google Voice Beta

2008 → 2011

Additionally, Telcos will have to redesign their offering structure to rebalance the revenues between voice and data provide angles of differentiation in data services





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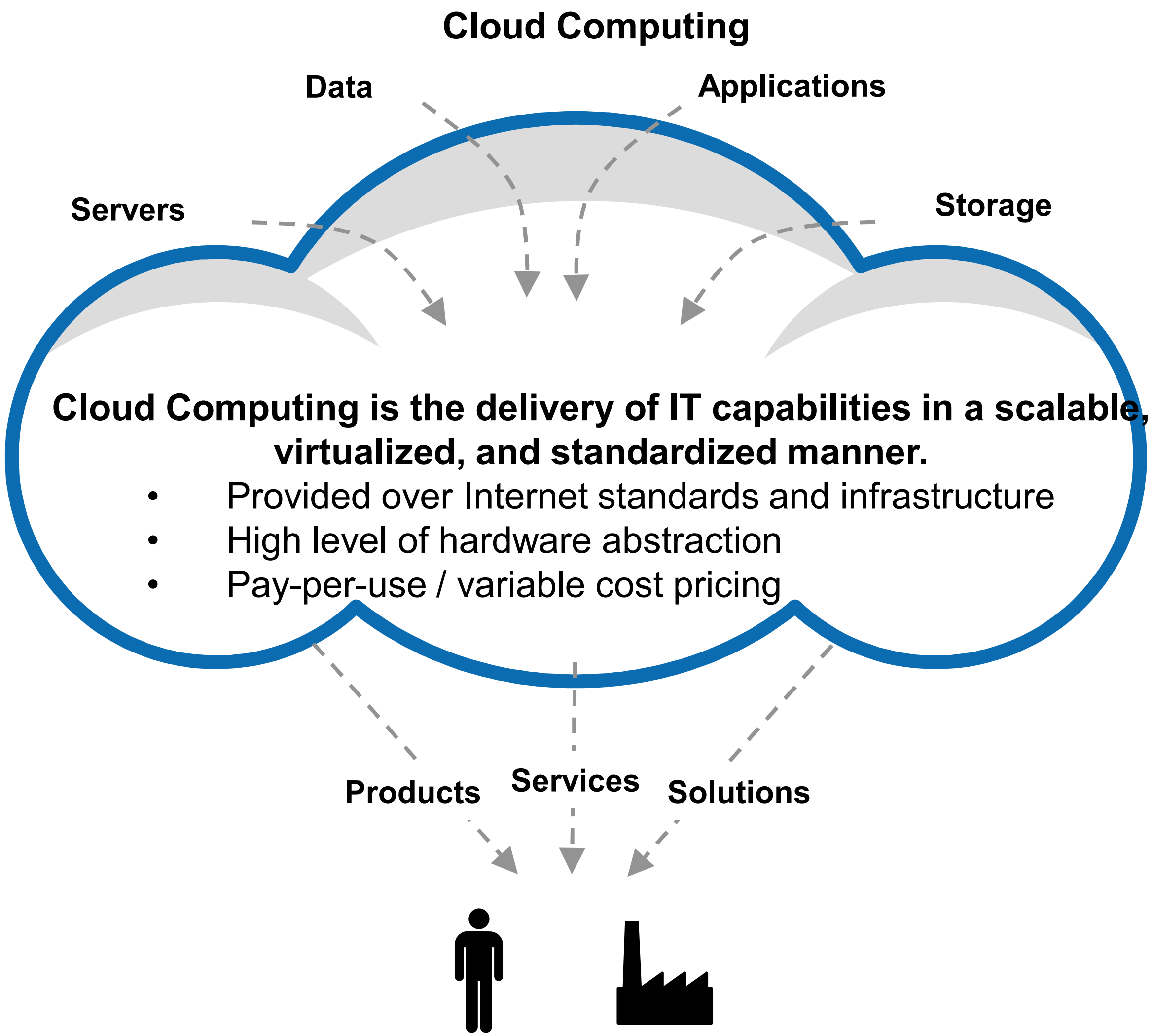
Cloud Computing is seen as next stage in the evolution of IT delivery: seamlessly scalable and standard in a virtual way



Source: Booz & Company analysis

Many services have emerged across the cloud 'stack' around the three areas which cover from just infrastructure to a full application

Cloud Service Stack

- Application
- Operating System / Middleware / API
- Automation Software
- CPU / Storage
- Network Connectivity

Standardization of Application
Synergies in Operation of Software

Infrastructure as a Service [IaaS]

Pure infrastructure

- Hosting
- Remote storage
- Back-up
- Network connectivity

Standard infrastructure to run own solution - purchase CPU, storage, memory as a service

Platform as a Service [PaaS]

Frameworks for applications

- Hosting
- Application engines
- Billing
- Universal Address Book
- API hosting

Integrated development platform offered as a service

Run software on standardized platforms

Software as a Service [SaaS]

