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BIG DATA AND 5G

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Agenda

- Introduction
  - 5G is becoming a reality
  - 5G as a part of the cluster of technologies
  - 5G - From people onto things
- The main usage scenarios of 5G
- Let’s talk about data
- European Data Market
- Data Economy
  - EU Strategy
  - BEREC’s public consultation process
  - EMERG activities
- The European 5G Framework
- The European Electronic Communication Code
- Conclusion

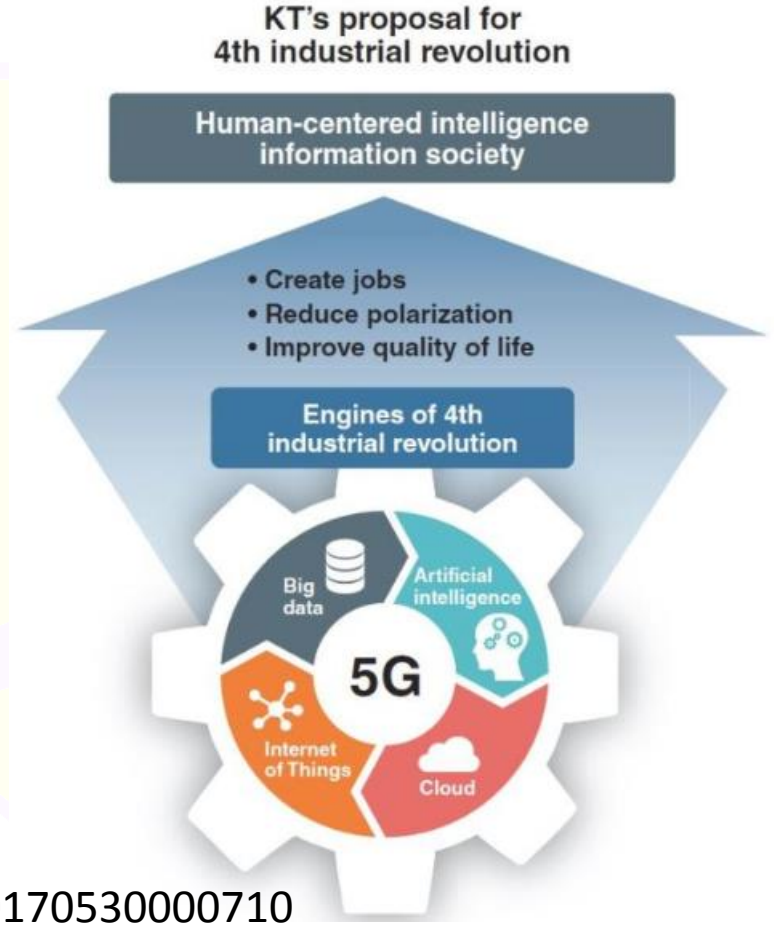
Introduction – 5G is becoming a reality

- "I don't have to ask you anymore to imagine 5G," Cristiano Amon, Qualcomm's president, told attendees during that company's tech summit this month. "It's here. It's all around us.“
- 5G will be ready for prime time in 2019. Software is being tested, hardware is in the works, and carriers are readying their plans to flip the switch on their 5G network in the first half of 2019.

