

The real challenge is not 5G - but who is datamining?

How countries can leverage their economy with data mining

1 Setting the Stage

Every nation will have to overhaul its information technology strategy. Every country needs to rethink its approach. The reason is simple: the world has been colonized by dataminers. Everyone despises colonialism, where a foreign power takes all resources without any consideration of the local needs, we have arrived at a situation whereby nearly every nation in the world has been colonized by those who take all data, without offering anything in return. It is amazing that no one is protesting, or are we not aware of the hard reality when it comes to the control and the processing of data?

2 Each nation that neglects to have a deliberate strategy for the “connectivity” of its citizens will without exception turn into one of the underdeveloped countries in the world of datamining. Even nations that have pursued a strategy with massive investments in digital infrastructure of all kinds will realize soon that these investments in hardware and software are all at the service of datamining by third parties who never pay taxes in the countries where the information was gathered.

3 Policy makers (and citizens) have to realize that with each new device equipped with IoT (Internet of Things) comes an opportunity to record, analyse and resell another detail of everyone’s daily life. As each individual accumulates more permanent data connections centered around one or even two mobile smart phones, so does each of us divulge ultimately the totality of our behavior - often unknowingly - to a remote dataminer who will convert trillions of raw data into gold and power.

4 Some countries are leading the debate in the world on key issues related to the Internet. Italy for example is leading the debate in the world on the “Constitutional Right to Connectivity”, one of the key policy proposals of The Five Star Movement. I applaud this visionary approach. There is only one country (China) that is deliberately establishing an industrial policy and a citizen data strategy. It is long overdue that the European political and business world needs go beyond the assessment of the technologies as well as the financing of infrastructure and consider three critical questions:

- (1) who controls the profitable business of data-mining in Europe?
- (2) Who is ready to shift the internet from 2D to 3D? and,
- (3) Which legal and technological system can really protect citizens from digital exploitation?

1. Who Controls Data Mining?

Data mining will turn into the most strategic and most profitable industry ever. Datamining is poised to turn into a fastest growing sector generating income and influence to the operator like never before. It is not the one who controls the infrastructure to collect the data nor the media, rather it is the one who controls datamining through millions of servers and trillions of algorithms that will determine the game. This obscure operator, and limited today to only a handful, has the power to spread unbiased news (a Government task), to stop fake news, and to refuse to divulge news (like the prohibition to disclose suicide data which is in several population groups is higher than COVID death). China recognized this differentiation since years and deliberately blocked all American “dataminers” and “dataspreaders” from its market.

Whereas many experts discuss on fora technologies from communication innovations, to artificial intelligence, investments in infrastructure like fiber optics and satellites, the only **business that makes and will make real money to pay for innovations and connectivity is datamining**. Thus, there is the urgent need to coordinate all infrastructure investments, communication techniques, especially Artificial Intelligence (AI) to enable the design and the enforcement of “data mining” policies. Once these are determined, then countries can derive from it an economic development strategy. Without it, countries are colonized just in the same way as the Belgian King Leopold II took over Congo, with force and without remorse.

Let us not be conceited, just one fiber optic cable or one satellite connection would permit the undermining of any comprehensive policy. Whereas some may consider this a totalitarian approach, even a step towards endangering democracy, I argue that it is rather the opposite. Refusing to have an overarching strategy would endanger democracy since it turn the nation and the citizens into a colonized data state. We may have to learn a few lessons from China which is the only nation that has closed its internet realm.

The real issue is not if you are connected, and at what speed, but rather **who has the right to analyse your data when you are connected**. Europe is nowhere in the debate and has blindly permitted foreign companies to connect to its networks while China and the USA deliberately block take-overs, and

even outright operations. Worse, Europe has freely opened its leading companies for predatory acquisitions, and has permitted the use of both its infrastructure and the syphoning off of its data as if it were a 19th century colony. Actually, there are nearly no nations that represent an exception to this colonial style of rule. Actually, no one seems to have made a conscious decision: “it just happened” while policy makers and hardware suppliers were looking at the profitable contracts for the installation of fiber optic cables, satellites and 5G antennas.

