Next Generation Networks
Agenda

1. A Brief History of Electrons Movements
   - From Talking to Communicating
   - Demand
   - Cost
   - Outlook

2. Convergence, Evolution or Revolution?

3. What is NGN?
   - Baseline
   - Technology
   - Outlook
   - Opportunities

4. Does a Brand New Network Addresses Lack of Imagination?
   - Apple, Google & a Mobile Operator?
   - Partnerships
   - New Opportunities
1. A Brief History of Electrons Movements

**Fixed Perspective**

- **1870s**: Telephone
- **1970s**: Personal computer
- **1980s**: Computer with 64kb/s modem
- **1990s**: Laptop
- **2000s**: Internet TV
- **2010s**: IPTV

**Technology**

- **1G**: Mobile Phone
- **2G**: SMS
- **2.5G**: Data
- **3G**: MMS
- **3.5G**: Video Call
- **4G**: Cloud

**Services**

- **Voice**: PSTN, ISDN
- **Internet**: Wi-Fi, Wi-Max
- **Hi-Speed Internet**: xDSL, ISDN, PSTN

**Inventing | Stagnating | Investing | Leveraging | Revolution ?**

**Mobile Perspective**
1. Evolution of Mobile Networks

Services

- Voice
- SMS
- Data
- Mobile TV
- MMS
- Video Call
- Mobile Internet
- HDTV
- Video Broadcast
- QoS
- Fast Mobile Internet
- HDTV
- Video Broadcast

Technology

- Analog Signal
- Digital Signal
- GPRS
- EDGE
- HSDPA
- UMTS
- HSDPA+
- LTE
- LTE Advanced
- Mobile Wi-Max

Timeline:
- 1870s
- 1970s
- 1980s
- 1990s
- 2000s
- 2010s
1. Growing Demand for Connectivity

Source: National Institute of Information and Communications Technology (NICT)

Global IP traffic 2010-2015

2010 2011 2012 2013 2014 2015

Thousands PetaByte/month

Fixed Internet
Managed IP
Mobile Data

Source: Cisco VNI 2011

2020 Forecast: Internet Traffic 1000 times more

Source: National Institute of Information and Communications Technology (NICT)
1. What is Cost Implication for this Demand?

Keeping pace with expected growth of connectivity demand will require European Telcos to invest in enhancements of current-generation networks.

Additional CAPEX over 5 years (ATKearney estimates)

<table>
<thead>
<tr>
<th></th>
<th>Fixed networks:</th>
<th>Mobile networks:</th>
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<tr>
<td>Fixed</td>
<td>10 bn €</td>
<td>30 bn €</td>
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Conversely, new demand for data traffic only brings marginal revenue increase.
1. Customer Perspective Evolution

Yesterday
- Computing
- Telephone
- News
- Television
- Mail

Today / Tomorrow
- Converged Phones
- IPTV
- Interactive gaming
- Reality Augmented
- Content and Services
  - YouTube
  - Apple
  - Microsoft
  - Google
  - Discovery Channel
  - Yahoo!
  - Twitter
1. Europe: State of The Union

2020 EU Digital Agenda Goals: 100% > 30 Mbps, 50% > 100 Mbps
1. Market Trend – Huge Competition

Market **competition** is increasing

Core revenue (voice) is **saturated and profit declining** whereas data revenue increases

Network costs are too high, and old equipment need **replacing**

Networks are **complex**, hard to scale and interoperate

**Roll-out time** for new services is too long

Also customers are pushing for more **innovative services**

Mobile operators squeeze fixed operators

Fixed operators fight back with Wi-Fi / Wi-MAX solutions

New players (MVNOs, VoIPs, Google, Skype) squeeze everyone
2. Market Convergence

**Commercial Convergence**
- Bundling of fixed, mobile, data and TV services
- Subscribers can access fixed, mobile, internet and TV services from a single operator

**Service Convergence**
- Subscribers access same services regardless of whether they are using a fixed or mobile connection (e.g. Email access on a computer, mobile or fixed phone)

**Device Convergence**
- One device may integrate various access types:
  - This may include Mobile Networks (GPRS, 3G, HSDPA) and wireless technologies (Bluetooth and/or WLAN 802.11 b/g)
  - Also may refer to ‘one device does all’ with enhanced functions such as Music / Photo / Data / GPS
2. Network Convergence

Network Convergence

- Removal of distinctions between fixed and wireless networks

Source: Ericsson
3. What is Next/New Generation Network, NGN?

