TIM Group

OPERAZIONE RISORGIMENTO DIGITALE **TIM**

AI4EE & EE4AI – A Win-Win Challenge
New Technologies for Environmental Efficiency and Environmental Engineering for New Technologies' Efficiency
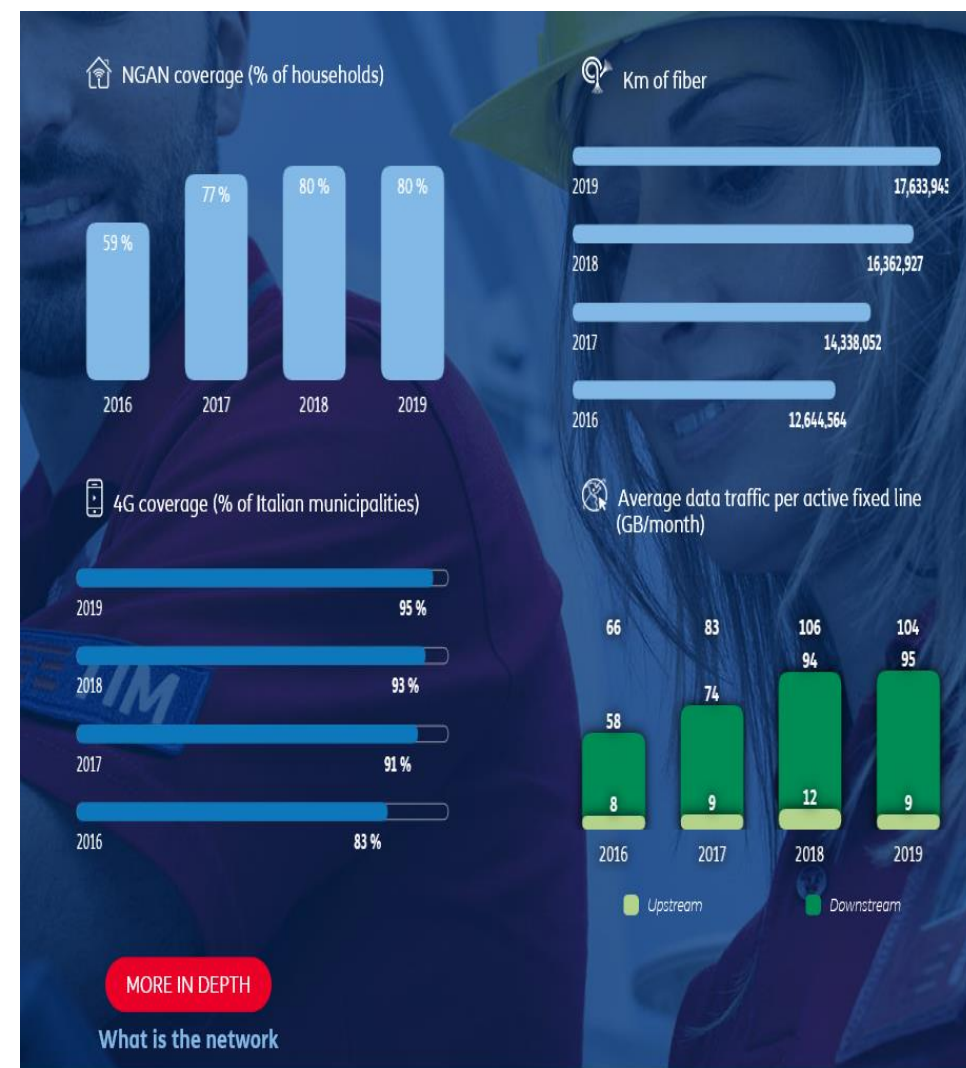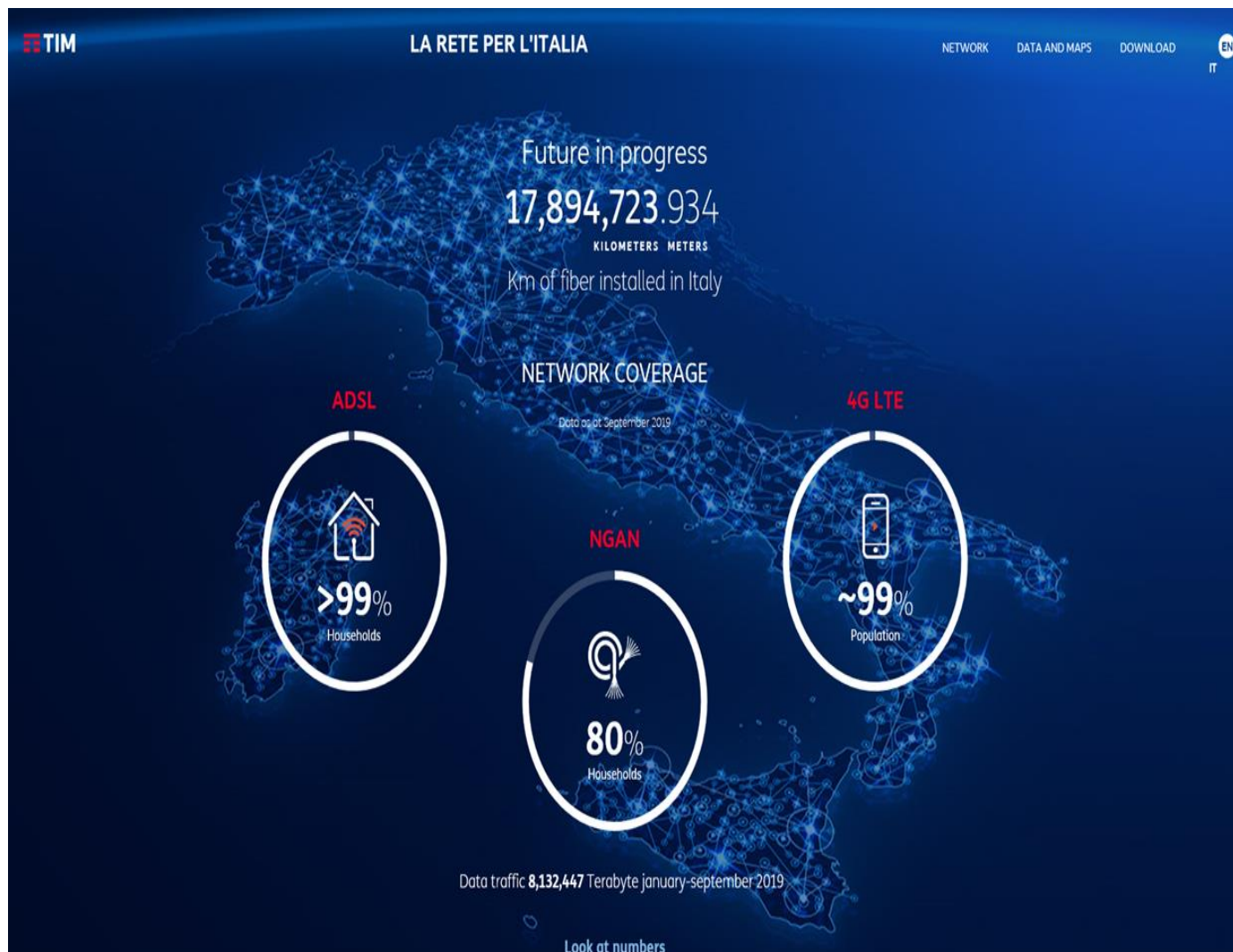
Claudio Bianco
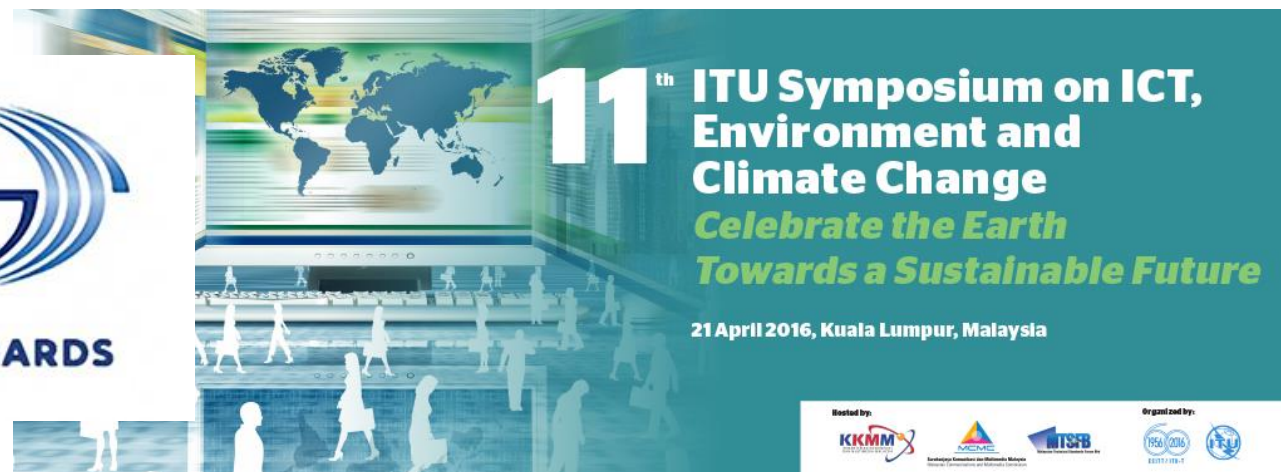*Environmental Efficiency R&D Engineer, TIM (Telecom Italia)*