Full application

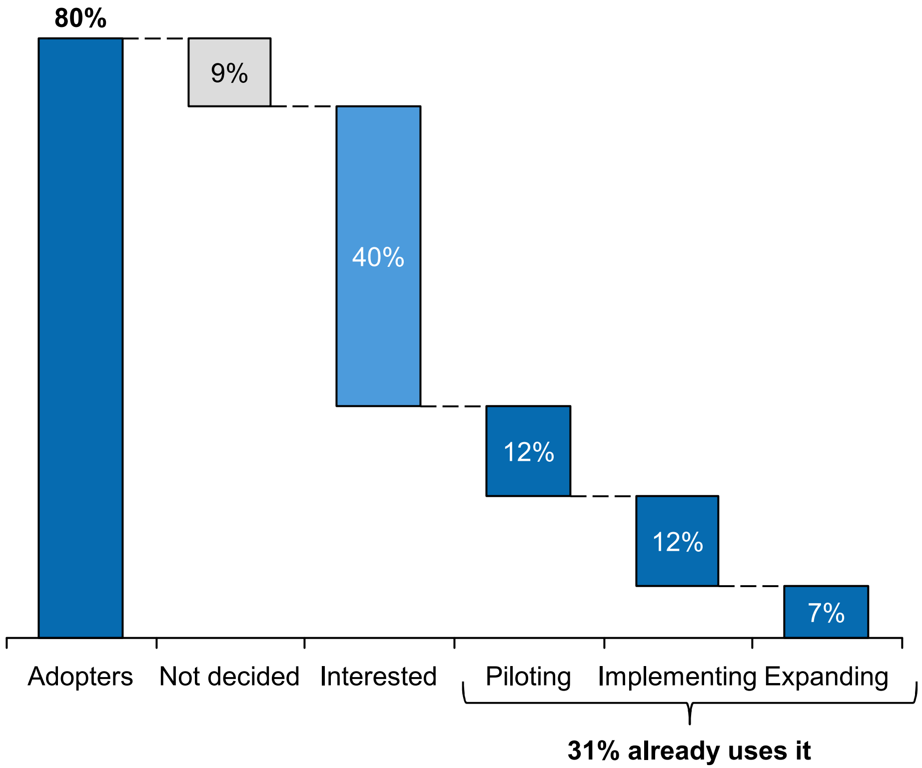
- ERP
- CRM
- Salesforce automation
- Virtual Office
- Messaging
- Web / m-commerce/ social/ retail enablement

Purpose-built applications delivered over the web

Source: Booz & Company analysis

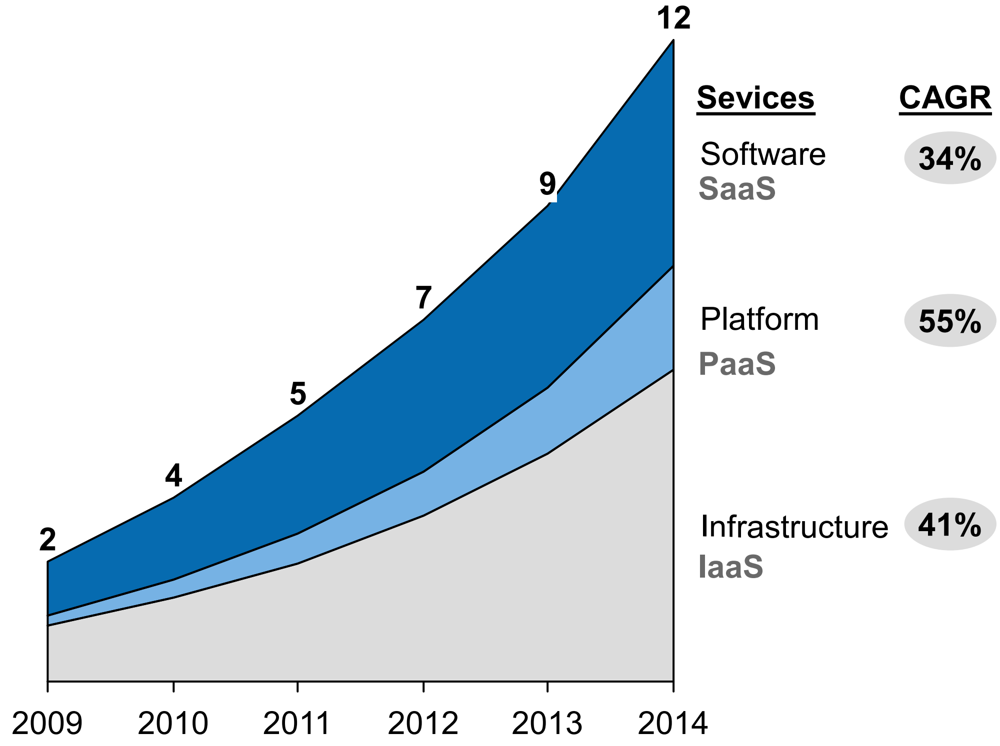
Strong demand for all cloud service models is expected in the next years, with nearly a third of businesses already using them

Adoption of Cloud Services (Businesses)
Europe and North America



Source: Forrester - Market overview of cloud IT services from major Telcos, Booz & Company analysis

Sales Forecast Cloud Services Europe
(in billion euros)



Source: IDC, Gartner, Booz & Company analysis (1 USD = 0.74 EUR)

Cloud services will represent a relevant change and important opportunities for all stakeholders

Selection of benefits from cloud services

Telcos
- **Increase of their offering to Business customers** (alone or as a trusted broker or aggregator)
- **Increase client's BroadBand needs and network utilization**
- **Better buy-in of the Quality of Service premium**

Industry
- **Focus on key value adding activities**
- **Seamless operations throughout multiple locations**
- **Standardization and fast deployment of solutions**
- **Cost reduction and CAPEX-free IT**

Government
- **Relevant cost reductions and control**
- **Speed up the e-government initiatives**
- **Increase collaboration between agencies**
- **Continuity of operations/Disaster recovery**

Vendors
- **Higher turnover, thanks to an easier selling proposition (**pay-as-you-go, high automatization/low implementation requirements**)**
- **Broader portfolio of products on reach**
- **Better visibility on client's real product usage**

SME and Consumers
- **Access to services previously reserved for corporations**
- **Scale your IT as needed**
- **Increased level of competition will foster better services and lower prices**

Many players are chasing the opportunity – Telcos must seek a way to solidify their position as value adding players

Integrated Giants
SI and outsourcing powerhouses with asset-heavy offers across IaaS, PaaS, SaaS

Asset-light integrators
Already strong in outsourcing; partnering for IaaS; making asset-light bets

Web and Cloud Masters
End-to-end IaaS to SaaS players with huge data centers, significant scale economies

Virtualization & Automation SW Specialists
PaaS focused players partnering broadly; seeking to set standards

