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Developing a Smart Union:
Europe towards the digitalization process

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Ad Maiora.

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"Technology is nothing. What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them. It's not the tools that you have faith in, tools are just tools. They work, or they don't work. It's people you have faith in or not". – Steve Jobs, 1994[1]

1. Introduction

What exactly is "communication"? This English term evolved from the Latin language. Also, "communication" is related to the term "community", with whom it shares the Latin root *communis*, a noun meaning common, communality or sharing. Similarly, to this root belongs the Latin verb *"*communicare", which means "*to make something common*" (Weekley, 1967: 338). Indeed, communication cannot occur unless something is shared. Then, the logical consequence of sharing is that two or more people would have something in common. Community members have necessarily something common to each other, at both the domestic and international levels. Hence, where there is no communication, there cannot be a community. Therefore, rooted in the claim that an international community exists must be the assumption that its members are communicating. We cannot have a world community unless the members of that reality, be they states, organizations or individuals, are communicating.

In this regard, technology is a key concept in the discourse on international communities and international communication because it represents the key variable in the ability of humankind to develop societies. Mankind has always struggled to overcome two main difficulties with respect to communication: space and time (i.e. communicating over long distances in as brief a time possible). And since technology can be generally considered as the application of knowledge for a purpose, in particular, all communication technologies reflect the peculiar concerns about communication of the societies that invent them. Principally, technologies are employed to deal with the specific concerns of the regions where they are developed while other areas are left to benefit by these inventions much later.

The most common international communication technologies have been those in telecommunications, the most basic being telephone and radio. Their capabilities have been

[1] Steve Jobs. 1994. Interview for *The Rolling Stones*

significant factors in the quest to establish local and international communities. But the specific nature of these technologies has also meant that international cooperation to plan and regulate them was required at a level never seen before in human history. It is for this reason that the International Telecommunication Union (ITU) was the first international governmental organization. It was established in 1865 as the International Telegraph Union, and now is a specialized agency of the United Nations responsible for all matters related to information and communication technologies. Subsequently, more recent communication technologies (photography, cinema and phonograms) actually dealt with the problem of communicating over space and time. They allowed sound and images to be transported to anyone in any place. Such technologies contributed to the creation of cultural industries, promoting cultural products (Appadurai, 1996).

Later on, communication made a colossal step forward in the international arena with the invention of the Internet, along with the improvements made in information technologies and the consequent world digitization. Indeed, global digitalization has changed every previous known vision people had of the world. That is why, it is in the interest of every social agent that the public at large is able to use and understand the benefits of new digital technologies. To this purpose, having completed industrialization, developed countries are successfully digitalizing their economies and societies. They are rapidly developing innovative technologies where artificial intelligence, automation and digital platforms prevail, while raising public awareness on technological and digital development in order to reduce the gap between the information "haves" and "have-nots".

In fact, digitalization became a relevant phenomenon because information turned out to be a valuable good that actors hold to make their economies more competitive, and necessarily more innovative. Information is referred especially by economists as an experience good, meaning that consumers need to actually experience the good to judge its value, but the problem with information is that the experience *is* the good itself. For example, how to judge a book before reading it? Of course, a solution could be branding and the role of advertisers, which try to convince you to buy and read the book they are promoting by underlying the reputation of the author, the quality of the editors or the appeal of the genre. In fact, given the peculiar nature of this experience good, societies and organizations continuously engage in digital transformation processes, where information and digital innovation are exploited in order to develop or improve products, services and business models in general.

Undeniably, the world impact of digitalization can be best valued in the current, pandemic environment, due to the significant transformation of society. Mostly all areas of our economic and social life have been transplanted to the digital world, thus reshaping the global social order, recalibrating priorities, fostering new policies and reconsidering the concept of globalization itself. In fact, at the very beginning of 2020 we have seen the world froze. We witnessed – and still do – the surreal situation faced by every citizen, in every part of the globe, brought by the world-diffusion of the new COVID-19 pandemic. This is the infectious disease caused by a newly discovered coronavirus. As said, the word stopped. The economy faced major crashes, people have helplessly observed their lives froze in time and had to slowly readjust to a new reality. However, it could be argued that, following the 21st century teachings, in reality, change is the new constant. The world actually never stops, and it is up to every single actor to constantly be on track, especially in this extremely globalised era. Therefore, resourceful agents, institutions, organizations and people worked – and are working – to improve their conditions even in the middle of the harshest, surreal scenario. And as a fully functioning and strongly established political entity, the European Union kept moving as well.

In particular, the current COVID-19 pandemic has shown how important digital assets have become to our economies. Networks and connectivity, data, Artificial Intelligence, supercomputing and advanced digital skills sustain our economies and societies by allowing work to continue, especially tracking the spread of the virus and accelerating the search for medications and vaccines. Sadly, the pandemic has come accompanied by a global "info-demic" that poses a direct threat to one of the columns of democracy: the right to access truthful information. Indeed, new forms of manipulation of news and electoral and democratic processes have emerged and were exploited by some through digital technology and social media. That is why, for example, the European Union and Member States have effortlessly worked in order to put in place specific measures to mitigate the impact of the pandemic, in every sector of social life. In particular, digital solutions, developments and discoveries will certainly play a key role in the robust economic recovery through the deployment of 5G and very high capacity networks (VHCNs), digital skills, the digitisation of companies and the public administration. Additionally, the European Council and the European Commission have decided to frame the support to the recovery along the twin transition to a climate neutral and resilient digital transformation (EC, 2020e).

The purpose of this thesis is to analyse to what extent the European community will be affected by the phenomenon of digitalization over time, and its path towards the development of a Smart Union. It has already started to adapt to this new reality, in the attempt of developing a connected, unfragmented continent, through the *mise en oeuvre* of the newest European strategy*: Shaping Europe's digital future.* This is a European approach to social and economic digital transformation, with international dispositions as well, which demands and fosters the empowerment and inclusion of every citizen, while strengthening the potential of every business, and meeting global challenges in line with European core values. The European Commission's project aims at a digital transformation that will benefit everyone. In particular, I chose to make this the core topic of my final thesis especially because I had the incredible opportunity of spending four months at the Permanent Representation of Italy to the European Union in Brussels as a trainee in the Cooperation and Development Unit, after winning this position according to the curricular internships offered by the MAECI-CRUI partnership. In Brussels, I attended Council's working groups especially on digital innovations, climate change and international cooperation and development. Some conclusions of such meetings eventually ended up in this Strategy. Being encouraged by diplomats, development experts and other functionaries, I wanted to coronate the end of my Master's degree with a work inspired by this amazing experience along with my ever-growing European spirit.

Before focusing on this digital European project, in the first part of this thesis, we shall first and foremost investigate the world's digital background, that is to say, observe how the digital revolution has come to be the backbone of the latest, hybrid era in which we are now currently living, a mixture of the Information Age and the Digital Era. To this regard, we shall observe the relevance of the new Information and Communication Technologies (ICTs), while witnessing how people and countries have come to accept and acclimatise to this digital reality, one where a global revolution embraces local adaptations. Finally, we shall consider digitalization not as technological phenomenon, but rather as a social one.

In the second part of this work, from the digital revolution we shall move towards one of the major concerns brought by this digital novelty in development theories, that is to say the phenomenon of the digital divide, trying to highlight the fact that what is known is gold. Personally, this means that nowadays, the more you (i.e. people, governments, organizations) know, the more you are a valuable asset in society. Basically, since information, communication and digital adaptations today are source of income and independence, the more you have access

to them, the more you will economically and socially develop. Here, after trying to define such an evolving concept as the digital divide, we shall observe to what extent globalization has affected or has been affected by the world digitalization, with a short focus on different regions of the world. Moving on, we shall see how social and economic inequalities are strongly related to information inequalities, stating that in reality it is a matter of (lack of) opportunities. To this regard, in the final section of this second part we shall see some observations, and attempts, about closing this gap of digital opportunities.

Finally, this thesis will present, as mentioned, the European Commission's strategy for a digitalization process. Of this new European policy, we shall learn its structure, how it is built on three main pillars – technological, economic and social implications for the well-being of European citizens – and the key actions foreseen for the achievement of each of these priorities, as set out in the final European Commission's Communication presented on February 20th, 2020[2]. A fourth section will be dedicated to the role of the European Union as a global digital player, focusing on its foreign policy and digital key actions. We shall then conclude this work by observing the Union's effort in addressing inclusion, health and governance digital issues in order to improve people's lives, transforming this political, unitarian entity in a cutting-edge, digitally-innovative European Union.

[2]See COM(2020) 67 final.

2. The Digital Revolution – The Third Industrial Revolution

"A digital revolution is transforming the world as we know it at unprecedented speed" –

European Parliament, *Policy Briefing: Digital Transformation*, 2019.

Introduction

Digital technologies are profoundly changing our daily life, our way of working and doing business, and the way people travel, communicate and relate with each other. In fact, the development of high-speed networks in these last decades is having the same impact as the advancement of electricity and transportation networks a century ago. Undoubtedly, digital communication, social media interactions, e-commerce, and digital enterprises are increasingly transforming our world. They are generating an ever-increasing amount of data, which, when pooled and used correctly, can lead to completely new possibilities and levels of value creation. Indeed, the digital revolution is a transformation as fundamental as that caused by the industrial revolution.

The digital revolution (also known as the Third Industrial Revolution) is the transition from analogue mechanical electronic technology to digital electronic technology. It began in the most industrialized countries of the world in the late 1950s with the adoption and proliferation of computers and digital memories for data storage (Lamberton, 1974). Overall, digital innovation has continued to occupy a relevant role in our lives in the present day as well, in various historical phases, within the so-called third industrial revolution and later evolving into the fourth one. We refer to this period of change and technological development also with the expression "computer revolution", in order to indicate the wide socio-economic changes brought about by Information and Communication Technologies (ICT), whose relevance we shall later examine. Additionally, thanks to the development of interactive devices, the World Wide Web (WWW or W3) and lately the smartphones, we have witnessed the proliferation and multiplication of information access channels, which have changed the ways in which the communication act itself takes place (Goodrick & Srivastava, 2002). The Fourth Industrial Revolution, instead, involves a systemic change across many sectors and aspects of human life, thus empowering previous discoveries. Indeed, the crosscutting impacts of emerging technologies are even more important than the exciting capabilities they represent, and our

ability to edit the building blocks of life itself has been expanded by artificial intelligence, neurotechnology, automation and cyber-physical systems (Bojanova, 2014).

Of course, there have been some contradictions and negative regards given to the two latest industrial revolutions, yet, it has to be recognised that – willy-nilly – digitalization is part of our daily life and it is generally regarded as a positive characteristic of societal development. Indeed, current scientific literature defines digitalization as a fundamental component of the modern global economy which contributes to a more rational resource management (Antikainen et al., 2018), optimization of business management models (Rachinger et al., 2018) and structural changes (Heavin & Power, 2018). Moreover, it is true that digital development makes technological processes more complicated, but it also accelerates innovation cycles (Latos et al., 2018) and improves supply chain management (Srai & Lorentz, 2019). Especially in the last decade, digitalization has led to the internationalization of industries and start-ups (Neubert, 2018), as well as the creation of production ecosystems (Alcácer & Cruz-Machado, 2019). Finally, on a global scale, the concept of work itself is now generally divided between information work – with "mind workers" (e.g. engineers, doctors, lawyers, professors, scientists), who are supposed to be more capable of competing in the world market and receive (relatively) high wages, and manual work – with positions and careers where you perform physical work (e.g. packager, assembler, or farm worker) that is naively perceived in the social scenario as less rewarding.

As a final remark, and with the European Union in mind, being it the core object of this thesis, we recall that in more recent times, the digital revolution and the technologies involved in it have changed the way businesses operate, how people connect and exchange information, and how they interact with the public and private sectors as well. However, European businesses and citizens alike need an adequate policy framework and appropriate skills and infrastructures to capture the enormous value created by the digital economy and properly enjoy such digital transformation. In order to help European citizens to adapt to these changes and national economies to achieve the necessary conditions for a complete digital transformation, the Union constantly plays an active role in shaping the digital economy and society.

For example, the 2014-2019 parliamentary term has seen a number of initiatives in the areas of digitalisation of industry and public services, e-commerce, copyright and data protection legislation and so on. In fact, generally, there is a growing awareness among European citizens that digital technologies are here to stay and hopefully improve their everyday lives. Of course,

digitalization has a positive impact on society, but it also brings new challenges. In fact, encouraging this digital revolution is higher than ever on the Union's political agenda. As we shall later see, it has been identified as a priority for unlocking future growth in Europe, especially when dealing with strategic technologies to help workers gain the right skills to avoid widening the gap in the labour market.

Overall, the shift from physical to digital assets can be observed as a gradual – but consistent – change during time. It goes from a first industrial revolution of mechanization and power to a second industrial revolution of mass production, followed by a third industrial revolution of computers and automation arriving, now, at Industry 4.0 or the fourth industrial revolution, where most of the talks focus on cyber physical systems. Today, the digital and physical are meeting in industry in a hybrid way by building bridges between past, present and future innovations.

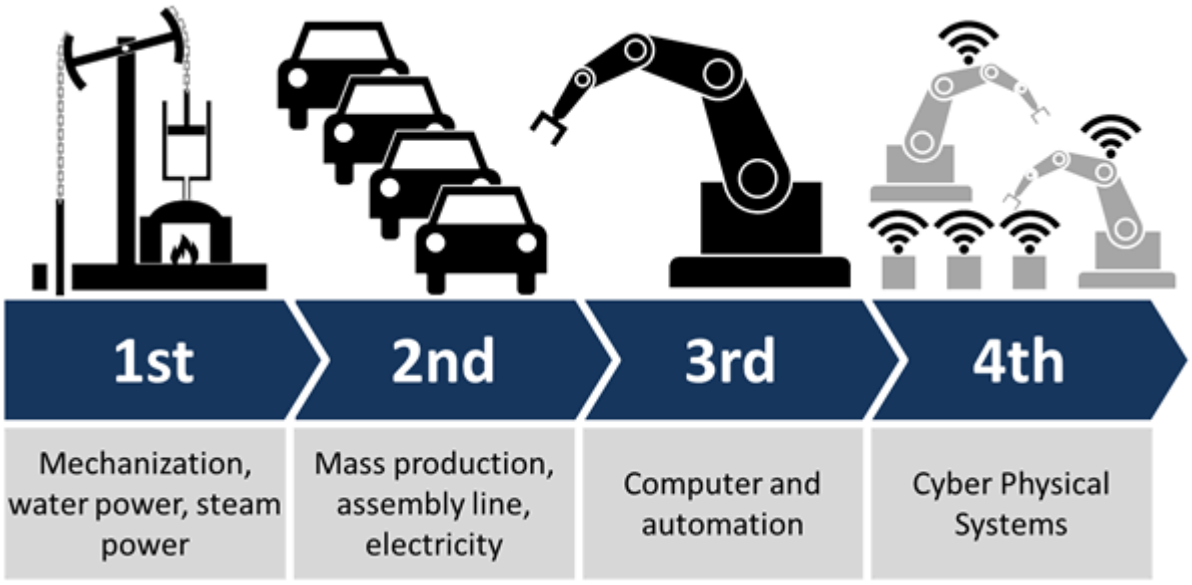

Figure 1. DeVisionX. 2019. Journey from 1st to 4th Industrial Revolution.

In this chapter, we shall investigate the relevance of the third industrial revolution – the digital revolution – in our daily lives, starting with the study of the rise of the so-called Information Age and its connection with the new digital era, as well as its future interpretations, wondering whether this Age will fall or survive the constant changes in technologies and, more generally, in society. Then, to have a deeper understanding of such technological change, we shall examine the functions and implications of the Information and Communication Technologies (ICT), fundamental pillar of the third and now especially of the fourth industrial revolutions. Furthermore, we shall move towards the examination of general, global and local

responses to these most recent digital changes. Finally, we shall move towards the analysis of the human impact that the digital revolution had and continues to have on society, and on the economy, therefore treating it as a sociological phenomenon, with a focus on the new discipline of digital anthropology.

2.1 The hybridization of the Information Age and the Digital Era

Information is an exchangeable and valuable good. As any other type of product, knowledge and information help build a rich future especially by shaping people's opinions. We have been living in the Information Age since at least the end of the seventies with the advent of the personal computer (PC), yet there are researchers who point to far earlier periods and inventions triggering this shift towards an epoch where information is freely, rapidly and universally disseminated and received, while others consider the rise of the Internet in the nineties as the real start of this *Age*. Certainly, it has a strong connection with the Third (Digital) Revolution, a period where society has shifted from an economy based on traditional industry brought by the Industrial Revolution with industrialization, to an economy based on information technology (IT), also defined as the knowledge economy.

Following the two latest revolutions – but especially the Third one – as we shall later see, by the terms "digital age" or "information age", we mean that historical phase characterized by the wide diffusion that the various digital products have had. Generally, this new stage of development includes all that series of social, economic and political changes that have taken place around the advent of digitization and digitalization of different access channels to information and which have led to the current information society. In particular, the concept of "information age" was first discussed in *Age of Information: An Interdisciplinary Survey of Cybernetics* by T. C. Helvey in 1971, while that of "information revolution" in *Information Revolution* by Donald M. Lamberton in 1974 (Beniger, 1989).

Furthermore, the concept of "digital revolution" should be preferred to others such as "digital economy" or "digital society", in order to give the parallel idea of the colossal social changes previously brought about by the agricultural revolution and the industrial revolution. Indeed, the impact that the digital revolution had on the economic and social life of people was extremely surprising: the development of the so-called "New economy" is entirely based on the information revolution (Stiglitz, 2004). For example, information, together with matter and

energy, is part of the building blocks of the universe; Information is also the central theme of the new sciences, which have emerged since the 1940s. In this regard, information is also becoming an economic activity, and consequently a valuable means of exchange, since today industries and institutions are involved in the collection, processing, production, transmission and distribution of data (Madon, 2000).

Indeed, the Information Age is defined as *the era in which the retrieval, management, and transmission of information, especially by using computer technology, is a principal (commercial) activity.*[3] However, there is not one invention, one evolution or one technology simply marking its official start. Also, it is at least as much a series of events and a constant evolution as it is a period in time. As a basic principle, what is peculiar to the Information Age is its speed: it is the only period in human history constantly subject to fast evolution processes, impacting large numbers of people. Moreover, it has globally contracted time and space, transforming long-distances and high-risk travels in distant memories, blurring physical and ideological borders, and establishing a basic, shared ground of knowledge.

Additionally, as its relevance kept growing, during time the term information has lost much of its original meaning. Today, as a modern term, *Information* is used with particular emphasis by high-tech supplies salespeople. It no longer equates with knowledge; information means fact. It is not simply understanding or comprehension; it is quantifiable data. It is not education; it is world rankings and competition.

An earlier analysis of the Information Age was provided by Liora Salter (1993), who argued that there are four critical perspectives on the new ICTs. The first perspective defines the "Information Age" as rhetorical: it is never the cause of economic and social relations *per se*, but it simply presents what best fits – especially the political – scenario at that moment, with the consequence of driving a social revolution. The second perspective argues that the information age exists, but as a synonym of technological capacity: the computers, for example, do make communication and information available, but they are irrelevant to the type of communication presented. On the contrary, the third perspective underlines the relevance of technological change within the Information Age as providing the possibility of universal, proper communication. Finally, the last perspective is the inverse of the former. Here, ICTs are

[3]Oxford Dictionaries | English. (2020). information age | Definition of information age in English by Oxford Dictionaries. [online] Available at: https://en.oxforddictionaries.com/definition/information_age [Accessed 6 July 2020].

active agents of social revolution, but they do not empower ordinary people, on the contrary, it is the multinational corporations that gain benefits. In fact, informational power is consolidated in the hands of fewer dominant entities making use of the new technologies.

From this standpoint we make a further step and argue for the "ending" of the Information Age and the rise of the Digital Era. Indeed, if the Information Age has been characterized by the speed and amount of data circulating globally, producing new benefits socially and economically speaking, the Digital Era can be seen as the development of an evolutionary system in which knowledge turnover is very high and also increasingly out of the control of humans. In this Era our lives become more difficult to manage. In fact, the main difference between these two – apparently similar – time frames can be found in the ability of managing the technologies we have at our disposal. Basically, during the Information Age, people's lives and realities have been certainly altered – and hopefully improved – by the Information and Communication Technologies (ICT) development, but the creation and diffusion of data were in some way under the control of humans (Castells, 2001). On one hand, during the Information Age ICTs functioned as a very useful instrument to ease our lives, while on the other hand, it could be argued that in the Digital Era this control is failing. It is true that we still have the right to choose what to share in the world wide web, but the same cannot be said for the other way around. Indeed, some content is chosen and displayed for us even when not requested; We cannot control when or whether things such as commercials or promotional posts are shown in our social networks' homepages. The information available online is digitally readapted to our interests, without us asking for it (Galperin, 2004).

Therefore, in general terms, it could be argued that this Digital Era is embedded in both the Third and Fourth Industrial Revolutions. The difference between the two may lie in the fact that, while the former used electronics and information technology to automate production, the latter is building on its "ancestor", the digital revolution that has been occurring since the second-half of the last century. But it is about more than just technology-driven change. The digital era is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres. We are dealing with an opportunity to help everyone, including leaders, policy-makers and people from all income groups and nations, to connect converging technologies in order to create an inclusive, human-centred future. Therefore, the real opportunity in this revolution is to look beyond technology, and find ways to give the

greatest number of people the ability to positively help their families, organisations and communities.

As we mentioned, nowadays the main focus is the creation of data and the possibility of turning it into actionable knowledge, along with the opportunity of using such data for any given human, business or societal goal. For example, already in his 1995 book, *Being Digital*, Nicholas Negroponte described a future in which everything which could be digitalized would be digitalized. The main reasoning behind such confidence in a digitalized future could be found in the difference of opportunities between the physical and digital world. In the book, Negroponte emphasised how in the world of "atoms" physical limits are an obstacle to breadth and depth, taking as an example the realm of books (and thus knowledge and information). These limits do not exist in the realm of "bits": depth, breadth and veracity do tend to be relative in many digital environments such as the Web, given its open nature and gigabytes of opinions, errors and unchecked facts. One can never put the same amount, depth and breadth of information in a book as it is possible in a digital form, unless you really have a lot of space and trees. Generally, these differences between bits and atoms, characterizing the information age and the current knowledge economy, are typical of a greater digitalization process, and as a consequence, we denote a lesser importance given to "physical" activities and products. For example, music has become an online service and books are regularly found in digital formats at cheaper prices.

With all these new changes, with the rise of digital communication over the basic information flow, one may wonder whether we still live in the information age or in a mis-representation of the social transformation taking place in the contemporary world (Avgerou, 2002). The answer may be tricky: we are currently living in a transforming information age, one where even the digital era represents a sub-category of a greater ensemble. Yet, leaving aside futurists beliefs that literally everything will be digital one day, including many parts of ourselves, we can state that the information age – as we know it – in many aspects has entered a new, hybrid stage (Appadurai, 1990). Information and information management, as well as all other spheres involving connected data and information, are crucial in all aspects of the new digital economies and global revolutions. In fact, given that there are still many information sources, carriers and formats that can be digitized and that surely there still is a lot in our daily lives that can be digitalized, our information age is moving towards the intersection of the digital and the physical – the bits and the atoms. Its new role of builder of multiple bridges in

innovative ways, especially in the industry realm, goes along with the different attempts made to automate multiple aspects of our current reality.