Source: https://www.tomsguide.com/us/5g-release-date,review-5063.html

Introduction – 5G as a part of the cluster

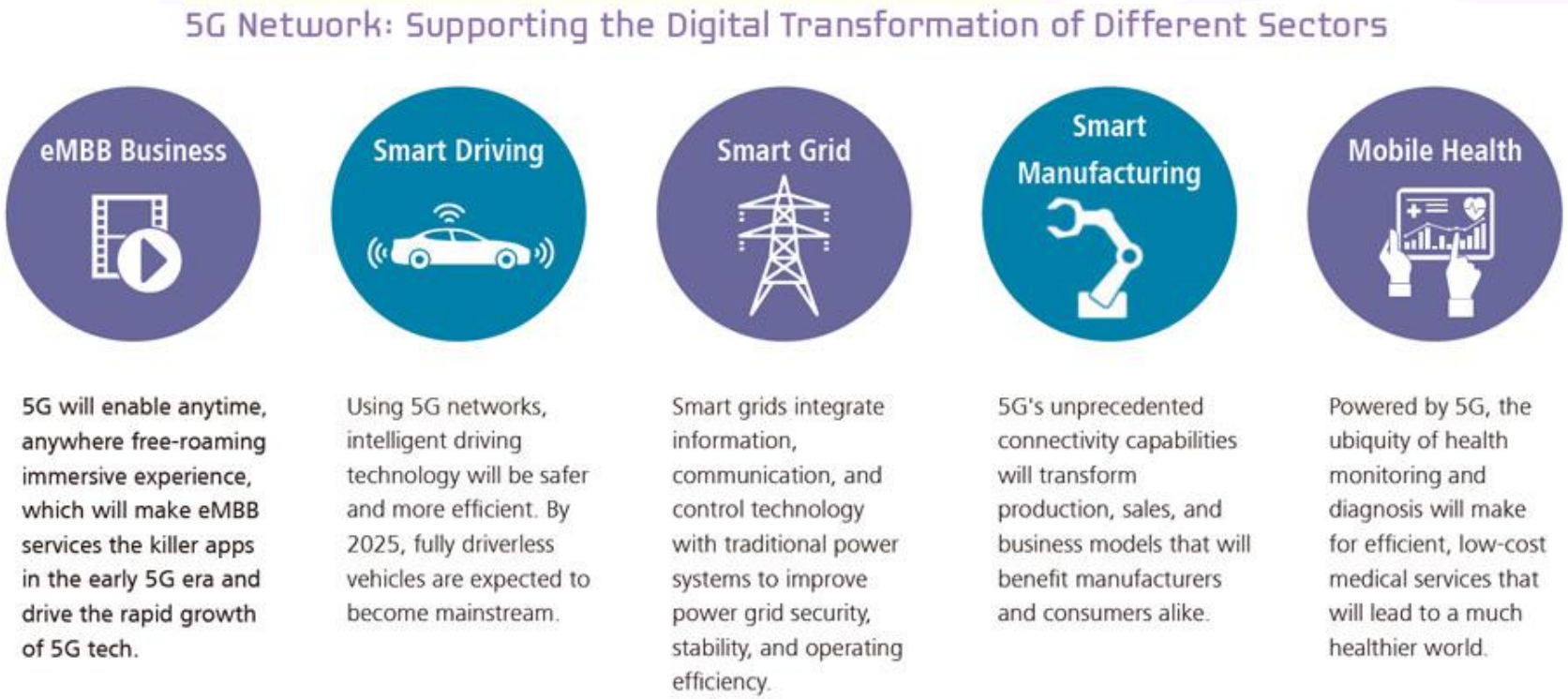
- The cluster of technologies is what really matters, not any single one of the technology trends.
- Artificial intelligence, edge computing, cloud computing, gigabit mobile networks (5G and others), internet of things and big data all are key trends across many industries.



Source: http://www.koreaherald.com/view.php?ud=20170530000710

Introduction – 5G from people onto things

5G will integrate mobile tech, big data, IoT and cloud computing, and give rise to powerful applications