TIM

Wien
December 2019, 11th

TIM NetBook – https://rete.gruppotim.it/en

EE for AI – The Technical Standardization Arena

..... and more .....

TIM – Technical Newspaper
Special issue on Artificial Intelligence (Feb.'19)

AI: a progressive evolution (starting in the 50'es...) and consolidation, up to nowadays. with first relevan impacts and results

An acceleration/explosion due to big data, high performance computing and availability of Ultra BroadBand network connections and cloud computing resources.

With an impact on all economy and service areas (e.g. smarthphones' images elaboration, new vocal interfaces, network automation, manufacturing automation, e-commerce, sanitary services).

**BUT** also a big challenge on related ethics issues

Building trust in human-centric AI
The Ethics Guidelines for Trustworthy Artificial Intelligence (AI) is a document prepared by the High-Level Expert Group on Artificial Intelligence (AI HLEG). This independent expert group was set up by the European Commission in June 2018, as part of the AI strategy announced earlier that year.

TIM – Technical Newspaper - Special issue on Artificial Intelligence (Feb.'19)
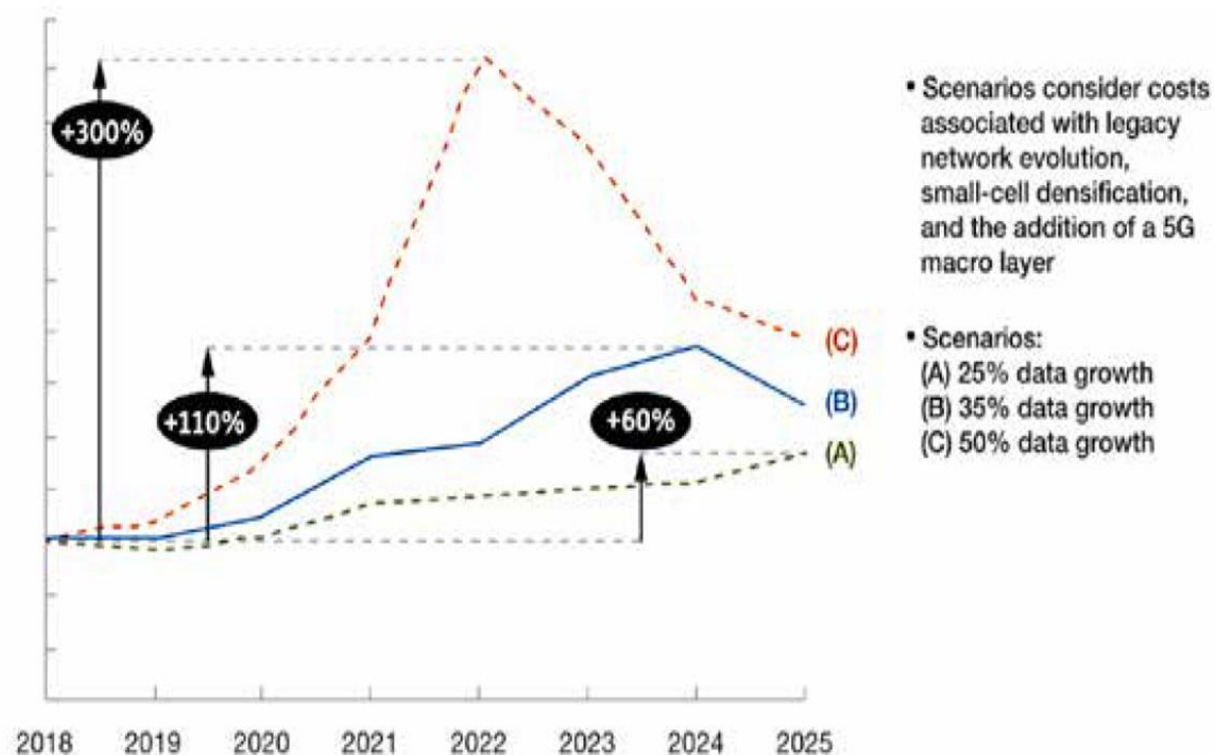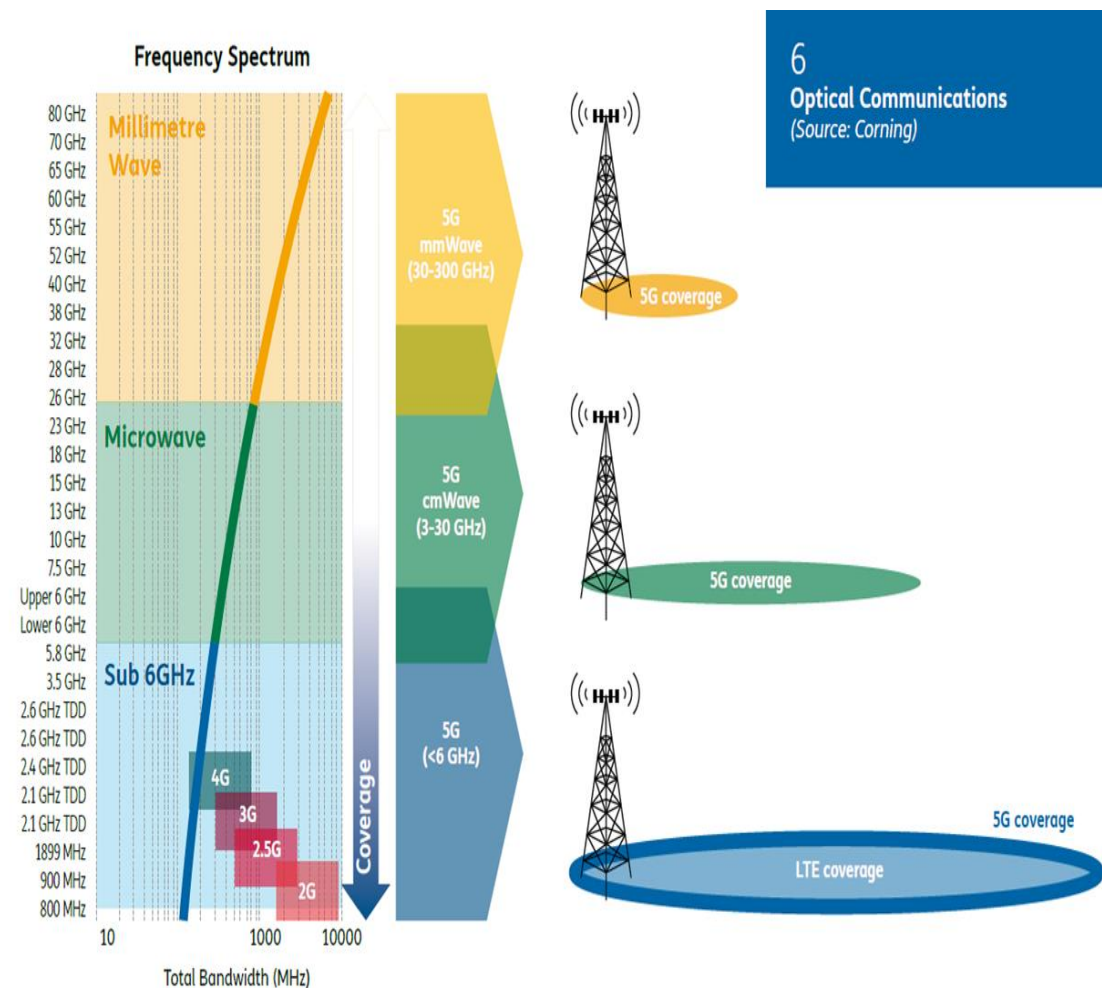## Some snapshots (1/4)
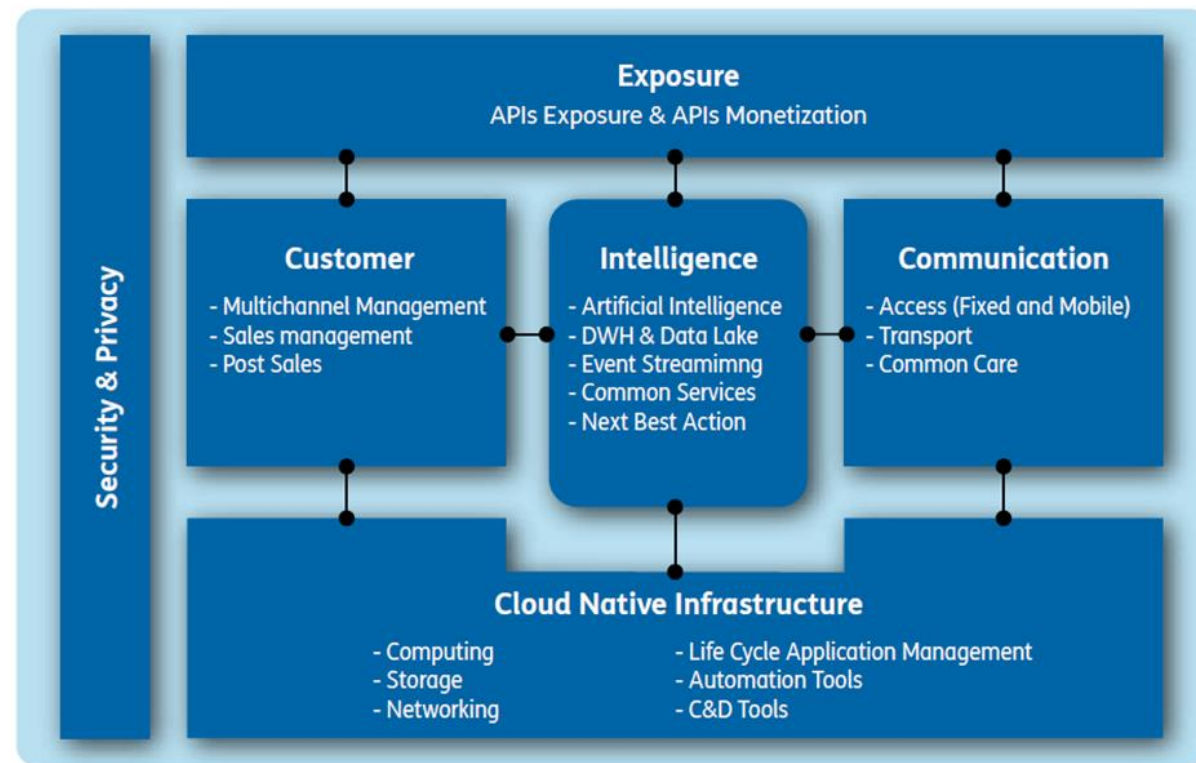
The long history of AI (AI past, present, future) - *(Source: Ovum)*