The next phase of the information age, embedded in the digital era, is hybrid especially because one cannot live without the other, and their borders are so blurred that we no longer realise that there is a difference between the two in the first place. The two worlds rely on one another because we – the humans – need both information sources and digital devices, whether it is in the customer experience, the shopping journey, the Internet of Things or the cyber physical systems of Industry 4.0. And while for some it is tempting and for others it is extremely scaring to see the future as fully digital, this new information age stage is classified as hybrid because today it is the driving force of production, physical and digital worlds convergence (Hatzilygeroudis & Palade, 2018).

In this way, information gets its place alongside human and physical assets, which are the foundations of the DX economy. This is an economy where digital transformation grew to macroeconomic scale and it impacts the main activities of industry leaders and their business results (Pavlichev & Garson, 2003). In the end, people want both digital and physical experiences, they want digital information and entertainment as well as books they can touch and read, they want to be able to produce and create both at the digital and physical level, while having the opportunity to tell stories, basically passing on information in the form of digital and physical content

This hybridization of the information age with the digital era is an opportunity for every social actor to raise awareness about the world we live in. Constant digital development will increase material abundance, but technology alone cannot solve the problem of figuring out whom to distribute resources to or how to distribute them. We need to embrace a period of self-reckoning, aiming at improving – or simply ease – our daily lives. Indeed, in the Industrial Age and the Information Age, there was widespread optimism that technology would eventually solve all of our problems, from poverty to disease or violence. Yet, especially in the last years, this confidence has been slowly declining and people started to worry about that more technology, by itself, cannot be the solution, and consequently, the social, legal and economic systems we currently have in place, while they may solve some problems, create others equally severe (Appadurai, 1996).

It is undeniable that technology has lifted many humans out of poverty and enriched our lives in many ways, but it has also made the world increasingly complex and difficult to navigate. The unexpected closure of many well-known industries revealed that even the most ingenious individuals struggled to stay relevant in the modern globalized economy, while others need more time to make efficient choices the first time, and tend to spend years broke, jobless, or unemployed. People are not weaker or more imprudent than our ancestors, but it is the world that is more challenging than ever before and there is the need to go through more trial and error than our families ever did in order to promise a comfortable future (Beck, 2000). That is why, in order to face these challenging times, there is a general, social necessity to look inward and confront – reckon – some rough truths about human nature, understand the fact that technology can amplify both the best and the worst aspects of it, and possibly foster collective action towards the solution of collective problems to build a world that is truly better for all of us.

To conclude, if we consider the Information Age as a period in human history, there are some who speculate it will come to an end at some point. The basic idea is not that information will become obsolete – firms will always need to harness information in effective ways – yet, information will become necessary but not sufficient for firms to be successful. So, what would a world with too much information look like? Would it create more problems than solutions? In 2014, London Business School Professor Julian Birkinshaw (2014) proposed four answers. Firstly, in a world of pervasive information, he fears the possibility of "paralysis through analysis", meaning that the ability to make decisions would be paralysed by the constant request for further information; secondly, he believes that easy access to data makes us intellectually lazy, since we tend to allow rapid processing power of data to substitute for thinking and judgment; thirdly, he judges today's consumers as "impulsive and flighty", since they are presented with multiple sources of stimulation, and thus with a decreasing capacity to focus and concentrate on a specific activity; lastly, if the democratization of information creates an imbalance between the different professions in society (e.g. Doctors who have to deal with patients showing up with often incorrect self-diagnoses), Professor Birkinshaw sees superficial learning as a dangerous thing. We are capable to access information that helps us, but we often lack the ability to make sense of it, or to use it appropriately.

2.2 The Information Communication Technologies

Every age has things that seem novel and wonderful at the time, but tepid and banal to future generations. In fact, today's digital technology is under the spotlight because after decades of development it has become incredibly useful, yet, we need to start preparing for a new era of innovation in which different technologies, such as genomics, materials science, and robotics, rise to the fore. To understand what's happening, it helps to look at earlier technologies. The rise of electricity, for example, began in the early 1830s, when Michael Faraday invented the electric dynamo and motor. Still, it was not until 50 years later that Edison opened his first power plant, and then 40 years after that, during the 1920s, electricity began to have a measurable impact on productivity. Every technology follows a similar path of discovery, engineering, and transformation. Innovators find new principles, then there is the need to understand how to make them useful.

However, in order to carry out a successful social, economic and technological transformation, there is a multi-phase process to follow. Firstly, it is necessary for people to change their habits and accept the upcoming revolution of their realities; secondly, innovations need to come into play. Following the example of electricity, factories had to be redesigned and the concept of work itself underwent a readjusting process before it began to have a real economic impact. Finally, household appliances, radio communications, and other innovative things changed life as we knew it, but that certainly took time and was never taken for granted by society. Indeed, our world has been profoundly transformed by digital technology. It would be hard to explain to someone in the 1950s or 1960s that someday machines would, almost entirely, replace books and newspapers, give us recommendations on where to eat and directions for how to get there, or even talk to us. Yet today, those machines are our daily lives' partners.

Information and communication technologies (ICTs) are the set of methods and techniques used in the transmission, reception and processing of data and information (including digital technologies), presenting the characteristics of general-purpose technologies (GPTs) – one that has the power to continually transform itself, progressively branching out and boosting productivity across all sectors and industries (Bresnahan & Trajtenberg, 1995). ICTs are an input with a decreasing cost over time, with vast and potentially pervasive applications, capable of decreasing both the burden of other inputs and the price of the output, at the same time affecting the quality of the products. Such transformations are extremely rare; in fact, only three previous technologies earned the distinction of a GPT: the steam engine, the electricity generator and the printing press. The use of technology in the management and treatment of information has assumed growing strategic importance for organizations, governments and

citizens as a result of the internet boom that occurred in the 1990s. Today, computer science (digital devices and software programs) and telecommunications (telematic networks) are the two pillars on which the information society is based. ICT can be divided into two sub-sectors: information technologies and telecommunications. Additionally, universal access and affordability of ICT generally denotes its availability in terms of local dispositions, its accessibility in terms of demography and affordability in relation to costs, which, in turn, is affected by technology, efficiency and rate of extension (Avgerou, 2003).

ICT includes all those professional areas that concern the design and technical development of digital communication. Today, the number of skills related to ICT is growing and evolving in specificities, in order to operate in highly heterogeneous but increasingly interconnected environments, such as online information, cloud computing, social networks, electronic commerce, digital marketing, home automation, virtual reality, automated transport, etc. Indeed, nowadays ICT is used in many areas of daily life: by being used in a wide variety of public and private areas without being dedicated to a specific, exclusive use, ICT technologies can be considered general purpose technology and are increasingly connected to social and economic development of human communities (Bresnahan & Trajtenberg, 1995).

Technically speaking, ICT includes the resources needed to manipulate information, in particular computers, software, networks, and web sites and platforms needed to convert, store, manage, transmit and find data. These technologies can be grouped based on networks, terminals and services. In the first place, the concept of telecommunications network refers to the so-called information highways (Katsaros, 2005). The information highway or transport network is a wired (copper or optical fiber) or non-wired (radio bridges and satellites) network that combines services traditionally offered from different suppliers, such as telephones, digital contents and IT services. In the second place, terminals act as an access point for citizens to the information society. Moreover, they are one of the elements that have evolved more over time: the appearance of terminals that allow you to take advantage of the digitization of information and the growing availability of infrastructures for the exchange of digital data is persistent in society. Finally, the first ICT services were email and search engines. A second group of ICT services appeared and included e-commerce, online banking, access to information and entertainment content and access to public administration services (Krishna & Madon, 2002).

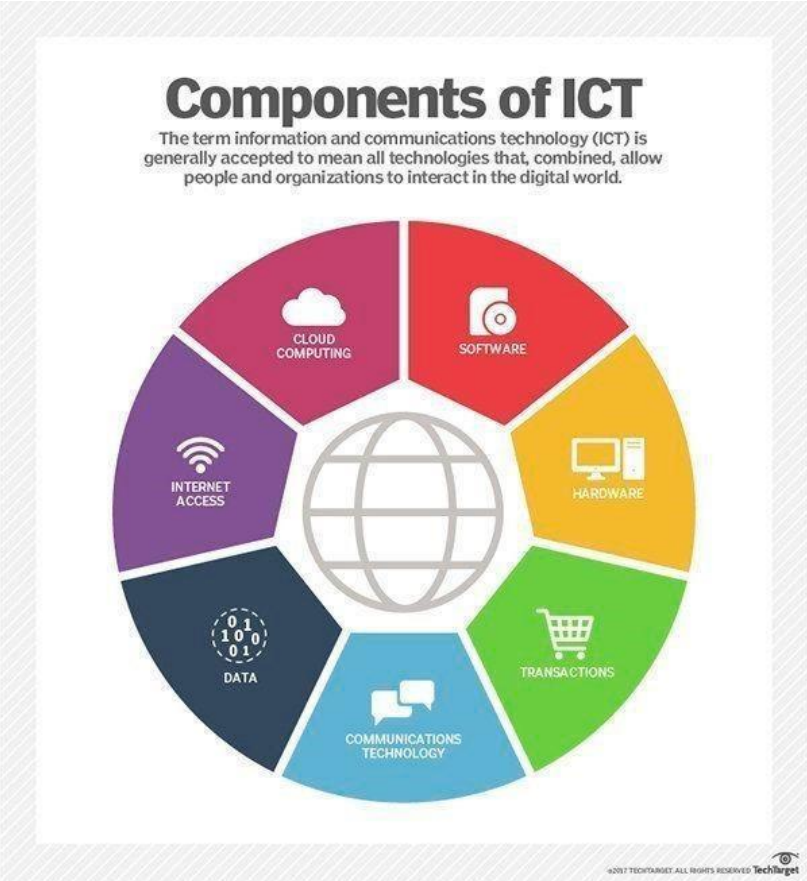

Figure 2. Techtarget. 2017. Components of ICT.

Additionally, there are theoretical frameworks as well when discussing about Information and Communication Technologies. In fact, the study of a given region or country stage of development in the adoption of ICTs has made steps forward over the last two decades. The original focus was to assess the development and adoption of ICT infrastructures – broadband, mobile phones, computers – whereas lately research has expanded its scope of interest and now includes new dimensions of ICT, such as usage of digital technologies and development of industries within the digital value chain (Kaur, Lechman & Marszk, 2017). Thus, in order to measure the impact of e-commerce, e-government, social networks, internet platforms and services, a number of indices have been developed, including the International Telecommunications Union ICT Development Index (2009), the World Bank Knowledge Economy Index, the World Economic Forum Network Readiness Index (2002), the Inter-American Development Bank Broadband Index and, as we will later see, the most recent European Union Digital Economy and Society Index (2015).

Finally, it is worth recalling that the considerable development of ICT has been studied in various ways in economics and compared, due to its vastness and impact on development,

productivity and productive and organizational structures, to changes in the technological paradigm. The concept of a technological paradigm is inspired by Thomas S. Khun's major work, *The structure of scientific revolutions* (1962), which presented the technological paradigm as a set of knowledge, both tacit and codified, including scientific notions, research and operationalization procedures related to the creation and development of a given technology. Thus, this paradigm represents a shared model for a community of practice (engineers, scientists) involved in solving problems that emerge in the normal development of a technology.

2.3 A global revolution with local adaptations

Economic, legal and political systems vary across cultures and reflect the norms and customs of people. That is why the discipline of intercultural communication and the wider concept of international communication are extremely fundamental today. On the one hand, international communication belongs more to a political sphere, since it can be defined as communication between nations. However, in particular, it is necessary to keep in mind that nations do not exist independent of people. Therefore, it is more accurate to state that international communication is typically a government-to-government – or better governmental representative to governmental representatives – type of communicative relation. On the other hand, intercultural communication studies any type of interaction (not only communication) across different identities, cultures and social groups. The interculturality factor is also referred to as the base for international businesses in an ever-more globalized world (Washington, Okoro & Thomas, 2012).

Globalization as a world economic and social trend generally includes the lowering of trade borders on an economic level, yet it has much to do with technology, culture and media content as well. In fact, in a world in which trade progressively takes place within global value chains, market access is often defined by a company's capacity to communicate with different means in the production process, in order to add value through its contributions and to innovate production, while promoting collaboration with other participants in the same value chain. Indeed, just as the sharing of technological innovations and commercial transfers stimulates the influx of foreign money into national economies, the transfer of culture and media coverage opens up these same markets. Moreover, on a social level, as globalization has taken hold, communities tend to resemble each other, personalising one's cultural values and adopting other

way of living. This outcome is known as homogenization – the local culture becomes more like the other – but the opposite can also happen: heterogenization consists of local values living in concomitance with other communities' values, but emphasising the local culture, making it more diverse (Rantanen, 2005). Nonetheless, the general hope is that the Information Society becomes an open and multi-cultural society which will promote, rather than disrespect, the expression of different cultures.

Both processes of homogenization and heterogenization have been particularly influenced by the Third and Fourth Industrial Revolutions and the growth of technologies and internet connection, which represent a global, fundamental change in the way people live, work and relate to one another. Those are new chapters in human development, enabled by astonishing technology advances as relevant as those of the two previous industrial revolutions. As we mentioned, these progresses are merging the physical, digital and biological worlds in ways that create both huge promise and potential peril. The speed, breadth and depth of this revolution is forcing every social actor to rethink how countries develop, how organisations create value and even what it means to be human (Hatzilygeroudis & Palade, 2018).

General-purpose technologies (GPT) are extremely flexible and pervasive. In fact, many benefits yield from their usage depend not only on adopting the technology but also on adapting to the technology. In fact, to make the most out of them, technologies need to be first widely adopted before society adapts to it. For example, electricity distribution depended on generators, just as the digital revolution depended on computers, internet and digital platforms. Of course, adaptation to new processes takes more time than adoption of technologies, and that it why it takes more time before output growth accelerates. In fact, in the early stage of such revolutions, the majority of resources are devoted to innovation and reorganization, and the benefits come only much later – but tend to be much wider in scale (Anderson & Rainie, 2018a).

Instant consumerism, fear of job losses or general uncertainty brought by the digital revolution tend to fuel social anxiety about the future, especially with political consequences. However, digital technology will spread further, and efforts to ignore it or legislate against it will probably fail. Of course, every fear is justified: we tend to disregard and deny what is unknown, since we cannot foresee the consequences it can bring. Yet, current job automation fears are seen sometimes as tender parallels of John Maynard Keynes's reservations in 1930 about increasing technological unemployment brough about new machineries. However, we know now that humanity eventually adapted to using steam power and electricity, and chances are we will do

the same with the digital revolution, if we stay confident enough. The same confidence is not mere reliance on providence, but concrete actions culminating in devising smart policies that can maximize the benefits of the new technologies while minimizing the rising short-term social panic, thus responding to the organizational changes driven by the digital revolution. For example, in a world where automation is the ultimately fear, future jobs – and governments in general – should emphasise more human empathy and originality in any social occupation and interaction depending especially on these two characteristics (e.g. nursery schools, clergy, artists, teachers, doctors).

The rapid pace of global diffusion of the modern technologies made them largely available in every part of the world. Indeed, it is striking that less-developed countries are today among the leading nations in technological advancement in many areas: Kenya for mobile payments, India for digital land registration, China for e-commerce. These countries enabled the rapid adoption of new technologies because, unlike many advanced economies, they were not bogged down in pre-existing or antiquated infrastructures (IMF, 2018). Nonetheless, it is fundamental to underline the fact that even though the digital revolution is global, the pace of adaptation and policy reactions will necessarily be national or even regional, thus reflecting different economic structures and cultural and social preferences.

The digital revolution has strongly affected economies that are financial hubs, such as Hong Kong or Singapore, while it has not radically altered the situation in nations specialized in oil production, such as Qatar, Saudi Arabia or Kuwait. This will inevitably shape the response to automated production technologies from those countries, thus reflecting different societal views especially on employment protection (Fine, 2003). Where local preferences diverge, international cooperation actions will probably need more attempts of trying differentiated experiences before nailing the policies which work best. The same reasoning goes for policy responses to inequalities, which will eventually continue to follow the gradual discovery of the best organizational arrangement for firms in the field of new technologies. In fact, as we shall later see, major development inequalities rise with the widening of the gap in productivity and profit maximization between firms with new business models and those that have not reorganized yet. Consequently, such gaps close only once old processes have been replaced.

Given the global reach of digital and technological developments, there is a strong need for well-functioning policy cooperation among nations similar to the one of global financial markets or sea and air traffic. Moreover, by living in an increasingly interconnected world,

social, economic and legal rules must be based on a global, shared ethic (Singer, 2003). In the digital arena, such collective cooperation includes, for example, standardization of data treatment – which is hard to control in a country-specific way especially for the international nature of the Internet – or assured mutual support among global international organizations (IOs) such as the World Bank and the International Monetary Fund in order to monitor transactions, given the growing number and speed of peer-to-peer payments. In particular, the relevance of global IOs comes first and foremost from their broad membership, and thus broader reach, which can provide a wider forum of discussion for addressing the challenges posed by the digital revolution and working on policies solutions and guidelines to integrate experiences across nations, but also tailor advice to specific countries' needs.

Additionally, we said that the digital revolution has been a global event impacting all nations on different levels and degrees. Some countries have benefitted from it and made the digital industries their economic strength (e.g. Asian Tigers – Hong Kong, Singapore, South Korea and Taiwan), while others have adapted differently and used the digital innovations but maintained their economies focused on other types of productions (e.g. OPEC countries). However, whatever the typology of the revenue, world nations share – at least – a certain degree of familiarity with the digital, especially because of the globalization process, but decided to "stay local". That is what we call today glocalization: *the simultaneous occurrence of both universalizing and particularizing tendencies in contemporary social, political, and economic systems*[4].

Glocalization is a term formulated in the 1980s and come from the Japanese word *dochakuka* and it had referred to the adaptation of farming techniques to local conditions (Khondker, 2004). During the 1990s, it was translated into English by sociologist Roland Robertson (1995) and then further elaborated by sociologist Zygmunt Bauman to adapt the globalization landscape to local realities, in order to better study their relations with the international environments. Economically and socially speaking it refers to the creation or distribution of products and services designed for a global or international market, but modified according to local laws or culture. Many companies "think global but act local": they maintain the internal values of the brand, while adapting to local trends. In fact, companies that chose the "glocal" strategy may adapt their logo and colours, their marketing campaigns and social media strategies depending on the market where they are working. The most striking example of this phenomenon is the

[4] *"Glocalization". Encyclopedia Britannica. Accessed 15 Aug. 2020.*

glocalization of Starbucks. Starbucks is a coffeehouse chain founded in 1971 in Seattle which quickly multiplied across the U.S. the company increased profits by expanding internationally and in 1995, Starbucks International was born. Today, there are thousands of locations trying out local designs in stores. The stores are not excessively Starbucks branded in order to capture the feel of their local coffee shop. Finally, as a theoretical framework, apart from geography, economy, sociology, and anthropology, glocalization is also compatible with many of the concerns of postcolonial theory, and its influence is particularly detectable in the digitization of music and other forms of cultural heritage (Hebert & Rykowski, 2018).

Figure 3. BIV. 2016. Starbucks location on Qian Men Street in Beijing

2.4 Digitalization as a social phenomenon

To begin with, we need to underline the fact that there is a difference between *digitization* and *digitalization*. Thus, we make clear that the former is the conversion of analogue to digital, whereas the latter is the use of digital technologies and digitized data to impact daily social life (Savić, 2019). In this section – and more generally in this whole thesis – we focus on the second phenomenon: here in particular, we shall mostly observe social and economic novelties brought about the digital revolution. For example, we shall see changes in how work gets done, the transformation of the relation between customers and companies, observing how they engage, interact and create new digital revenue paths.

During the last decades, we have witnessed a new wave of digitalization – one that goes deeper in our conception of digital dependency – characterized by phenomena such as big data, machine learning, smart algorithms, artificial intelligence and advanced network solutions. In

fact, the digital era is determined by continuous flows of data containing information, knowledge, ideas and innovations. Digital infrastructures, which are arranged within a semi-autonomous category, have been delegated increasingly more tasks and responsibilities in society, at the same time as they have become more transparent for the public, and hopefully more accountable (Royo-Villanova, 2020). This transition towards a more digitalized world affects social life in a wide range of areas, starting from how we communicate and establish social relationships or how we experience our workplace and conduct our work up to how we access media and culture, and how we deal with our relations to public agencies both as citizens and costumers.

A central concern for any research group on the matter is to investigate how digital technologies are developed in the first place and then put into use in an interplay between social and technological factors. As technologies have – literally – transformed our conception of living, it is easy to get seduced by the apparently neutral, efficient and intelligent performance of modern computer systems. However, such digital innovations most of the time are created for purposes that are, sadly, far from neutral: to create capital and profit, to direct behaviours and preferences under certain guidelines, and to identify and categorise people.

In fact, especially within the field of social sciences, the latest and major task ahead is to investigate and follow this encoding of social values through all phases of the development of modern digital technologies – the establishment of big and small data archives, the development of algorithmic groupings, and the design of artificial intelligences (Allwood, 2017). At the same time, social scientists' quest does not stop at the study of the mere development of such technological innovations, but it appears to be more relevant to carry out new researches especially on how digital infrastructures are implemented and appropriated in social contexts, the acceptance or resistance they face, and how the technologies are changing the users' environments as well as how users are transforming and employing the technologies for other means than those intended.

Finally, this also brings up an epistemological question: if "change is the new constant", and the world as we know it is ultimately evolving, then should theories and methods of understanding those developments change as well? In other words, do established theories in sociology and social sciences need rethinking or can they still be the super structural models of this change? Among many others, the most discussed ones in the last decade have been different theories in media sociology about filter mechanisms, theories in cultural sociology about the

establishment of cultural preferences, democracy theories about the constitution of the public sphere, interactionist perspectives of society building from below and so on (Schumacher, Sihn, & Erol, 2017). Concurrently, the validity of existing theories is not the only issue going under scrutiny: indeed, this new wave of digitalization requires the development of more suitable qualitative and quantitative practical methods of investigation and analytical tools as well (e.g. new approaches to ethnography or anthropology, new structures of surveys focusing on the interplay between technology and society). In particular, concerning the socio-economic impact of the digital revolution, there are wide-ranging positive and negative aspects.

On the bright side, socially speaking, among the positive aspects we certainly can include greater interconnectedness, easier communication, and the exposure of information that in the past could not circulate so rapidly and freely. For example, in his *Physics of the Future*, Michio Kaku (2012) argued that the failure of the Soviet coup of 1991[5] was due largely to the existence of technology such as the fax machine and computers that exposed classified information. Following the same line of thought, it could be argued that the Revolutions of 2011[6] were made possible especially thanks to social networking and smartphone technology, even though these revolutions in retrospection largely failed to reach their goals. Economically, the impact of the digital revolution has been wide-ranging. Without the creation of the World Wide Web (WWW) in 1991 by the British computer scientist Tim Berners-Lee, for example, globalization and outsourcing would not be nearly as available as they are today. The digital revolution radically changed the way individuals and companies interact, take decisions and ponder utility. Small regional companies were suddenly given access to much larger markets, also because of the rapidly dropping technology costs of production, thus making possible innovations in all aspects of industry and everyday life.

