

TIM Group

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DIGITALE 

AI4EE & EE4AI – A Win-Win Challenge
*New Technologies for Environmental Efficiency
and Environmental Engineering for New Technologies' Efficiency*

Claudio Bianco

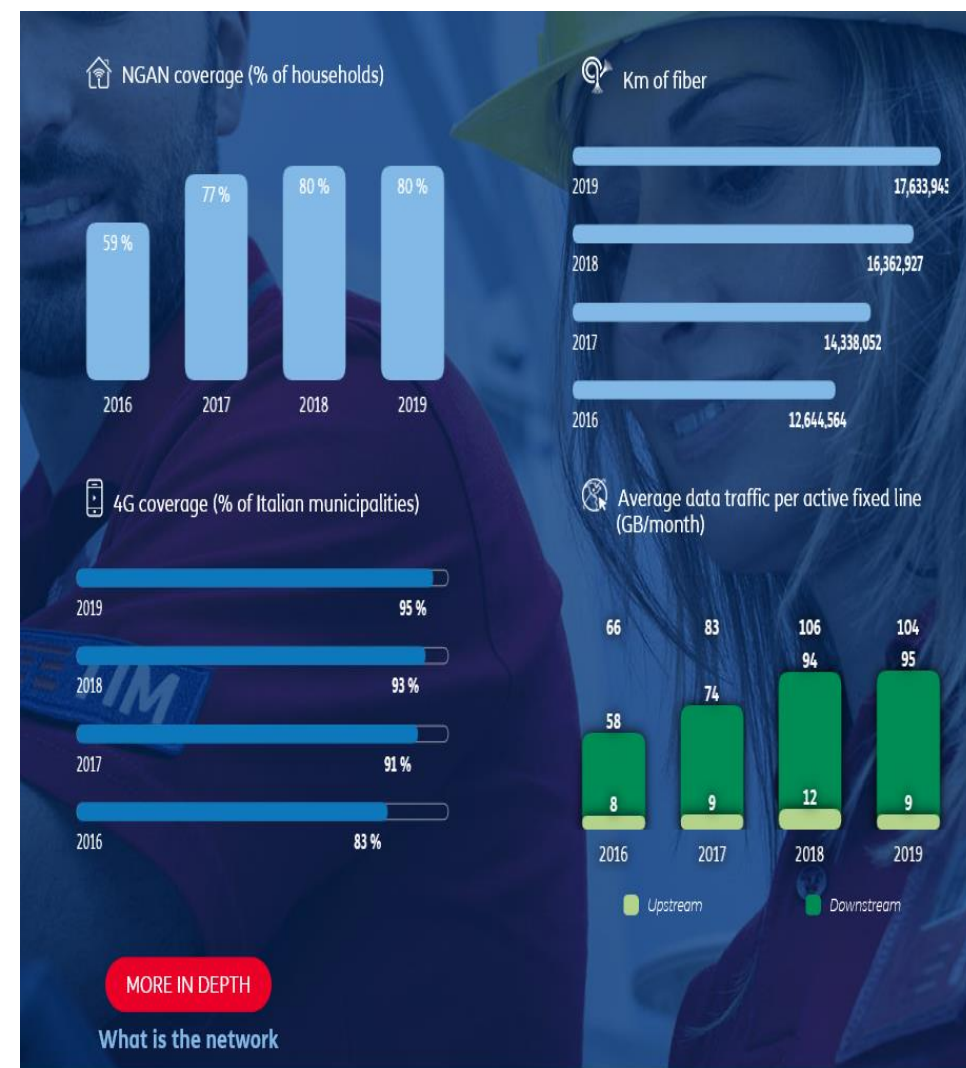
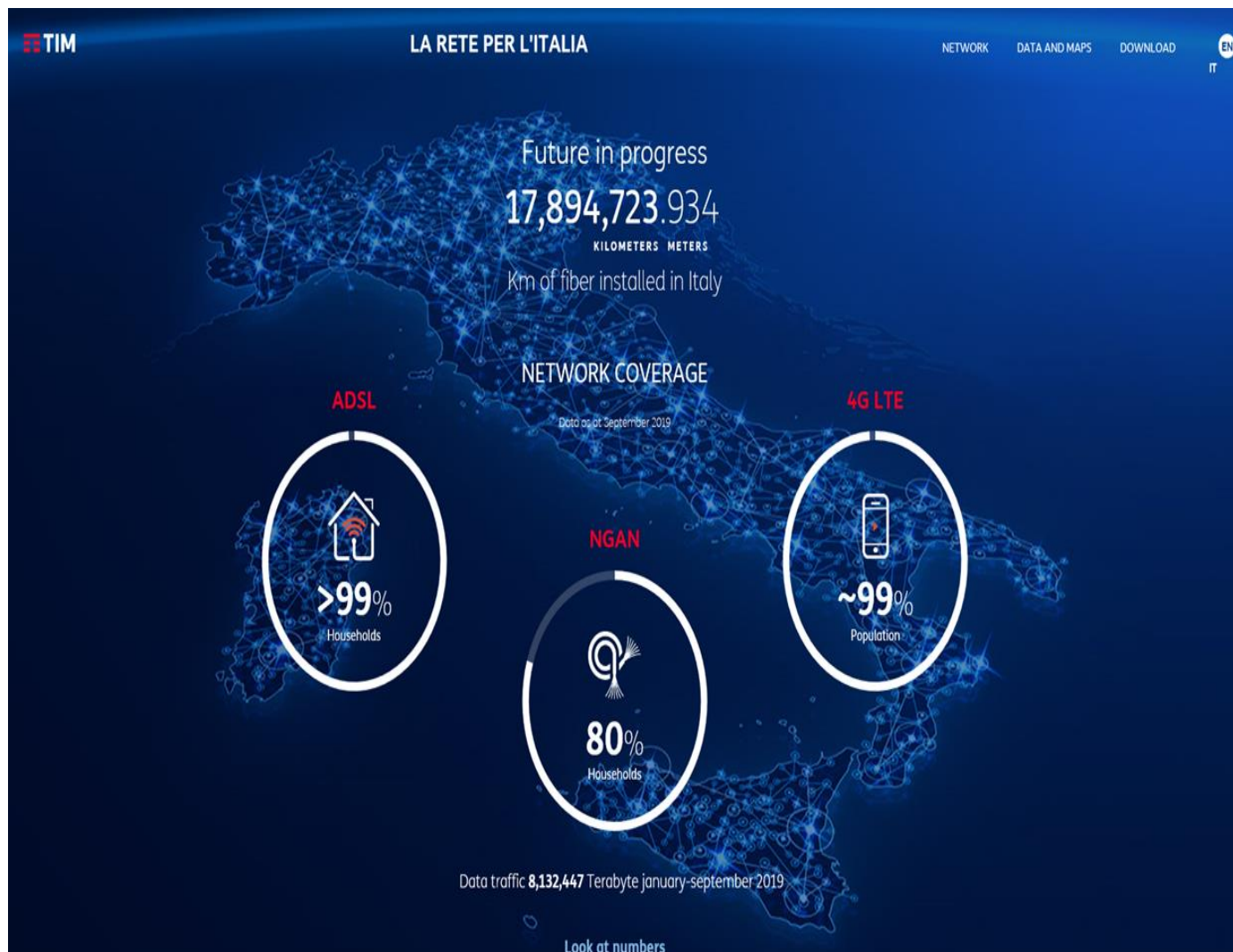
Environmental Efficiency R&D Engineer, TIM (Telecom Italia)

