THE PANDEMIC AS THE GREAT "BIG DATA" FAILURE AND THE INTERNET OF BEINGS AS THE NEXT FRONTIER (VISION[1] POST PANDEMIC SERIES – IN PROGRESS – MARCH 2021[2])

[1] Vision is the think tank that brings together researchers and young European professionals who all share work and study experiences gained in the best universities and European capitals, and the belief that the technological revolution we are experiencing will lead to a radical change in the forms of institutions, the nature of competition amongst businesses and in the governance of economic systems (more details on www.thinktank.vision).

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Among the most recent projects, the one on a "Taxation System for the 21st century" and "Technologies for the Reform of Civil Justice".Vision is also developing Social Innovation projects in Europe and Italy that see young people developing technologies that allow the elderly to access remote health services and the elderly engaged in mentoring young people seeking their first job. At the beginning of October 2020 the first conference on the future of Europe organized by Vision in Messina/Taormina saw the participation of thirty political scientists, economists and intellectuals who produced a MANIFESTO suggesting reforms of the way European Institutions work.In the months of the first Lockdown (March - July 2020), Vision presented its "Post-Covid Series" with proposals on the "cities of the future", tourism, compulsory civil service and school.

[2] Vision working group on INTERNET of BEINGS is multi-disciplinary from the start so that it can tackle and reduce the complexity of a question of very high importance. Members of the group are

"Where is the *knowledge* we have lost in *information*? Where is the wisdom we have lost in *knowledge*?". This quote is from one of the greatest Poets of the twentieth century, the American born and British naturalized Thomas Stern Eliot who gave – in "Choruses from the Rock" - one of the most brilliant versions of the information paradox we are living today. He said so fifty years before the invention of the INTERNET (in the late seventies) and one century before the COVID-19 Great PANDEMIC which, as this paper will show, has dramatically demonstrated that it is data which will create or waste the wealth and the health of nations.

Countries as different as South Korea, China or Israel, do show that it is the capability to aggregate, access and analyze large amounts of data which makes countries and firms around the world different in terms of containing the damages of COVID19 and even create huge competitive advantages out of the discontinuities that the pandemic is producing. After years of rethoric on "big data", the information age is, eventually, becoming crucial to even the survival of families and individuals.

The paradox, however, is that the WEST seems to be on the losing side of what has been defined the first global "war" of the 21st century, although it is the WEST (Europe and even more the USA) to invent the technologies which are changing the world: with 10% of global population and 60% of global health expenditure, EU and the USA also account for half of COVID cases and deaths. In a recent paper[3], Vision has attempted to measure the efficiency of every euro spent by Government on healthcare in terms of healthcare resilience vis-à-vis the Pandemic: Asia Pacific countries[4] appear to be tens (if not hundreds) of times more efficient, even when we neutralize differences in terms of age structure[5], immunity due to previous epidemies from similar coronaviruses (the 2002 SARS)[6], reliability of death tolls[7] and numbers of COVID tests[8]. Yes, official numbers seem to have underestimated the death toll of the Pandemic and yet the magnitude of the difference seems to say that there are, indeed, countries which have proved to be much more resilient than Europe/ USA.

The paradox is, then, that we (the WEST) have been navigating in oceans of (BIG) data, and yet we know little about the invisible enemy we are fighting and we will argue that the paradox is explained by a totally different approach to technological progress that the WEST and the EAST are pursuing: the 2020 will be probably be remembered by historians as the year which signposts the failure of a western approach to technologies as a tool for entertainment, and the start of a new era which will be characterized by a more pragmatic use of the INTERNET as an enabler of solutions to concrete problems (as with the constant use of technologies in China to both test and track people so that restrictions to individual mobility could be extremely targeted to real dangers and minimized; but also the use of Artificial Intelligence (AI) to replace large clinical trials – as for the discovery of new vaccines – with testing hypotheses on much more limited number of human beings).

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[3] Covid19 Pandemic: Winners and losers (2021) at https://www.thinktank.vision/en/media-en/publications/the-covid19-pandemic-winners-and-losers

[4] The 15 which just agreed the Regional Comprehensive Economic Partnership spanning from China to New Zealand, Singapore to Japan, plus Taiwan.

[5] Japan has the highest percentage of over 65 years old in the world; median age for South Korea and Taiwan are higher than in France and UK, whereas they are almost the same for the US and China

[6] The SARS 2002 outbreak was indeeed limited to China, Singapore, Vietnam and Taiwan. The explanation seems not to work for 11 of the Asia Pacific countries.