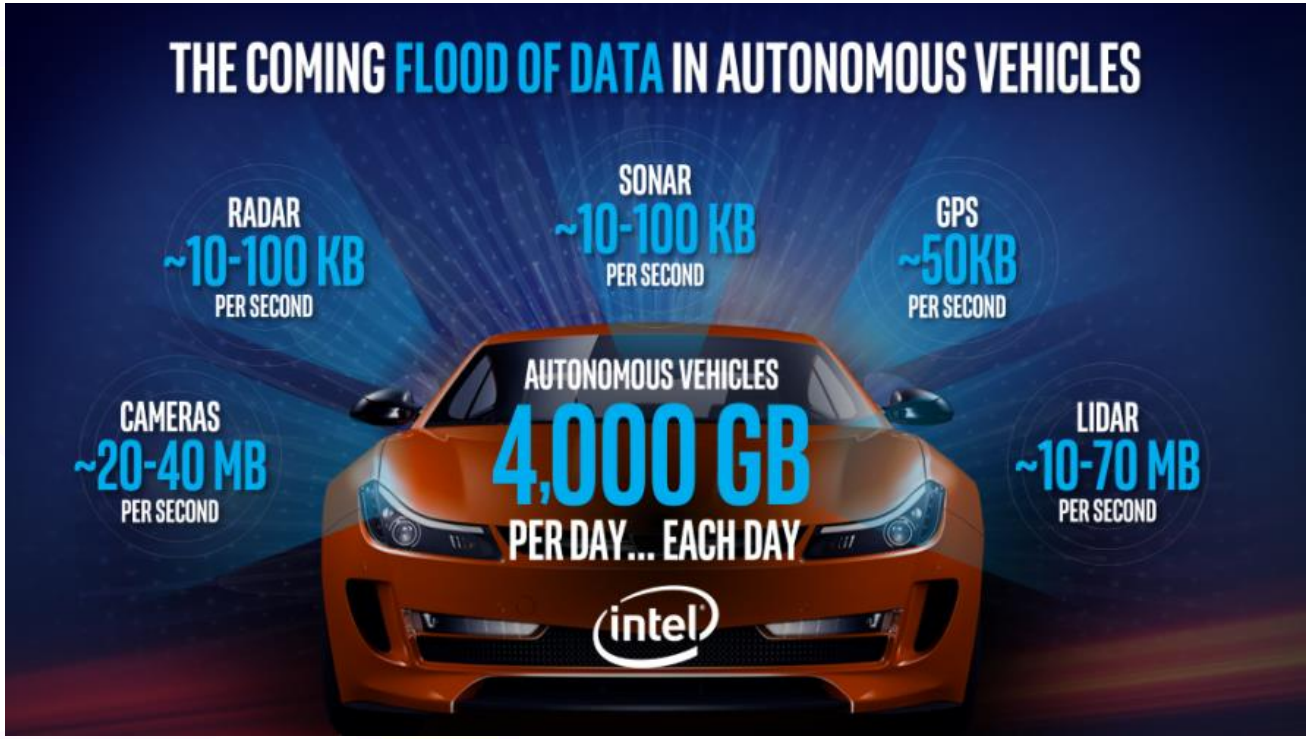
https://www.huawei.com/en/about-huawei/publications/communicate/81/5g-will-amp-up-connections

The main usage scenarios of 5G

- ITU-R has defined the following main usage scenarios for IMT for 2020 and beyond in their Recommendation ITU-R M.2083:
  - **Enhanced Mobile Broadband (eMBB)** to deal with hugely increased data rates, high user density and very high traffic capacity for hotspot scenarios as well as seamless coverage and high mobility scenarios with still improved used data rates
  - **Massive Machine-type Communications (mMTC)** for the IoT, requiring low power consumption and low data rates for very large numbers of connected devices
  - **Ultra-reliable and Low Latency Communications (URLLC)** to cater for safety-critical and mission critical applications