Europe, and all other nations that have undergone this transition, needs to reverse the reality now, and deploy policy frameworks and business models that permit *at least* to mine its own data, to generate value from this raw information, to exchange its own processed information on equal trading terms, to design the new industries and professions that support data mining, and finally (and most importantly), it needs to figure out how to secure the data from its citizens as the law prescribes but is hardly ever applied. We often forget that with one click on the internet, everything on a computer is siphoned off without any trace to unidentified “new” owners of the data. The simple tick to connect the phone to a WiFi spot potentially sucks all the data out of a phone on to a server without ever asking permission. The innocent -looking prompter on a pop-up only asks the user to click on “Agree to the Terms and Conditions” to have free internet in exchange for a total handover of all information.

The Gross Data Product - is only the beginning

Academia have established criteria for the importance of “data” in the overall economy. This has lead to the ranking of world’s top “Gross Data Product” producers, according to four criteria:

(1) Volume: Absolute amount of broadband consumed by a country, as a proxy for the raw data generated.

(2) Usage: Number of users active on the internet, as a proxy for the breadth of usage behaviors, needs and contexts.

(3) Accessibility: Institutional openness to data flows as a way to assess whether the data generated in a country permits wider usability and accessibility by multiple AI researchers, innovators, and applications.

(4) Complexity: Volume of broadband consumption per capita, as a proxy for the sophistication and complexity of digital activity.

Not one EU member state figures in the top five, and Switzerland conspicuously ranks above Germany, a nation with twenty times its population. Italy, once renowned as the home of the radio (Marconi) and electric

typewriters (Olivetti) does not score well. Italy ranks¹ only 16th after The Czech Republic, Sweden, and even New Zealand, and barely better than Mexico and Argentina.

In the framework of this article, we must point out that this ranking only relates to the Gross Data Product. If this exercise were to include the contribution of data mining to the national economy, then all European countries with the exception of the UK and Switzerland would realize they are not generating any value from their own data, nor from data that pass through its territory. On the contrary, not only are the data sent overseas, Europe pays billions to have access to the processed information.

Each European nation treats the data highways like the Belgians treat freeways: trucks from around Europe use it, no trucking company pays anything (not even a tax), no one stops to have a coffee and leaves a penny behind, while the massive number of trucks pollute the air with heavy diesel fumes and contribute to traffic jams that cost the locals millions of hours in lost working time. More disappointing at this stage of the debate is that no European country keeps any detailed statistics demonstrating the contribution (or rather the embarrassing drainage) of data deliveries and data mining to its economy.

In the run up to the European Unification in 1986-1990 the economy was suffering from the second oil crisis. When we pointed to the dramatic growth generated in the European economies by fast growing service companies, these sectors had been left unaccounted for as these were lumped together under the label “other services”. As soon as the European Statistics Office in Luxemburg adapted the data gathering and realized the role of security (Securitas), cleaning (ISS), catering (Sodexo), express postal services (DHL), quality control services (SGS, Veritas) and data transmission (like SWIFT and EuroClear) represented double digit growth sectors policies immediately came into place. The old adagio of management applied then, and applied now: you cannot have policies if you do not have data on datamining. The European Statistics on data mining requires immediate remediation.

Research undertaken by the ZERI Network² has made provisional calculations and suggests that one way fiber optics (to supply data and entertainment services to households only - not to deliver nor to transform data) represents a drain of 100 million euro per year per hundred thousand inhabitants solely for home deliveries of data (€1,000 per citizen per year). This drain in cash for subscriptions, commissions and services online represents for a country like

¹ <https://hbr.org/2019/01/which-countries-are-leading-the-data-economy>

² Considered by the University of Pennsylvania one of the top 10 creative think tanks in the world)

Italy an estimated € 5.5 billion annually and increasing at double digit rates. The number for Europe could reach €40 billion. Thus, foreign information arriving - and paid for - in the country through “connecting” each home to this high speed fiber optic networks linked with 4 and 5G represents one of the largest invisible losses of cash and purchasing power for local citizens. This implies that Italy (and all European nations with the exception of Switzerland) has a gross data IMBALANCE, and this is directly affecting the purchasing power of its citizens at a rate of €1,000 per device! And this imbalance is increasing. On top of that, all the data derived from these sales are profiting only the datamining companies which are not based in Europe! As indicated before, these corporations do not pay any taxes.