But there is also the downside to this argument: some socially and economic negative effects of the digital revolution are overlapping, and sometimes they are mutually dependent. We can mention information overload, diffusion of fake news, Internet sociopaths, forms of social isolation, and media saturation. In the work and academic field of journalism, different members of that community tend to argue against Internet, believing that it is hurting this

[5] The August putsch was an attempted coup in the Soviet Union in 1991, organized by some members of the Soviet government to depose President Michail Gorbachev and take control of the nation. (Grachev, A., 1995)
[6] By *Arab Spring* (best described as Arab Revolutions) is meant a term of journalistic origin, used mostly by the Western media, to indicate a series of protests and unrest that began in Tunisia and continued throughout the Arab world, between the end of 2010 and the beginning of 2011. (Corrao, F. M. 2011)

profession more than it is helping it (Master, 2009), especially by allowing anyone no matter how amateur and unskilled to become a reporter. It is not simple diffusion and/or expression of opinion that journalists criticize, but the irresponsible use amateurs make of social networks or blogs – out of convenience, boredom or mere ignorance. This, in turn, causes information to be less accountable and favours the rise of conspiracy theory in a way it did not exist in the past. Moreover, on the business level, there have been some occasions in which company employees' universal use of portable digital devices and work-related computers for personal use (email, instant messaging, computer games) were often found to, or perceived to, reduce those companies' overall productivity. Personal computing and other non-work-related digital activities in the workplace in this sense also helped lead to stronger forms of privacy invasion.

However, whether we perceived it as a threat or as an improvement, the digital revolution is changing the way we live our daily life by encouraging online communities, by empowering personalised learning experiences, by supporting the development of soft skills (e.g. problem solving, collaboration and creativity), and by trying to make learning fun. In general, the digital revolution progressively highlighted the need for every citizen to have at least basic digital skills in order to live, work, learn and participate in the modern society. In fact, nowadays we may find digital skills requirement in nearly all jobs where technological development accompanies existing tasks, especially in the fields of engineering, accountancy, nursing, medicine, art, architecture and so on.

In particular, this digital revolution is leading to the need for more skilled ICT professionals in all sectors of the economy, encouraging young workers to specialize in one single, sometimes unusual sector by giving for granted that they already master general, basic tasks (Anderson & Rainie, 2017). Indeed, digitalization has permeated every aspect of human life up to the point that in a 2016 Pew Research Center survey[7], *"The State of American Jobs"*, it was noted that employment is much higher among jobs that require a superior level of preparation (in education, experience and job training); average or above-average interpersonal, management and communication skills; and advanced levels of analytical skills, such as critical thinking and computer skills. Nowadays, diversity is a competitive advantage: everybody else's job is easy until it is you that you have to perform it, and this highlights the importance of innovation and specialization in every sector, even for the most basic tasks.

[7] PRC. 2016. Survey: The State of American Jobs.

Undeniably, the fields where digitalization married the economic principle of maximization of cost and benefits are financial markets, insurance and pensions (OECD, 2018). Revolutionary changes in information processing systems of banks, qualification requirements and financial services brought a transformation of the whole banking system model, which makes it possible to reduce costs and increase the productivity of financial services while accumulating intangible capital (Carbó-Valverde, 2017). Digitalization is responsible for the individualization of modern production as well, meaning that product development is adapted for each client (Paritala et al., 2017). Production includes visualization, human factor analysis, holistic approach to product and process design, which are impossible without the general characteristics of Industry 4.0, such as analysis of data, network systems, artificial intelligence, the Internet of things (IoT), and digitalization of business processes (Kockmann et al., 2018). Of course, as we saw, digitalization is also important for new industries, but is a complex process combining public procurement, control of production, and commercialization.

Nevertheless, every positive benefit to society coming from this digital revolution – especially in terms of the accessibility of information – could be counterbalanced by some concerns. Extended powers of communication and information sharing, bigger capabilities for existing technologies, and the advent of new technologies brought to the average audience general worries about automatization, and to a more expert eye, it brought concerns about many potential opportunities for exploitation. In fact, the digital revolution contributed in bringing people into a new age of mass surveillance, generating a range of new civil and human rights issues. Moreover, reliability of data became an issue as information could easily be replicated, but not as easily verified, and the possibility to store and track facts, articles and statistics that are usually unavailable became a reality – and sometimes source of income or disagreements.

From an academic point of view, especially in the eyes of geologists, anthropologists and historians, a large part of human history and knowledge has been recognised through physical objects belonging to the past that have been found, preserved and passed on principally in the form of written documents (Schwägerl, 2014). That is why, adversities towards digitization can be justified by scholars' concerns rising from the fact that digital records are easy to create but also as easy to delete and modify. Also, critiques are moved against the Internet, which is believed to not distinguish between the true and the false, the important and the trivial or between the enduring and the ephemeral (Birkerts, 1994; Himmelfarb, 1996). Nonetheless, on the other side of the matter, some other academics and artists have embraced

this digital revolution especially because it made possible, and even faster, the recovery of some documents, the instant sharing of ideas all over the world and in different languages and the storage of data in digital formats, therefore not forcing anymore academics to carry around, and sometimes all over the world – literally – heavy folders (Goodman, 1990).

In particular, the improvement of digital technologies has recently made vast progresses to the availability and appreciation of the arts and culture on a global scale. Not only this, but with virtual reality, users are now able to observe objects, artworks and sites than previously sat behind glass displays, were too distant geographical terms, or are now destroyed. One brilliant example of digitalization in the arts is *Rekrei*, a project that emerged from the Mosul Museum in Iraq, as a response to the permanent damage done to the museum and its artifacts in February 2015 by the ISIS terrorist organization (The Guardian, 2015). The *Rekrei* website lets users navigate to sites which have suffered destruction and loss of culture, art and heritage – whether through human intervention or natural disaster – and uses gathered data (such as public and private photos) to create 3D representations, as in a virtual museum (Project Mosul, 2015).

As a final remark, it goes without saying that digitalization has penetrated into the socio-cultural sphere, from information to entertainment; in the music, publishing and cinema industry, for example, digitalization has negative effects in connection with piracy and ignoring copyright on books, music, radio, television and cinema (Waldfogel, 2017). Conversely, digital technologies helped these industries expanded the audience of its consumers and reduced costs for introducing new products to their markets. Concerns that the consumer welfare would decrease due to the media have not been justified, while the opposite scenario has been observed: consumers are ready to pay for the use of media channels. Finally, digitalization has transformed education systems. Especially in developed countries, a typical school class includes all forms of e-learning and teaching (Mashhadi & Kargozari, 2011), assuring a transfer of skills and knowledge through a computer and a network. It means that the forms of presentation of educational material and the formation of skills have completely changed.

2.4.1 Digital Anthropology

As it is well-known, anthropology is the science that studies humanity. Basically, the focus of the subject spans from the biological and evolutionary history of *Homo sapiens* to the societal and cultural features that ultimately distinguish humans from other animal species. Because of its wide variety of observations, anthropology has become, especially since the

middle of the 20th century, a collection of more specialized fields. Physical anthropology is the branch that concentrates on the biology and evolution of humanity, while cultural anthropology (or ethnology), social anthropology, linguistic anthropology, and psychological anthropology are the branches that study the social and cultural constructions of human groups. Finally, archaeology, seen as the method of investigation of prehistoric communities, became an integral part of anthropology since its emancipation as a self-conscious subject in the latter half of the 19th century (Encyclopaedia Britannica, 2020a).

Indeed, it is remarkable how the connection between digitalization and human nature grew so strong that some scholars are arguing for the rise of a new branch within the study of human beings: digital anthropology (Horst & Miller, 2012). In short, digital anthropology is the anthropological study of the relationship between human beings and digital-era technology (specifically referring to online and Internet technology). It focuses both on online contexts and technological phenomena, such as the study of mass-use devices, among which we can find iPods, Personal Digital Assistants (PDA) and all kinds of hardware; the latest interest is on the fusion of the human being with the machine as is the case with cyborgs (Escobar, 1994). That is a new research field, and because of this, it has a variety of names reflecting a variety of nuances, including techno-anthropology, digital ethnography, cyber-anthropology, and virtual anthropology (Weber & Bookstein, 2011).

The research field of digital anthropology is the cyberspace, which allows the observation, analysis, and interpretation of the sociocultural phenomena springing up and taking place in any interactive space. However, different digital anthropologists who study online groups use traditional methods of anthropological research. They participate in online communities in order to learn about their customs and practices, and support their observations with private interviews, historical research, and quantitative data, in order to produce ethnographies, qualitative descriptions of their experience and analyses. (Hine, 2000).

Digital anthropology is related to, but not synonym of neither Sociology of the Internet nor Digital Sociology. The former – sociology of the Internet – involves the application of sociological theory and method to the Internet as a source of information and communication. In this field of study, sociologists are concerned with the social implications of the Internet, technology, as well as new social networks that have arisen. Particular interest is put in the study of interactions in five domains: inequality (the digital divide), public and social capital, political participation in civil society, organizations and economic institutions, participatory

culture and cultural diversity (DiMaggio et al., 2001). Also, from a sociological point of view, issues related to cyber-crime are observed with particular attention. The latter – digital sociology – is a very recent sub-discipline of sociology that focuses on understanding the use of digital media as part of everyday life, and how these various technologies contribute to patterns of human behaviour, social relationships, and concepts of the self (Lupton, 2015). Digital sociology differs from the sociology of the Internet and from digital anthropology since it is a term wider in scope, that addresses not only the Internet or cyberculture but also the impact of the other digital media and devices that have emerged since the first decade of the twenty-first century (Wynn, 2009).

The field of digital anthropology is becoming so attractive to "classical" anthropologists because it has been observed that digital – national and international – communities tend to establish their rules, practices, traditions, beliefs and even language features just as much traditional, geographically confined communities do (Horst & Miller, 2012). Therefore, among those who have both access and the skills to navigate, online communities are formed and live in virtual, not tangible worlds, but their boundless, digital, common land makes them ever more connected citizens. It is way easier for them to keep in touch – no matter the time or distance – and share any thought, than for any other community in history. Thus, because of this good rate of inclusion, it could be dared to say that the in the cyberworld problems of citizenship, immigration, race discrimination and so on tend to be unjustified. Any user is a citizen of the virtual world and they all share a common, virtual reality.

Conclusions

Overall, this chapter has focused on the impact that both the Third Industrial Revolution (also known as the digital revolution), and the more recent Fourth one, have had on different aspects of people's lives. First of all, we have underlined how the use of the term "revolution" is not accidental, but rather it was chosen to highlight the parallel idea of the colossal social changes previously brought about by the agricultural revolution and the industrial revolution. Once the relevance of the concept was outlined, we moved towards the presentation of the era in which we live this revolution, something we call the Information Age, which is strictly connected to the Digital Era. We argued that if the Information Age is characterized by the speed and amount of data circulating globally, producing new benefits socially and economically speaking, especially thanks to the new technologies, the Digital Era can be seen as the development of an evolutionary system in which knowledge turnover is very high and

also increasingly out of the control of humans (some content is chosen and displayed for us even when not requested). However, we argued that we are living in a hybridization of the two eras: Information management is crucial in all aspects of the new digital economies and global revolutions and it is moving towards the intersection of the digital and the physical – the bits and the atoms. From this standpoint, we made a further step towards some technical explanations of the "driving wheels" of this digital revolution, all the technological innovations known as Information and Communication Technologies (ICT). Subsequently, we discussed about globalization in correlation with information, digital and cultural content. Indeed, we argued that the rapid globalization, and the resulting immediate sharing of information during the digital era, has brought about two phenomena: homogenization and heterogenization. The former explains how a local culture becomes more like another (usually the "dominant" one), while the latter consists of local values living in concomitance with other communities' values, but emphasising the local culture, making it more diverse. In our thesis, the general hope is that the Information Society becomes an open and multi-cultural society which will promote, rather than disrespect, the expression of different cultures. In this regard, we presented the phenomenon of *Glocalization* (a combination of globalization and localization) – the concurrent occurrence of both universalizing and particularizing tendencies in contemporary social systems. Finally, we observed the crucial focus of this work, that is to say digitalization seen first and foremost as a social phenomenon, with its ups and downs. Positively speaking, digitalization brought greater interconnectedness, easier communication and circulation of information that in the past could not circulate so rapidly and freely. Negative cases may include information overload, diffusion of fake news, Internet sociopaths, forms of social isolation, and media saturation. We concluded this chapter with a brief presentation of digital anthropology, the new branch within the scientific study of human beings, given the strong relation and interdependence between digital innovations and human life.

Now, being the focus of this thesis the analysis of the relations between technological – digital – development and sociality, we shall observe one of the most discussed topics within the field of development theories (and not only): the digital divide.

3 The Digital Divide – what is known is gold

"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect"[8] – Tim Berners-Lee, W3C Director and inventor of the World Wide Web.

Introduction

The global scale societal transformation brought by the digital revolution is undeniable. Indeed, by affecting the incentives, rules, and norms of our social and economic life, it transforms how we communicate, learn, entertain ourselves, relate to one another and most importantly to what extent we perceive and understand ourselves as human beings. Concurrently, the awareness that new technologies are being developed and implemented at an increasingly rapid pace has an impact on human identities, communities, and governmental structures. As a result, our responsibilities to one another, our opportunities for self-realization, and our ability to positively impact the world are intricately tied to and shaped by our chances to engage with the technologies of the latest Industrial Revolutions. Digital changes are not just happening to us – we are not their victims – but rather we have the opportunity and especially the responsibility to give them structure and purpose, on equal level and degrees for any social actor (Anderson & Rainie, 2018a).

In general, as we mentioned, all previous industrial revolutions have had both positive and negative impacts on different stakeholders. For example, some nations have become wealthier, and technologies have helped pull entire societies out of poverty, but the inability to fairly distribute the resulting benefits or anticipate externalities has exposed new global challenges. Therefore, it is fundamental to align common human values with technological progress and guarantee that any digital transformation goes first and foremost to the benefit of all human beings, no matter their location, gender, age or economic status. In fact, we have the opportunity to proactively shape our future to be both inclusive and human-centred. Basically, this digital revolution is about much more than technology: it is an opportunity to unite global communities, to build sustainable economies, to adapt and modernize governance models and to reduce material and social inequalities (ILO, 2019).

When reflecting on the theme of the social and global impact brought by Information and Communication Technologies (ICTs), the digital divide is possibly one of the first concepts

[8] W3C, Press Release, 1997.

that comes to everybody's attention. The Digital Divide is a relatively recent phenomenon, very complex and articulated, generally linked to the development of ICT and the Internet, but a development that is broadly generating relevant cultural and social inequalities. Due to the complexity and multidimensionality of the phenomenon, there is no univocal definition of the concept, but rather some explanations continually modified and readapted, as the Digital Divide is a process in continuous and fast evolution.

In this chapter, we shall investigate the relevance of one of the most discussed topics when dealing with development theories: the digital divide, following the belief that what is known is gold, and therefore not accessing (digital) information and skills is a social and economic disadvantage. First and foremost, we shall begin with an attempt to define such evolving concept, according to the angle of study, this "divide" has multiple acceptations. It is not only a digital divide, it is an economic, social, cultural, gender, age divide and so on. Then, by being digitalization a global phenomenon, we shall examine the digital divide in relation to globalization, with a presentation of this topic consistent with some different regions of the world: Europe, United States, Japan; BRIC; Eastern Europe; Middle East; Latin America, East and Central Asia, sub-Saharan Africa. Furthermore, we shall move towards the examination of digital and information inequalities, where we shall see how the whole discussion of the digital divide actually turns around a different divide: there is a high degree of inequality, a gap of opportunity of access and skills, which are then followed by all the other divides. Finally, we shall investigate such gap of digital opportunities and the efforts made to close it, especially in the international realm and within the new UN Sustainable Development Goals.

3.1 Trying to define an evolving concept

On a general ground, people notice that innovative technologies produce differences in the development opportunities of individuals, and that a gap is established between those with access to these technologies and those without. To the mechanisms of social exclusion and discrimination already existing, therefore, we add this new element which, as Professor Manuel Castells underlines, amplifies the distance between those who live in the above-mentioned Information Age and those who are excluded from it. In his work *The Rise of the Network Society*, considered one of the milestones of contemporary sociology, he uncovers the dynamics of the epochal transition from the old to the new type of society, thus concluding that the new

global social network system totally depends on both access to and mastery of technology (Castells, 2000).

However, in order to review the concept of the digital divide, it should be kept in mind that – as we noted before and we shall see later as well – the relationship between technology and development has normally been perceived to follow a linear trajectory. Generally speaking, with the discovery and adoption of the former, usually followed the improvement of the latter; thus, it is since informatics, and not primarily since the expansion of the Internet, that the discourse on the digital divide began to be built (Anderson & Rainie, 2018b). Historically, the first to talk about the Digital Divide were Al Gore and Bill Clinton, respectively Vice President and President of the U.S.A., when, in 1996 they held a speech to the people of Knoxville, Tennessee about the different opportunities for students to be able to use or not personal computers at school (Gunkel, 2003). The Clinton Administration then started the drafting of some policies aiming at developing and enhancing the Internet as an infrastructure – see, for example, the Telecommunication Act of 1996 (FCC, 1996). The improvement of new technologies that took place in the U.S. highlighted, in fact, the enormous possibilities that they opened up, but also the new inequalities that followed. At the beginning, in the States, the divide was in terms of costs, focusing on Internet access affordability in some areas of the Country. Thus, it was an economic rather than a social issue. Later, when the Internet exploded as a mass phenomenon, it became an important tool for work and economic investments, and the gap started to be increasingly marked on the social level as well. Indeed, not being connected to the network, and in particular not having the cognitive tools to do so, meant being relegated to the margins of society (Putnam, 2000).

Of course, it is undeniable that the rise of the Internet strongly generalized the discourse. The relevance of the concept of the Divide took an international position when the G8 leaders, during the 26th Okinawa Summit in 2000, set the development of a global information society as one of the main goals of the Group. As recognised in the Okinawa Charter, during this occasion it was even established a Digital Opportunity Taskforce (dot force) with a view to integrate any G8 digital effort into a broader international approach, thus securing the participation of every stakeholder (G8, 2000). Another historical milestone in the definition of the concept of the digital divide is the World Summit on the Information Society (WSIS): it was a two-phase United Nations-sponsored summit on information, communication and the information society that took place in 2003 in Geneva and in 2005 in Tunis. One of the main goals of the Summit was to bridge the global digital divide, which separates rich countries from

poor countries, by fostering access to the Internet in the developing world. Furthermore, the G8 dot force was followed by the United Nations Information and Communication Technologies Task Force (UN ICT TF). Indeed, by being established by UN Secretary-General Kofi Annan in 2001 within the realm of the United Nations, in the eyes of many developing countries this Task Force enjoyed a broader legitimization than any previous initiative. Finally, a general, world-recognised definition comes from the OECD (2001:5), which specified that the digital divide is *the gap between individuals, households, businesses and geographic areas at different socioeconomic levels with regard to their opportunities to access ICTs and to their use of the Internet for a wide variety of activities.* Therefore, *the digital divide reflects various differences among and within countries.*

Subsequently, the concept of the digital divide has been largely discussed over the last decades on a global level. It entered the public discourse especially in the 1990s and it initially implied an element of technological determinism, a technology-led theory of social change. In this view, technology is the sole or prime antecedent cause of changes in society, while human and social factors are seen as secondary (Smith & Marx, 1996). It was only later that scholars (e.g. Mason & Hacker, 2003) began to focus on the human-factor involved in the process. Indeed, the concept of the digital divide strongly resembled the argument about the knowledge gap hypothesis proposed by Tichenor, Donohue and Olien (1970). They believed that knowledge regarding the use of adopted technologies is greater among those with high socio-economic status who are already well informed. Thus, with high probability, whoever, individually or collectively, succeeds in developing the infrastructures and the capacities to use them will be consequently more advantaged. Those will be the ones with a greater decision-making capacity and will consequently influence the building of the new information society. And that is why different scholars started to argue that the digital divide needs to be defined in terms of both access and use (e.g. Hargittai, 2002; Akhter, 2003; Selwyn, 2006).

Hence, along with the one proposed by the OECD in 2001, new definitions began to emerge. For example, according to the Encyclopaedia Britannica, the notion of the digital divide outlines *the uneven distribution of information and communication technologies (ICTs) in society*, and it *encompasses differences in both access (first-level digital divide) and usage (second-level digital divide) of computers and the Internet*[9]. Eszter Hargittai (2002) illustrated that there are factors beyond mere connectivity that need to be considered when discussing the digital divide.

[9] Britannica. Digital divide

The author presented the five dimensions along which a digital divide may exist: technical means (software, hardware, quality of connectivity), autonomy of use (location of access, freedom of use of the medium for the user's preferred activities), use pattern (types of uses of the Internet, experience of using ICT), social support networks (availability of others who can be turned to for assistance with use, size of network to encourage use) and skill (the ability to use the new technology efficiently and effectively). Indeed, it was Hargittai who called the difference in people's online skills the second level digital divide. Later, this disparity of skills, literacy and types of usage has been further divided by van Dijk (2006) into three types: instrumental skills (the capacities to work with hardware and software), information skills (the ability to search, select and process information on computer and network sources) and strategic skills (the capacities to use computer and network sources as the means for particular goals and for the general goal of improving the user's position in society).

Moreover, with a focus on infrastructure, capacity-building and resource usage, those differences are measured between industrialized and developing countries, thus depicting a global divide; between various socioeconomic groups within single nation-states, thus describing a social divide; between different kinds of users concerning their political engagement on the Internet, thus presenting a democratic divide (Norris, 2001). Additionally, those differences are generally believed to reinforce already-existing social inequalities and to cause a persisting information or knowledge gap among the "haves" and "have-nots" – namely, people who have access to, as well as the skills to operate, information and communication technologies, and those who have no access to these technologies, who may not even be aware of their existence and/or do not have the skills and/or resources to utilise them (Cullen, 2001; Antonio & Tuffley, 2014).

It is unforgivably clear that developing, technologically less advanced countries are at a severe disadvantage in respect of the exposure to and use of technology, as a large fraction of the population in such countries lack access to what would, in developed countries, be categorised as ordinary ICTs, such as the telephone and even the radio. The most obvious reason for this is the extreme shortage of resources for the acquisition and maintenance of the equipment essential to create the necessary infrastructure, given by the lack of financial support from the governments of these disadvantaged countries, as well as absent training facilities and common knowledge (Mansell, 2002). At the core of the digital divide, therefore, is the fact that digital, technological change occurs in an uneven manner, and notwithstanding the rapid

progress of technologies, their diffusion is always less so (Campbell, 2001). In addition, the conditions for optimum development of ICTs in a particular region or in a particular society are not always linear, but rather conditional to the situation faced by each nation (geographical, economic, political, social issues etc.).

Indeed, when dealing with the digital divide, most authors fear that the world would become divided along the lines of the so-called information rich and information poor (McNair, 2000; Goodrick & Srivastava, 2002), with the resultant consequences of fostering a wider divide rather than a narrower one. That explains why the fundamental desire of the Information Society is to enable all individuals to enjoy the daily and long-term benefits of technologies such as the Internet, through equitable access for all individuals to ICTs. The impact of such uneven distribution and disparity of opportunities is often neither described nor quantified, but is usually extrapolated to the consequence of the individual being left behind, as well as more broadly to countries who are then unable to participate in the emerging global Information Society (Mansell, 2002).