Enterprise SW Specialists
Like cloud masters, but focused on enterprise suites; can be asset-heavy or -light

Service Providers and Telcos
Role evolving, many going asset-heavy, and exploiting reach and cloud-relevant assets

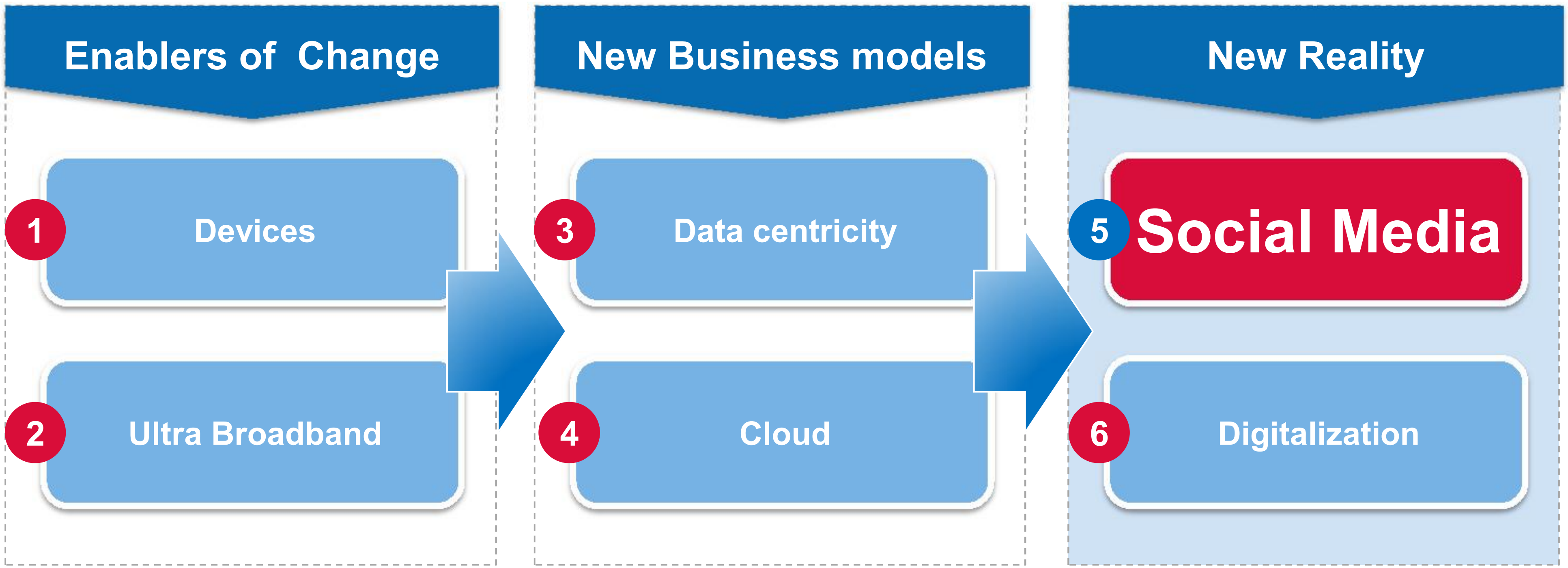
Equipment Players
Computing, PC and handset/device OEMs seek to exploit device proliferation
Network equip. players looking to enable "NaaS" services and play selectively in PaaS

Pure Play ISVs
Broad swath of SaaS ISVs vying for pieces of cloud market

Aggregators
Potential new class of SaaS/ PaaS players, including SaaS app stores

Web VAPs
Fragmented, but could leverage strength in web services into cloud

Note: This is an idealized view of the future cloud ecosystem, showing the primary player types; logos are illustrative only. Booz & Company analysis.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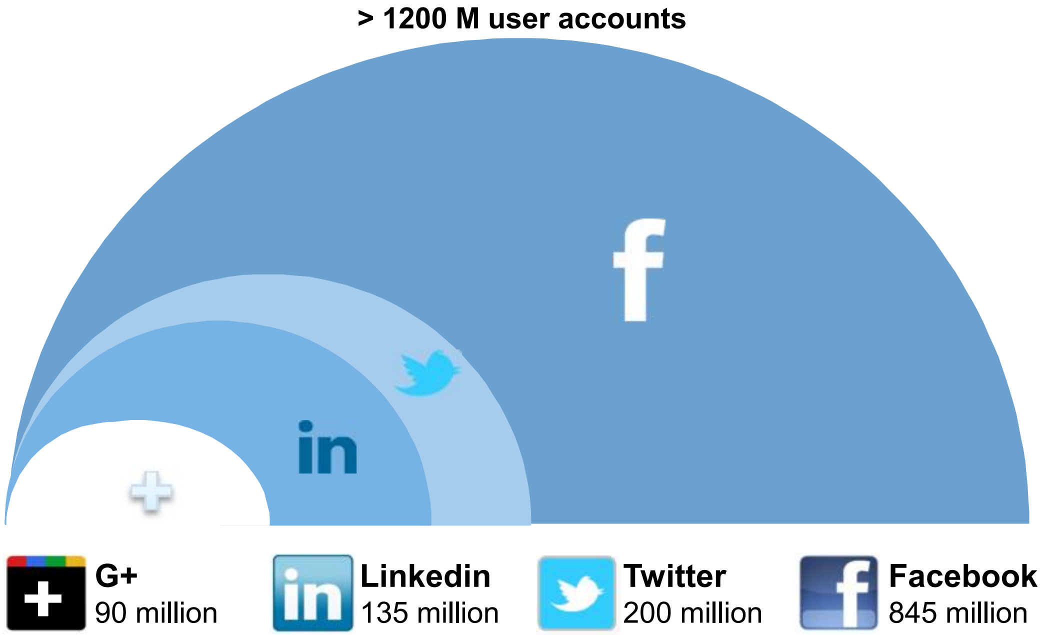
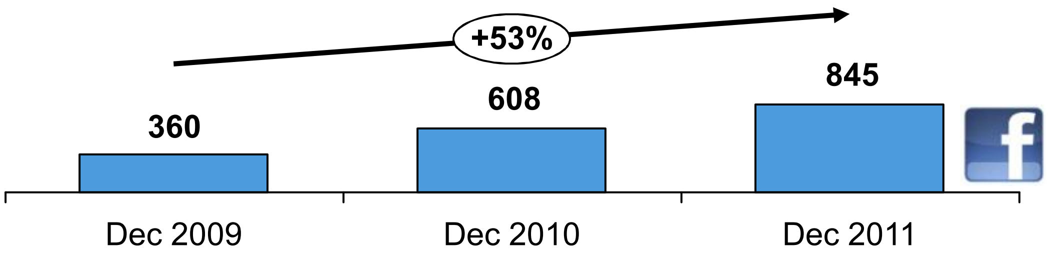
Social networks, led by Facebook, already represent more than 845 million users