 **TIM**

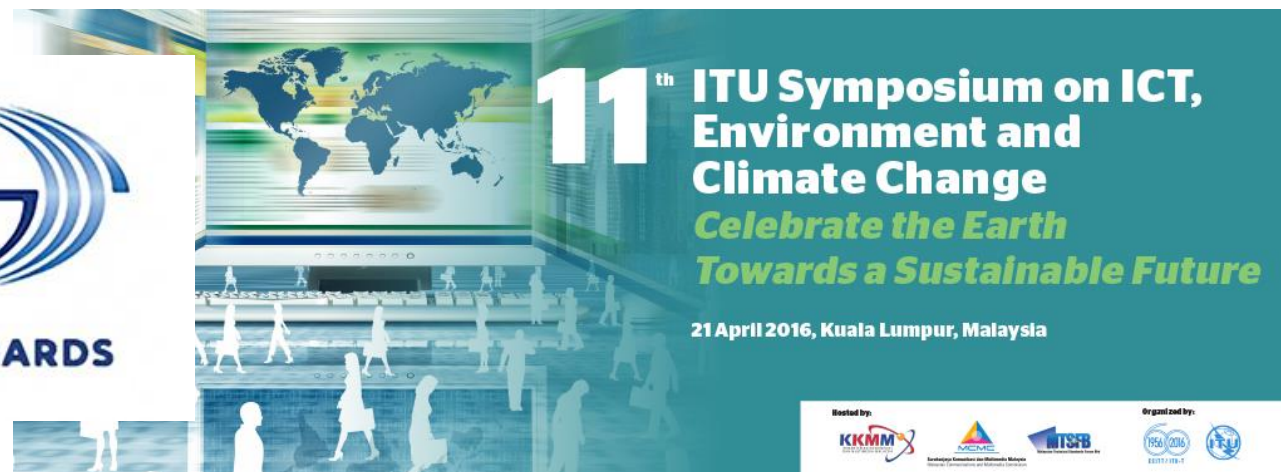
Wien

December 2019, 11th

TIM NetBook - <https://rete.gruppotim.it/en>



EE for AI – The Technical Standardization Arena



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 relevant 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. smartphones' images elaboration, new vocal interfaces, network automation, manufacturing automation, e-commerce, sanitary services).