A further analysis of the concept of the digital divide is presented by Laura Sartori: in 2006, the author formulated two hypotheses, normalization and stratification. According to the former, the gap currently existing will be progressively overcome and with the gradual, global availability of technology at lower costs and with simpler instructions, we will arrive at a general levelling. Through a similarity with what happened for the use of household appliances such as television, refrigerator and washing machine or automobiles, it was reasonably expected that the initials inequalities can be overcome over time. The basic belief is that the current gap is temporary and will tend to disappear (Sartori, 2006). The stratification hypothesis, on the other hand, refers to possibility that the digital divide fits into a social structure already stratified for economic, cultural and social reasons, and will tend to accentuate already existing inequalities. However, over the past years, an attitude fairly equidistant between the two hypotheses has been consolidated, according to which both are partly valid but neither is considered completely exhaustive.

The original notion of a divide based on opportunity of access and usage became popular in the mid-1990s, after the publication of a survey on Internet diffusion among US citizens, *"Falling Through the Net: A Survey of the 'Have Nots' in Rural and Urban America*" (1995), by the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce. Generally, widespread social inequalities in ICT access share some

common characteristics: people tend to be particularly excluded by age, education, ethnicity, race, family structure, gender, income, occupation, and place of residence. Thus, on one hand, young urban men (and sometimes women) with high levels of education who lived in relatively wealthy families used wisely the media. Such people are most likely to materially possess ICTs and master the skills necessary to use the Internet in their free time, while those from less-advantaged groups lack basic navigation skills and prefer entertainment on the Internet instead when not occupied at work. On another hand, on a global, macroeconomic level, factors such as per capita gross domestic product (GDP), international trade volume, degree of democratization, density of communication infrastructure and investments in R&D influence Internet diffusion as well. Thus, industrialized societies will tend to implement more new technologies than less-developed countries (Patel, 1974).

Now, at large, the early differences between men and women and between rural and urban areas (but only in Western livelihoods) diminished, possibly due to extended telecommunications networks, lowered entry barriers, and additional ICT experiences at work. However, other initial inequalities continued, especially those caused by more deep-rooted factors such as geography, age, education, ethnicity and race, and income. And sadly, the proliferation of Internet-enabled mobile phones created time-wasting gaps: some young people, especially from poorer families, became so dependent on Internet access that they spent most of their time on social-networking sites and games, rather than doing homework, and thus fell behind academically (Anderson & Jiang, 2018).

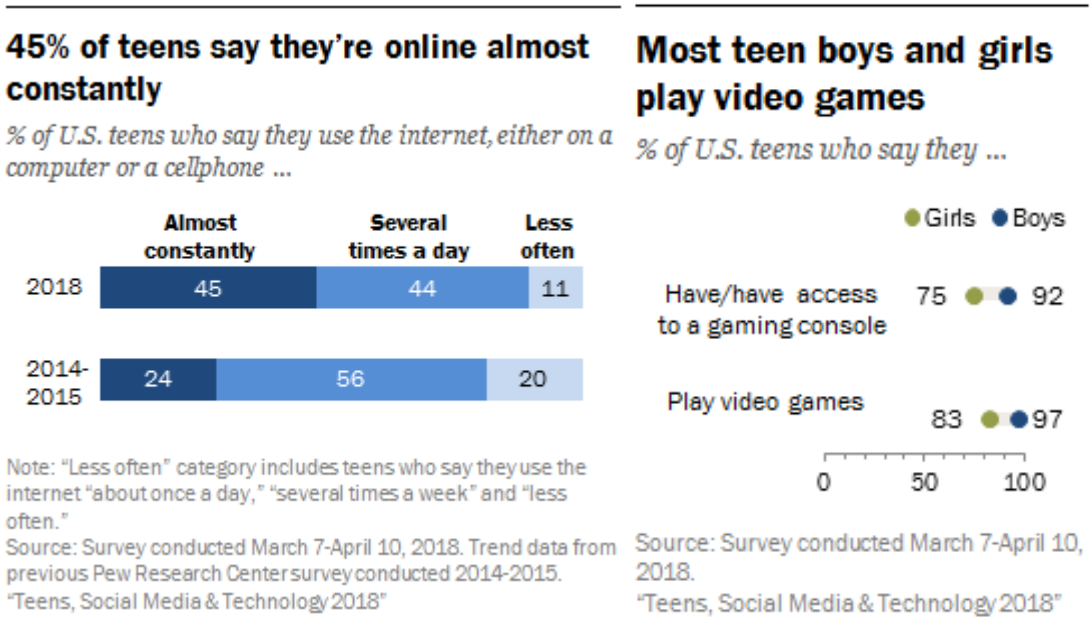

Figure 4. Pew Research Center. 2018. US Teens online and Video Games usage.

We have repeatedly mentioned that the digital divide is an information and knowledge gap between those who can access the Internet and those who do not. Consequently, it leads to the widening of the inequality gap among nations and individuals. However, it would be more appropriate to state that it is not a mere difference of well-being, but rather an inequality of opportunities. This conceptualization comes from Nobel Prize in Economic Sciences Amartya Sen, who wrote in 1999 his *Development as Freedom,* where he presented for the first time a new capability approach towards development. Sen stated that development needs to be judged by its impact on people – not only by changes in their income – and more generally in terms of their choices, capabilities and freedoms.

This led to the introduction of the UN Human Development Index (HDI): it is a summary measure of average achievement in key dimensions of human development – life expectancy, literacy, standard of living. The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by gross national income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI. The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean (UNDP, 2020). Thus, from this standpoint, even digital inequalities, as any inequality, is a discrepancy of opportunities to benefit from digital innovations between nations, rather than simple possession of assets.

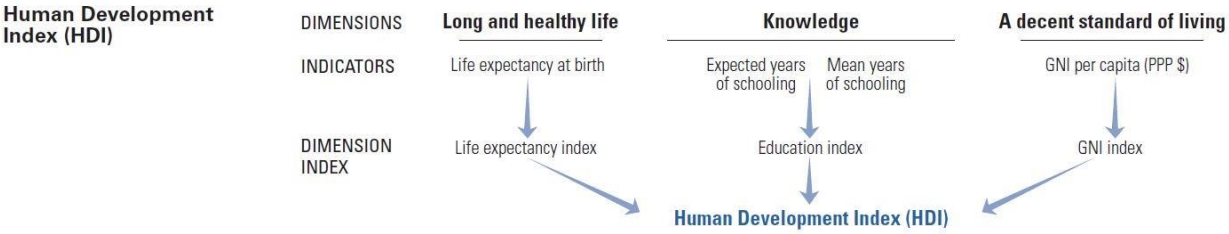

Figure 5. United Nations Development Programme. 2020. Human Development Index (HDI).

Finally, in 2006, web-usability consultant Jakob Nielsen wrote an article where he breaks the digital divide up into three stages: the economic divide, the usability divide, and the empowerment divide. The first divide is what we generally call the digital divide. The economic divide is the idea that some people can afford to have a computer and Internet access while others cannot. Since the price of technologies has continued to drop and we can now access digital technologies, such as smartphones, for little prices, Nielsen believes that the economic divide is probably the easiest to bridge – or, at least, the one we know how to deal with. The

second divide, concerning usability deals with the fact that the majority of people do not master the skills required to use and enjoy the benefits brought by computers, even when they would have the possibility to buy one. Indeed, included in this group are those with low literacy and seniors. According to Nielsen, we know how to help these users, but we are not doing it because there is little profit in doing so. Finally, the last divide deals with empowerment, and it seems the most difficult to solve. It focuses on how we use technology to empower ourselves. Different users do not dive into the Web, they accept first results of their search engines and cannot even distinguish paid search advertisements from organic search results. Many people will limit what they can do online by accepting the basic, default settings of their computer and not work to understand how they can truly be empowered (Nielsen, 2006).

3.2 Globalization and the Digital Divide

The world has undergone a real process of metamorphosis: the entire globe has become more interconnected as the result of the propagation of media technologies throughout the world. It has transformed, to use a famous expression coined in the 1960s by the Canadian media theorist Marshall McLuhan (1964), into a large global village, where ideas, technologies, products and people move from one place to the other and where different cultures come into contact with each other, mutually influencing each other in an ever more dynamic way.

As the 21st century progresses, worldwide communication has become increasingly imperative for a healthy economy, creating a new challenge to ensure that rapid technological changes do not preclude economic success for less developed economies. In fact, Internet connection has become a conduit for a globalized workforce, which, however, does not separate the world into easily divisible political territories but rather into those that have useful access to technology to reach a wider market and those that do not. For example, since classified advertisements and job postings have left newspapers in favour of the web, Internet access has become vital to even finding a job to apply for.

At the same time, it is true that internet access, particularly for business, has made development possible in remote areas, allowing corporations access to less expensive labour and allowing money to flow into developing countries. However, as the Internet has become integrated into daily business life, a lack of access among certain groups could severely hamper upward economic mobility, thus widening an emerging digital divide, where some derive the benefits

from this integration, but many others do not (Crenshaw & Robison, 2006). Indeed, it was the technological development that made it feasible to separate complex activities over distance throughout the value chain of production, but it was the vast wage gaps that had arisen during the great divergence that made it profitable.

In general, advances in telecommunication and transportation technologies accelerated globalization, and over time, the advent of the worldwide Internet has made all nations virtual next-door neighbours. Indeed, the Internet is truly a worldwide phenomenon, which exponentially increased the growth of and the integration between countries, making globalization a fact of life for citizens all over the world. Today, 50% of internet users are found in Asia, followed by Europe and Africa, respectively with around 15% and 12% of users (Internet World Stats, 2020).

WORLD INTERNET USAGE AND POPULATION STATISTICS
2020 Year-Q2 Estimates

World Regions	Population (2020 Est.)	Population % of World	Internet Users 30 June 2020	Penetration Rate (% Pop.)	Growth 2000-2020	Internet World %
Africa	1,340,598,447	17.2 %	566,138,772	42.2 %	12,441 %	11.7 %
Asia	4,294,516,659	55.1 %	2,525,033,874	58.8 %	2,109 %	52.2 %
Europe	834,995,197	10.7 %	727,848,547	87.2 %	592 %	15.1 %
Latin America / Caribbean	654,287,232	8.4 %	467,817,332	71.5 %	2,489 %	9.7 %
Middle East	260,991,690	3.3 %	184,856,813	70.8 %	5,527 %	3.8 %
North America	368,869,647	4.7 %	332,908,868	90.3 %	208 %	6.9 %
Oceania / Australia	42,690,838	0.5 %	28,917,600	67.7 %	279 %	0.6 %
WORLD TOTAL	7,796,949,710	100.0 %	4,833,521,806	62.0 %	1,239 %	100.0 %

Figure 6. Internet World Stat. 2020. Internet Statistics by Continent.

Another analysis of the relation between globalization and the digital divide is provided by Thomas Friedman. In his 2005 book *The World Is Flat,* the author presented the impact that the personal computer, the Internet, and communication software have had on business and on globalization in general. Accordingly, he describes three eras of globalization: Globalization 1.0, G2.0 and G3.0. The first one occurred from 1492 until about 1800 (European colonization): in this era, globalization was centred around countries. It was about how much productivity power a country enjoyed and how creatively it was arranged. World distances and the perception of its size start to shrink, going from large to size medium. The second era occurred from about 1800 until 2000, interrupted only by the two World Wars. In this period, the dynamic force driving change was multinational companies, and the world shrunk to size small. Finally, the last globalization is our current era, beginning in the year 2000. The convergence of the personal computer, improved Internet connections, and mobile telephones created,

according to Friedman, a flat-world platform for global collaboration that allows small groups and even individuals to go global. The world is tiny now (Friedman, 2005).

Economically speaking, this new era of globalization allows virtually any business to become international. By accessing innovative technologies, working as a unit in real time on a planetary scale can be possible, especially because of the ability to locate expertise and labour around the world, the ability to operate 24 hours a day and the availability of larger market for businesses' products (Castells, 2000). However, because of the above-mentioned processes of homogenization and heterogenization, the idyllic view of globalization having people working on equal basis and in complete harmony faces some challenges. Indeed, firms need to understand that working with employees and dealing with customers from different cultures requires particular attention for language, customs and preferences, infrastructure differences, labour laws, regulations and legal restrictions, international shipping.

In globalization, the international division of labour between rich and middle-income countries follows a simple rule: tasks requiring more skilled labour, composed primarily of managers and experts, would be performed in rich countries, whereas standardized or codified tasks would be transferred to low-wage workers in developing countries. This process enables lower-income countries to catch up profiting from their advantages of cheap labour and capacity to transfer it from agriculture and underemployment to manufacturing industry. Concurrently, this process would guarantee that high-income countries continue to grow at satisfactory rates (Fine, 2003). Lately, a significant number of middle-income countries, as China, India, South Korea, Taiwan, Thailand, Malaysia, and Indonesia – and more recently Russia, Argentina, and Vietnam – are growing at substantially higher rates than the rich countries. They are catching up, and, therefore, approaching the levels of income of the rich countries. However, in other middle-income countries, especially in Latin America, Middle East and Sub-Saharan Africa, the growth rates are much more modest: consequently, we have fast-growing and slow-growing developing countries (Grunberg & Laïd, 2007). There is the need for an effective, global collaboration of nations, so that the standards of living continue to increase in both groups of countries – both rich and middle-income ones – thus ensuring that no one is left behind.

For global cooperation and successful growth to be effective these days, there is the need for digital collaboration, being the interdependence between countries in the Digital Age undeniable. Efficacious digital cooperation requires a stronger multilateralism, complemented by multi-stakeholderism – a type of cooperation involving governments, civil society,

academics, engineers and the private sector as well. There is the need to involve different actors, particularly from developing countries and traditionally marginalised groups, such as women, youth and the elderly, indigenous people and rural populations. This is necessary specially to contrast uncertainty and polarized opinion between those who see themselves as winners in the future of the digital revolution and those who fear that they can only be losers (ILO, 2019). Thus, a devoted reinvigoration of the social contract is fundamental: its importance in achieving social justice is a necessary condition for global development. Modern social contracts around the world are based on the collective understanding that in return for their contribution to growth and prosperity, people are protected against the unpredictability of the market economy and their rights are respected. Solidarity is demanded among people, who need to come together to shape a future that meets their shared aspirations and hopefully those of future generations (Council of Europe, 2011).

Now, generally, if we discuss about digital collaboration, it could be said that over time in single nation-states some gaps in ICT access and usage have slowly begun to decline, and that global economic convergence – the catching up – is finally happening (UNCTAD, 2019). A pivotal factor mitigating the digital divide was the rising use of mobile phones and computer-like smartphones. Indeed, some people who formerly did not use the Internet found cellular wireless connections a more affordable means of access, and the number of mobile cellular subscriptions grew at double digit rates (WTO, 2017). The relevance of this is worldwide. For example, once the least connected country in the world, Myanmar now has one of the world's fastest growing telecom markets. This change can largely be attributed to the liberalization of the ICT sector, consequent competition between service providers, and falls in the cost of connecting to both voice and Internet services[10]. Indeed, with the development of technology and the widespread use of broadband, there are more opportunities for low-income countries to catch up with richer ones, and the main goal is to provide every country with such opportunities.

Another successful story showing how innovative uses of both new technologies and broadband communications technology are helping low-income nations is the partnership between the Aravind Eye Clinics in India and UC Berkeley. Basically, by utilizing new software, building a Wi-Fi wireless network available for free to poor rural communities and installing digital cameras to arrange videoconferences, the Aravind Eye clinics are able to reach

[10] See OECD-WTO Aid for Trade monitoring exercise 2017, NGOs and Academia case story 5, http://www.oecd.org/aidfortrade/casestories/ casestories-2017/CS%2005-A4AI-Affordable-Internet-in-Myanmar.pdf

thousands of customers located in poor rural Indian communities, providing them with instant diagnostics and appointments (Greensfelder, 2006). On the other hand, some ineffective initiatives include monetary aid programs, which can only solve a small percentage of the problem. Those programs fail for one main reason: inevitably, the majority of the money that is given to those in need are used by others or for different reasons than the one targeted. In all countries where the citizens are not empowered, money transfers are used by their rulers for personal purposes or most of the time such transfers are used to satisfy short-run, basic, immediate needs (e.g. hunger, shelter, health) rather than long-run plans (e.g. education, infrastructures, digital connectivity) (Quadir, 2005).

3.2.1. Around the world observing the digital divide

The global digital divide is a distinct case of the digital divide: it focuses on the fact that "Internet has developed unevenly throughout the world" (Guillen & Suárez, 2005: 681) causing some countries to fall behind, among many other things, especially in technology, education, and labour. The concept of the digital divide was originally popularized regarding the disparity in Internet access between rural and urban areas of the United States of America, while the global digital divide mirrors this disparity on an international scale. This global divide is often characterized as falling along what is sometimes called the North–South divide of northern, wealthier nations and southern, poorer ones (Krueger, 1993; Attewell & Battle, 1999).

In this section we shall observe the assessment of the digital divide in different regions of the world, following the work of Massimo Ragnedda and Glenn Muschert (2013): *The Digital Divide: The Internet and Social Inequality in International Perspective.* The authors start with the description of the state of play of highly developed nations and regions – Europe, the U.S.A and the case of Japan. The second group of countries includes rapidly developing large nations – the BRIC (Brazil, Russia, India, China). Then, they move towards Eastern European countries (Estonia, Romania, Serbia). A step forward is made when analysing Arab and Middle Eastern nations (Egypt, Iran, Israel). Finally, the work focuses on under-studied areas (East and Central Asia, Latin America, and sub-Saharan Africa).

- Europe, U.S.A, Japan:

Firstly, in the “Old Continent”, the authors concluded that people with more resources – technical, financial, social, or cultural – use the web for more beneficial purposes. The incorporation of new media and the Internet into status-high people`s everyday lives gave them even more resources through which they generally improve their positions. At the same time,

those in less favourable positions only partially enjoy the beneficial uses of the Internet (Zillien & Hargittai, 2009). Consequently, there will be fewer positive payoffs for people from less privileged backgrounds, which means that the Internet will reinforce or even increase existing social inequalities.

Secondly, in "the New World", the authors found out that despite incredible changes in the content available online and the use agents make of it, there has been little improvement in the fundamental relationship between the Internet and inequality in the States. Particularly with regard to educational attainment and income, the divide is still shockingly wide (Witte & Mannon, 2010). Moreover, given that today what is known is gold, and the informational resources available on the Internet are more valuable, then the relative costs and consequences of exclusion increase as well.

Thirdly, in "the Land of the Rising Sun", the authors exploited the cultural perspective to uncover the roots of inequality in Internet use: material and motivational access and knowledge disparities. Japan is one of the leaders of broadband deployment in the world, yet individuals rich in cultural capital use a wide variety of broadband applications, while others are excluded from newly emerging communicative possibilities. This happens by choice or by circumstance because they do not have the right cultural tools; Of course, socioeconomic factors and demographic characteristics are influential as well (Akiyoshi & Ono, 2008).

- Brazil, Russia, India, China: the BRIC

As a general observation, for this block of countries the authors recognised that where Internet access is not available to large portions of the population its initial social impact is to increase social inequality because it reaches first the wealthiest sectors of the population. Thus, the fight against the digital divide is not so much a fight to diminish social inequality in itself as it is an effort to prevent inequality from increasing because of the advantages that those groups of the population with more economic resources and education enjoy as a result of exclusive or better access to telematics. In Brazil, scholars recognised that the divide is a matter of policy implementation and general inclusion in the job market (Sorj & Lissovsky, 2010); In Russia, an uneven pace of progress toward ICT equality has been noted (Rosstat, 2010); In India, some argues that the digital divide and the exclusion process observed in the ICT industry is a manifestation of social inequalities and the continuation of class privileges (Upadhya, 2007); In China, it has been observed a growing number of Internet users in rural areas, yet, the

increase rates are behind those in urban areas (CNNIC, 2017). Therefore, unequal distribution of Internet resources between segments of the population endures social inequalities.

- Eastern Europe

The general observation for nations of Eastern Europe is that socio-demographic differences in access to and use of the Internet largely correspond to the patterns of social stratification in these regions. In fact, a lack of policy action related to digital literacy leads to even higher digital divides and inequalities among different social groups. Indeed, in a rapidly changing society where the class structure is still unsettled, a set of different resources such as economic and cultural capital, digital literacy and sufficient leisure time are needed to flourish in all aspects of the emerging information society, which will advance one's capitals and the perceived social status (Vihalemm, & Kalmus, 2009).

- The Middle East region

In this particular area of the globe, the authors underlined the fact that those best positioned to capture the benefits of new media technologies will be the networked elites. In many ways this confirms materialist assumptions about the disparate impact and use of new technologies (as well as culturalist understandings about women exclusion. from power and society in the Middle East), and to understand that simple diffusion of Internet access and wireless technologies will not undermine entrenched gender hierarchies or class relations. However, it is true that digital media both reflect and reinforce certain inequalities, but at the same time, they offer elites the opportunity to subvert dominant paradigms and discourses, and to organize dissent even under stifling conditions of authoritarianism (Etling, Faris & Palfrey, 2009).

- Latin America, East and Central Asia, and sub-Saharan Africa

Firstly, the Latin American region has witnessed an improvement of technological development as well. However, the market-driven forces tend to leave some social sectors behind and to reproduce pre-existing social inequalities between and within nations. The great risk is an increase in social polarization, leaving some social groups completely excluded from the possibility of integrating with the knowledge society. In these regions, it is the difference between those who access these technologies especially at home and those who do not that determines the depth of the digital divide (ECLAC, 2011). However, a positive impact to narrow the divide in this region comes from education policies and the school system.

Secondly, Central Asia has had a slow introduction to the world's telecommunications networks, given its legacy of Soviet rule. However, the Internet is permeating the region with surprising consequences, including the creation of new forms of civil society and new geographies of centrality and peripherality. Users in these regions are usually young, often well educated, overwhelmingly urban, and predominantly male. Moreover, the introduction of e-government in some areas may lead to greater transparency and efficiency in the provision of public services. However, while most of the population has achieved universal literacy, low incomes and limiting gender roles still shape the digital divide. Anyhow, in general, the digital divide in Eastern and Central Asia, while undergoing rapid change, simultaneously reflects and transforms the region's power relations (McGlinchey & Johnson, 2007).

Thirdly, sub-Saharan African countries proved that the digital divide cannot be solely reduced to unequal access to computers or mobile phones. It is also a matter of literacy, income, or even level of access and certain structural constraints – location, electricity, cost of calls – affecting users in different ways and at different degrees. Finally, some authors noted that there is a strong, complex interplay between the economic capital, the cultural capital and the social capital, that is to say, the rural/urban divide, the differential access to the Internet, the disparity in cultural/technological competence (Aker & Mbiti, 2010).

3.3 Digital and information inequalities

The phenomenon of inequality, in general, consists in a differentiated access to economic, social and natural resources. Starting from this definition, it is possible to highlight the fact that in today's society the most striking inequality is the economic one, given that it is thanks to monetary resources that individuals can take advantage of the other two (Ruggiero, 2015). Moreover, the phenomenon of income inequality is one of the most worrying global risks, since its intensification may threat social cohesion and political stability. The situation has assumed global proportions, causing a general stir, when a confederation of 20 independent charitable organizations, Oxfam International (2016, 2017), published for two consecutive years two shocking reports: *"An economy for the 1%"* and *"An economy for the 99%"*. In the former, the confederation assessed that privilege and power in the economy drive extreme inequality up to the point that the richest 1% (62 people) have more wealth than the rest of the world combined. In the latter, the confederation assessed the fact that eight individuals held

more assets than the poorest 3.6 billion combined, and it called for action in order to build a human economy that benefits everyone ("the 99%"), not just the privileged few. Furthermore, the same report highlighted how from 2010 to 2017 (at least), the wealth of the richest has seen an increase of 44% while that of the poorest half has decreased with a rate of 41%, a clear indication that this trend is growing and it is necessary to take action in order to stop it.