The 5G Digital Business Platform: Functional view

Frequency Spectrum

6 Optical Communications (Source: Corning)

- Scenarios consider costs associated with legacy network evolution, small-cell densification, and the addition of a 5G macro layer

- Scenarios:
  (A) 25% data growth
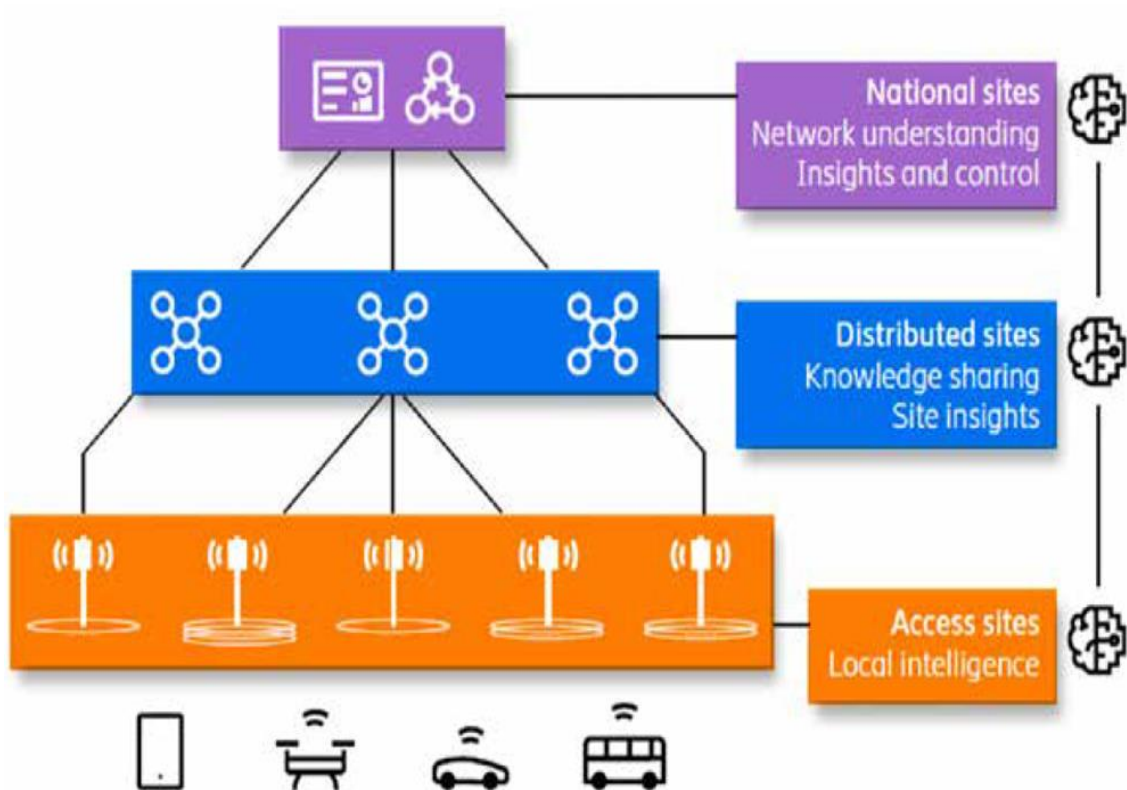 (B) 35% data growth
  (C) 50% data growth