Reach of Social Networks



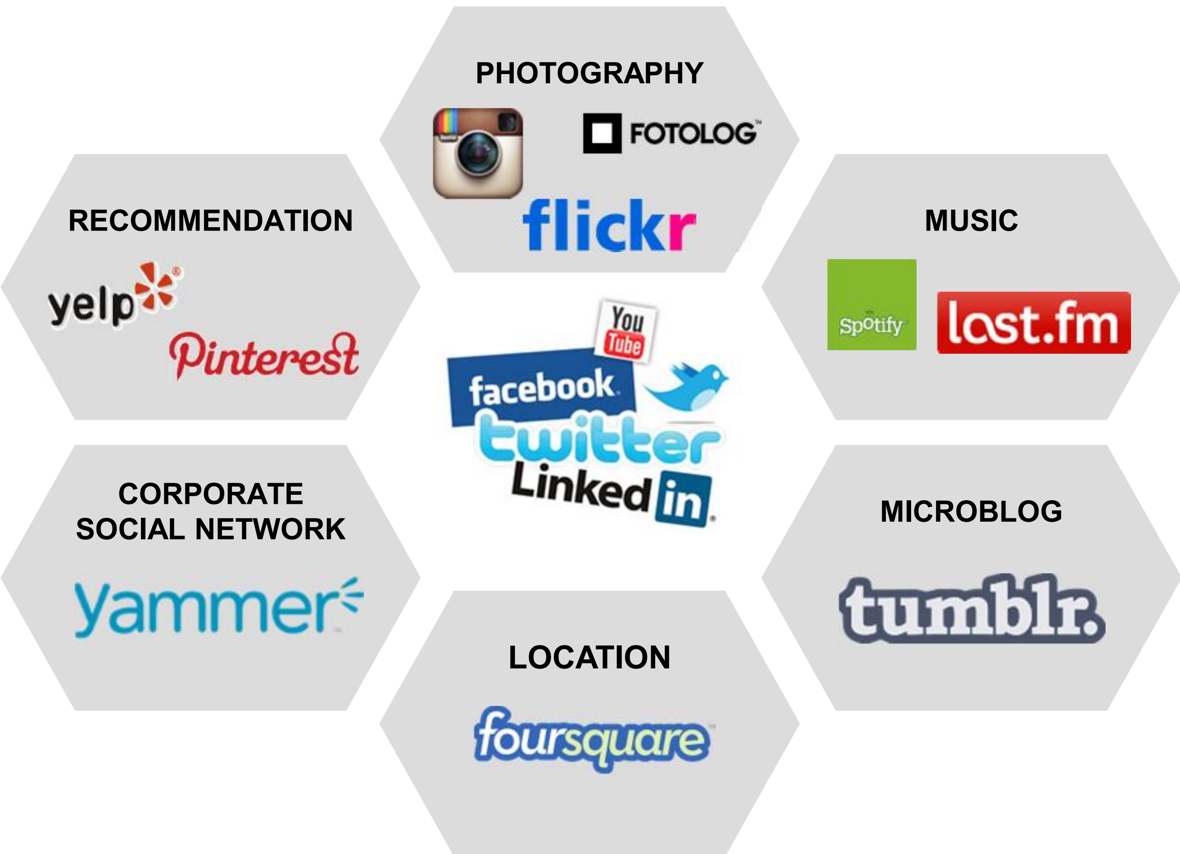
- **1** out of **13** world's inhabitants has a Facebook account.
- If Facebook was a country, it would be the 3rd in the world.
- With more than **845 million** of users, it is still growing 50% y-on-y



Source: Facebook IPO 2012, Google reporting at jan2012, Linkedin reporting at November 2011. Booz & Company analysis

A developing ecosystem, with new and continuous additions that are exploiting the micro segmentation of this phenomenon

Explosion of Social Networks



- More than **400** social network initiatives have been set up…
- … in many different categories and segments: automobile, languages, travels,…

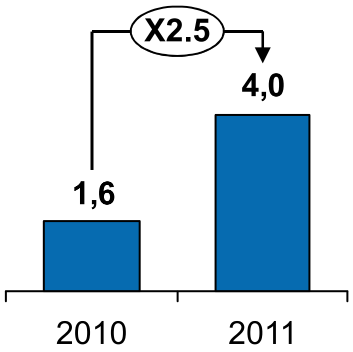
Corporations and businesses should take social networks very seriously: upgrade from the fans site to making *social-business*

Collaboration between employees

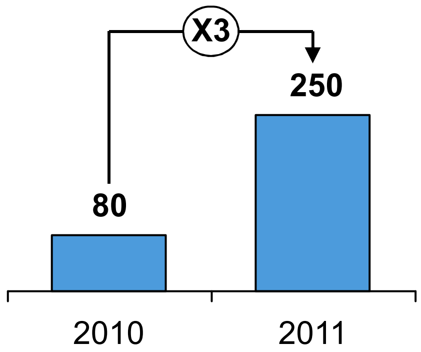
yammer

- More than 200,000 companies are using Yammer as a corporate social network…
- … including 85% of the Fortune 500 companies