Figure: The wealth of the richest 62 individuals continues to grow, while that of the poorest half of the world stagnates[4]

Figure 7. Oxfam International. 2016. An Economy for the 1%.

In this regard, it is worth mentioning how to measure inequality. We have the Gini coefficient, introduced by the Italian statistician Corrado Gini (1912) in his "*Variabilità e mutabilità"*. It is a measure of the inequality of a distribution, often used as a concentration index to measure inequality in the distribution of income or even wealth, and it is a number between 0 and 1. On one hand, low values of the coefficient indicate a fairly homogeneous distribution, with the value 0 corresponding to perfect distribution (perfect equality), for example the situation in which everyone receives exactly the same income. On the other hand, high values of the coefficient indicate a more unequal distribution, with the value 1 corresponding to the maximum concentration (perfect inequality), for example the situation where one person receives all the income of the country while all the others have a zero income (Gini, 1921).

However, it is important to underline the fact that, especially during these last decades, inequalities are not only seen in economic terms. We have growing inequalities especially by

gender, age, ethnicity, skills, culture that eventually widen the already-existent human divide. Among such factors, it has been recently added a digital divide that, as we mentioned, is the inequality in access and use of information and communication technologies. In fact, there is a general belief that new technologies appear, depending on the social context and the situations faced by the subjects as a barrier towards fruition and sharing of information (van Dijk, 2006). A common hope exists concerning the transformation of those new technologies into a bridge towards information sharing and economic growth. Basically, transforming the consideration of the divide from a source of disappointment to source of empowerment, thus enticing social agents to take actions for their lives. Indeed, if technology positively becomes a bridge, it offers the possibility to connect people, communities, countries, in a more egalitarian way and therefore becoming democratic. But if the inability to access it creates a barrier, a wall, between people also according to the census or the geographical place where they live, this would be added to other existing barriers that divide human beings, be they fundamental for survival such as access to water or food availability, medical care or education, or basic compliance of human rights and individual freedoms (Witte & Mannon, 2010).

Indeed, in a country where adequate food, housing, electricity, security and medical aid are but mirages for the majority of citizens, as a result of poverty, unemployment, crime and/or illiteracy, the question of priorities is raised, and the attention is focused on technological and digital innovations surely after many considerations (Selwyn, 2006). In this regard, Luis Osin (1998) wonder whether it is a sensible investment to spend huge amounts of dollars on technological development, instead of focusing on improving the living conditions of those in dire need. The ultimate question posed by the author basically investigates to what extent these citizens need to be computer literate or to have Internet access. At first glance, if we stay on the surface of our consciences, the logical answer could be no: these people's basic needs are not met, they literally die of hunger and thirst, they face many different "divides" (in terms of education, health care and so on), so why should they care about internet connection. Moreover, if we follow Maslow's hierarchy of needs, it indicates that the basic requirements for survival are not linked to any need for technological advancement or literacy. It is only when the basic needs for food and shelter have been satisfied that the needs for improvement, development, competition and self-realisation manifest themselves (Maslow, 1943).

Notwithstanding such arguments, it is undeniable the importance, both for economic growth and social evolution of a nation and all of its individuals, to concentrate a reasonable

number of resources on the development and diffusion of ICTs. Information today is the new currency, it is the driver of innovation, progress and stimulates competition. In other words, information is a valuable asset and consequently, what is known is gold. It is what we do know that makes us less malleable to the will of the leaders; it is what we do know that makes us able to take our own risks and chances in order to pursue a dream-goal; it is what we do know, in contrast to what we do not know, that makes us humans. In general, in every aspect of human life, it is true the saying: "the more you know, the better". And it is our duty as global, ever connected, world citizens to work together in order to give *everyone* – no matter their income, culture, age, gender, ethnicity – the opportunity to access information and develop accordingly.

In fact, as McNair (2000) underlined in his article for the OECD *"Schooling for Tomorrow: Learning to Bridge the Digital Divide"*, not having information will necessarily lead to individuals with low income jobs, who, in turn, will have limited or no access to digital technologies, which will eventually lead to limited or no knowledge of skills required to fully participate in society. This is a vicious circle resembling the poverty trap – *a mechanism that makes it very difficult for people to escape poverty. A poverty trap is created when an economic system requires a significant amount of capital in order to earn enough to escape poverty. When individuals lack this capital, they may also find it difficult to acquire it, creating a self-reinforcing cycle of poverty*[11]. Under the same mechanism of reiteration of lack of information, not participating in society will once again lead to "information poor" individuals. This is what McNair defined the Digital Divide Cycle.

[11] Investopedia, the Poverty Trap.

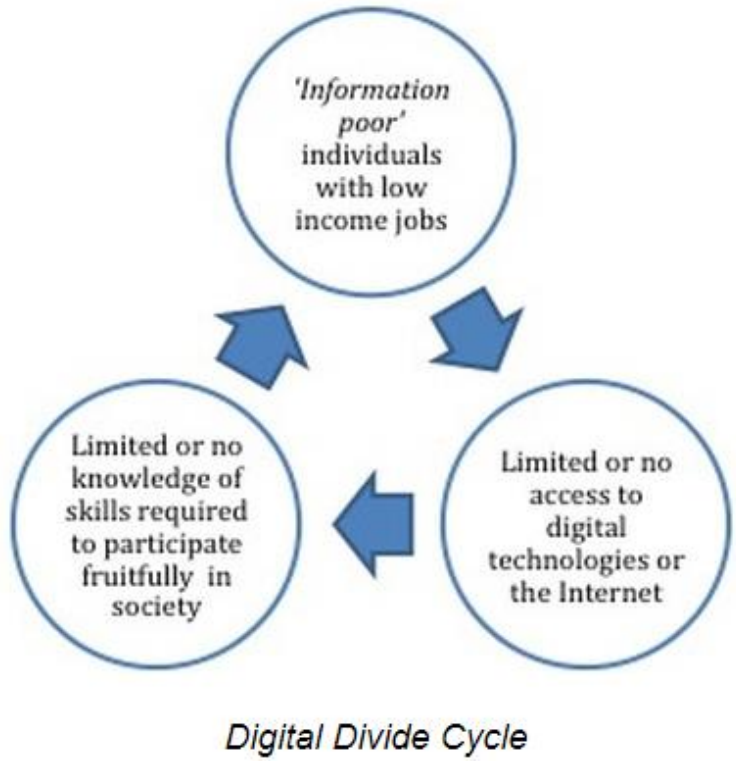

Figure 8. McNair. 2000. Digital Divide Cycle.

Moreover, researchers have also started to discuss the concept of digital inequality. This term refers to socio-economic disparities within the online population and virtual communities, found inside the above-mentioned virtual reality, such as the quality and the cost of the connection to the Internet, the skills and the knowledge to find the required information, and so on (Nielsen, 2006; Norris, 2001). As we have highlighted throughout this thesis, the primary issue nowadays is not whether there is an Internet access but what people are able to do when they have access to the Internet. There are five broad forms of digital inequality (DiMaggio & Hargittai, 2001): Inequality with regard to technical means; Inequality with regard to autonomy of use; Inequality with regard to skills; Inequality with regard to social support; Inequality with regard to purpose of use.

Basically, the authors argued that those who cannot afford powerful (and usually expensive means) cannot exploit the full range of Internet content, and among those who could access them, their autonomy of Internet could be restricted by the constraints of their location (e.g. access through public libraries or workplaces). Also, a deterrent for the full exploitation of digital technologies is the ability to use it: Internet users differ regarding the level of their expertise, education, and technical skills. However, this problematic could be counteracted by social support: in fact, those with friends and/or families familiar with new technologies, are

usually more motivated to adopt and use ICTs too. Finally, the last form of inequality according to DiMaggio and Hargittai (2001) concerns the purpose of use, meaning that if digital technologies are used only for entertainment, then the user usually has limited knowledge of it; but if the medium is used for the achievement of complicated tasks, the user is required to have expert knowledge, but if this requirement is not met, the user cannot fulfil his research need.

Finally, if in the late 1990s there was a strong, optimistic consideration towards the eradication of inequalities thanks to the rise, development and diffusion of digital technologies, the current digital divide has proven otherwise and somehow disappointed such high expectations. Without any doubt, it is true that today, more than ever, we can not only engage *with* what we hear and see, but we are involved *in* the process of producing and circulating information (Mattelart, Papathanassopoulos, & Trappel, 2019). However, we shall present both the arguments in favour of this disproportionate optimism, and those challenging this view.

On one hand, among the optimistic internet evangelists, the shared belief is that the rise of the web has shaped a new decentralized, networked information economy thanks to its ubiquity and relatively low costs, thus eliminating some of the main filters that previously impeded the production and distribution of news to the ordinary user (Benkler, 2006). There is no longer a hierarchy of agents accessing information, but generally there is a networked environment where plenty of information is available and often produced by multiple actors. Moreover, the old political economic structures cannot successfully follow the logics of the new networked information environment (McNair, 2006). As we have often said throughout this thesis, in a way, the web has socially, culturally, economically and geographically democratized information production and consumption by equalizing the power exerted by the old dominant news media industries (Rosen, 2006).

On the other hand, those who challenge this optimistic view argue for a superficial victory of the online world over the offline reality. In fact, they recall that traditional, old-fashioned news organizations are still prominent even in the offline world (Southern countries tend not to be players of the news environment) and that old patterns, characteristic of the "ante-web" period, typical of international news production and consumption (there is still strong news dependency on Western press agencies), are reproduced online as well (Hindman, 2009). To this, we connect the general problem of the digital divide, since the gap in news access and mastery between high-income countries at the core of the world system and low-income countries on the periphery, is still wide. The periphery lacks especially digital infrastructures, resources and

news alternatives and the existing divide is worsened by problems of social classes, culture, ethnicity and so on (Mattelart, Papathanassopoulos, & Trappel, 2019). Finally, because of that, it is undeniable that on the macro level, the Western news system reinforces its leading position and the less developed countries have no alternative if not to follow them to achieve convergence, increase their relative power in their regions and hopefully close the divide, which nonetheless remains wide (van Dijk, 2006).

Overall, since inequalities exist, one may wonder: does the digital divide worsen the situation or did the digital developments narrow the gap? Indeed, if one would present the different arguments *for* and *against* the existence of the digital divide in a relatively schematic way, I considered this table to be quite useful:

Does the digital divide worsen the situation?	**Do digital developments narrow the gap?**
Wealthier households are the ones that can afford to access technological improvements	Computers are cheaper to purchase as a result of falling prices making them more accessible to lower income families
Low-income families cannot afford technological devices given the high costs	
Low-income communities are limited by a lack of skills in term of PC usage or illiteracy	Computers are increasingly easier to use and require less skill to operate them, making it a less complex task to those with lower skills
Poor countries do not enjoy internet access neither for educational purposes nor social interactions	There is widespread Internet access available to everyone in most countries through schools and cafes
The Digital Divide is seen as an image of the Economic Divide around the world	Access to ICTs cannot be useful unless basic needs are met (e.g. health, hunger)
Minority groups suffer more in low-income countries from this limited digital access	Homogenization, heterogenization and hybridization processes are well embedded among communities regardless of the divide

3.4 A gap of digital opportunities: efforts to close it

As we repeatedly underlined, the digital divide in general, and between men and women in particular, is a global manifestation of exclusion, poverty and inequality, given the difference between opportunities to and capabilities in achieving basic digital requirements. Future, positive expectations support the idea that digital skills will provide the poor a catalyst to break out of the poverty trap and empower themselves. In fact, the ultimate goal of closing the digital divide is to inclusively provide every social agent – no matter who, when or where – with an equal opportunity to benefit from digital development (OECD, 2001).

The challenge facing state and local governments, then, is how to address all of the digital discriminations. The traditional role of state and local governments was to regulate telephone companies, negotiate access to public telecommunications, pave the way for network construction, and help connect anchor institutions. However, there was no commitment at neither state nor local level to fund digital skills programs, offer discounted subscriptions and devices to at-risk households, or even to communicate directly with disadvantaged communities to understand their needs (Cullen, 2001). But now, especially with the COVID-19 pandemic the situation became inescapable. The current coronavirus crisis forced even more activities online, and effectively changed our economic behaviours. It has hastened the uptake of digital solutions, tools, and services, speeding up the global transition towards a digital economy, but it has also exposed the wide gap between the connected and the unconnected, revealing just how far behind many are on digital convergence. Indeed, broadband inequities have become vividly visible, thus making this time period ideal time for communities to focus on building all of the digital infrastructures required to increase development capabilities, and transform social, digital fractures in, hopefully, opportunities (UNCTAD, 2019).

In order to make sure that we can keep track with the opportunities given to any country to develop and benefit from digital technologies, the International Telecommunication Union (ITU) developed the Digital Opportunity Index (DOI). This is an updated version of ITU's 2003 Digital Access Index (DAI) and it was endorsed in the Tunis Agenda for the Information Society, adopted during the Tunis Phase of the previously-mentioned World Summit on the Information Society – WSIS (ITU, 2005). The DOI is a standard tool that governments, operators, development agencies, researchers and other agents can use to measure the digital divide and compare ICT performance within and across countries. In fact, it is an e-index based

on the most relevant, internationally-agreed ICT indicators which allow the tracking and comparison of countries in different aspects of the Information Society. We are dealing with 11 ICT indicators measuring countries' ICT capabilities in infrastructure, access path and device, affordability and coverage, and quality, all grouped in 3 clusters: opportunity, infrastructure and utilization (ITU, 2007). As any other index, the DOI ranges between 1 and 0, where 1 would be complete digital opportunity, and 0 absence of it.

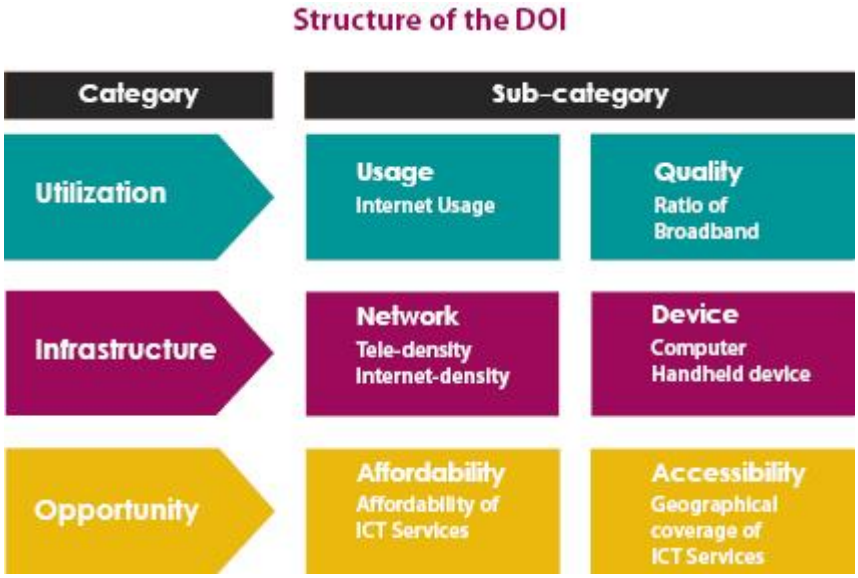

Figure 9. ITU. 2007. Structure of the DOI.

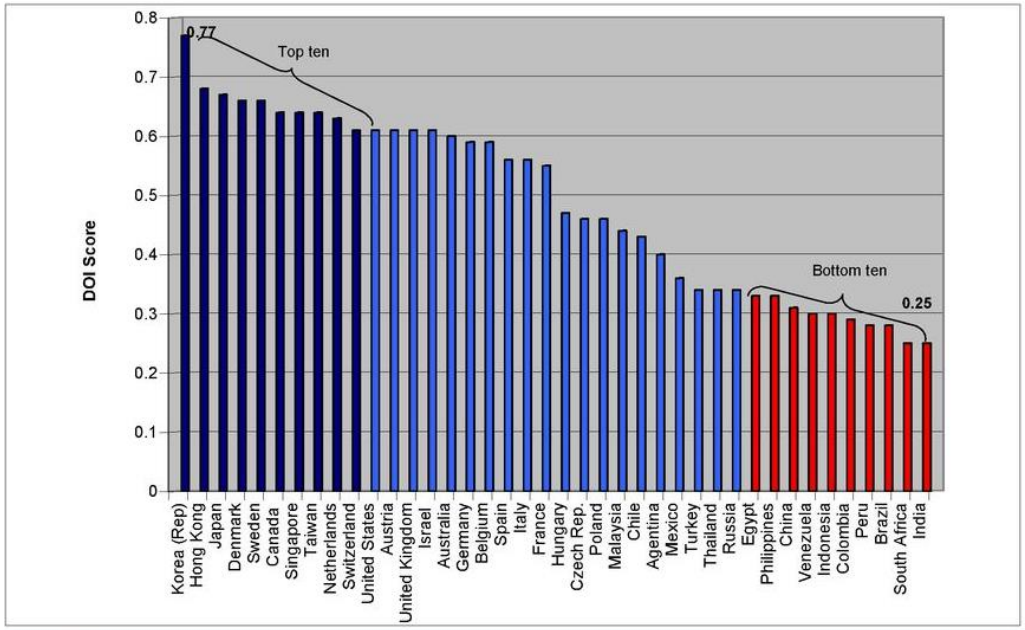

Figure 10. ITU. 2006. DOI Ranking: Top and bottom ten countries.

What we tried to highlight throughout this thesis is that digital technologies and services (the well-known Information and Communication Technologies – ICT) are enablers of sustainable development and growth. They are today's keys to improve lives even in the poorest countries, by empowering women and young girls, by fostering democratic governance and transparency, and by boosting productivity and job creation (Kaur, Lechman & Marszk, 2017). Of course, connectivity and affordability remain a problem both across and within world regions, since there are large variations between high- and lower-income countries and between cities and rural areas. In fact, today, the challenges facing internet agents are about how networks are used (what we could call the "demand side") and how they are built (what we could call the "supply side"). Moreover, when global interconnectedness brings new vulnerabilities in those regions where coordination mechanisms are already weak, the situation is seen as doomed (Krishna & Madon, 2002).

But no hope is lost. In fact, according to the UN 2020 *World Social Report,* as in any process of rapid structural change, technological innovation can be constructive but also disruptive. However, its effects are not set in stone. Indeed, practical policies and supportive institutions can help ensure that technological dividends are globally shared. Three key policy interventions are called for. First, invest in skills that enable workers to perform new tasks over a lifetime of changing work environments. Second, support people through work and life transitions, especially through universal access to social protection. Third, strengthen efforts to bridge technological divides within and among countries (UN-DESA, 2020).

Therefore, coordinated efforts at both national and international level are fundamental in order to promote developing policies and try to close the digital opportunity gap. Fostering and ensuring fair and equal access to education (especially at higher levels) to a larger share of the population is also key to encourage digital literacy and developing complementary skills. Likewise, public and private institutions must be accountable and especially commit to achieve long-term goals (Lupton, 2015). Consequently, partnerships which bring together members of different sectors should share otherwise scarce resources so that efficiency can be globally improved and cost reduced, thus promoting development as well as reach consensus and solve disputes in an environment of trust and equality. Accordingly, the greatest achievement for any multi-stakeholder partnership is to accelerate the pace in which the benefits of the digital revolution are brought to global communities, by drawing upon the unique strengths and capabilities of each actor (Madon, 2000).

It is in this regard that, on the 25th September 2015, with the declaration *"Transforming our world: the 2030 agenda for sustainable development*", the United Nations General Assembly approved the 2030 Agenda for Sustainable Development, comprising 17 Sustainable Development Goals (SDGs) with 169 associated targets which are integrated and indivisible. The vision of the Agenda 2030 foresees a world free of poverty, hunger, disease. Moreover, universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination are central pillars to the development and achievement of the SDGs. Consequently, just like their "ancestors" did, the Millennium Development Goals (MDGs), these new goals have inclusive and sustainable economic growth and decent work for all at the core of their mission as well. Of course, among many other topics, the Agenda highlights also the importance of information and communication technologies.

A direct reference to ICT can be found as a target under Sustainable Development Goal 9 "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"[12]. A parallel reference to ICT is also found in the targets related to climate change, gender equality and women empowerment, private sector development, education and health. Worldwide, the adoption of the SDGs was followed by a vast number of initiatives, including the 2015 conference to the World Summit on Information Society (WSIS+10) and the World Bank's 2016 World Development Report focusing on digital dividends (World Bank, 2016), all emphasising the gains of using digital solutions for development.

[12] Sustainable Development Goal 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"; target: 9.5 "Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending" and target 9c: "Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020" http://www.un.org/sustainabledevelopment/infrastructure-industrialization

Figure 11. United Nations. 2015. Sustainable Development Goals.

At the European Union level, the EU and the United Nations are closely working together in order to protect the planet from degradation, so that it can support the needs of the present and future generations. The EU and the UN are natural partners, since they both promote a multilateral and rules-based global governance system. Such system aims at defending universal values, promoting shared public goods and delivering benefits to citizens, who are the ultimate demanders and beneficiaries of sustainable development. In particular, the EU aims at sustainable consumption and production, by sustainably managing the world's natural resources, ensuring just transition and economic viability, and especially taking urgent action on climate change. In relation to that, the Union provides Eurostat reports on progress towards the SDGs in an EU context, detailed information on each SDG, visualisation tools and direct access to and monitor of the data[13].

[13] Eurostat. Monitoring the SDGs in an EU context.

Figure 12. Eurostat. Sustainable development in the European Union.

Additionally, when dealing with digitalization as a way to close the digital divide, we recall also the Commission's strategy known as the Digital Single Market for Europe[14] (DSM). It was adopted in May 2015 in order to recognise the significant impact that digitalisation has on growth and job creation within the European community and its economy. There is great scope for further translating the key principles of the DSM to a wider EU development policy by promoting digital economies in the rest of the world and in particular in developing countries. Internally, the Union fosters a vision of access to affordable broadband connectivity, with equally trained men and women accessing and creating relevant content and services that are beneficial for themselves and their societies.

Conclusions

The potential of new technologies cannot be realized if entire segments of the population lack access to them. Even in contexts of broad access, the use of new technologies can exacerbate inequalities. For example, gaps in education can widen if new technologies improve the learning outcomes of children in wealthier households but not those living in low-income families. Consequently, reducing inequality requires the closing of the digital divide between and within countries. Thankfully, a number of countries, including some in the developing world, have made progress in extending the necessary infrastructure to rural and remote areas and in expanding education and training in the use of digital technologies, but national and international efforts are still required. Indeed, in this chapter, we investigated the relevance of

[14] See COM(2015) 192 final, 6/05/2015

one of the most discussed topics when dealing with development theories: the digital divide, following the belief that what is known is gold, and therefore not accessing (digital) information and skills represents both a social and economic disadvantage. We firstly tried to define such an evolving concept, since this "divide" has multiple acceptations, depending on the angle of study (a digital, economic, social, cultural, gender divide and so on). Then, by being digitalization a global phenomenon, we observed the digital divide related to globalization, with a presentation of this topic in relation to some different regions of the world: Europe, United States, Japan; BRIC; Eastern Europe; Middle East; Latin America, East and Central Asia, sub-Saharan Africa. Furthermore, we considered the issue of digital and information inequalities, where we saw how the whole discussion of the digital divide actually turns around a different divide: there is a high degree of inequality, a gap of opportunity of access and skills, which eventually cause all the other divides. Finally, we investigated such gap of digital opportunities, underlining in this regard the current situation faced under the coronavirus crisis, and enumerated some of the efforts made to narrow this divide, especially in the international realm and within the framework of the new UN Sustainable Development Goals (SDGs).