[7] New Zealand and Australia appear to have been even more reliable of countries like Italy or USA whose mortality numbers have been debated widely confronting official numbers and general mortality rates (by the FT, The Economist and also a paper of VISION on "measuring differences between official COVID related numbers and mortality rates")

[8] Australia and New Zealand tested more than countries like Germany or Netherlands, where we don't have comparable data for France and Spain.

However, when it comes to scientific prowess, it is still the western labs which are leading the race to the vaccines which are seen as the only "final solution" of the Pandemic: even in this case, however, the quantum leap may come from a novel technique (the RNA Messenger, as in the name of ModeRNA) which says, again, that information technologies and natural science are merging and that data are about to produce a revolution[9] even in the way scientific discovery is achieved, commercialized and protected. After all, as THE ECONOMIST recently said, "the alphabet of RNAs is like a computer's operating system mediating the relationship between the cell's hardware (the proteins) and its software (the DNA)". By ripping the possibility to engineer and re-engineer the RNA platform, information is creating the potential for a quantum leap which may repeat the miracle of the COVID-19 vaccines (coming to the market in a record one year after the first outbreak in WUHAN) for many diseases (starting from cancer) which still do not have a killing solution.

An entire brave, new world of possibilities is unfolding and – as the picture[10] introducing this paper on the first page – we are probably getting closer to the fulfillment of the visions of some of the fantastic movies dating back to the times of the landing on the Moon and the invention of the Internet. which appear now to have run too fast in terms of forecasting great developments.

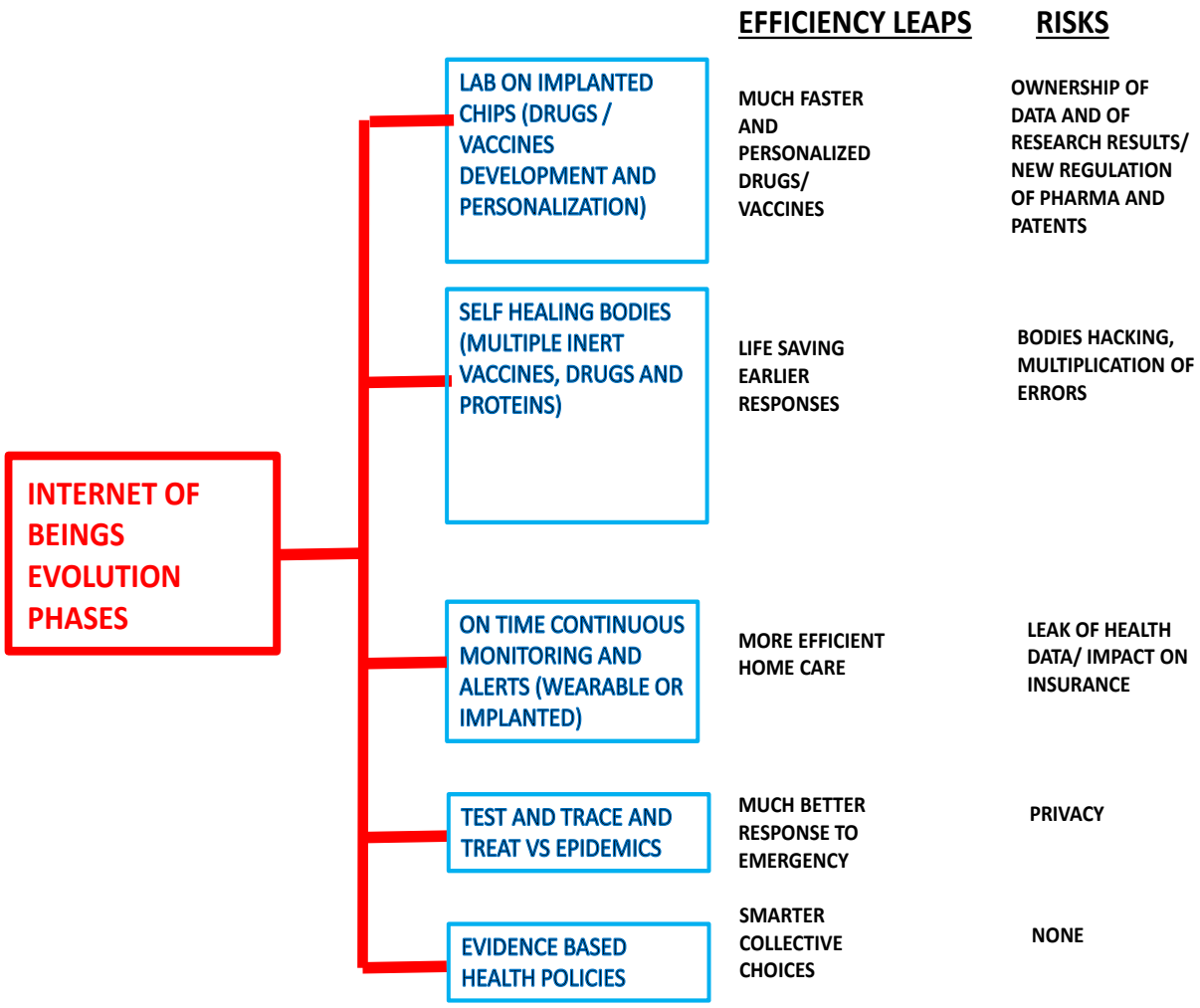
VISION project on INTERNET OF THE BEINGS is going to investigate how Internet-triggered technologies, and more specifically the exponential reduction of the unit cost to access, transmit and process data are changing a) the way health emergency is dealt with and health policies are designed; b) healthcare systems are organized, patients are monitored and services are delivered; and c) research of new vaccines and treatments is conducted; and lastly d) how health policies are designed and assessed.

