Telcos as natural growth accelerator

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What was the contribution of 4G in global GDP?

2019 estimates

- **Direct**
  - $1.3tn

- **Productivity contributions**
  - $3.3tn

- **Indirect**
  - $500bn

4G = a truly global technology standard, and the foundation for applications that we rely on daily for both work and life. Mobile broadband networks are established as key pillars for national growth.
Use cases and examples of past innovation

**2G**

**MPESA**

Launched in 2007 in Kenya

Bank the unbanked

Introduced: Loans, solar power, merchants, agri, healthcare, education and more

50% of Kenya GDP in 2019

**3G**

Launched 3G & “Mobile 2.0” in 2007

Introduced web browsing on mobile devices

40K devices sold on 1 weekend

Beginning of the mobile web

**4G**

First to launch 4G globally

Commoditized mobile broadband

Created social networks, sharing economy and video calling

Created the “mobile first” economy
4G well established today, 5G introducing new applications

4G is providing a consistent mobile broadband foundation while 5G is starting to introduce new applications.

Carriers will spend >$1.5tn in the next 5 years to sustain these subscribers.

- 70% of global population is connected to a mobile network.
- 50% of global population is connected to a 4G network.
Use cases where 4G and 5G are making a difference today

4G being used to track virus spread throughout the world

5G innovation

Broadband connectivity for new hospitals

Thermal imaging cameras throughout a city

Verizon’s COVID-19 Network Reliability report.

Throughout the first 90+ days of the country’s COVID response, Verizon’s networks performed remarkably well, maintaining pro-COVID reliability levels even in the midst of dramatic usage spikes and shifts in demand.

- 10.3+ trillion megabytes of data*
- 519+ billion text messages*
- 58+ billion phone calls*
- 297+ billion minutes of talk time*

Connected consumers with timely, trusted information during COVID-19

In addition to the significant usage on our wireless and fiber optic networks, Verizon Media properties helped consumers connect and consume timely, trusted content during COVID-19.

- 4.8 billion page views
- 602 million users globally
- 29 Verizon Media events
- 87 million streams

*Data reporting period: March 1 - May 15.
Revisiting 4G contribution to GDP in 2019

Direct
$1.3tn

Productivity contributions
$3.3tn

Indirect
$500bn
Contribution of 5G to GDP in 2030

**LTE in 2019**
- Direct: $1.3tn
- Productivity contributions: $3.3tn
- Indirect: $500bn

**5G in 2030**
- Direct: $2tn
- Productivity contributions: $5tn
- Indirect: $600bn

Both are ~10 years after standard is frozen

- A new generations typically takes 10 years to reach full maturity
- 5G is different: its enterprise focus will likely make it a longer term technology
- 5G will transform enterprise verticals the same way 4G transformed the consumer app ecosystem
Favorable policies and continuous investment are needed

China, Japan and South Korea have issued policies to accelerate 5G construction, such as tax cuts or subsidies or increased investment.

In Europe, Middle East and Africa, regulators are accelerating the release of spectrum and increasing investment during the pandemic.
### Industrial manufacturing: 5G use cases

| **Collaborative robotics** | **Current state:**  
Device connected via Ethernet and are largely immobile  
**5G capabilities:**  
High bandwidth (eMBB), low latency (URLLC)  
**5G opportunities:**  
Remote control of cobots, Augmented Reality applications |
| **Reconfigurable production lines** | **Current state:**  
Industrial Ethernet, proprietary protocols (e.g. Profinet), custom WiFi, OPC UA  
**5G capabilities:**  
As above, can replace several of these existing proprietary protocols  
**5G opportunities:**  
Introduction of consistent wireless connections for both devices and humans |
| **Automated Guided Vehicles** | **Current state:**  
WiFi throughout the factory floor, disconnections when moving between APs  
**5G capabilities:**  
Millisecond handover, soft-handover, high accuracy positioning and location  
**5G opportunities:**  
Remote control for AGVs, cm-level location capability |
Smart cities: 5G use cases

### Surveillance and safety
- **Current state:** Cameras using a mix of private and public infrastructure
- **5G capabilities:** High bandwidth connectivity for HD streams, edge computing for analytics
- **5G opportunities:** Machine vision for suspect and behavior identification

### Traffic optimization
- **Current state:** Same as above: mix of public and private communication infrastructure
- **5G capabilities:** Massive and low latency capabilities for near-real-time control and monitoring
- **5G opportunities:** Monitoring and control as a service by specialist companies, utilizing 5G

### Smart grid
- **Current state:** Public infrastructure for smart metering, shift to distributed & renewable energy
- **5G capabilities:** Consolidate eMBB, URLLC and mMTC options until single standard
- **5G opportunities:** Near-real-time monitoring of smart meters, substations and energy generation
Conclusions and recommendations

- 3G and 4G have created the foundation for so many innovations.
- The importance of telecom networks is very often ignored in favor of value chain neighbors.
- Covid-19 has proven that telecom networks are national infrastructure.
- 5G will continue this innovation in the enterprise domain.
Thank you

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