BUT also a big challenge on related ethics issues

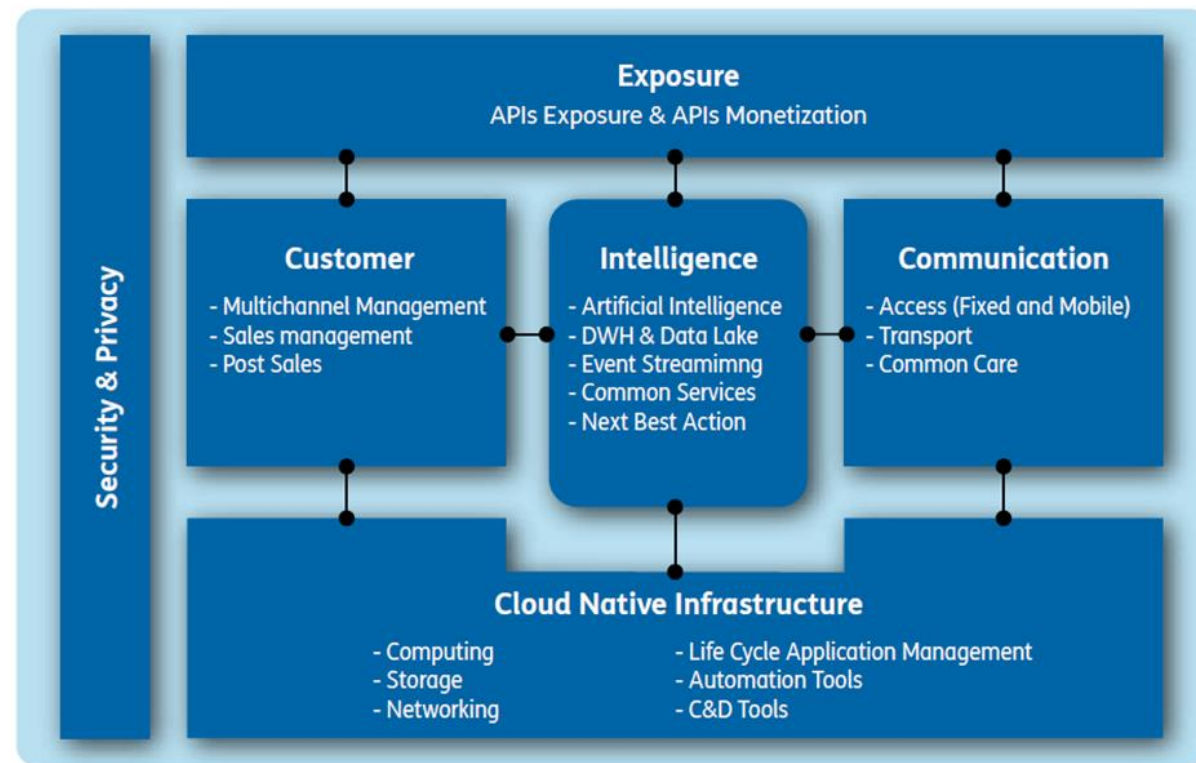
Building trust in human-centric AI

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)