We shall finally move towards the core of this thesis, the presentation of the newest European Commission's strategy which aims at the digitalization of the European Union: *Shaping Europe's digital future*, published on 19th February 2020.

4 The European Digital Strategy: *Shaping Europe's digital future*

"We do have in Europe a long history of technological success and innovation. We have big businesses; we have a very strong industry. And in Europe, we are caring very much for individual rights and our values. And the digital strategy we put forward today is connecting all these dots and putting it into a concept." – Press remarks by President von der Leyen on the Commission's new strategy: *Shaping Europe's Digital Future*, February 2020

Introduction

It is true that the European Treaties do not contain any special provisions for Information and Communication Technologies (ICTs) usage. Nevertheless, as stated in the 2020 European Parliament's Digital Agenda for Europe[15], the European Union is legally allowed to take relevant actions within the framework of sectoral and horizontal policies. Those include: industrial policy (Article 173 of the Treaty on the Functioning of the European Union (TFEU); competition policy (Articles 101-109); trade policy (Articles 206 and 207); the trans-European networks (TENs) (Articles 170-172); research and technological development and space (Articles 179-190); the approximation of laws for improving the establishment and the functioning of the internal market (Article 114); the free movement of goods (Articles 28, 30 and 34-35); the free movement of people, services and capital (Articles 45-66); education, vocational training, youth and sport (Articles 165 and 166); and culture (Article 167).

Legally speaking, the possibility to safely move among all of these spheres of actions, in different combinations and degrees, made possible for the Union to develop its digital strategy and thus shaping Europe's digital future. The transversal, but pretty concentrated and detailed work carried out by the European Commission is one of the latest achievements of the Union.

In order to constantly improve the European Union and its citizens' life conditions, among many other initiatives and within the six Commission priorities for 2019-24[16], the European Union aims at developing a European society powered by digital solutions. Under the newest von der Leyen Commission, in office since 1 December 2019, the Commission's

[15] The Digital Agenda for Europe (DAE) is one of seven flagship initiatives under the Europe 2020 strategy. It focuses on the development and improvement of modern technologies and online services.
[16] POLITICAL GUIDELINES FOR THE NEXT EUROPEAN COMMISSION 2019-2024

priority "A Europe fit for the digital age" aims at empowering people with a new generation of technologies. In such a digital age as the one we are living in today, the development and diffusion of new technologies must foresee that such innovations are strongly entrenched with our common – especially European – values, and that they improve the lives of every citizen.

Therefore, people must have the opportunity to develop personally, to choose freely and safely and particularly to engage in society, without being excluded because of their age, gender, professional or economic background. Following the same reasoning, business initiatives need a framework that allows them to start up, scale up, gather and use data in order to innovate and compete and/or cooperate with each other on fair terms. That is why MS and their governments should consider such new digital changes as empowering challenges and as an opportunity to grow socially, economically and on an international level. That being said, we shall now observe how our Union decided to pursue this digital transformation in its own way.

Since 1995, information and communication technologies (ICTs) have driven productivity gains and growth in the European Union – and more generally, all over the world. Along with the improvement in economic and social conditions of European citizens, we witnessed how over the past three decades, technological progress and expansion have been blurring the boundaries between telecommunications, broadcasting and IT systems. In more practical terms, in fact, we mentioned that the European Commission launched the Digital Single Market in 2015 to deliver the main legislative proposals, such as advancing e-commerce, copyright, harmonisation of digital rights and cybersecurity. Moreover, over the years, the Commission has effortlessly worked to ensure the development of a data-driven agile economy, developing and promoting different initiatives such as the regulation on the free movement of non-personal data[17], the cybersecurity regulation[18], the Open Data Directive[19] and the General Data Protection Regulation[20]. The basic principle behind each initiative is that citizens should be granted the opportunity to make wiser decisions based on general information collected from non-personal data. And such data should be available to every actor – whether public or private, big or small.

[17] See Regulation (EU) 2018/1807.
[18] See Regulation (EU) 2019/881.
[19] See Directive 2013/37/Eu.
[20] See Regulation (EU) 2016/679.

As time moves on and technological development runs faster than ever, data circulation became an ever-present, parallel topic during digital talks within the Union. In fact, in 2018, during the last period of the Junker Commission, the EU first presented an Artificial Intelligence Strategy[21] and agreed on a coordinated plan with the Member States (MS). This led, in April 2019, to the presentation of ethical guidelines for reliable AI by the high-level expert group on artificial intelligence, which are based on the Artificial Intelligence (AI) framework (White Paper on AI) later presented under the new Commission on 19 February 2020[22].

Today, in fact, all over her political orientations, newest Commission President Ursula von der Leyen stresses the need to guide the transition to a healthy planet and a new digital world. The relevance of the matter can be observed also in the structure and roles of the new European Commission's political leadership, where at its top management positions we find digital-responsible figures: in fact, for example, Executive Vice-President Margrethe Vestager is in charge of anything concerning the Digital. In particular, she has the responsibility of setting the strategic direction of the political priority "Europe Fit for the Digital Age" and chairs the Commissioners' Group on the latter.

Therefore, in the eyes of the Commission, the development of a green, sustainable and Smart Union will help society to get the most out of innovation and competition and in so doing ensuring that everyone benefits from a digital dividend. The twin challenge of a green and digital transformation, therefore, has to progress simultaneously. It requires, as set out in the European Green Deal[23], an immediate change of course towards more sustainable solutions which are resource-efficient, circular and climate-neutral. Digitalization can help improve social and economic conditions of Europeans, surely through the development and diffusion of new technologies, but it can also ease the climate burden that todays' generations face and find every day harder to address. By being part of our everyday life, the digital world can be a partner – rather than an enemy – during this collective action aiming at tackling a collective problem. For example, digital connections help spreading the word of such a greener-world-necessity in any part of the globe more rapidly than ever (e.g. *Fridays for future* march-movements taking place on the same day at the same time all over the world), or we could make use of digital devices instead of paper in the workplaces and so on.

[21] See COM(2018) 237 final.
[22] See COM(2020) 65 final.
[23] See COM(2019) 640 final.

Finally, in order to ensure that this digital European Union reflects the best of Europe – an open, fair, diverse, democratic, and confident society – for the next five years, the von der Leyen Commission will focus on three key objectives: technology that works for people; a fair and competitive economy; an open, democratic and sustainable society. Such forefront solutions will help the Union pursue its own way towards a digital transformation that works for the benefit of all people through respecting European values, while also achieving its target of a climate-neutral Europe by 2050. Not to underestimate there is a positive side effect, that is to say that this digital process towards a Smart Union will hopefully put Europe in a trend-setting position within the global debate.

We shall now observe the three pillars of this 2020 Commission's digital strategy, *Shaping Europe's digital future:* Technology that works for people; A fair and competitive digital economy; An open, democratic and sustainable digital society. The Strategy further presents a fourth section, which is not a pillar, but it is equally relevant to the Commission and fundamental for a successful implementation of all the previous segments, the vision of Europe as a global digital player. Finally, as the daily importance of these topic is continuously expanding, a further examination of a fifth section has been added to this chapter, analysing the role of digitalization in three particular EU realms: Inclusion, Open-Government, Health.

4.1 The first pillar: Technology that works for people

The first objective of the new European digital strategy, which tends to develop a Smart Union, focuses on the use of technology and analyses how it can improve people's lives. At the core of this section we shall observe how the development, deployment and uptake of technology can make a real difference to people's daily habits, and how the latter may change because affected by this digital revolution. In more practical terms, we shall see why the Union needs a strong and competitive economy able to master and shape technology while respecting European values.

4.1.1 Material and Artificial Digital Forces

The European continent has a long and successful history of innovation, technology and creativity. Europe – as a political entity – has proven to be stronger when acting together and

joining forces between the Union and its MS. As a matter of fact, EU and MS' initiatives on crucial areas of the next wave of innovative technologies include High-Performance Computing (HPC) – or supercomputing, micro-electronics involving quantum technologies, the Blockchain and Distributed Ledger Technologies (DLT). This will allow companies and administrations to reach agreements on and permanently record transactions and information in a transparent way without a central authority, and also the relevance of Cloud computing, an essential condition for an agile and innovative economy. Promoting the digital transformation of public administrations throughout Europe is also crucial in this regard (EC, 2020b).

However, technological advancements, seen in the shape of material objects enabling us to make the best out of this new era of digitalization, are not enough: we need to feel – literally – more connected. In fact, by merging physical and virtual worlds, the Internet of Things (IoT) creates smart environments among people, industries, organisations and academic institutions across EU Member States and beyond. Thus, from a global, digital point of view, the IoT represents the next step towards the digitisation of our society and economy, where objects and people are interconnected through information and communication networks and report about their status as well as their surrounding environment.

Therefore, the European Union (EU) must invest more in the strategic capacities that allow us to develop, deploy and use digital solutions at larger scales and to promote on every level a strong interoperability in key digital infrastructures, such as extensive 5G (and future 6G) networks. This is fundamental because, for example, the "fifth generation" of telecommunication systems, or 5G, will serve a wider range of applications and sectors embedded in our daily lives, including professional uses, such as eHealth, energy and safety managements.

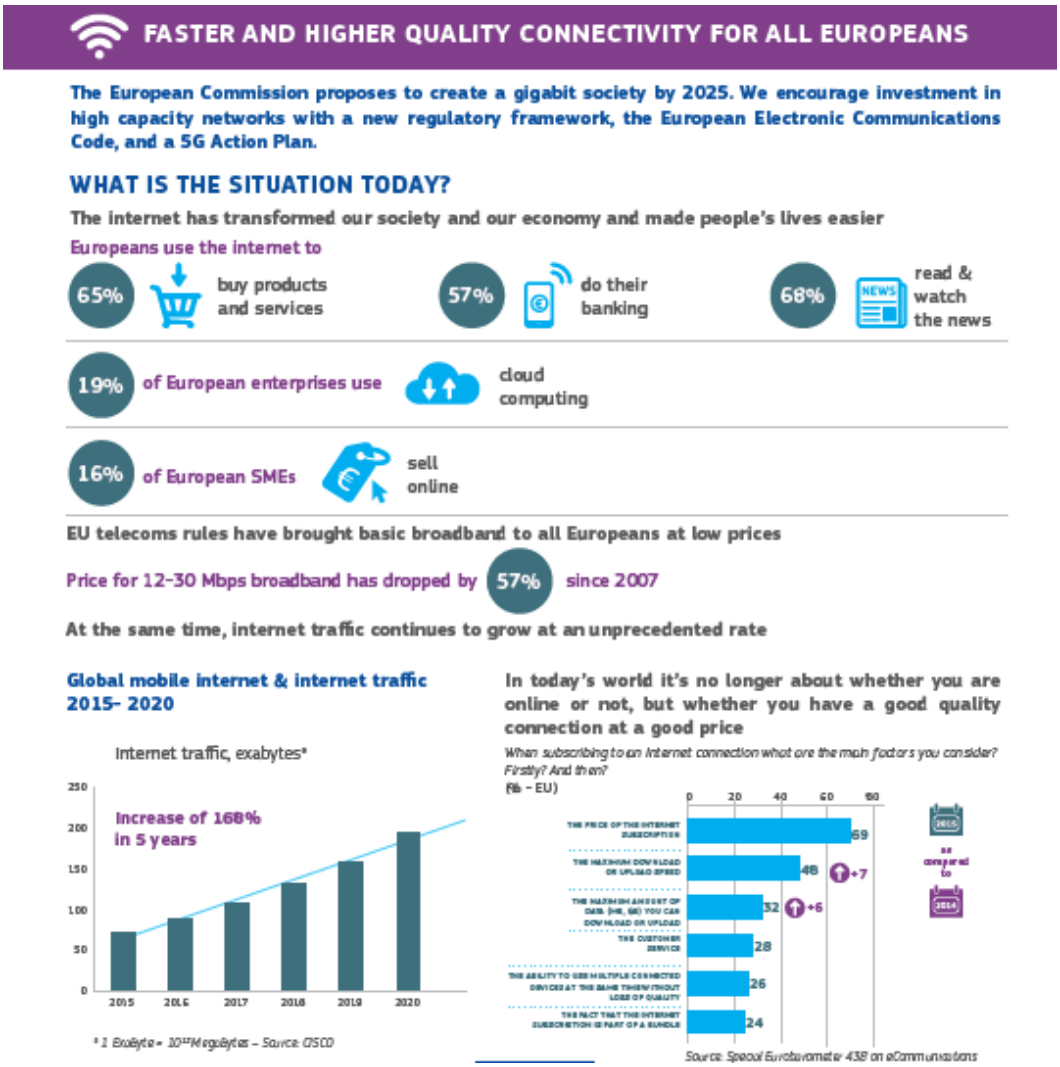

Figure 13. European Commission. 2016. Telecoms FactSheet.

Following this line of thought, we can state that, in general, effective and efficient connectivity is the backbone of the European digital transformation – and surely of the European digital strategy. Functional connectivity is what enables data to flow, people to reach out for each other and collaborate wherever they are, and to connect more objects to the Internet, while transforming manufacturing, mobility and logistic chains. Thus, if we are to bet on Europe's digital growth potential, satisfactory investments at the Union, national and regional levels are necessary to achieve at least the EU 2025 connectivity objectives[24].

But how to make this potential a reality? The new EU Multiannual Financial Framework[25] will support these objectives. The main goal is to achieve more and better strategic capacity where

[24] These objectives require for all European households, rural or urban, an internet connectivity of at least "100 Mbps, upgradable to Gigabit speed".
[25] European Commission. 2019. EU Budget for the Future.

it matters – through targeted funding programmes[26], and making use of the *InvestEU*[27] guarantee and other development funds. This public funding has to be used to stimulate private investment, because only by joining forces and working together it would be possible to close the investment gaps, guaranteeing a certain level of equity between different economic realities.

To transform its digital potential in a successful story, Europe needs to invest in connectivity through boosted digital infrastructures, in deep tech trough advanced machines and in human capital through the development of digital skills, as well as in smart energy and transport infrastructures. As time goes by real fast, a suggestion for the Union could be to act quickly, for example by adopting measures by 2022 rather than by 2025, which could increase GDP and surely have a positive effect on the job creation scenario, especially in the aftermath of this world-pandemic year, where digital arrangements have proven the only solution to a massive quantity of problems, from schooling to business, from diplomacy to security, from information to entertainment. This is a socio-economic boost that Europe cannot afford to miss. But investing in innovation is only part of the issue, however.

A true digital transformation has to be founded on the well-being of European agents (citizens, institutions, businesses), trusting that their applications and products are secure. People fear what they do not know, what they do not understand and what they do not control. In fact, if we have learnt anything from the lesson that Thomas Hobbes taught us at the end of the 15th century in his *Leviathan*, we know that in a state of fear, humans do not thrive. And even though for Hobbes this fear was represented by a rule-less world – the state of nature – today, we may face another threat, but the reasoning behind this thought stays the same. We should never underestimate the importance of feeling safe in every circumstance, and in the digital world, the more technologically interconnected we are, the more we are vulnerable to malicious, uncontrolled cyber activities.

Therefore, in order to tackle this growing menace, people need to cooperate and be coordinated at every stage. For example, to keep the online economy running and to ensure social prosperity, it is fundamental to set reliable rules for companies and stronger mechanisms for positive and safe information-sharing; it is necessary to ensure efficient cooperation between MS, and between the EU and MS; it is essential to build synergies between civilian cyber resilience and

[26] The Digital Europe Programme (DEP), Connecting Europe Facility (CEF 2), Horizon Europe, the Space Programme.
[27] European Parliament. 2019. "InvestEU": MEPs support new programme to boost financing for jobs and growth.

the law enforcement and defence dimensions of cybersecurity; it is crucial to guarantee that law implementation and judicial authorities can work effectively by developing new tools to use against cybercriminals; and last but by no means least, it is decisive to raise the awareness of EU citizens on cybersecurity.

Feeling safe and secure is not just a question of cybersecurity. Citizens need to be able to trust the technology itself, as well as the way in which it is used. This is particularly important when it comes to the issue of Artificial Intelligence. People perceive technology as frightening especially because it dematerialises and disintermediates the everyday reality. The most common fear is the automatization of life itself: to witness finally the rise of the machines, which will, eventually, control us, and not the other way around, a scenario in which technology takes the place of man in analysing reality and making decisions.

It is true that the AI, in applications that we have seen so far, has come quite far in development, but man is able to do much more than this: just consider the abstract reasoning or a crucial element such as the free will, all aspects that appear only partially in artificial intelligence. What do we worry, then? The reasoning behind is more human than technical: technology is taking away from us what we felt good at, the most basic mechanical activities that everybody can perform, leaving only complex actions and thoughts to us and thus exposing the weaknesses and limits of the common man, and this, unconsciously or not, frightens us.

In this respect, the European Commission has presented the above-mentioned White Paper on creating ecosystems of excellence and trust in the field of AI, based on European values. The White Paper deals with technological, ethical, legal and socio-economic aspects which aim at boosting the Union's research and industrial capacity and to put AI at the service of – not in competition with – European citizens and especially European economy. In fact, during the years, Artificial Intelligence has acquired strategic importance and is becoming a key driver of economic development. It can bring solutions to many societal challenges from treating diseases (just think about computerized solutions in education for blind or deaf people) to minimising the environmental impact of farming.

Figure 14. European Commission. 2020. AI and EU in figures.

4.1.2 Human Digital Forces

A fundamental factor of the revolution, improvement and future benefits of this digitalization process of the Union – and for any other interpersonal arrangement – is the presence, inclusion and relevance given to people. Of course, machineries, inventions and discoveries play a major role in technological development, especially in the field of digital, but still such advancement is possible when any agent involved feels comfortable enough in his environment to work at full potential. Indeed, human capital is the true investment.

To feel at ease means to feel safe and confident about our abilities, so that we are not stopped by fear or social anxiety when deciding to embark in new adventures. As development theories economist and sociologists taught us, the first step to empower people is to help them improve their knowledge (Mansell, 2002; Ozturk, 2008; King, 2011). When we know things, we are more independent, we are less mentally malleable, we can have our own ideas and develop them accordingly, and we become resourceful assets in society and especially for any business and we improve our own life-condition. That is the reason why improving education systems and boosting practical skills is a key part of the overall vision for digital transformation in any developing country, but also within the European Union, for example with the Development Education and Awareness Raising Programme (DEAR). The DEAR programme supports projects that engage the European Union audience in worldwide issues of social, economic and environmental development. DEAR works with civil society organisations and local authorities

to promote universal values of freedom, democracy and the rule of law especially through education[28].

In fact, European companies need digitally savvy employees to thrive in the global technology-driven marketplace. In turn, workers need digital competences to succeed in an increasingly digitalised and fast changing labour market, given that the majority of jobs already require at least basic digital skills. However, the need for digital skills goes well beyond the jobs market. Actually, the digital world has affected – *democratically* – everybody's routines: no matter the gender, age, geographical or economic background, willy-nilly, and in different degrees, the digital revolution has impacted our way of thinking and living, and digital solutions for digital and non-digital problems have become real presences in people's realities. Therefore, as digital technologies permeate our professional and private lives, to have at least basic digital literacy and master such skills has become a necessary condition for participating effectively in today's society.

It is for this particular reason that, by always having at the top of its priorities the well-being of its citizens, the executive branch of the European Union is promoting various initiatives aimed at increasing training in digital skills for the workforce and for consumers, starting from the modernisation of the education systems across the EU, passing through the creation and establishment of digital technologies for learning and for the recognition and validation of skills, up to the investigation and analysis of needed skills and their performances in multiple sectors, for example, through the Digital Economy and Society Index (DESI). This is an index that monitors Europe's overall digital performance and follows the progress of EU countries in terms of digital competitiveness. More generally, it keeps track of the performance of MS in digital connectivity, digital skills, online activity and digital public services. We shall later investigate more about such Index, with a focus on Italy's latest digital performance, in the section dedicated to a fair, competitive, digital economy.

From a human perception, when dealing with digital and economic issues, many Europeans, and more generally people all around the world, fear for their job position, not only because they fear of being left behind, as they are not sufficiently up-to-date with the technologies, but they fear that, as more processes are automated, digitisation will lead to changes beyond the technological sector. The general, shared concern is that numerous occupations will be entirely transformed or, in the worst scenario, eliminated. That is why the

[28] European Commission. DEAR Programme.

digital transition must be fair and just and encourage every actor in society, especially women, to fully take part. Social partners have a crucial role to play in this context. At the same time, promoting innovation and technological diffusion are necessary conditions for a good quality of life, employment opportunities and to close existing participation gaps, notably in rural and remote areas suffering from population ageing and decline, gender discrimination and web accessibility. The latter, in particular, shall be further examined in another section of this dissertation, when observing the inclusivity aspect of the digitalization process of the Union.

Finally, new challenges are also emerging as regards working conditions. Empowered to treat the users fairly and take action to limit the spread of illegal content online, it is true that the rising number of online platforms has also created new opportunities for people to earn income, enter or remain in the labour market. At the same time, however, it has raised new questions as regards legal protections for people who do not have a worker status yet who share some of the vulnerabilities of workers, such as influencers, digital entrepreneurs, content creators and any occupation based on digital, online-profit. An enhanced framework for online platform workers will be needed, and we shall later discuss this issue in the section dedicated to a fair, competitive, digital economy.

To conclude the explanation of this first section, we shall now observe some key actions foreseen by the European Union to pursue every goal set in the first pillar, technology that works for people.

4.1.3 European Commission's Communication of 19.02.2020: Key actions for the first pillar

When dealing with Artificial Intelligence, one of the most relevant achievements to reach for the Union is the already-mentioned White Paper on Artificial Intelligence, which sets out options for a legislative framework for trustworthy AI, with a follow-up on safety, liability, fundamental rights and data to be delivered on the Q4 of 2020.

Connected to the field of AI there are also computing and blockchain issues. In fact, another key action will be to build and arrange joint digital capacities in the areas of AI, cyber, super and quantum computing, quantum communication and blockchain.

We mentioned the strong relevance of connectivity, and that is why there is a need to accelerate investments in Europe's Gigabit connectivity, through a revision of the Broadband Cost

Reduction Directive[29], an updated Action Plan on 5G and 6G and a new Radio Spectrum Policy Programme, all foreseen by 2021 and 2023.

Moreover, in order to ensure the safety of any digital action taken on the web, a European cybersecurity strategy will be needed, including the establishment of a joint Cybersecurity Unit, a Review of the Security of Network and Information Systems (NIS) Directive[30] and boosting the single market for cybersecurity.

We underlined the relevance of the human digital force, meaning that machines alone cannot work properly. In fact, a "Digital Education Action Plan" to boost digital literacy and competences at all levels of education and "A reinforced Skills Agenda" to strengthen digital skills throughout society and a reinforced "Youth Guarantee" to put a strong focus on digital skills in early career transitions are in the drafting stages.

To conclude, in 2021 the Union will focus on two main issues: an initiative to improve labour conditions of platform workers and a reinforced EU governments interoperability strategy to ensure coordination and common standards for secure and borderless public sector data flows and services.