\# Yammer Users (MM)



\# Companies using Yammer (‘000)



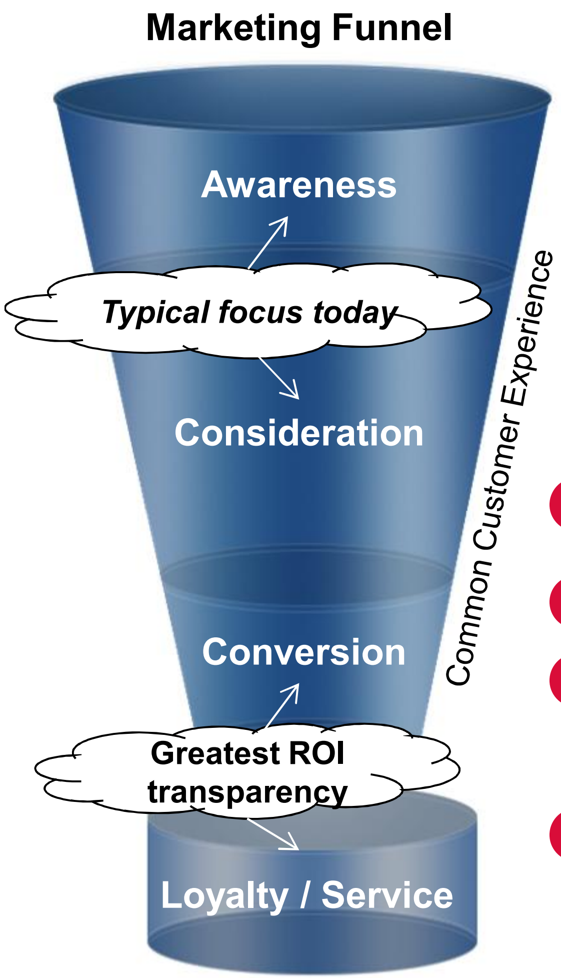
Collaboration with customers

@WalmartLabs
Social + Mobile + Retail

- Walmart is vey active in social networks
  - ***Get on the Shelf,*** where customers vote the products they would like to find in Walmart’s shelfs
  - ***Shopycat,*** that recommends gifts based on your Facebook’s profile
- Back in 2011, it acquired Kosmix for $300 Millon, a company specialized in social media and mobile commerce, ….
- ... Additionally, it acquired companies specialized in mobile publicity and retail technology associated to mobile phones

Source: Yammer, Walmartlab

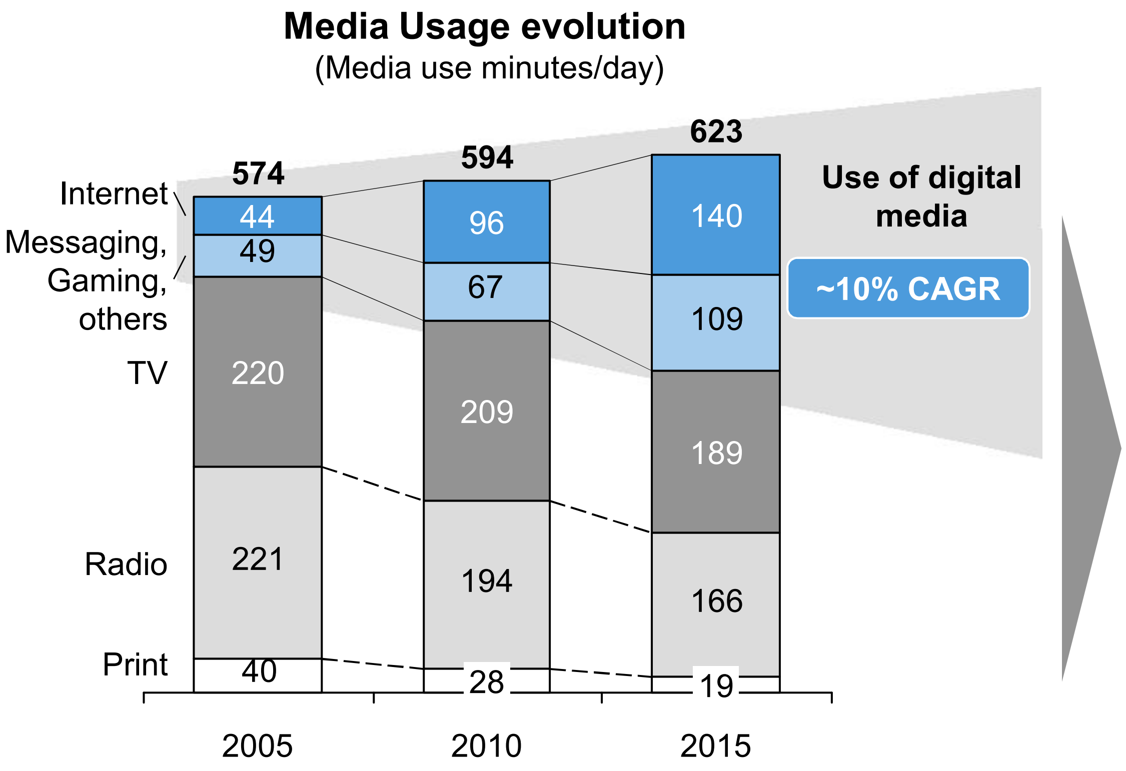
However, social spend today is mostly focused at "top of funnel" – we believe there is even greater promise further down the funnel