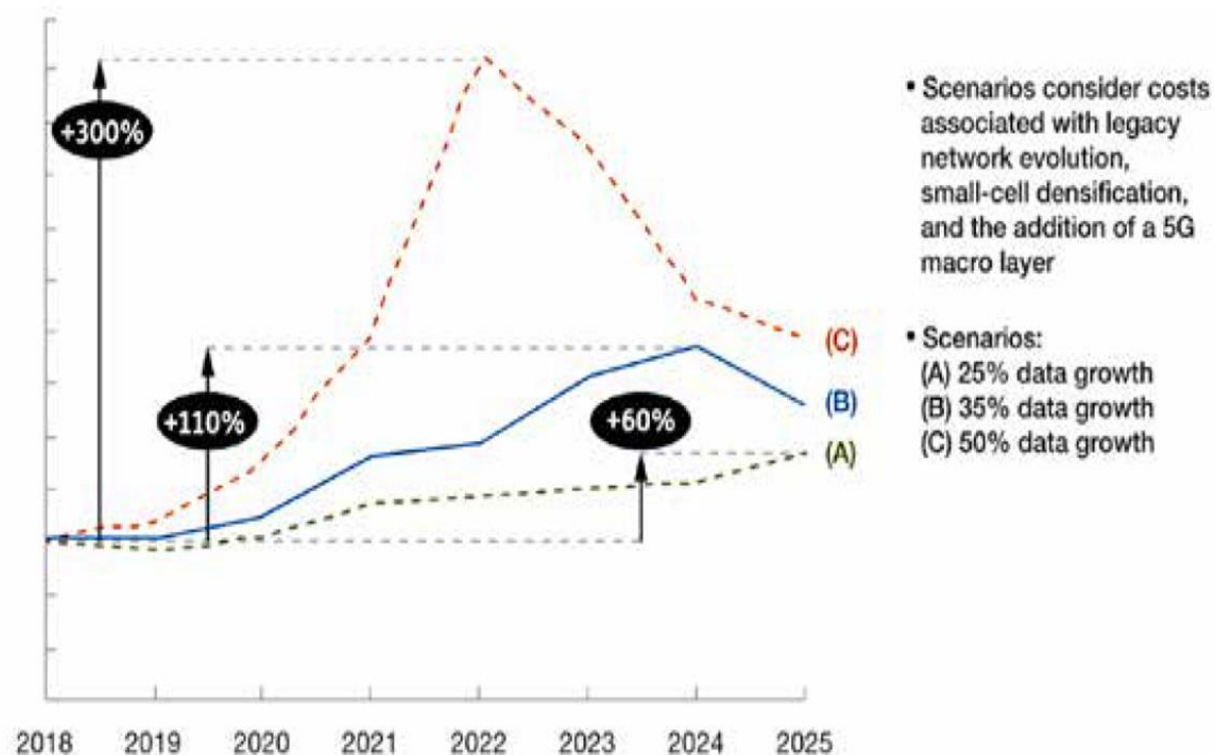
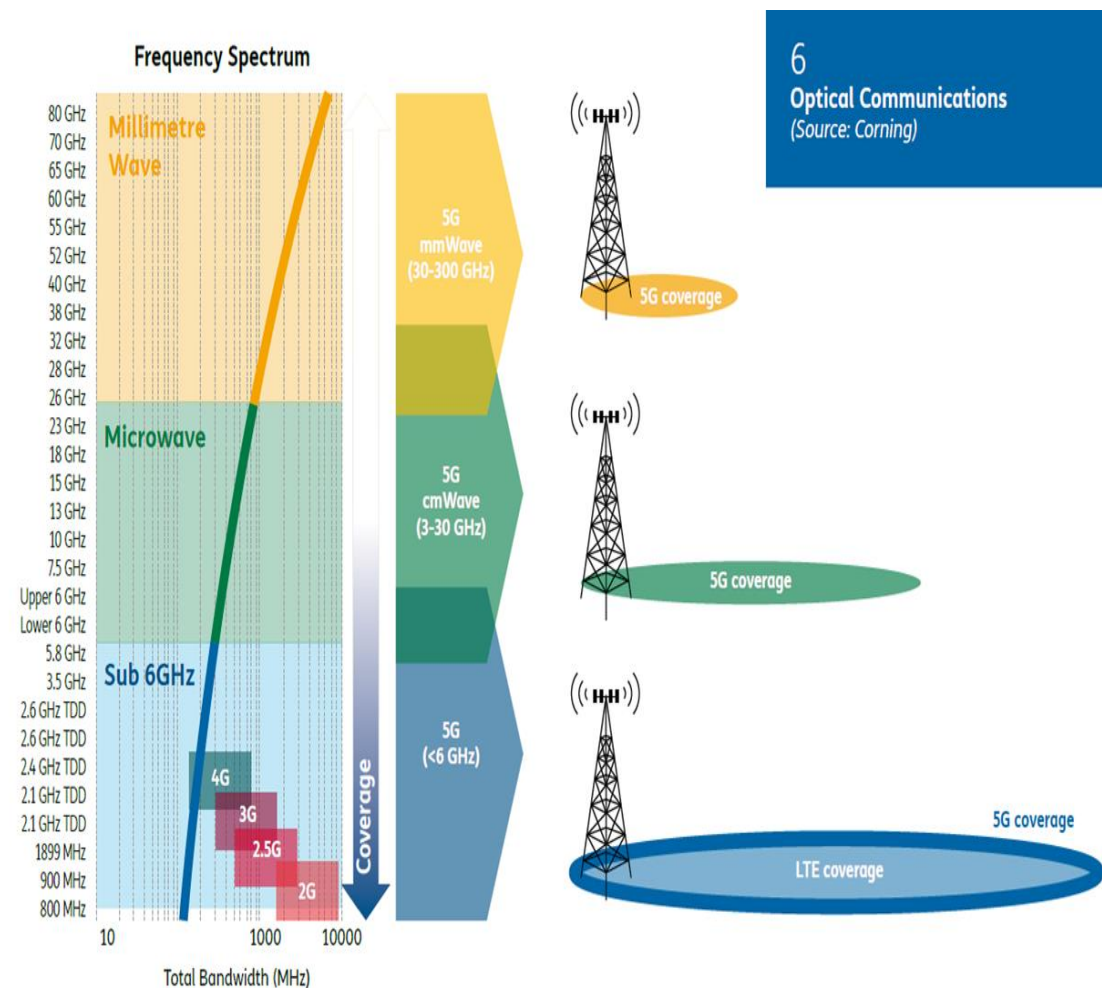


The long history of AI (AI past, present, future) - (Source: Ovum)

The 5G Digital Business Platform: Functional view

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

Some snapshots (2/4)

