# 5G: Evolution or Revolution?

## Implications for Competition & Regulation

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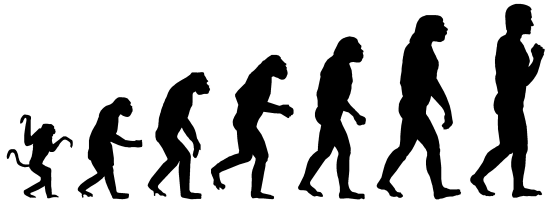
# 5G: Evolution or Revolution?



A continuum

between these 2 extremes

*evolution*

*revolution*

5G: an **incremental** innovation relative to 4G

Service = **output**

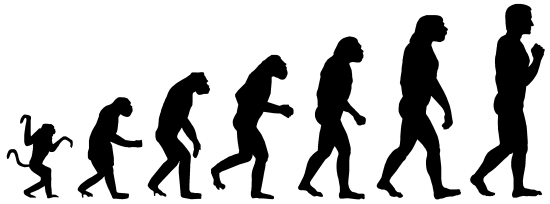
*Success factors*: the same than for the previous mobile generations

5G: a **radical** innovation, due to network virtualization and entry of virtual operator addressing “vertical” industries

Service = both **output** and **input**

*Success factor*: make virtualization work

# Evolution



- **Incremental** improvement of the technology
  - More antennas, more spectrum… to deliver higher speeds
  - More security
  - Etc.
- Does not disrupt the **structure** of the mobile market
  - Oligopolistic market, with a competitive fringe of virtual operators
  - Vertical integration between network and services
- **Question**: How quickly will the old mobile generations (2G, 3G, 4G) be replaced by the next generation (5G)?

# Migration to 5G

- **Consumers:**
  - Comparison of the expected additional benefits from 5G to the additional cost of this new technology
  - What willingness to pay for an (incremental) improvement in the quality of service?
- **Network operators:**
  - Is the willingness to pay for 5G sufficient to cover investment expenses?
  - Competition (and cannibalization) from other technologies (4G, fixed broadband, etc.)

# Revolution

- Technical evolutions facilitate the **separation** btw network and services
  - *Software Defined Networks* (SDN): enable third-party control of the network
  - *Network Function Virtualization* (NFV) : network features implemented through software on generic devices
- **Changes** in market structure!
  - Upstream: concentration of infrastructure operators (natural monopoly?)
  - Downstream: entry of vertical service providers
  - The 5G network as a multi-sided platform
- Potentially **more value generated**, but high levels of uncertainty
  - How can network sharing be organized?
  - Compatibility with strict net neutrality rules?

# 5G and network sharing


- ***Horizontal*** network sharing
  - Sharing infrastructure to share costs
  - Competition concerns?
    - Risks of collusion?
    - Concerns with increased concentration?
- ***Vertical*** network sharing
  - Access to infrastructure for vertical service providers
  - Competition btw network operators and vertical service providers to capture the value → potential market failures?

# 5G and net neutrality

- **Increased traffic** → more traffic management problems
- **Heterogeneity** of vertical service providers
  - Linked to verticals (connected car, e-health, etc.)
  - Different needs in terms of QoS (latency, energy consumption, etc.)
- **Experimenting is key!**
  - Revolution: vision of 5G as a *general-purpose technology*
  - Search for the best technical solutions
  - Search for the best business models

cerre Centre on Regulation in Europe
Improving network industries regulation

# *Towards the successful deployment of 5G in Europe:*

## *What are the necessary policy and regulatory conditions?*

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