Note: Total cost of ownership includes capital expenditures and operational expenditures for radio access network and transmission but not core networks. Data are based on 3 operators in a European country. Results are rounded.

Total cost of ownership for mobile access networks will increase
(Source: McKinsey&Company)

Source: https://www.telecomitalia.com/tit/it/notiziariotecnico/edizioni-2019/n-2-2019.html

TIM – Technical Newspaper - Special issue on Artificial Intelligence (Feb.'19)
Some snapshots (3/4)

Local and global learning and decision making in large distributed networls
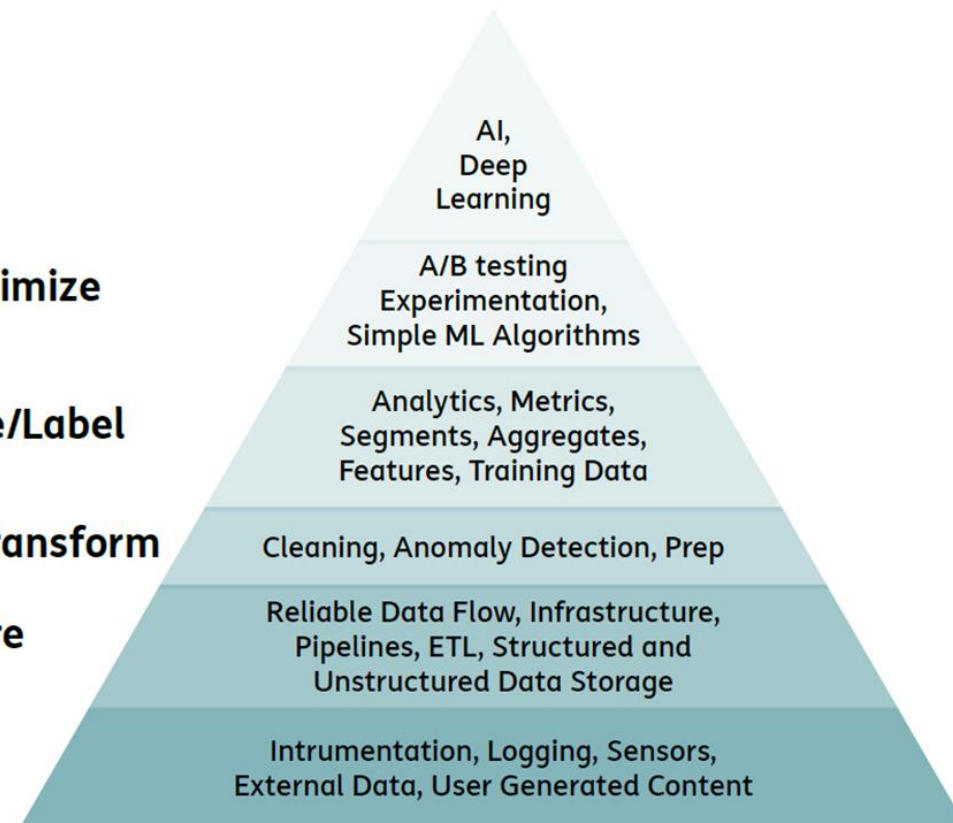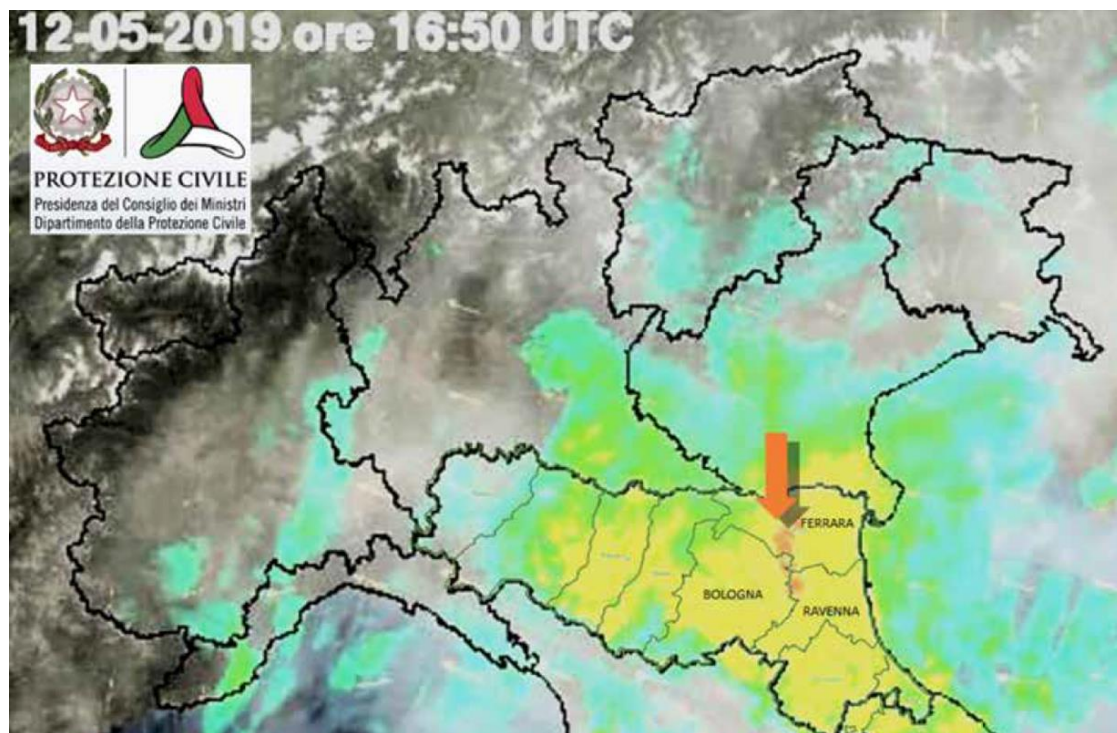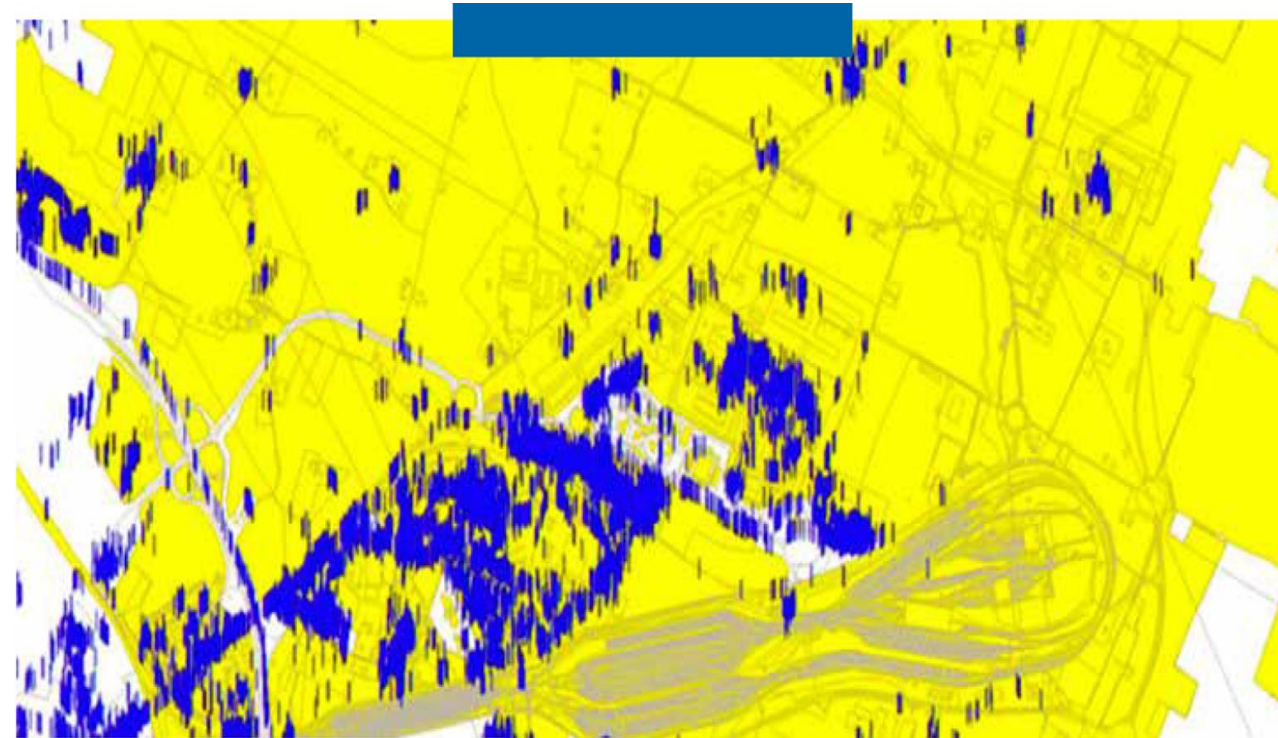*(Source: Ericsson "AI and ML in next generation systems")*

The Data Science Hierarchy of Needs Pyramid
(Source: "The AI hierarchy of needs" Monica Rogati)

TIM – Technical Newspaper - Special issue on Artificial Intelligence (Feb.'19)
## Some snapshots (4/4)

Radar images published by the Italian Civil Protection Service (strong storm near Ferrara, May 2019)

Graphic mapping of an example of geographical distribution of the samples in an area under study/observation

3GPP MDT (*Minimization of Drive Test*) standard (collection of measures from mobile terminals - both for Connected Mode and Logged Mode – in combination with GPS coordinates