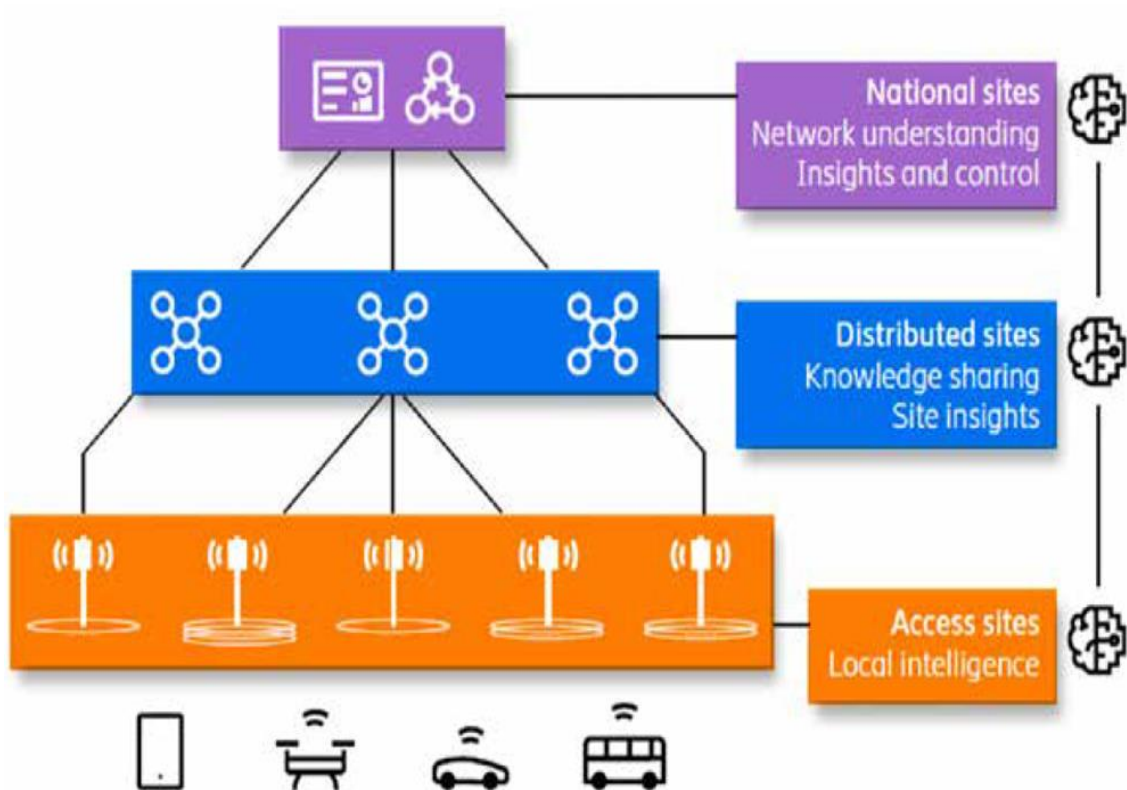


Note: Total cost of ownership includes capital expenditures and operational expenditures for radio access network and transmission but not core networks. Data are based on 3 operators in a European country. Results are rounded.

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

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

Some snapshots (3/4)



Local and global learning and decision making in large distributed networks

(Source: Ericsson “AI and ML in next generation systems”)