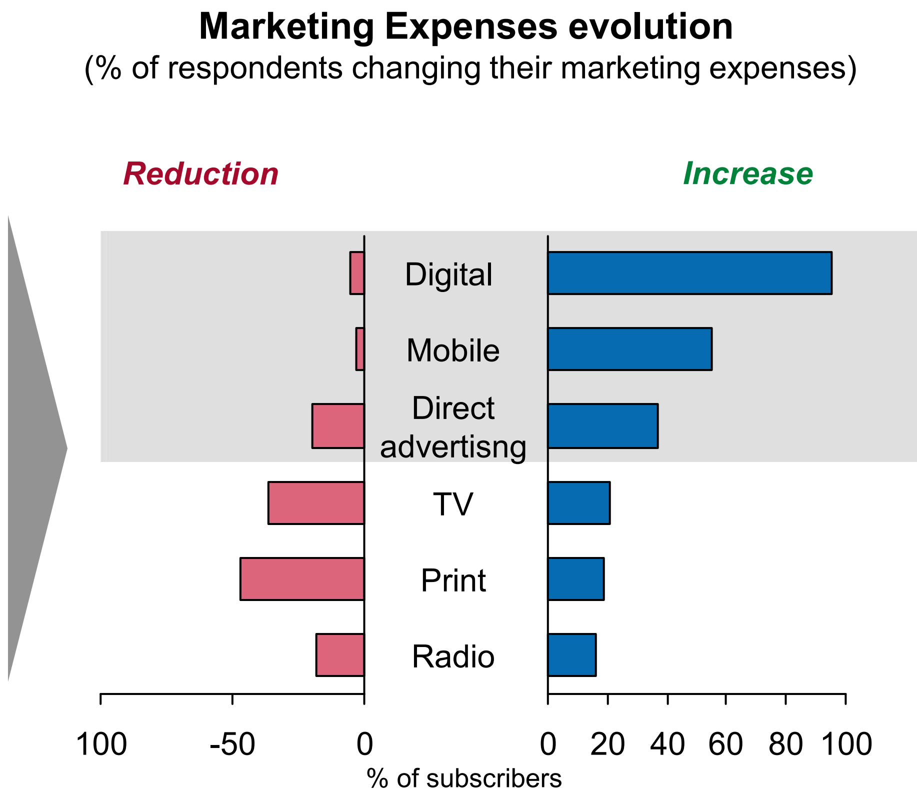


Typical Activities	What Social Media Enables
Branding	▪ New environment for promoting broader brand
Content Creation	▪ Forum for new social/viral content (often user-generated)
Traffic Generation	▪ Additional ways to drive traffic to own site or social network presence
Engagement	▪ New microsites/widgets/apps to engage potential customers
1 Innovation / Ideation	▪ Engage customers proactively in product/service innovation
2 Lead Generation	▪ New mechanisms for targeting and incenting potential customers
3 Purchase Decision	▪ Additional e-commerce channel ▪ Unique buying propositions ▪ Purchases as syndicated social content
4 Loyalty / Advocacy	▪ Deeper connection with customers after-sale ▪ Activation of brand loyalists to market/sell on your behalf
After-Sale Service	▪ Additional mechanism for community-based support
5 Measurement	▪ Rich sociographic data set for effective real-time social targeting

Social Network relevance and the increasing digitalization changes marketing and requires a stronger presence in digital channels…

Change towards Digital Marketing in Germany





Source: Media map in 2010-2015, OMD Germany, Booz & Company analysis

Source: Marketing & media Ecosystem 2010 survey and Booz & Company analysis

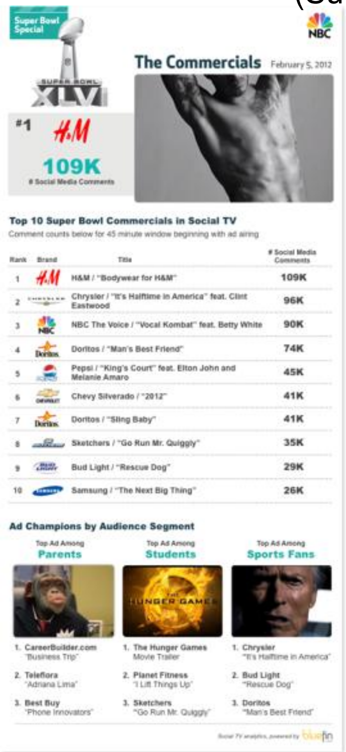
… having the media companies, the first to be affected and to react, given the potential of information and of real time interaction

Social Media Response Analysis for Media Companies

bluefin LABS

- BlueFin detects, registers and analyzes all the comments and the “sentiment” that is being generated in the social network regarding TV programs and advertisements
- In near-real-time, you can visualize the success of the TV programs, the profile of the most hooked viewers, the geographical origin of comments…
- Regarding advertisers, they have been able to identify that ads efficiency not only depends on creativity and “prime time” but also on the contents of programs taking place before and after the ads

Social Media Sentiment analysis for Advertising
(Superbowl 2012)