4.2 The second pillar: A fair and competitive digital economy

The second objective of the new European digital strategy, which aims at developing a Smart Union, focuses on the need of improving a smooth and plain single market, where companies of all sizes and in any sector can compete on equal and fair terms. Following directives for smart and digital solutions, such companies should be able to develop, retail and use digital technologies, products and services at a scale that lifts their productivity and ensures global competitiveness.

Moreover, being the well-being of its citizens at the core of the Union, this section emphasises how consumers can be confident that their rights are respected notwithstanding all the new digital, and sometimes alarming, changes in the economy and society. Thus, it is fundamental for the European Union to continue to act and decide autonomously as a unitary political entity,

[29] See Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014.
[30] See Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016.

while reducing its over-reliance on digital solutions created elsewhere, especially because technology is more and more gaining in importance in an ever-shrinking, ever-connected world.

4.2.1 Data and Online Platforms

What we witness more and more every day is that the importance of technology, economically speaking, lies not only on material capacities to produce advanced goods, but also – and I would say above all – on the possibility and ability of companies, governments and every other actor to collect, analyse and use data.

By definition, data is *information, especially facts or numbers, collected to be examined and considered and used to help decision-making, or information in an electronic form that can be stored and used by a computer*[31]. Thus, in order to properly and efficiently develop many products and services, data needs to be widely and easily available, easily accessible, and easy to use and process. At the same time, data today is a source of income, an essential resource for economic growth, competitiveness, innovation, job creation and societal progress in general: information has become the new currency and, in different occasions and for most countries, what is known is gold.

Data is at the basis of digital transformation. It shapes the way people produce, consume and live. To grant access to an ever-growing volume of data and the ability to use it are essential constant innovation and growth (Krueger, 1993). Data-driven revolutions can bring major and concrete benefits to the citizens – through, for example, personalised medicine or improved mobility – and, on a larger scale, to the European community and economy, from allowing better policymaking to improving public services and investments. This is the main explanation behind the heavy relevance of data today: it has become a key factor of production, and therefore of competition, and the value it creates has to be shared back with the entire society participating in providing and analysing such data (Benkler, 2006). This is precisely why, as a strong, unitarian political entity, the Union needs to build a genuine European single market for data, a European data space based on European rules and values, in order to guarantee profit for all – businesses, researchers and public administrations.

[31] Dictionary.cambridge.org. 2020. DATA | *Meaning In The Cambridge English Dictionary*.

So, at the European level, how to guarantee such smooth transition towards a digital market and a fair and competitive data-driven economy? The Data Strategy[32] and the White Paper on Artificial Intelligence are the first pillars of the new digital strategy of the Commission. They both highlight the importance of putting people first when developing technology, as well as the need to defend and promote European values and rights in how people design, make and deploy technology in the real economy.

The main goal of the European strategy for data is to create a single market for data that will ensure Europe's global competitiveness and data sovereignty. In this regard, common European data spaces and key sectors will guarantee that more data becomes available for use in the economy and society; the main purpose is to let data flow within the Union and across sectors, for the benefit of all, while keeping companies and individuals who generate such data in control, in so far as that European rules, in particular privacy and data protection, as well as competition law, are fully respected. In this way, the European Union will become an attractive, secure and dynamic data economy by investing in next generation standards, tools and infrastructures to gather, store and process data and joining forces in European cloud capacity. In fact, data driven applications will benefit citizens and businesses in many ways: data will improve healthcare, create safer and cleaner transport systems, and at the global level, it will boost world sustainability and energy efficiency for a more prosperous society (Carbó-Valverde, 2017).

[32] See COM(2020) 66 final.

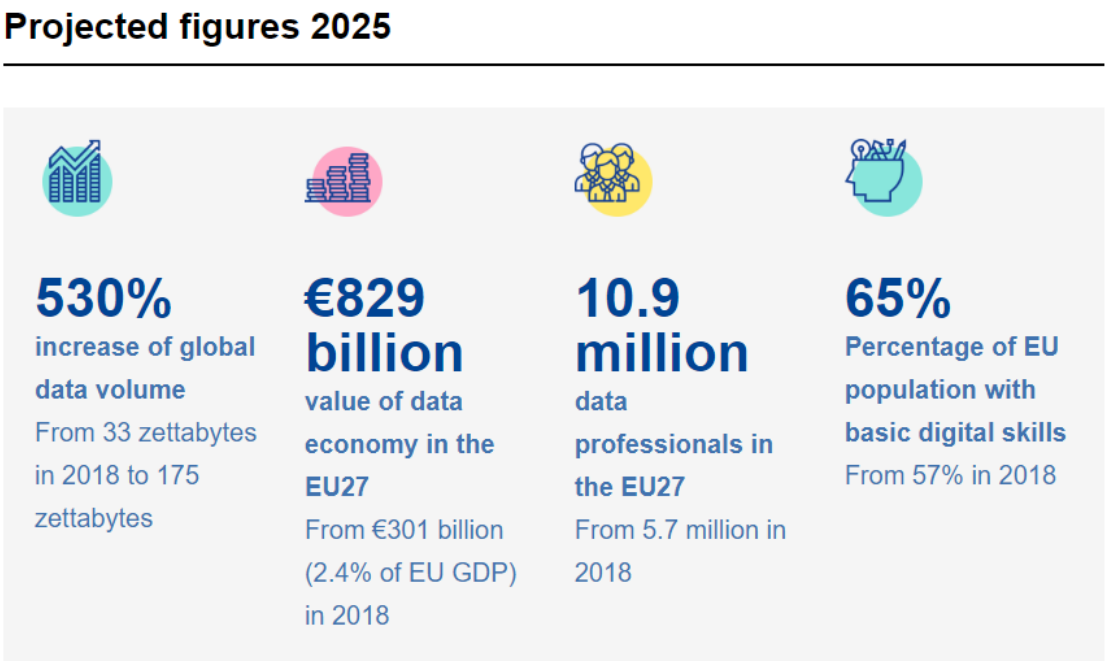

Figure 15. European Commission. 2020. European data strategy. Projections for 2025.

Considering data as the most innovative, fructuous and agile online-currency, there must exist online-customers and online-sellers. That is the digital realm of online platforms. These are strong drivers of innovation and play an important role in Europe's digital society and economy, as they do generally all over the world as well. Online platforms cover a wide range of activities including online marketplaces, social media, creative content outlets covered by copyright, app stores, price comparison websites, platforms for the collaborative economy as well as search engines. Such online platforms increase consumers' choice, improve efficiency and competitiveness of industries and can exponentially increase civil participation in society. Online platforms share key characteristics, such as the use of information and communication technologies to facilitate interactions between users, collection and use of data about such interactions, and network effects. These network effects make the use of the platforms valuable. Finally, in her political guidelines, the President of the European Commission, Ursula von der Leyen, has committed to upgrade the Union's liability and safety rules for e-commerce and digital platforms, services and products, with a new Digital Services Act Package[33].

[33] European Commission. 2020. *The Digital Services Act Package - Shaping Europe's Digital Future - European Commission.*

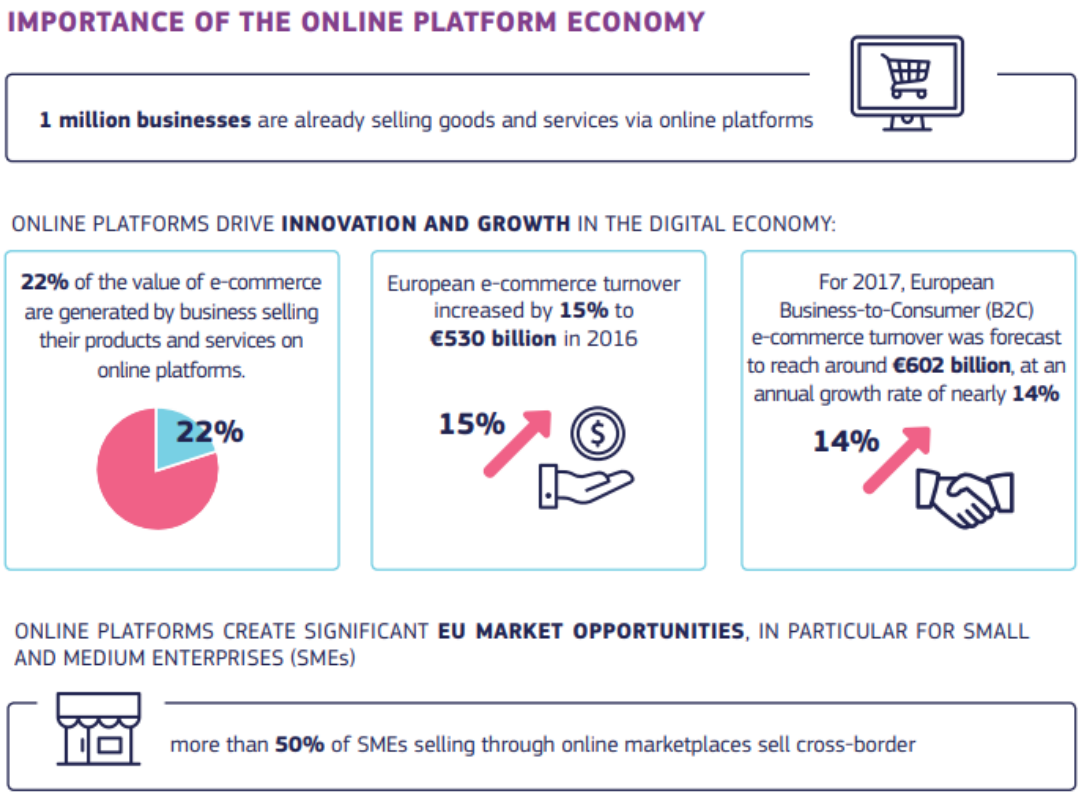

Figure 16. European Commission. 2019. Digital Single Market: Online Platforms Factsheet.

4.2.2 Digitising European Industry

Because of the digital revolution, the factories of the future need to deal with competitive pressures and incorporate new technologies, applications and services if they want to keep on thriving and gain profits. Successful digital industrial platforms address this need by providing the means to assimilate different technologies, take data from the market and the supply network, make it accessible to monitoring and control applications, and finally allow the development of complementary applications.

It is almost certain that data will play a key role in the transformation of manufacturing, but this also poses significant challenges in terms of security. Manufacturing facilities will need to be digitally connected with external partners throughout the value chain, so it is pivotal to guarantee an adequate level of security without limiting the capability to exchange data and information both on the manufacturing floor and beyond the factory developments. In so doing, while factories will become more autonomous, manufacturing processes will be designed and controlled by engineers, and so a highly skilled workforce becomes a pre-condition for the triumph of these innovation methods. Moreover, energy sustainability will also be essential,

because it will aim at reducing resource consumption and waste generation in order to make the industrial sector ready for the low-carbon economy (EC, 2017).

During these last decade, many European companies – and particularly Small and Medium Enterprises (SMEs) – have been slow at keeping up with digital solutions, and therefore have not been able to benefit from such innovations and missed different opportunities to scale up. The European Commission will seek to address this issue with the new EU Industrial Strategy[34] that sets out actions to facilitate the transition towards a more digital, clean, circular and globally competitive EU industry. Because of this, businesses, firms, researchers and public authorities will join in national and regional initiatives and increase investment through strategic partnerships and networks. The new Industrial Strategy will also include an intensive strategy for SMEs, a vital part of the European economy, often disadvantaged by lack of available skills, access to finance and markets.

In order to boost SMEs and in general the industrial sector, companies should integrate in their production processes more and more digital innovations, such as artificial intelligence, Internet of Things, modelling and simulation, cloud computing and big data analysis. By assimilating these new solutions, factories can become digital, smart and virtual; they can thrive on their own at a faster rate, and also help others to grow. That is the European *Industry 4.0*[35].

In the first place, by defining a factory as digital, the Commission hopes for any company to be able to develop and analyse products and processes in a digital way in order to boost its creativity and reduce the time spent from design to production. For example, creating prototypes digitally allows saving time and resources in physical testing. In the second place, by defining a factory as smart, the Commission hopes for any company to be able to develop sensors, new architectures and control methods that will make existing production facilities smarter, that is to say, capable of adapting and reacting autonomously to changes in production. Finally, by defining a factory as virtual, the Commission hopes for any company to be able to be connected with other factories, so that the manufacturing process can be virtually controlled, while integrating production, supply chain, logistics and customisation needs in real time.

The European Commission, building on and complementing the various national initiatives for digitising industry, will take actions along five main pillars. These include use of

[34] See COM(2020) 102 final.

[35] European Parliament. 2015. Industry 4.0

policy instruments, financial support, coordination and legislative powers to trigger further public and private investments in all industrial sectors and create the framework conditions for a proper digital industrial revolution and final transition towards a digitalised Europe.

Figure 17. European Commission. 2018. Pillars of the Digitising European Industry initiative.

When it comes to financing, overall, today's plans should mobilise both public and private investments in support of the digitisation of industry. The main goal is to boost digital innovation, to sustain national and regional investments in digital innovation hubs, to carry out the first production lines of next-generation electronic components and to progress with the European Cloud Initiative[36], which aims at providing European science, industry and public authorities with a world-class data infrastructure to store and manage data; high-speed connectivity to transport it; and more powerful High-Performance Computing to process it.

[36] See COM(2016) 178 final.

Figure 18. European Commission. 2016. European Cloud Initiative - Building a competitive data and knowledge economy in Europe.

Back to the practical examples of factories, in order to start up and grow in Europe, SMEs need a fluid single market, unhindered by conflicting local or national regulations that increase administrative burdens especially for smaller companies. They need clear and proportionate rules that are effectively and uniformly enforced across the EU, providing them with a powerful *home* market from which to launch themselves on the *world* market scenario.

In the digital age, ensuring a fair and competitive playing field for businesses, big and small, is more important than ever. This suggests that rules applying offline – from competition and single market rules, consumer protection, to intellectual property, taxation and workers' rights – are required to also apply online. Consumers need to be able to trust digital products and service just as much as they would any other way. There is a need to pay attention to the most vulnerable consumers and to ensure the enforcement of safety laws, also in relation to goods originating from third countries. Some platforms have acquired significant scale, which effectively allows them to act as private gatekeepers to markets, customers and information. The EU and national authorities and must ensure that the systemic role of certain online platforms and the market power they acquire will not put in danger the fairness and openness of European markets.

With specific respect to EU competition law, its foundations are as relevant for digital as for traditional industries. EU competition law serves Europe well by contributing to a level playing field where markets serve consumers. At the same time, it is important that the competition rules remain fit for a world that is changing fast, that is increasingly digital and is required to become greener and sustainable in order to survive. With this in mind, the Commission is currently reflecting on the effectiveness of the way in which the current rules are applied, for

example in relation to anti-trust remedies, and also conducting evaluations and reviews of the rules themselves to ensure that they meet today's digital and green challenges and goals.

However, competition policy alone cannot address all the systemic problems that may arise in the online platform economy, given its pretty much unlimited scope of action. Based on the single market logic, probably additional rules may be needed to ensure contestability, fairness and innovation and the possibility of online market entry, as well as public interests that go beyond competition or economic considerations. In fact, ensuring fairness and prevent monopolies in the digital economy is a major challenge, both for European leaders and the rest of the globe. In the borderless digital world that we dive into every day, only a selective minority of companies with the largest market share get the majority of the profits on the value that is created in a data-based economy. Those profits are often not taxed where they are generated as a result of out-of-date corporate tax rules, thus distorting fair competition.

To conclude, why do we need a digitised EU industry? There are four main reasons according to the plan proposed by the Digital Single Market. Firstly, a digitally industrialised Union would favour a smooth transition towards a smart economy; secondly, we need to be ready to prepare the next generation of products and services able to satisfy future generations' needs and keep up with their social and technological developments; thirdly, a digital industry would boost innovation capacity across the sector; fourthly, such improvements would generally increase GDP growth all over the Union. Along with the reasons explaining why the digitisation of the European industries would be an overall improvement for the Union, we underline the fact that there are industrial areas where EU is already leader, and they can all benefit from digital solutions; these are, among others, manufacturing; constructions; electronics for energy, security and transports; robotics; telecommunications; business initiatives; R&D; advanced education; publishing; tailoring; food and beverages. However, high-tech sectors face strong competition from other parts of the globe and many traditional sectors are lagging behind because of large disparities in digitisation between regions.

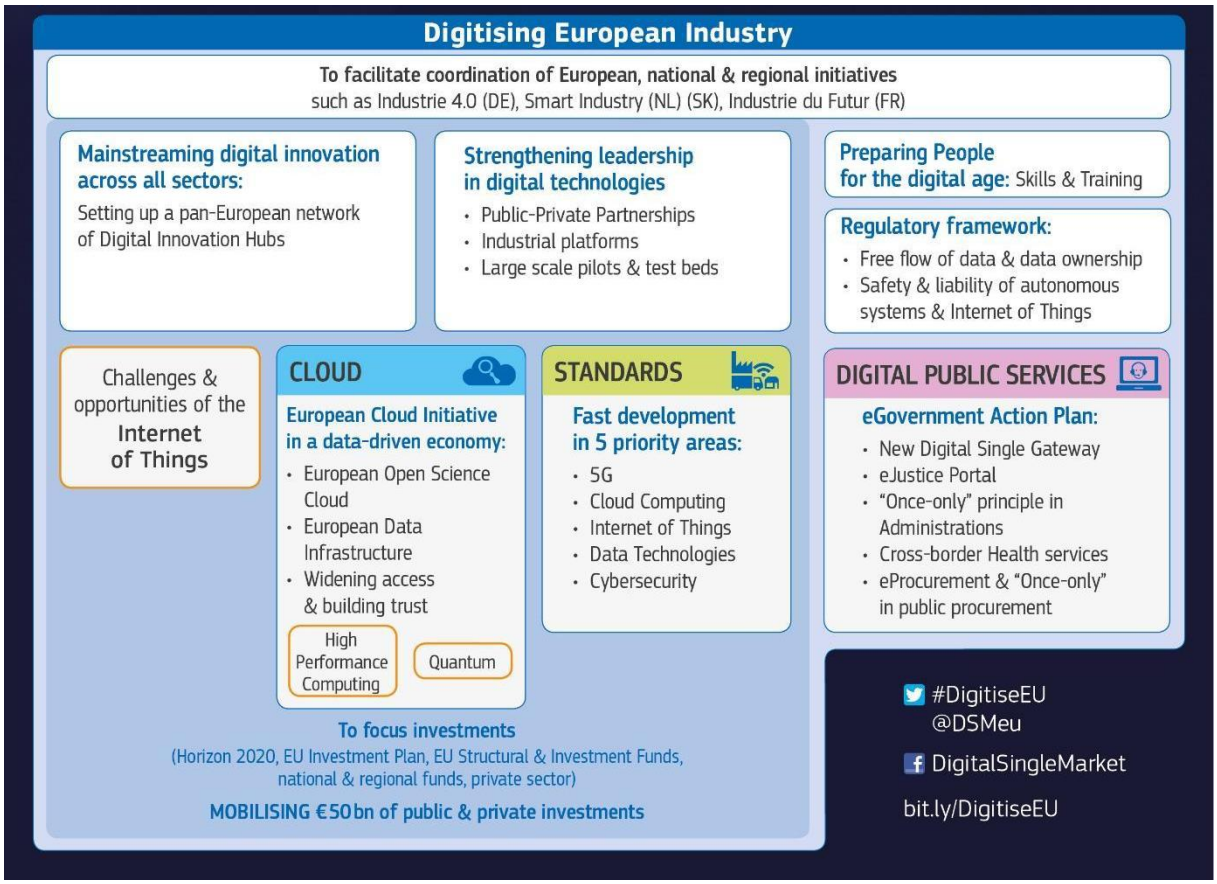

Figure 19. European Commission. 2017. DSM: Digitising European industry, Infographics

4.2.3 The Digital Economy and Society Index (DESI)

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on the European Union and its Member States' digital performance while tracking their evolution in digital competitiveness.

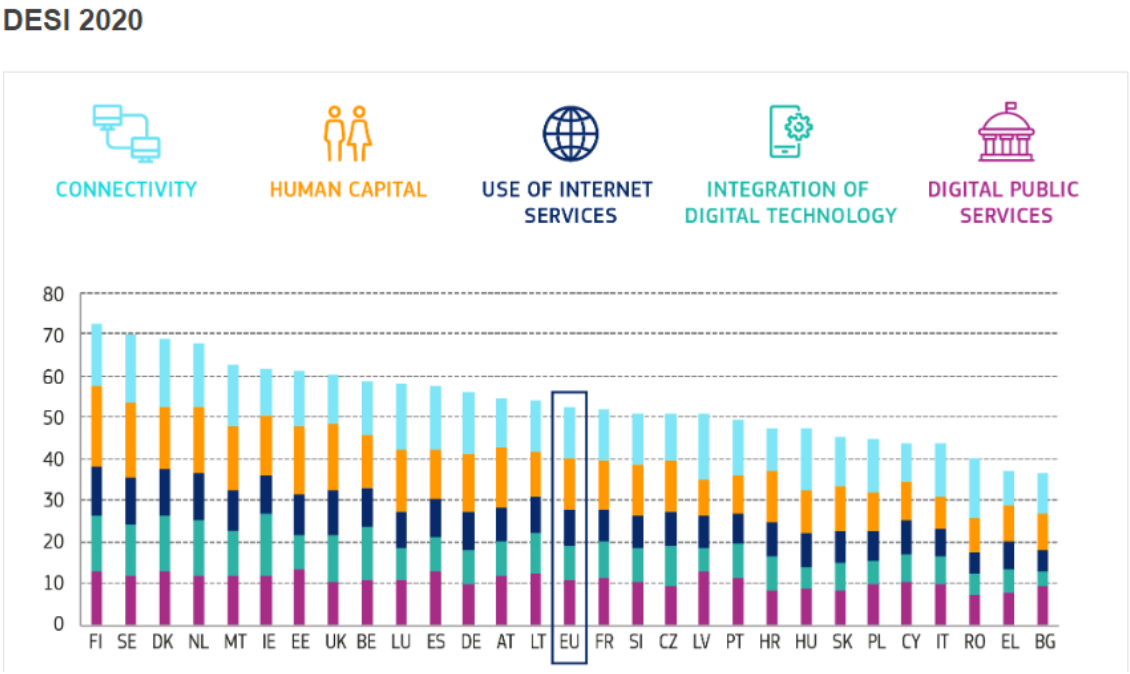

Figure 20. European Commission. 2020. The Digital Economy and Society Index.

The European Commission monitors Member States' digital progress through the Digital Economy and Society Index (DESI) reports since 2014, presenting country profiles and thematic chapters (connectivity, human capital, use of internet services, integration of digital technologies and digital public services). The DESI reports combine quantitative evidence from the indicators across the five dimensions of the index, each with country-specific policy insights and best practices. In addition, every year an in-depth telecoms chapter is annexed to the reports for each Member State.

The latest version and data available of the DESI reports are the recently-published 2020 ones, and as the figures refer to 2019, the United Kingdom is still included in the 2020 DESI, and EU averages are calculated for 28 Member States. In order to improve the methodology of the index and take account of the latest technological developments, a number of changes were made to the 2020 edition of DESI, and for example, it now includes also fixed very high capacity network (VHCN) coverage.

Italy

From a national point of view, we now briefly observe the 2020 DESI report for Italy[37], which this year ranks 25th out of 28 EU Member States. I decided to focus on the Italian situation because first of all it is my home country and secondly because of my internship in the

[37] European Commission. 2020. Digital Economy and Society Index (DESI) 2020 - Italy

Cooperation and Development Unit at the Permanent Representation of Italy to the European Union, as I mentioned at the beginning. Here, I could observe the different approaches to development by any MS during the weekly Council consultations that I attended.