Let’s talk about data –Big Data Era

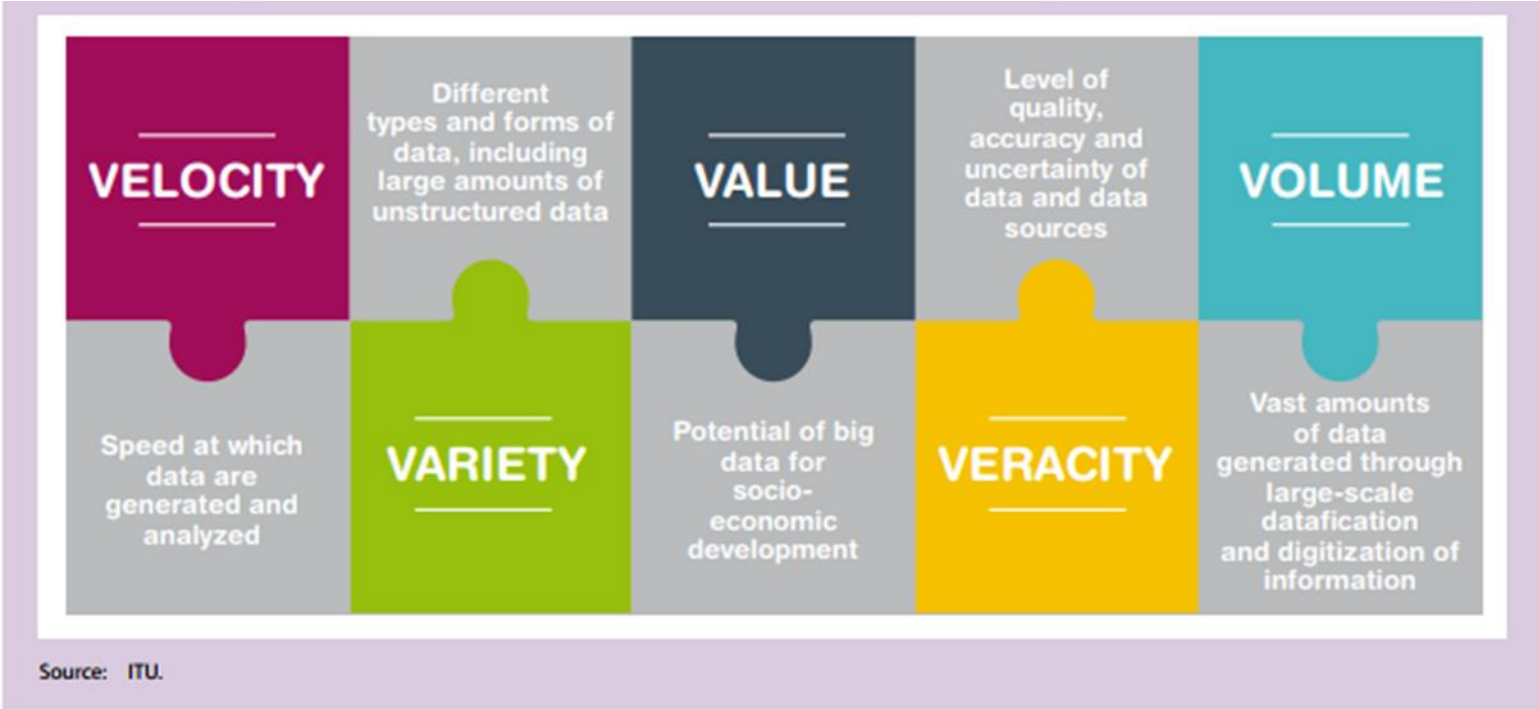
- In 2016, the average person generated 650MB of data a day.
- By 2020, projections show that the average person will generate 1.5GB of data a day – 200 % increase
- Autonomous vehicle will be generating 4,000 GB of data a day.
- In this scenario 5G is deemed to be a key enabling technology to accommodate Big Data.



Source: https://newsroom.intel.com/editorials/krzanich-the-future-of-automated-driving/#gs.DN9hqnu4

Let’s talk about data – Big Data

- 5Vs of Big Data: Too big (Volume), arrives too fast (Velocity), uncertain or incorrect data (Veracity), too diverse (Variety). Final ‘’V’’ is Value.
- Data is meaningless if it does not convey an understandable message