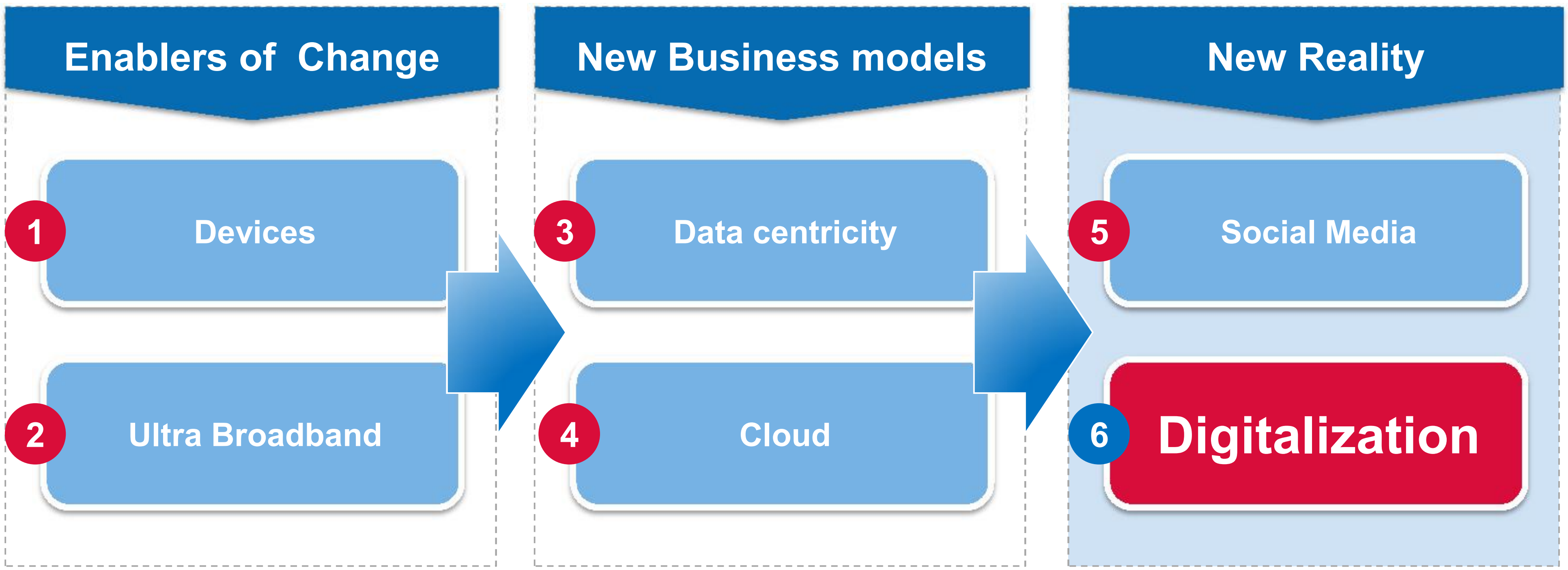


Advertising Analysis Superbowl 2012

The most appreciated advertisement

Segmentation

Source: Booz & Company Análisis, Bluefinlab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Digital habits will be increasingly embedded in our daily life

Upcoming Eras

VIEW 2012

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020

Working Nomads - flexible working times, teleworking, flexible employment relationships

OnLineLife - ubiquitous and seamless connectivity at no incremental cost or effort

Smart Cloud - remote data storage, software as a service, distributed computing

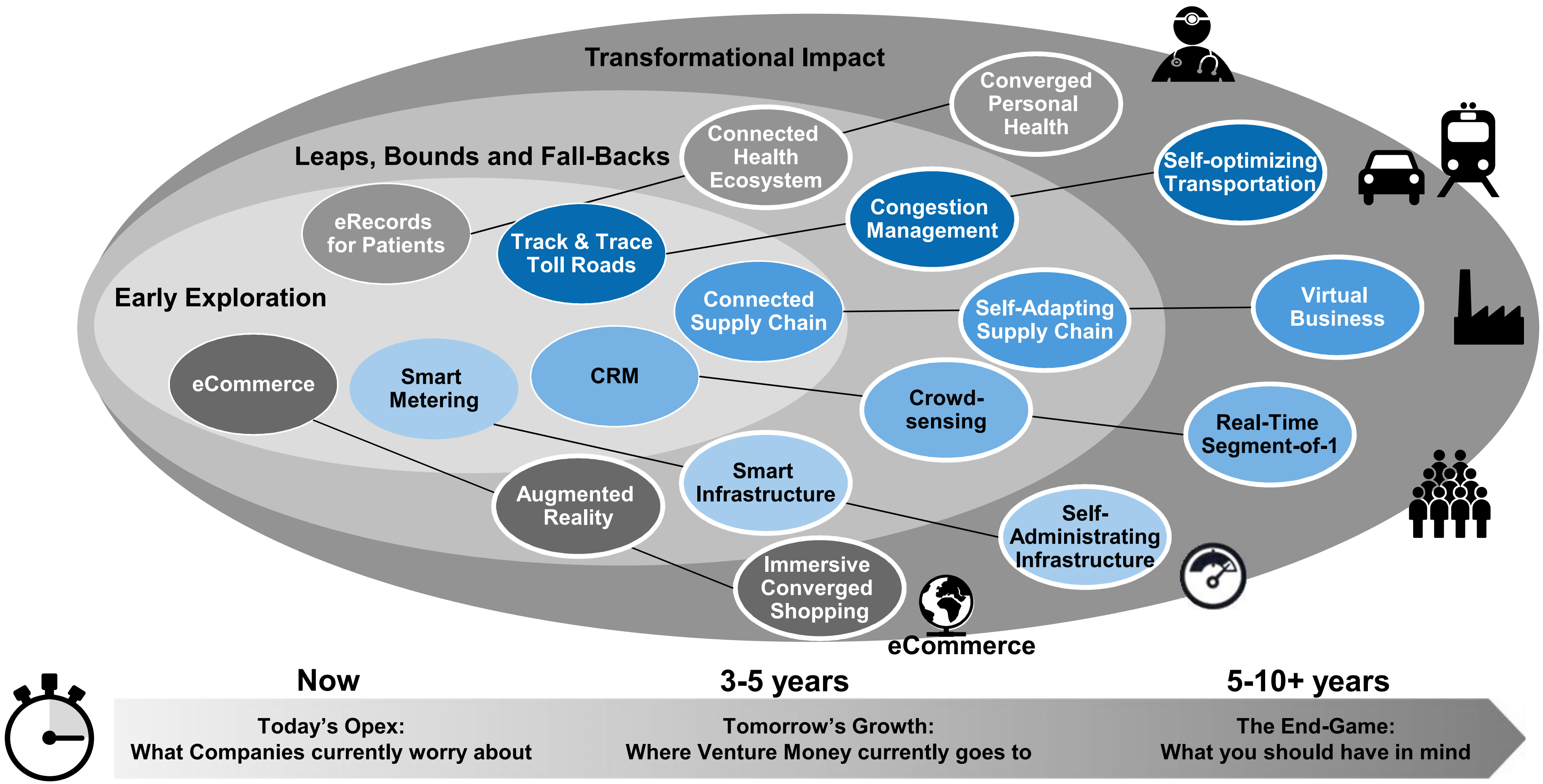
SensorEconomy - environment aware devices, location aware services, near range ad hoc communication