2. The Next New Technology Frontier

The race to install 5G, fiber optic networks, intercontinental marine cables, server parks and satellites is all geared towards one ultimate goal: the control of datamining. These investments will never offer a serious return when one is not considering the **next big shift in data**: the shift of the internet from a visual presentation of 2D to 3D. We overlook the fact that everything on this world wide web is a paltry 2D: documents, pictures, video. Even when there are games that offer a 3D rendering or a virtual reality, this is a far cry from what humans have been endowed with: a brain that processes everything in 3D with a sense of time (4D).

A child is born and sees a world in 3D. Then it is introduced to a “modern digital world” and it is forced to think, learn and play in 2D. **What we call modernity is a step backwards in terms of brain capacity and thus brain development.** We forget that a decrease from a 3D reality to a 2D virtual reality is also a decrease of opportunity for brain development! How can we ever compare the learning opportunity from a student led theater play with a repeated gaming of SIM City, or worse, the exercise of multiple choice questions? The recent confinement, school closure and forced masks obliging to breath their own carbon dioxide is further debilitating the capacity of children to develop their brain

The Power of the Eyes

Our visual system is the most perfected connection between the outside world and our brain. A soft artificial light, ideally similar to clarity of a full moon, stimulates our eyes to register the environment around us and to connect it with 120 million neurons ready to interpret everything in full 3D. Then our educational system forces the whole potential of the brain in its prime development years to 2D only, and puts children into an environment with

artificial light that simulates bright daylight with a blue overtone. Do we realize what we are doing with our children?

The blue light system forces the pupils of children's eyes to narrow down and now the visual impressions from a textbook, a screen or a blackboard are only connected to 5 million neurons, or 24 times less? Brain science is very conclusive, the health of the eye is critical for our life, but this simplification of visual communications in a world of bright blue lights and 2D requires an urgent correction. This is one of the reasons why we witness no improvement in learning, or in intelligence even with all the data and digital devices available. IoT is not making us more intelligent. On the contrary, the performance in science, mathematics, and engineering is dropping across the board. The only response the educational system is to cram more multiple choice questions into the minds of youngsters in order to increase the statistics on the passage of exams. We see a lot of data, a lot of screen time, but children formulate no vision, gain no knowledge and certainly no wisdom.

The next internet which will be built on fiber optics, AI and of course a new generation of data mining, will have to be a full 3D. The technologies from visualisation, dataprocessing and firmware at all levels are available. There is only one factor missing: the incapacity for wireless data to be transmitted in the superior volume required to operate in full 3D.

Radio-based data Transmission is the Bottleneck

The first editions of 3D computer and television screens launched last year in Japan which require no glasses. These operate with a light field with 150 million pixels that refreshes every 1/60th of a second³. This compares to the top of the line 2D wall screen available today with 1 million pixels, refreshing (only) every 6th of a second. The amount of data for a full 3D image presented in a light field activating both the light waves and the photons in the space before the screen, bypasses the capacity of 5G by a factor 100. While this transmission of data is no problem for a direct connection between screen and an optical fiber, it does lay barren the grand mismatch of today: the fiber optic networks which transmit data between 3 and 10 Terrabits per second and the mobile communications which can barely handle one Gigabit per second (and that Gig has to be shared with all users of that antenna). The unfortunate conclusion is that the last mile of connectivity through wireless devices is totally incapable of delivering the quality of visuals our eyes and brain are designed for (and our children need). The whole digital system is only as strong as its weakest link.