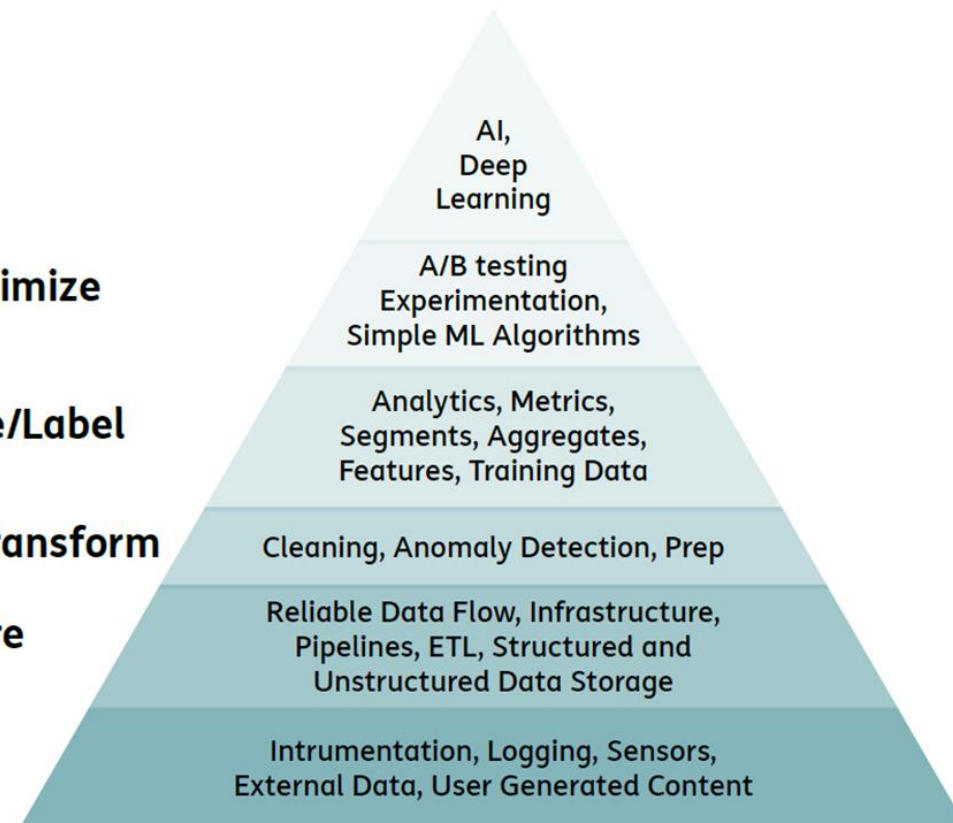
Learn/Optimize

Aggregate/Label

Explore/Transform

Move/Store

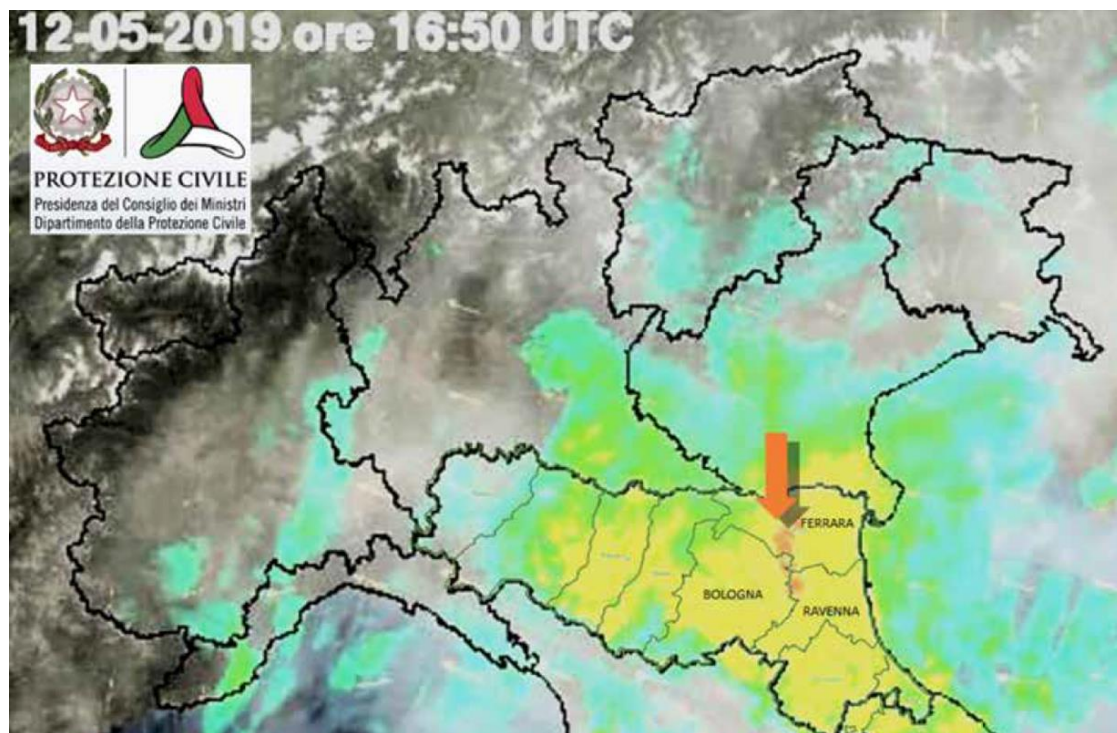
Collect



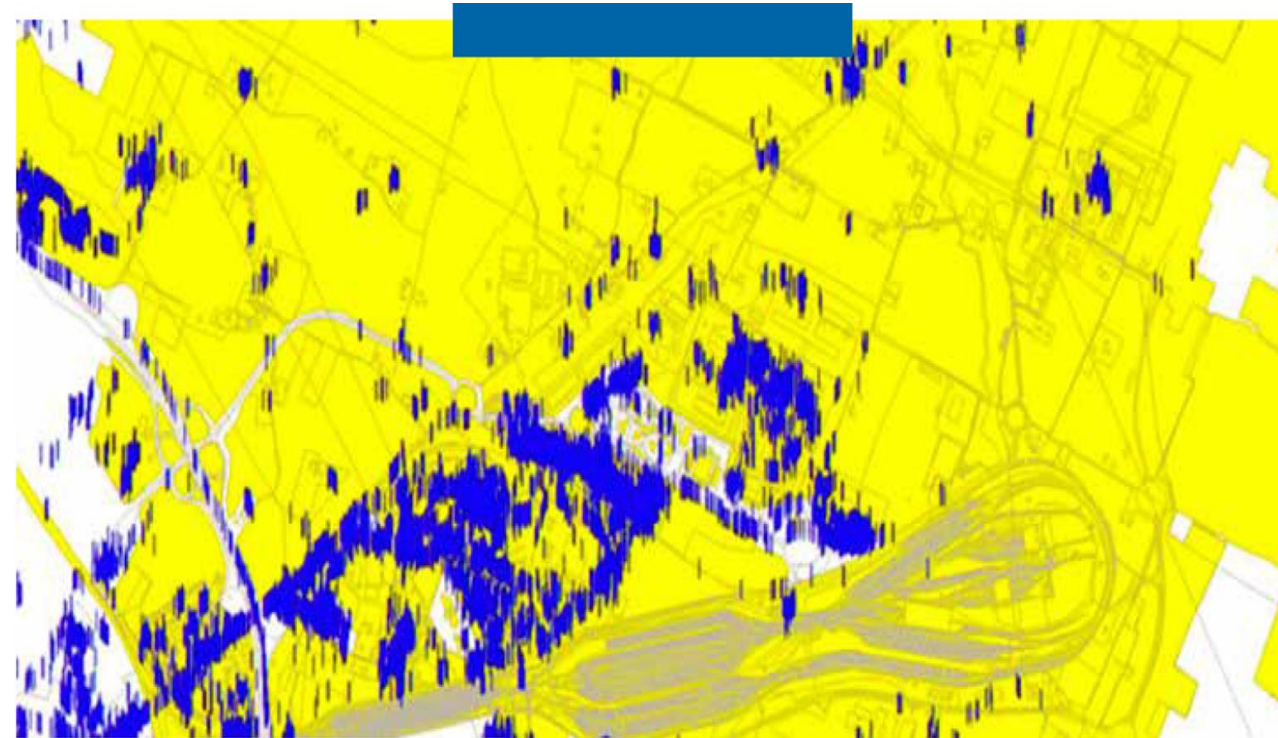
The Data Science Hierarchy of Needs Pyramid
(Source: “The AI hierarchy of needs” Monica Rogati)