AI for Cooling (Google DeepMind)
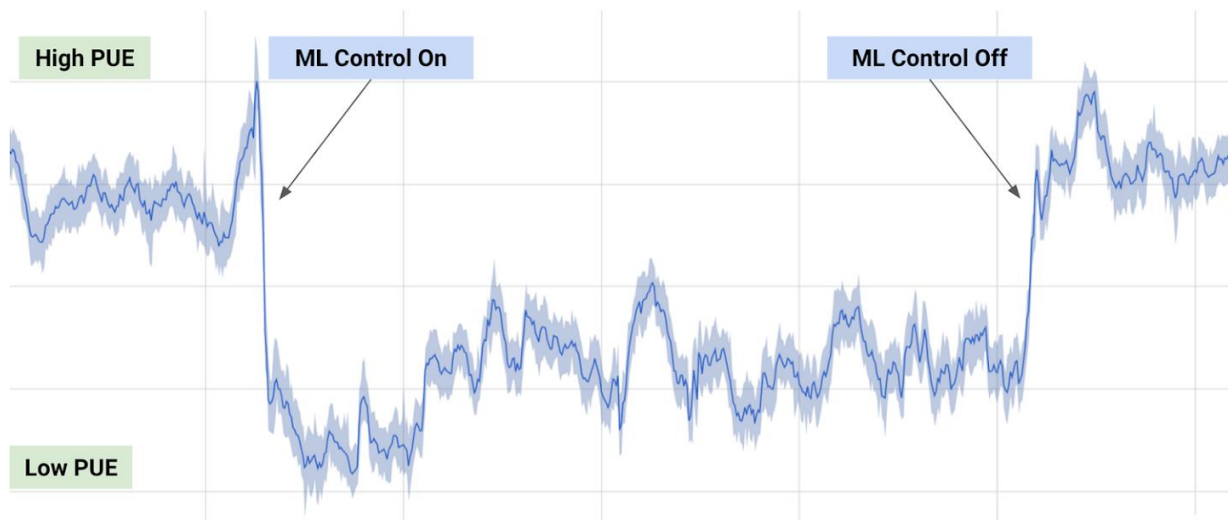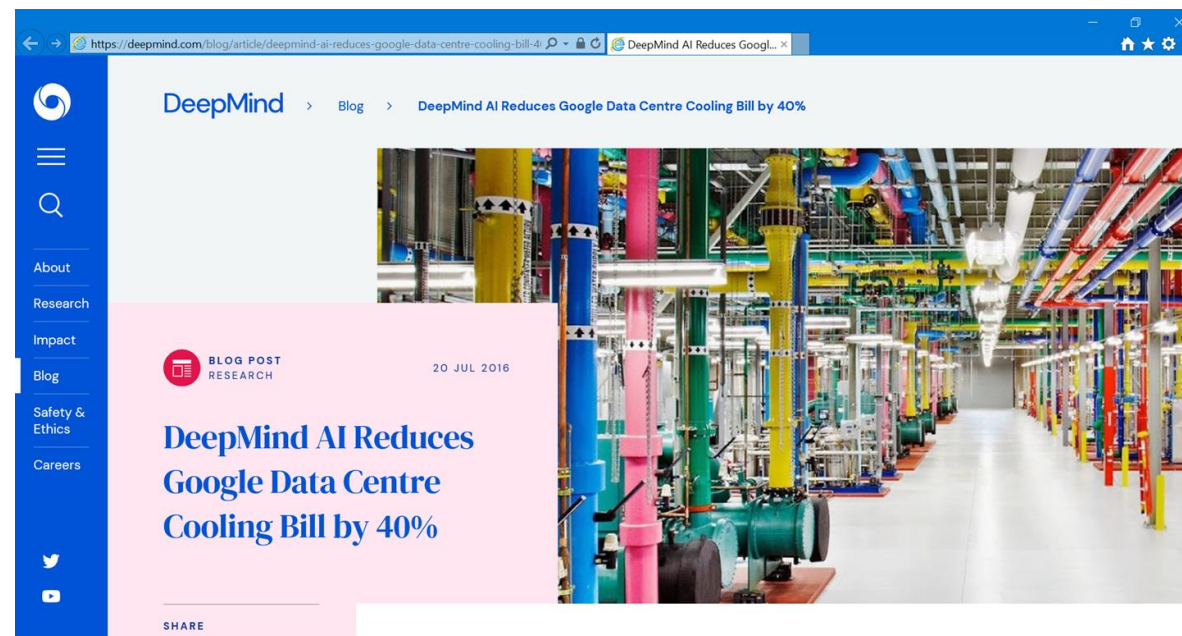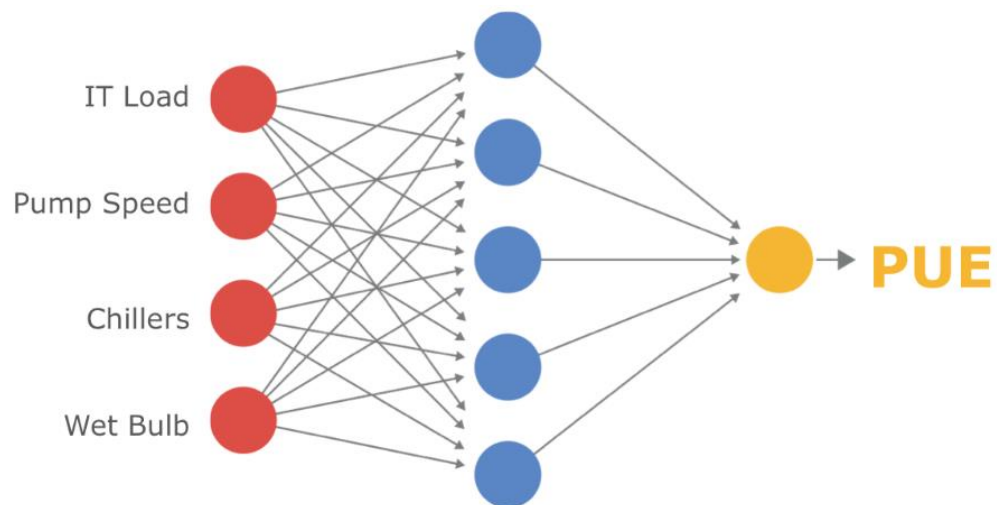
DeepMind AI Reduces Google Data Centre Cooling Bill by 40%
(July 2016)