Looking at the Evolution

NGN is a concept, not just a technology

Its goal is to provide a single technology platform

NGN facilitates convergence of network and services

It supports generalised mobility which will allow consistent and ubiquitous provisioning of services to users
A single IP packet-based network which replaces the different transport networks

Underlying network and access is enabled across a wide range of broadband technologies, both wireless (e.g. 3G, Wi-Fi, Wi-MAX) and wire line (e.g. DSL, Cable, Fibre)

The Migration to NGN reduces network and operational complexity resulting in better & more reliable services

It employs a meshed core, having embedded intelligence which would provide scalability, throughput and improved QoS

Source: Defined by ITU-T (International Telecommunication Union)
NGNs are structured and separated into functional layers, including:

- Access
- Transport & Switching
- Control & Intelligence
- Service (Application)

Layers are independent - they can be modified or upgraded regardless of other functional layers.

Source: Ericsson
3. Expected Benefits from NGN

NGN enables any category of customers to receive wide range of services such as voice, data and video over the same network.

It offers unrestricted access by users to different service providers.

Greater control and personalisation; offering continuity for existing PSNT services.

Enhanced revenue generation by providing optimised connection, service, flexibility and efficient network management.

End User perspective

Network Service Provider perspective

Converged Phones

IPTV

Reality Augmented

Interactive gaming
3. New Revenue Streams – Opportunity & Challenge

Digital Content Revenue (Global Consumer Market)

Who is going to earn the revenue? Telcos currently only earn traffic fees. Need to upgrade Business Models, not just Network capabilities.
4 – Apple, Google & Vodafone

**Product First**
- Understand the Users
- Focus on Customer Experience
- Apply and Use Technology as an Enabler
- Be Product Oriented
- Innovate

**Technology First**
- Invest on Technology
- Build Relationship with Customers
- Focus on Technology
- Be late with the Application of Technology
- Follow the Technology

**Market First**
- Identify a Need
- Create a Market
- Innovate
- Challenge
- Expand

Partners or Competitors? Who is the Service Provider?
4 – Other Players & Partnerships

Android Mobile OS
Google OS on the Cloud
Google Voice
Samsung Hardware

Microsoft Software
Phone Voice
Samsung Hardware

Nokia Hardware
Skype VoIP Service
4. A Sample Case

Japan is developing a “New-Generation Network”

New-Generation Network’s main features:

- Speed faster than Peta-bit/sec
- More than 100 billion terminals can be connected at the same time
- Security capable of Address Traceback
- Power Consumption less than 1 / 1000 of existing networks

Source: National Institute of Information and Communications Technology (ICT) - Japan
4. Final Consideration & Opportunities

**Opportunity**
- New Services
- New Revenue Streams
- New Innovative Business Models
- IT Rationalisation
- Consolidations
- Bridging Technology with Services

**Challenge**
- Revenue Sustainability
- Cost Rationalisation
- Innovative Offerings
- Differentiation
- Regulation
- Customer Ownership

**Need**
- Innovation
- Time to Market
- Integration & Migration
- Transformation & Change Management
- Focus on the Needs rather than Technology

**Risk**
- Market Instability
- Offshoring
- Regulation Constraints
- New Competition from OEMS
- New Competition from SW/Platform vendors
- New Paradigm
5. What Telcos Need to Consider?

**Design Next Generation Business**

- What to Bill & How to Bill?
- NGN Programs
- Governance

- New Revenue Streams
  - Engagement Approach, Model & Value
  - Manage Transition

- **RoI for Every Penny Spent**

**New Business Models**
Thanks

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