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

Some snapshots (4/4)



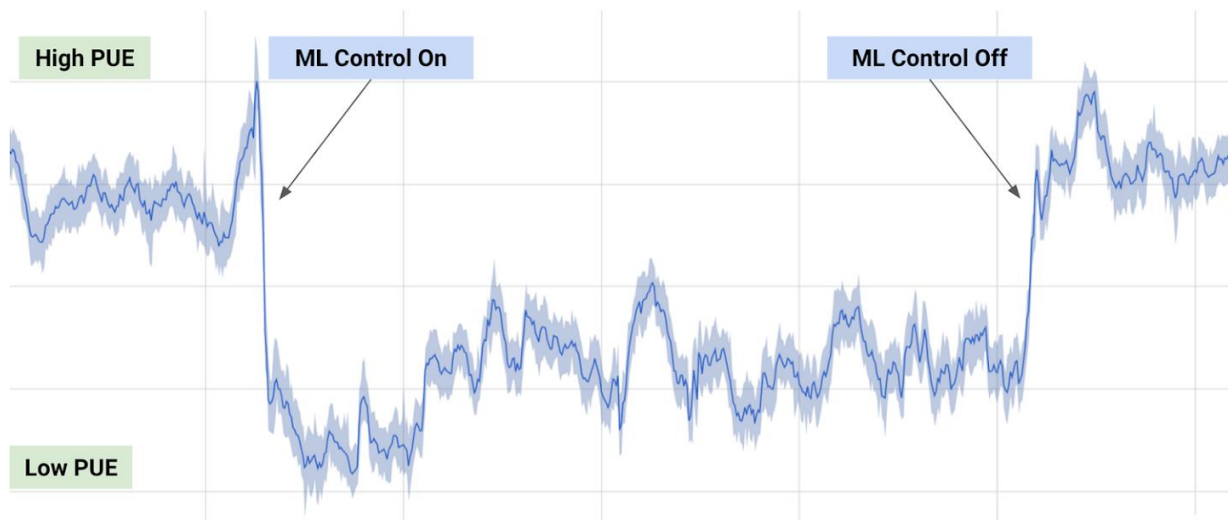
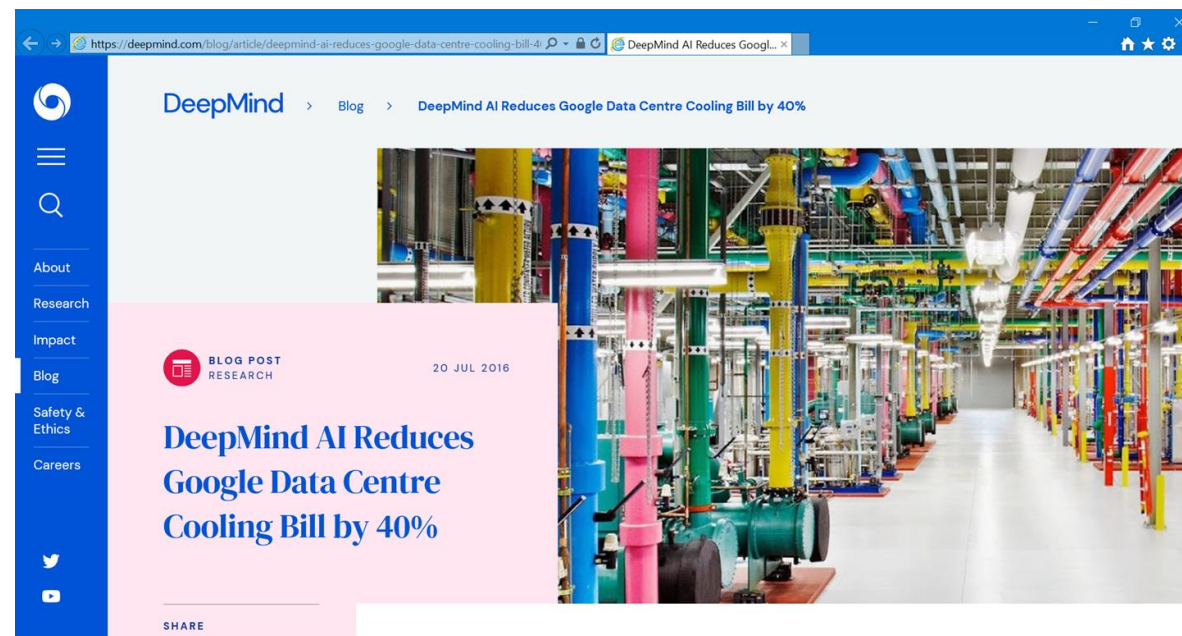
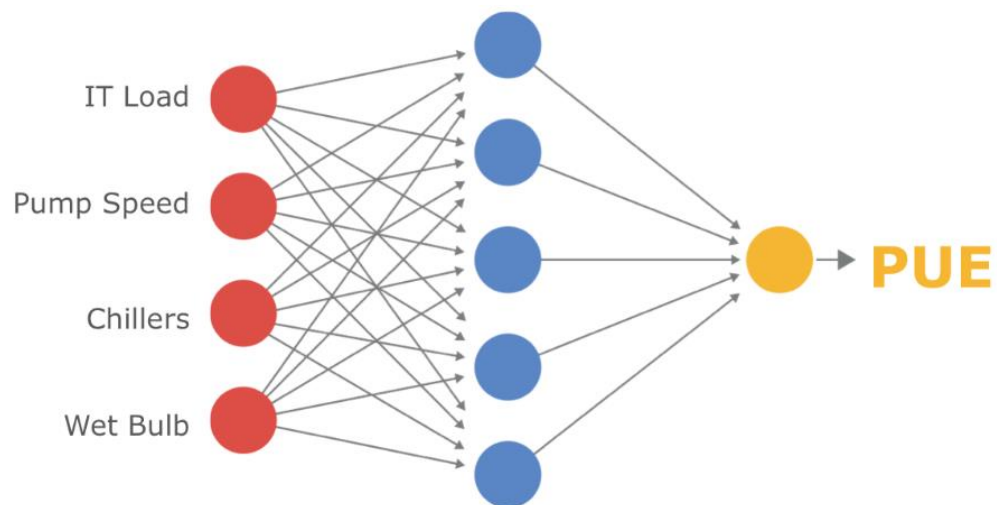
Radar images published by the Italian Civil Protection Service (strong storm near Ferrara, May 2019)