PUE (Power Usage Effectiveness) = total building energy usage / IT energy usage

https://deepmind.com/blog/article/deepmind-ai-reduces-google-data-centre-cooling-bill-40
https://googleblog.blogspot.com/2014/05/better-data-centers-through-machine.html

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Blockchain for Energy Sector (TIM)

Energy Communites (pro-sumers = Producers & Consumers): renevables power plant (with storage) allows energy exchange

Optimization of RES (Renewable Energy Sources) usage and **energy cost savings:** possible with adoption of **blockchain, which allows process automation (not only ... bitcoins ...☺)**

See also: **Overview of blockchain for energy and commodity trading** (by EY - Ernst & Young)

https://www.ey.com/Publication/vwLUAssets/ey-overview-of-blockchain-for-energy-and-commodity-trading/%24FILE/ey-overview-of-blockchain-for-energy-and-commodity-trading.pdf

Source: https://www.telecomitalia.com/tit/it/innovazione/come-la-blockchain-cambiera-il-mondo-dell-energia.html

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Blockchain for Energy Sector (IBM)

DCD – Data Center Dynamics

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How fast is it growing?
Although AI is clearly growing, the rate of growth of any new market is difficult to chart. The OECD in December 2018 indicated considerable growth in private investment from 2017 onwards and Gartner's 2019 CIO Survey indicates a growth rate of 270 percent in implementation since 2015 and 37 percent from 2018 to 2019. Gartner estimates that the enterprise AI market will be worth US$ 6.14 billion by 2022.
Almost 20 percent of 600 data center owners and operators in a 2019 *DCD* survey indicate that they are currently deploying AI in their datacentres and a similar proportion have this as a future priority.

ETNO – European Telecommunications Network Operators's Association

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Artificial Intelligence Task Force

The main objectives of the Task Force are as follows:

Video interview:
#ThinkDigital interview: Ieva Martinkenaite, Telenor Group and Chairwoman of the ETNO AI Task Force" from ETNO on Vimeo:
https://vimeo.com/374161978

- Identify the main objectives for an overarching ETNO position in the AI debate in Europe
- Provide a platform for ETNO Working Groups to coordinate on cross-cutting AI-related issues
- Develop and contribute to ETNO's positions based on input of the relevant Working Groups within their areas of responsibility, and convey that in ETNO policy documents
- Collect and leverage on members' expertise to foster the discussion in Europe on AI aspects that are relevant for business development, more generally, and for telecoms sector in particular
- Engage in AI-related initiatives by EU institutions for ensuring that the key aspects discussed under the AI TF are taken into account
- Collaborate with other associations such as GSMA, DIGITALEUROPE and other industry and institutional stakeholders that pursue relevant AI initiatives

- **Chair**: Ieva Martinkenaite, Vice-President, Telenor Research, Telenor Group: ieva.martinkenaite@telenor.com

https://etno.eu/working-groups/artificial-intelligence-task-force.html
https://www.politico.eu/sponsored-content/exploring-the-unexplored-ideas-for-building-european-leadership-in-ai/

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ETNO – European Telecommunications Network Operators's Association

European Telecommunications Network Operators' Association

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Sustainable Development

CORPORATE RESPONSIBILITY CHARTER

Back in 1996, ETNO launched its Environment and Sustainability Charter, demonstrating its members' commitment to reducing their carbon footprint. Thanks to measures to optimize energy consumption of their networks and data centres and increased use of renewable energy, ETNO members managed to continue reducing their CO2 emissions. The ETNO bi-annual Sustainability Report monitors progress made by the 22 signatories the ETNO Sustainability and Environmental Charter that is open to all players on the market. The signatories of the Charter account globally for a turnover of about €200 billion. Thanks to their efforts to improve energy efficiency, ETNO Charter signatories have been continuously reducing their CO2 emissions despite a significant increase in overall energy demand due to growing mobile and data traffic. ETNO launched its **Corporate Responsibility Charter** which reflects the new challenges ahead and increasing engagement of ETNO members in new areas such as minor protection online and supply chain management.

The SD WG Chair is Dr. Heinz-Gerd Peters of Deutsche Telekom AG: Heinz-Gerd.Peters@telekom.de.

GESI – Global E-Sustainability Initiative

Digital with Purpose: Delivering a SMARTer2030

More informed and purposeful development and deployment of digital technologies will catalyse progress on the Sustainable Development Goals

https://gesi.org/
https://gesi.org/platforms/digital-with-a-purpose-delivering-a-smarter2030
https://gesi.org/posts/5g-and-the-sustainability-riddle

Thanks

Operazione Risorgimento Digitale

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