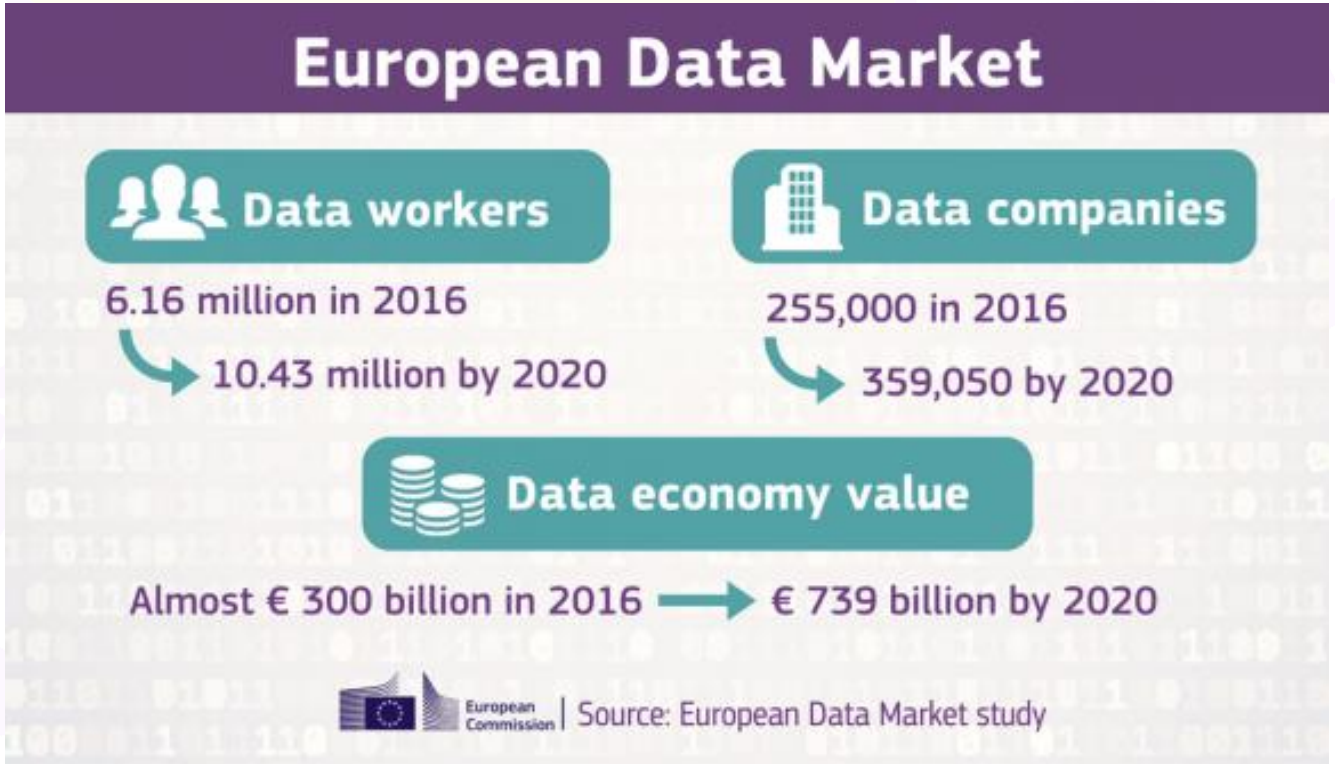
Let’s talk about data – 5G

- Very high-capacity networks like 5G will be a key asset for Europe to compete in the global market, with worldwide 5G revenues for mobile operators expected to reach €225 billion annually by 2025. 5G will
  - enable industrial transformation through wireless broadband services provided at Gigabit speeds.
  - offer data connections well above 10 Gbps, latency below 5 ms and the capability to exploit any available wireless resources and to handle millions of connected devices simultaneously),
  - enable the support of new types of applications connecting devices and objects (the IoT) and versatility, by way of software virtualization allowing innovative business models across multiple sectors.

Source: https://ec.europa.eu/digital-single-market/en/5g-europe-action-plan

European Data Market

The Data Market is the marketplace where digital data is exchanged as “products” or “services” as a result of the elaboration of raw data.