³ LookingGlassFactory produced in US and Hong Kong: <https://lookingglassfactory.com/product/8k>

The 5G (and 6G) are the bottleneck for the transition of the internet from 2D to 3D. The promise of 5G is not at all going to be delivered within the grand scheme that we described above. It is time for some precise context. The industry is desperately trying to keep up with the user networks in cities that evolve towards a density of one million IoT equipped devices per square kilometer. Now we quickly see that ***the rollout of 5G is tailored towards the need for mining data from everyone in dense areas***, rather than offering the top of the line digital services. There is need for a dramatic broadening of the choice of technologies for wireless data transmission and light communication techniques are ideal for this. As stated in previous communications, we are not against wireless of any type, we are in favor of wireless that delivers the promise embedded in the words of the Old Testament “*Let there be Light*” (Genesis 1:3). We never seem to have understood the wisdom behind these words.

Number of Radio Frequencies

Before we enter into details about the issue of light, there is more to discuss: the choice of radio waves as key wireless transmission medium for the individual user connectivity contains an additional fundamental shortcoming. Few regulators seem to appreciate that the available number of radio frequencies is limited to approximately one thousand, since major portions have been reserved for security and military purposes. The only way to increase performance is to pump more energy through the antennas. This has the adverse by-effect that the antennas (and the servers to back these up) consume an exponential amount of energy, and increase exposure in the area to electromagnetic fields (EMF). This is a very sensitive subject that cannot be neglected by policy makers since hypersensitivity to EMF and the nocebo effect⁴ have both been recognized by health officials and the World Health Organisation. Thus, the massive density of OiT combined with the necessity to increase wireless power causes a trap with the carbon emissions and the citizens' in between.

The necessity to provide connectivity to everyone over such a limited number of frequencies in a very densely populated area translates for business service providers into an opportunity to sell access and speed at prime rates. This means quality access is limited to the rich! This implies that regions with low population density will not be served. This scarcity of available frequencies and the costing of the volume per antenna constitutes one of the main hurdles for the democratization of connectivity. After all, companies paid billions of Euros for a license, and logically these enterprises wish to amortize their investments through prime rates for heavily advertised but only marginally better services.

⁴ The nocebo effect describes the psychological effect of “thinking that something is bad for you” and even though there is no proven cause and effect, the “expected bad does happen”. Phillip, D.P. and T.E. Ruth, e.a. (1993). Psychology and Survival. The Lancet 1993 Nov 6;342(8880):1142-5. [DOI:10.1016/0140-6736\(93\)92124-c](https://doi.org/10.1016/0140-6736(93)92124-c)

In addition, we should not lose sight of the fact that ***since the bandwidth available and the number of operators is limited, the datamining is automatically reduced to a few players.***

Commissions as an Obstacle to Change

Then, there is an additional limiting factor which explains the resistance to any new technology that bypasses the established model of radio frequencies. Companies like Apple receive a commission on the data transiting through its devices. Thus the drive of Apple to have millions of apps for each possible need, drives up data transmission for which the company is paid. Each new app ensures that the data mining can enter any possible activity of daily life. The first company to break with the pack is OPPO, the Chinese smart phone producer which is preparing the launch in 2021 of a LiFi-empowered mobile phone operating on Android.

This explains why the present business model based on 5G is rolled out with such force: the most valuable companies in the world have built their cash flow and their future *raison d'être* on the commissions model. They have established themselves as ***the pillars of the system without which the whole hardware supply chain of data to the miners would collapse.***

Connectivity through Light

The only way to facilitate 3D internet against all business models that are cast in stone, and to ***democratize connectivity is to complement the existing radio waves with transmission of data through light.*** The laws of physics are in favor - even when the business models en vogue are against: there are over one billion light frequencies that can be used for digital communications. This not only democratizes access, it also has the potential to increase transmission speed one thousand fold, thus enabling the fiber optic backbone to progress to full 3D interface. A million times more frequencies operating at one thousand times faster transmission clearly is a game changer that can catapult the internet into the next generation.