The Internet of Machines- proliferation of machine-to-machine interfaces and interaction

Semantic Networks

Transformation will happen in waves over more than a decade – but it pays to have the end vision in mind today

The Digitalization Waves



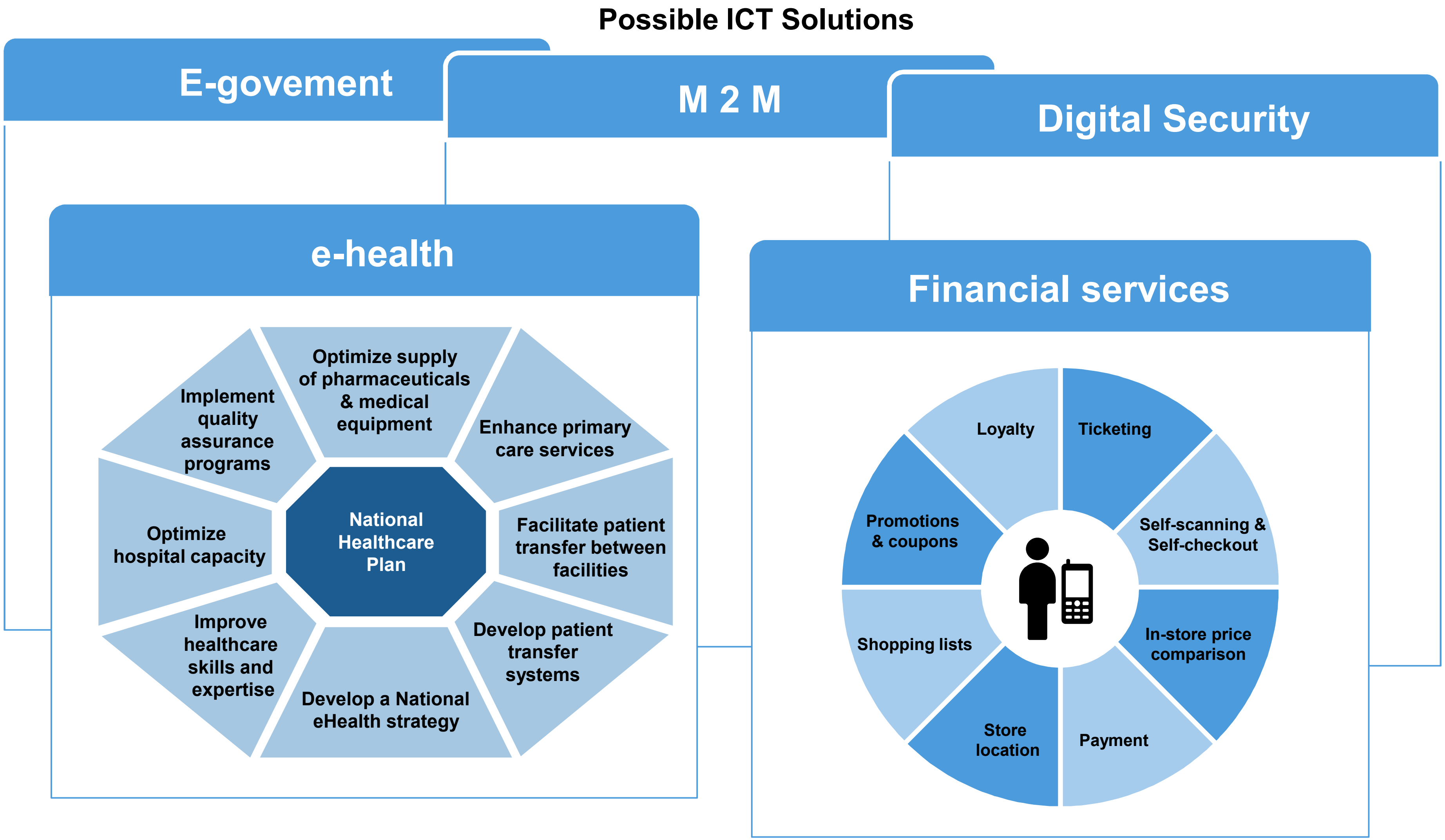
Digitalization is expanding to all industries, generating increased demand for connectivity and ICT infrastructure

Examples of New Digital Demands

Industry	ICT Spending 2014	CAGR 2009-2014	Possible ICT Solutions
Education	2	1.6%	▪ eLearning ▪ Collaboration
Transportation	4	1.4%	▪ Communication networks
Wholesale Trade	2	1.7%	▪ Payment solutions ▪ Supply Chain Management (RFID…)
Retail	4	2.5%	▪ Payment solutions ▪ Supply Chain Management (RFID…)
Healthcare Providers	5	2.2%	▪ Mobility solutions ▪ eHealth solutions
Utilities	6	5.0%	▪ M2M solutions ▪ Smart fields, Smart grids
Government	16	1.7%	▪ eGovernment solutions ▪ Safety and security solutions
Manufacturing	18	2.0%	▪ M2M solutions
Com., Media & Services	22	3.1%	▪ IPTV / Mobile TV ▪ Interactive content and games
Financial Services	26	2.5%	▪ Transaction infrastructure/systems ▪ M-banking

1) Gartner:Total ICT in 2014 incl. telecommunication equipment and services, in billion EUR (Germany)
CAGR 2009-2014

Digital opportunities and shift of the paradigm in other industries



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