Data Economy – EU strategy

- Elements of the European data economy strategy
  - **Communication on Towards a common European data space - 25 April 2018, the measures put forward along with this Communication include**
    - COM(2018) 234, a proposal for a review of the Directive on the re-use of public sector information (PSI Directive)
    - C(2018) 2375, an update of the Recommendation on access to and preservation of scientific information
    - SWD(2018) 125, Guidance on sharing private sector data in the European data economy
  - **Communication on Building a European data economy - 10 January 2017, proposal of policy and legal solutions to unleash EU's data economy i.e. to:**
    - Improve access to anonymous machine-generated data
    - Facilitate and incentivise the sharing of such data
    - Protect investments and assets
    - Avoid disclosure of confidential data
    - Minimise lock-in effects
  - All processing of data has to be done in full respect of the data protection rules (GDPR and ePrivacy legislation).

Data Economy – BEREC's public consultation

- ''In recent years data has become a key resource for companies, civil society and governments.
- Advances in technologies, such as communications, computing, storage and software engineering, have allowed for cost reductions in data processing and storage, leading to the progressive incorporation of different economic actors into the data economy.
- This has also led to an exponential increase in data generated by consumers, private and public entities and, more recently, objects (the IoT).
- Taking this into account, BEREC considers that it is important to study the impact of the data economy on the electronic communications sector that is under its regulatory scope, as well as considering the role that NRAs could play in the context of the data economy."

Source: https://berec.europa.eu/eng/document_register/subject_matter/berec/public_consultations/8245-berec-public-consultation-on-the-data-economy

Data Economy – BEREC's public consultation

10.10.2018. – 21.11.2018. BEREC launched its public consultation on the ″Data Economy″ to get insights on issues to be taken into account by NRAs in the context of the data economy, specifically in the:

- General issues regarding the data economy to be taken into account by BEREC
- Electronic Communications Networks (ECNs) and Services (ECSs) as enablers for the data economy.
- Impact of the data economy on competition in ECS markets
- The data economy in NRAs' regulatory activity.
- NRAs' regulatory experience applied to the data economy.

Data Economy – EMERG activities

- 18.10.2017. – 19.10.2017. EMERG workshop on OTT regulation, Cross Border content portability, Big Data regulation and Key market indicators in Rome, Italy.
- On September 2017, Communications Regulatory Agency of Bosnia and Herzegovina conducted the Big Data survey. The questionnaire was addressed to three SMP operators:
  - Q:To what extent does your organization have experience with analytics and using Big Data? A: (1- in plan; 2- effective in practice)
  - Q: Does your organization have a strategy of analytics and the use od Big Data? A: (3- Yes)
  - Q: Does your organizations possess the necessary skills to work with Big Data? A: (1- In plan, 2-Yes)

The European 5G Framework

- The strategic objectives:
  - Gigabit connectivity for all key social institutions like schools, transport hubs, universities, hospitals as well as “digitally intensive enterprises” by 2025 and
  - 5G connectivity in all urban centres by 2025.
- Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society, COM(2016) 587
- The 5G Action Plan (COM(2016)588
- European Electronic Communications Code: '5G-ready' review of the telecom framework

The European 5G Framework -EECC

- Directive (EU) 2018/1972 - 11 December 2018 establishing the European Electronic Communications Code
  - The agreed rules are crucial for achieving Europe's connectivity targets and providing everyone in the EU the best possible internet connection, so they can participate fully in the digital economy.
  - Enhance the deployment of 5G networks by ensuring the availability of 5G radio spectrum by end of 2020 in the EU and providing operators with predictability for at least 20 years in terms of spectrum licensing; including on the basis of better coordination of planned radio spectrum assignments.
  - Facilitate the roll-out of new, very high capacity fixed networks
  - Benefit and protect consumers

Conclusion

- 5G will support a world in which anyone and anything will be connected at anytime and anywhere.
- It is a world where everything and everyone are generating data everywhere.
- Big Data needs must be addressed before 5G can be possible
- Big attention for the complex relationship between 5G and Big data
- Big Data is an important part of 5G story

Big Data and 5G

Thank you

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