The shift to light-based transmission has the additional advantage that it can build on the available public and private infrastructure of light. ***Every public light can be enabled to provide the same services as a satellite*** ranging from data transmission to geolocalisation. The power of the innovation is that the shift from 2D to 3D internet requires only a limited capital investment in infrastructure as compared to all other options. There is no need for additional antennas. There is no need to change wires. The only requirement is to add local servers. Now most interesting in the framework of this paper on data mining, is that this light based technology ***opens the way for large scale data mining by thousands if not millions of operators*** in a controlled fashion (mainly through AI), and shield homes, cities and regions from data predators.

The light-based data transmission could be fully secured when directly connected to fiber optic networks. Hacking from mobile devices which is a sport today, will become impossible.

The data revolution of 3D offers a huge potential for local entrepreneurship. It is not the hardware nor the software that will trigger the transformation. Rather, it will be the local control of data mining and the availability of frequencies for everyone, building up the new infrastructure from each town, community and city. This type of democratization - thanks to light which is one of the key factors of life - that has not been envisaged to date. It is a level playing field, and therefore this could permit a country to develop itself into a stronghold nation for datamining ... if it so desires and decides.

3. Data Protection

Datamining, and novel wireless data transmission infrastructure are important features of a digital society. However, it is urgent that there is in parallel a clear and solid data protection in place and enforced. Whatever Europe has done to date is grossly insufficient. Information is today subjected to predatory strategies where all information is ultimately controlled by a few players, and none of them are local. We recognize that Europe has made an effort to protect data and limit the use of cookies (tracking), but that its enforcement has been disappointing. The hard reality is that all wireless transmitted data is immediately recorded, stored and instantly analyzed in order to be sold to a third party elsewhere with each click on a computer or tick on a smart phone screen.

We have come to the ridiculous situation, where a question submitted on an search engine by a citizen in Ravenna (Italy), about a restaurant in Ravenna is sent over mobile networks and a transatlantic fiber optical cable to a set of servers on the other side of the world that will have full control of the data. Then, Ravenna's public or private organizations will pay these data miners for placing advertising in their home location. The platform will make these local players pay for being ranked on top of others when questions are raised on "where to go", and so on. The data collected on the restaurants and the interested client are gathered overseas as well, and resold. The worst of all, these overseas datamining companies do not pay any taxes in Ravenna (or Italy). ***This is serfdom, not free search information!***

Only when Governments embark on a dedicated strategy to ensure full data protection while offering local data mining, will there be a chance to have this industry develop in full confidence in the eyes of the public at large.

Unfortunately, the radio communications chosen was never selected for its safety standards, and as a result over 30% of the world's digital budgets are spent on ... securing devices without much success. Since transmission of any data over light cannot be hacked, there is for the first time a window of opportunity that has been overlooked. Indeed, in order to recover data from light, one has to position a device between the sender and receiver, de facto disconnecting the transmission of data. This stands in stark contrast with radio wave based communications where one can steal data at hundreds meters distance with off-the-shelf equipment as Mrs. Angela Merkel had to learn the hard way when her secured calls were monitored from the American Embassy.

Conclusion

There is an urgent need to have an overarching strategy with integrated institutions that will ensure that nations have a chance to benefit from their own data. This implies that the present data serfdom is called to an end.

The best strategy forward would be to embrace not just the right to connectivity, but rather to aggressively promote the next generation of 3D internet which would open numerous ways to gain back control of datamining while offering citizens the jobs and the data security they need and deserve.

In the mean time, the take-over of European data infrastructure by foreign investors must be stopped until there is a clear alignment amongst all the key stakeholders. In addition, Governments should take pragmatic measures to protect infants and children like the French Government did with the "Loi Abeille" that prohibits the use of WiFi in kindergarden and elementary schools.

It is urgent to collect the data and to take reverse the "laissez-faire" attitude that has resulted in a drain of power and cash that must be reversed immediately. Once conscious, and once clear that a reversal is needed, then local economies can leverage this strategy for local growth, an impulse that is urgently needed.