Data as a lever to transform the entire value chain through which health is preserved and enhanced, as in the representation below: this may be the name of the game which is going to draft a new world order, new models of WELFARE and new methods to conduct research.

[9] whereas this may bring about unexpected breakthoughs into some form of personalized "vaccination" against other diseases (including cancers) which may even produce new jumps into life expectancies

[10] "A FANTASTIC VOYAGE" directed in 1966 by Richard Fleisher on a Isaac Asimov's plot, starring Stephen Boyd and Raquel Welch.

FIGURE 1 – THE INTERNET OF THE BEINGS MAJOR IMPACTS – EXPECTED QUANTUM LEAPS AND RISKS



SOURCE: VISION

Based on the previous elaboration, our research project is going to have impacts on five dimensions that we are going to explore:

a) **The method through which policies are advised, designed and assessed**. The PANDEMIC showed that both at national (single European countries) and international (European Union and WHO) levels, there is a dramatic lack of open information (we practically only know how many cases and how many deaths there are in order to compare countries and regions, whereas even the accuracy of this data is disputable) to answer some fundamental, strategic questions (for instance, there are great margins of possible reduction of the time currently needed to understand how are people who were infected or vaccinated are faring)

b) **The way PANDEMICS are dealt with**. Test and trace technologies are the ones that are allowing not only authoritarian countries like China, but also TAIWAN, JAPAN,

South Korea and, not less remarkably, Vietnam to achieve radically better containments of the spread of the VIRUS. The EU's very approach to privacy (the idea to develop twenty-seven, AD HOC applications) and to regulation (GDPR) is demonstrating all its fragility here.

c) **The mechanisms through which people (especially the elderly) are monitored, diagnosed and hailed at home**; this, consequently, will modify the principle itself around which healthcare systems were organized in the 20th century.
The impact of monitoring mechanisms which are in real time, remote and always on is going to be profound also on the very industry of insurance: opportunities and threats will be both radical.

d) **The organization of healthcare systems** because if bodies will be increasingly "fixed" at distance, what needs to be reconsidered is the nature itself of a twentieth century public service developed around the idea that everbody has the right to physically access all health services.
Telemedicine is one of the oldest ideas mankind has been toying with, however COVID19 is urging European countries to turn around a hospital based system. There are however great challenges to develop elderly (and high-risk/ low immunity) friendly technological interfaces.

e) **The way research is conducted**. The theoretical possibility to introduce sensors in human bodies which can sort of "use" normally functioning bodies to detect how certain individuals with certain genetic codes react to specific inputs under specific conditions (temperature, for instance) may be a game changer: it would produce such a large amount of data that can increase the efficiency and change the methodology through which epidemiologic studies or trials are conducted.
Artificial intelligence would also be of great importance to conduct much more focused and smaller trials which may slash costs.
This may have an enormous impact on the way the research on drugs is carried out, the nature of drugs themselves (which will progressively be personalized or segmented) and may transform the business of the pharmaceutical companies itself.
And the impact will be not smaller on the very approach to scientific research which is already transforming itself from a "hypothesis-driven" to a "hypothesis-generating" approach.

It is potentially a gigantic transformation. The trouble is that Asia may be on the winning side; the European Union may, instead, be on the losing one as the numbers of the economic costs of the PANDEMIC appear to say; America (and UK, progressively less the EU) still has the concentration of talent to enjoy breakthroughs.