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

Blockchain for Energy Sector (TIM)

Energy Communités (pro-sumers = Producers & Consumers): renewables 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>



Come la blockchain cambierà il mondo dell'energia

14 giugno 2019, 09:30

Vivere l'innovazione / Come la blockchain cambierà il mondo dell'energia

Stampa Text size

f in t

Immaginate che i tetti dei condomini del vostro quartiere siano tutti ricoperti da pannelli solari di ultima generazione. Questo, però, non vi permette soltanto di utilizzare l'energia prodotta dal sole per la vostra abitazione, ma anche di immagazzinare quella in eccesso e rivenderla ai vicini che, invece, potrebbero averne bisogno.

Tutto ciò – che consente di **ottimizzare l'utilizzo delle rinnovabili** e di ottenere ulteriori **risparmi sulla bolletta** – è reso possibile dalla **blockchain**: la tecnologia del registro distribuito (resa celebre dai bitcoin) che permette non solo di scambiare moneta digitale, ma anche di **automatizzare** la gestione di alcuni processi.

Blockchain for Energy Sector (IBM)

The screenshot shows a web browser window displaying an IBM blog post. The browser's address bar shows the URL: ibm.com/blogs/blockchain/2017/12/how-technology-is-shaping-the-renewable-energy-sector/. The page header includes navigation links: "Blockchain Pulse: IBM Blockchain Blog", "Categories", "Contributors", "About Us", "IBM Blockchain", and "Blockchain Podcast".

The article is dated "December 5, 2017" and written by "Renata Mattos". It is categorized under "Blockchain development", "Blockchain education", and "Blockchain explained".

Below the article text, there are social media sharing icons for Facebook, LinkedIn, and Twitter. A thumbnail image shows a large solar panel array in a desert landscape.

The main text of the article reads: "According to the World Economic Forum, in 2016 solar and wind energy became cheaper than fossil fuels, indicating that the battle against global warming could become a lucrative business. The same article indicates that by late 2016, 47 developing countries had updated their energy plans by raising their reusable energy consumption targets to 100 percent. At the same time, Bill Gates, Jeff Bezos, Mark Zuckerberg, Jack Ma and others invested \$1 billion USD in Breakthrough Energy Ventures, a fund for emerging energy source research. The World Economic Forum article points out that many new investments in energy infrastructure today go to renewable energy. The biggest investments come from Asia, where India and China have submitted huge projects in solar energy, which became the cheapest renewable energy last year, well ahead of the original".

On the right side of the page, there is a "Follow the conversation" section with a "Follow @IBMBlockchain" button. Below it, a tweet from Rachel Wolfson (@Rachelwolf00) is displayed, mentioning a keynote at @ELEV8con and the #Blockchain game. The tweet includes a video thumbnail showing a stage with "BlockPain", "BlockBlame", and "BlockShame" signs.

At the bottom of the browser window, a file name "Solar-Panels-768x...jp..." is visible in the download bar.

DCD – Data Center Dynamics

Better data centers through AI

AI will make data centers work better, and could be exactly what we need to manage the demands of Edge and the staffing crisis

November 20, 2019 By: Huawei

The deployment of AI in data centers will be an evolution rather than a revolution. It is coming, but we can't be sure at this point how fast, and how far, it will penetrate the sector.

The business case is clear, but will itself evolve. Very large and hyperscale facilities are already making major savings on power and operational efficiency. As AI matures the technology options and pricing levels will develop and the benefits will start to be seen in smaller multi-tenant data centers (MTDCs) and enterprise facilities.

A more detailed picture

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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.



Artificial Intelligence Task Force

The main objectives of the Task Force are as follows:

- 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

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



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.



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

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