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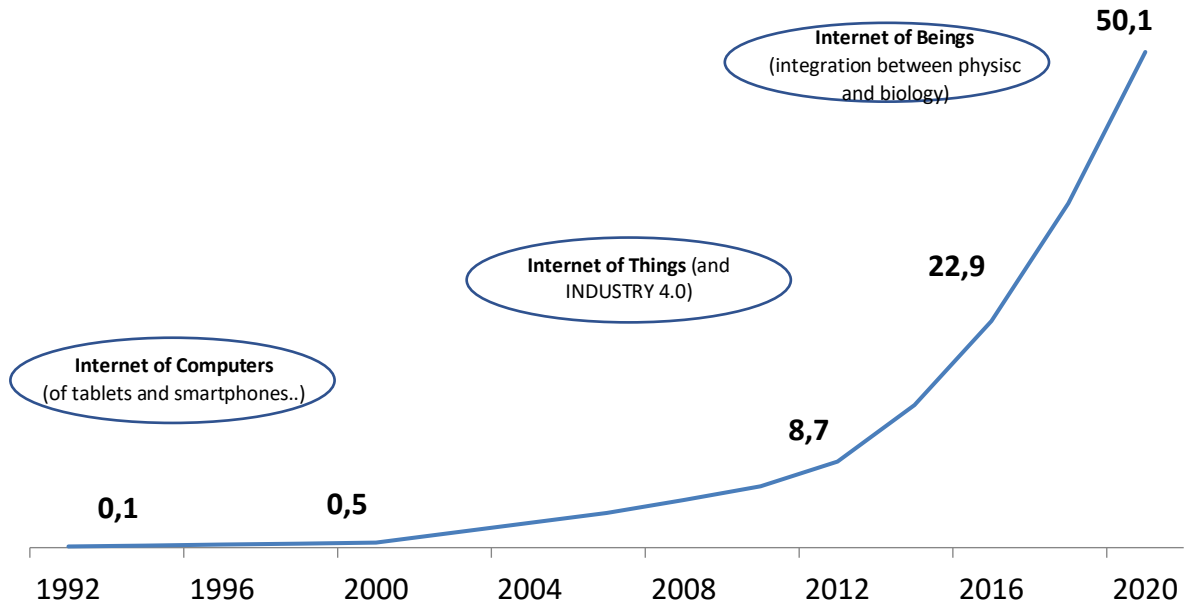
In brief the study is about the "INTERNET OF THE BEINGS"[11]. A new paradigm which may coincide with the third greatest and ultimate stage of the Internet revolution.

[11] Grillo F. and Nanetti R., (2019), Democracy and Growth in the Twenty-First Century: the diverging case of China and Italy,

GRAPH 1 – THE THREE STAGES OF THE INTERNET EVOLUTION - NUMBER OF DIGITAL DEVICES, PHYSICAL OBJECTS AND BODIES CONNECTED TO THE INTERNET (IN BN)



SOURCE: Vision on CompTIA and Gartner DATA

This is, then, going to be an evolution which will propose enormous ethical and security risks and problems of regulations; but also the opportunity to defeat the COVID19 and get prepared to further pandemics; realize a quantum leap in life expectancy and fight against diseases which we almost consider as an unavoidable part of modernity; develop and evaluate policies and public debate on the basis of evidence (which is an antidote to fake news which have multiplicated themselves lately); and last but not least give sense to a technological progress which is failing most of its promises.

The above typologies on possible impacts will articulate the VISION project. The last section of the project will spell out our recommendations which will mostly have the EU and national governments as their main targets.

London, Springer Nature

The synopsis of the study is therefore the following:

1. WINNERS AND LOSERS OF THE GREAT PANDEMIC WAR
2. TEST AND TRACE: THE ASIAN WAY AND THE EUROPEAN MISTAKE
3. MONITORING AND HEALING HEALTH IN THE 21ST CENTURY. A FANTASTIC VOYAGE INTO THE INTERNET OF THE BEINGS
4. SCIENCE IN A BIG DATA WORLD: THE QUANTUM LEAP OF THE FUSION BETWEEN BIOLOGY AND COMPUTER SCIENCE
5. REDESIGN HEALTH (AND WELFARE) SYSTEMS AND ECONOMICS FOR A BRAVE NEW WORLD
6. OPEN NUMBERS AS A QUESTION OF DEMOCRACY
7. THE IOB GREAT GAMBLE: RISKS AND ETHICAL DILEMMAS
8. IMPLICATIONS FOR POLICY MAKERS AND THE EU
9. IMPLICATIONS FOR EXECUTIVES AND POST PANDEMIC GLOBAL BUSINESS LIFE

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