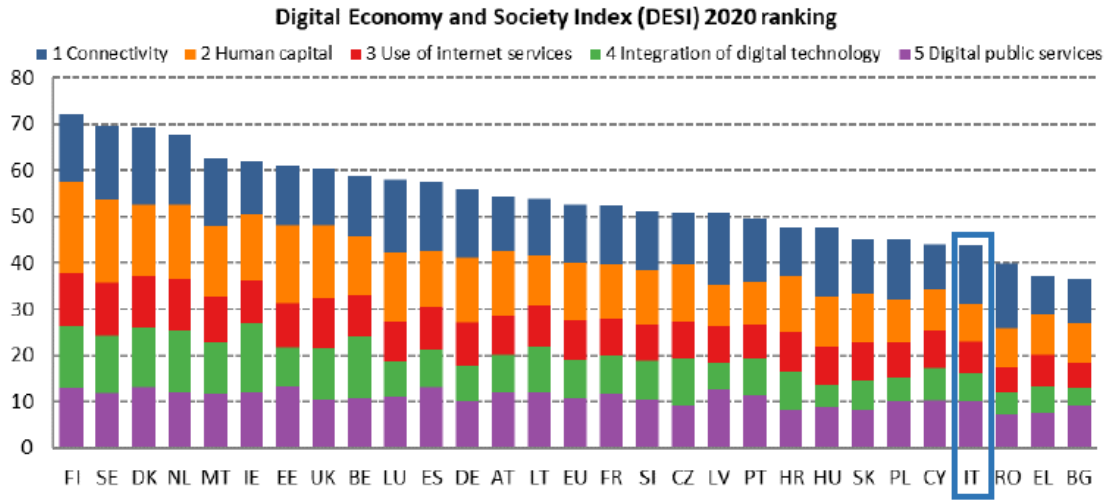

Figure 21. European Commission. 2020. The Digital Economy and Society Index: Italy

Overall, data prior to the pandemic shows that the country has a good ranking in terms of 5G preparedness, but compared to the EU average, Italy records very low levels of basic and advanced digital skills. The number of ICT specialists and ICT graduates is also well below the EU average. These gaps in digital skills are reflected in the low use of online services, including digital public services. Also, although the country ranks relatively high in its offer of e-government services, public take-up remains low. Similarly, Italian enterprises lag behind in the use of technologies such as cloud and big data, as well as in the uptake of e-commerce.

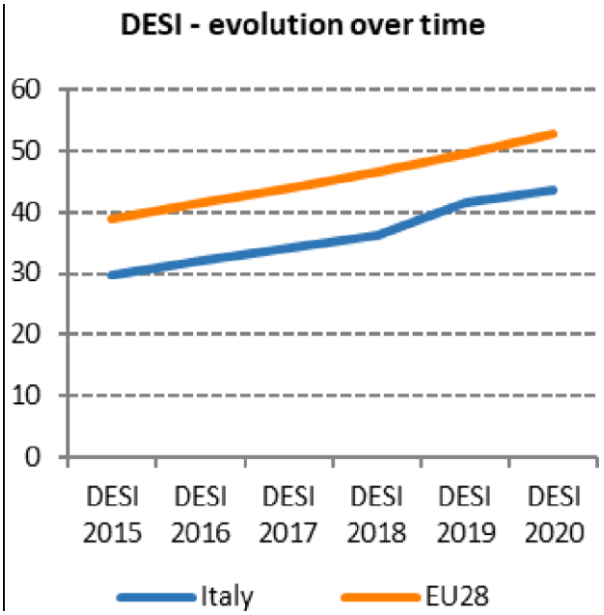

Figure 22. European Commission.2020. DESI index. Italy 2020 report. Evolution over time

In 2019, there was a heightened focus at political level on boosting the digitisation of the Italian economy and society. The year was marked by the launch of new initiatives and notably the establishment of a new Ministry for Technological Innovation and Digitisation (MID), acting as coordinator. In December 2019, the MID presented the strategy "*Italia 2025"*, a five-year plan that puts digitisation and innovation at the centre of a process for the structural, operational and deep-seated transformation of the country. This strategy is founded on three main challenges – a digital society, an inclusive and sustainable development, an innovation target – identified on the basis of the UN Sustainable Development Goals[38] (SDGs) and declined in twenty innovation and digitalization actions.

The pace of implementation of major projects to help digitise the public administration increased significantly during the last years. For example, in 2019, the Italian government presented the National Innovation Fund (NIF), a Fund with a starting budget of 1 billion € to support investment in the entire sector of innovative enterprises (MiSE, 2019). Then, the "Three-Year Plan for Information Technology in Public Administration" was launched in 2020 by the Agency for Digital Italy (AgID). The Agency set out a comprehensive list of targets for the next few years, with the objectives of promoting the digital transformation of the Italian administration and driving the uptake of digital technologies (AgID, 2020). Furthermore, concerning the digitisation of businesses, the Italian government recently launched the "Transition Plan 4.0", the new industrial policy of the country, more inclusive and attentive to sustainability. In particular, the Plan provides for greater attention to innovation, green investments, design and aesthetic conception activities and participation of SMEs (MiSE, 2020).

Finally, it is important to notice the relevant role of digital technologies to manage the coronavirus pandemic and to support the economic recovery in Italy. The current COVID-19 crisis is having an important impact on key societal indicators, relating to the use of internet services by citizens. This does not show in the latest 2019 official statistics as reported in DESI. Consequently, the DESI 2020 findings need to be read in conjunction with the strained demand that has been put on digital infrastructure and services during the pandemic and the immediate actions taken by the MS. In particular, Italy has taken a large number of digital-related initiatives to deal with COVID-19 crisis. For example, the Government adopted a package of

[38] The Sustainable Development Goals (SDG) are a collection of 17 global goals designed to be a "blueprint to achieve a better and more sustainable future for all". They were set by the UN General Assembly, as part of UN resolution 70/1, in 2015.

measures aimed at coping with the increase in the consumption of electronic communications services and of network traffic; Free Wi-Fi connections were provided to public hospitals. Digital instruments and platforms, the provision of devices to less well-off students, and the access to ultrafast connections and related services were adopted in schools. Also, simplified procurement measures were introduced to facilitate the purchase of IT goods and services by public administrations and a number of initiatives focused on the use of data against the pandemic. Finally, the government also invited the private sector and associations to offer their products or services for free and help citizens, professionals and companies to continue their activities (WEF, 2020).

4.2.4 European Commission's Communication of 19.02.2020: Key actions for the second pillar

As one of the key actions for the fulfilment of the second pillar – a fair and competitive digital economy – the European Union aims at following the "European Data Strategy" in order to make Europe a global leader in the data-agile economy (February 2020). Therefore, economic results of the MS and the EU as a whole will be monitored.

Moreover, the Commission will explore, in the context of the "Digital Services Act" package, *ex-ante* rules to guarantee that markets characterised by large platforms with substantial network effects acting as gatekeepers, remain fair and contestable for innovators, businesses, and new market entrants. (Q4 2020). The package should also facilitate the development of and transformation towards multiple clean, circular, digital and globally competitive EU industries, including SMEs, while reinforcing single market rules.

One of the top priority of the Union to fulfil every goal set in this second pillar is to create a framework to enable convenient, competitive and secure Digital Finance, including legislative proposals on crypto assets, and on digital operational and cyber resilience in the financial sector and a strategy towards an integrated EU payments market that supports pan-European digital payment services and solutions (Q3 2020).

Finally, being at the heart of the EU the well-being of its citizens, one of the most important action to take is to deliver a new "Consumer Agenda", which will empower consumers to make informed choices and play an active role in the digital transformation of the Union (Q4 2020).

4.3 The Third pillar: An open, democratic and sustainable digital society

The third objective of the new European digital strategy aiming at developing a Smart Union focuses on the establishment of a trustworthy environment in which citizens are empowered in any action and interaction with each other, and they feel safe about the data they provide both online and offline. The new Strategy plans to encourage a European solution towards a digital transformation which promotes shared democratic values, respects European fundamental rights, and contributes to a sustainable, climate-neutral and resource-efficient economy. In this scenario, people are entitled to technology that they can trust. As we stated before, there are no longer differences nor boundaries between the two realities: what is illegal offline must also be illegal online. Of course, it is true that we cannot predict the future of digital technology, nonetheless, European values, ethical principles and social and environmental rules must apply also in the digital space, setting out a basic, safe environment for all to work in (ILO, 2019).

In recent years, Europe has led the way towards an open, fair, inclusive and people-centric internet, especially with the above-mentioned General Data Protection Regulation (GDPR). It sets standards within the internet sphere and promotes rules for platform-to-business cooperation. The Regulation entered into force on 24 May 2016 and applies since 25 May 2018. In order to protect European democracies and the values underpinning them, the Commission will continue to develop and implement innovative and proportionate rules for a trustworthy digital society. Such a digital society should be fully inclusive, fair and accessible for all.

Generally, digital protection of data and digital privacy should go hand-in-hand. At the European level, the ePrivacy Directive[39] and the GDPR provide the legal framework to guarantee digital privacy for European citizens. Basic EU rules have been established to ensure that personal data enjoy a high level of protection everywhere in the Union, considering that every time that users access the web, they often entrust vital, sensible and personal information. On the one hand, that is the main reason why the GDPR ensures that personal data can only be gathered and analysed under strict conditions and for legitimate purposes. Organisations that collect and manage your personal information must also protect it from misuse and respect certain rights. On the other hand, the ePrivacy Directive ensures that all communications over public networks maintain respect for fundamental rights, in particular a high level of data

[39] See Directive 2002/58/EC. Directive on Privacy and Electronic communications. Amended in 2006 and 2009.

protection and of privacy, regardless of the technology used. Moreover, such Directive requires MS to ensure that users grant their consent before *cookies* (small text files stored in the user's web browser) are stored and accessed in computers, smartphones or any other device connected to the Internet.

In this context, it is essential that the rules related to digital services across the EU are strengthened and modernised, clarifying the roles and responsibilities of online platforms. For example, the sale of illicit, dangerous or counterfeit goods, and the dissemination of illegal content must be tackled as efficiently online as it is offline. Trust in the online world also means helping consumers take greater control of and responsibility for their own data and identity. Stronger and more efficient rules on the transparency, behaviour and accountability of those who act as gatekeepers to information and data flows are needed, as is real enforcement of existing rules (EC, 2020a). People should also be able to control their online identity, when authentication is needed to access certain online services.

In this regard, nowadays a universally accepted public electronic identity (eID) and electronic Trust Services (eTS) are necessary for consumers to have access to their data and safely use the products and services they want without having to unnecessarily share personal data with other platforms. Both eID and eTS are key enablers for secure cross-border electronic transactions and central building blocks of the Digital Single Market. The legal backbone of eID and eTS is the 2014 eIDAS Regulation[40], a landmark regulation on electronic identification and trust services for electronic transactions in the internal market to provide a regulatory environment protecting electronic interactions between businesses, citizens and public authorities.

4.3.1 The European Union fights disinformation

In a world where much of the public debate and political advertising has moved online, the audience must also be prepared to act to forcefully defend our democracies. Citizens want meaningful answers to attempted manipulations of the information space, often in the form of targeted and coordinated disinformation campaigns. The European Union needs greater transparency on the ways in which information is shared and managed on the internet. Moreover, trustworthy *quality* media – and not *quantity* media – is key for democracy as well

[40] See Regulation (EU) No 910/2014

as for cultural diversity. In general, and especially in the last decade, the exposure of citizens to large scale disinformation, including misleading or outright false information, is an important challenge for Europe. The Commission is working to implement a clear, comprehensive and broad set of actions to tackle the diffusion and impact of online disinformation in Europe and ensure the protection of European values and democratic systems.

Disinformation can be explained as verifiably false or misleading information created, presented and disseminated for economic gain or to intentionally deceive, or scare, the public. It may have far-reaching consequences, cause public harm, be a threat to democratic political and policy-making processes, and may even put the protection of citizens' health, security and environment at risk (WTO, 2017). In other words, if information "makes the world go round", every *fake news* spread stops the flourishing of communities, endangering the world development. That is why fighting disinformation in the digital era, where especially the use of social media and online platforms is very diffused, has to be a coordinated effort involving all actors, from institutions to social platforms, from news media to single users.

If we come to endorse the fact that information is the new currency, and that consequently "what is known is gold", it could be stated that nowadays, disinformation is a strong, intellectual weapon at the disposal of many, which can lead to practical issues. It erodes trust in institutions and in digital and traditional media and harms our democracies by obstructing the ability of citizens to take informed, free, proper decisions. It can polarise debates, create or deepen tensions in society and undermine electoral systems, and have a wider impact on security, not to mention the consequences on inequalities of opportunities diffused all over the world. Disinformation impairs freedom of opinion and expression, violating a fundamental right enshrined in the Charter of Fundamental Rights of the European Union[41].

Thus, a first attempt at monitoring this digital threat is the European Commission's Communication "Tackling online disinformation: a European Approach"[42], which sets the objectives and principles to follow in order to guarantee a collective response towards this evolving threat. In the Commission's assessment, four points should guide action to tackle disinformation: to improve transparency regarding the origin of information; to promote diversity of information; to foster credibility of information; to find inclusive solutions.

[41] Charter of Fundamental Rights of The European Union (2012/C 326/02)
[42] See COM(2018) 236 final

Following this Communication, the Commission presented the "Code of Practice on disinformation"[43]. We are dealing with the first worldwide self-regulatory set of standards aiming at preserving the integrity of worldwide information, voluntarily signed by platforms, leading social networks, trade associations and members of the advertising industry in Brussels in October 2018. Signatories are Facebook, Twitter, Mozilla, Google, then Microsoft subscribed to the Code in May 2019 and TikTok recently joined it in June 2020. Among different actions taken in different areas of concern, in order to fight disinformation, signatories put particular effort in addressing the issue of fake accounts and online bots, in this way they encourage consumers to report disinformation and allow access to different news sources, while improving the visibility and findability of authoritative content.

In the same year, another attempt at monitoring the negative effects of the digital transformation has been the joint "Action Plan on disinformation"[44], carried out by the European Commission and the High Representative of The Union for Foreign Affairs and Security Policy. The Plan aims at improving efforts to fight disinformation in Europe and beyond through political determination and unified action, mobilising all parts of governments. This should be done in close cooperation with like-minded partners across the globe. It requires close cooperation between Union institutions, Member States, civil society and the private sector, especially online platforms. The coordinated response to disinformation presented in the Action Plan is based on four pillars: improving the capabilities of Union institutions to detect, analyse and expose disinformation; strengthening coordinated and joint responses to disinformation; mobilising private sector to tackle disinformation; raising awareness and improving societal resilience.

Finally, the European Union has outlined a European Digital Media Observatory (EDMO)[45], which has started its activities on 1 June 2020. This is a CEF[46] funded project aimed at creating a European hub for fact-checkers, academics and other relevant stakeholders to collaborate with each other and actively link with media organisations, media literacy experts, and provide support to policy makers. It has been put in place to help the Union control disinformation, and the activities are based on different pillars, such as building a public portal,

[43] European Commission. 2018. Code of Practice on Disinformation
[44] See JOIN(2018) 36 final
[45] EDMO: European Digital Media Observatory
[46] The Connecting Europe Facility (CEF) is a key EU funding instrument to promote growth, jobs and competitiveness through targeted infrastructure investment at European level.

ensure secure and privacy-protected access to platforms' data and support to public authorities. The EDMO is managed by a consortium led by the European University Institute in Florence, Italy. Also, it has a governance structure completely independent from public authorities, including the European Commission. The Governance is constituted of an advisory board in charge of defining the functioning rules and the strategy of the Observatory and the executive board responsible for implementing the contract and in consultation with the advisory board.

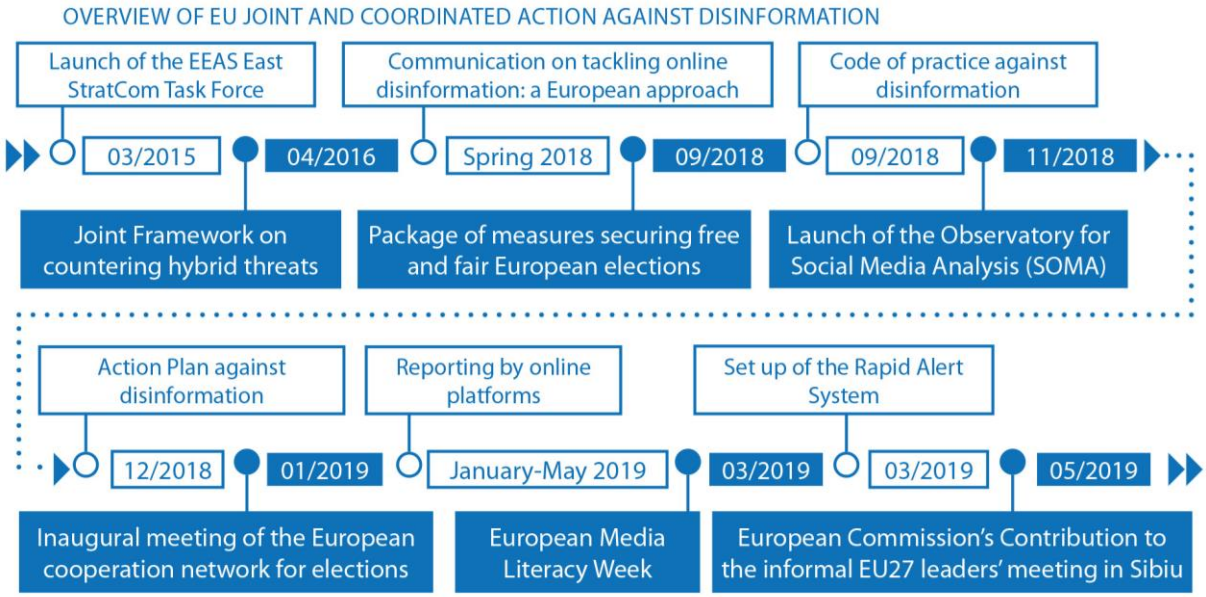

Figure 23. European Commission. 2020. Actions Timeline about Disinformation.

4.3.2 Developing a sustainable, Smart Union

In 2050, around two thirds of the world population will live in towns, consuming massive amounts of energy and emitting just as much greenhouse gases. As city populations grow, the demand for services but also the pressure on resources will increase. This puts a strain on energy, water, waste, mobility and any other service essential to a city's prosperity, survival and sustainability. So, how can innovative technologies and digitalisation help?

The classic view of "city" must be revised, encouraging a global transition towards *smart* cities. A smart city is a place where traditional networks and services are made more efficient with the use of digital and telecommunication technologies for the benefit of its inhabitants and business. This is not simply the use of information and communication technologies (ICT) for better resource use at disposal of a city and/or community; it means striving for sustainability

through smarter urban transport networks, upgraded water supply and waste disposal facilities, and more efficient ways to light and heat buildings. A sustainable city – just like sustainable development – is an urban area that through social, environmental and economic improvements meets the needs of the present without compromising the ability of future generations to meet their own needs. Correspondingly, a sustainable city develops a more interactive and responsive administrative system and safer public spaces.

At the beginning of this year, one of the most debated topics at the European and global levels was the European Green Deal, one of the 2019-2024 European priorities set by the European Commission. In this new project, the role of digitalization and its impact on the development of a Smart Union is crucial. Also, the digital component of this transformation will be key in reaching the ambitions of both the EU Green Deal and the UN SDGs.

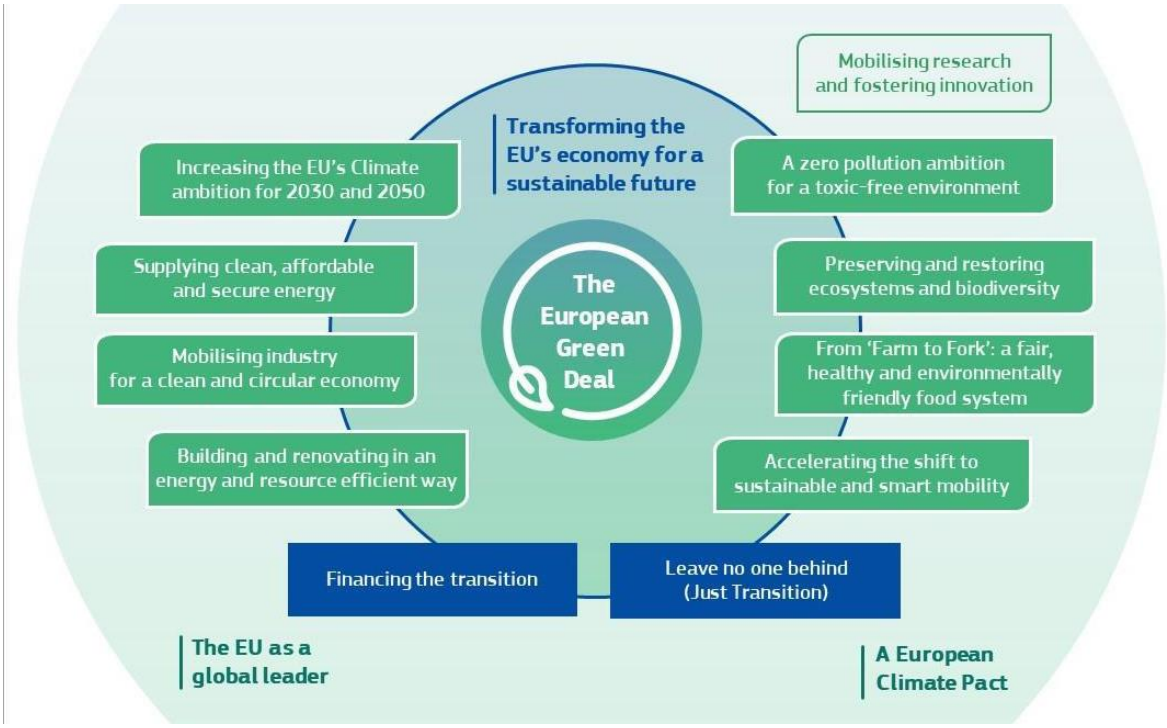

Figure 24. European Commission. 2019. The European Green Deal.

Climate change and environmental degradation are a huge threat to Europe and the world. To face these risks, Europe needs a new growth strategy that transforms the Union into a modern, resource efficient and competitive economy. This development processes towards a Smart Union includes the vision of a European Union where in 2050 net greenhouse gas emissions are no longer generated; economic growth is separated from the use of resources and no person is ignored anywhere. Thus, a sustainable European Union.

Therefore, the European Green Deal is the Union's roadmap for making the EU economy and society sustainable. Europeans will achieve this goal by transforming climate issues and environmental challenges into improvement opportunities in all policy areas while making the transition fair and inclusive for all. The main actions foresee the promotion of the efficient use of resources by moving to a clean and circular economy, the restoration of biodiversity and the reduction of pollution, the investment in environmentally friendly technologies and in industry innovation. The European Union will also provide financial support and technical assistance to help people, businesses and regions most affected by the transition to the green economy, in order to make sure that no one is left behind, given that some actors are more relying on fossil fuels than others. This is the recent "Just Transition Mechanism", which will help mobilize up to € 150 billion for the 2021-2027 period in the worst affected regions through three pillars: a new Just Transition Fund, the InvestEU "Just Transition" scheme and the EIB public sector loan facility.

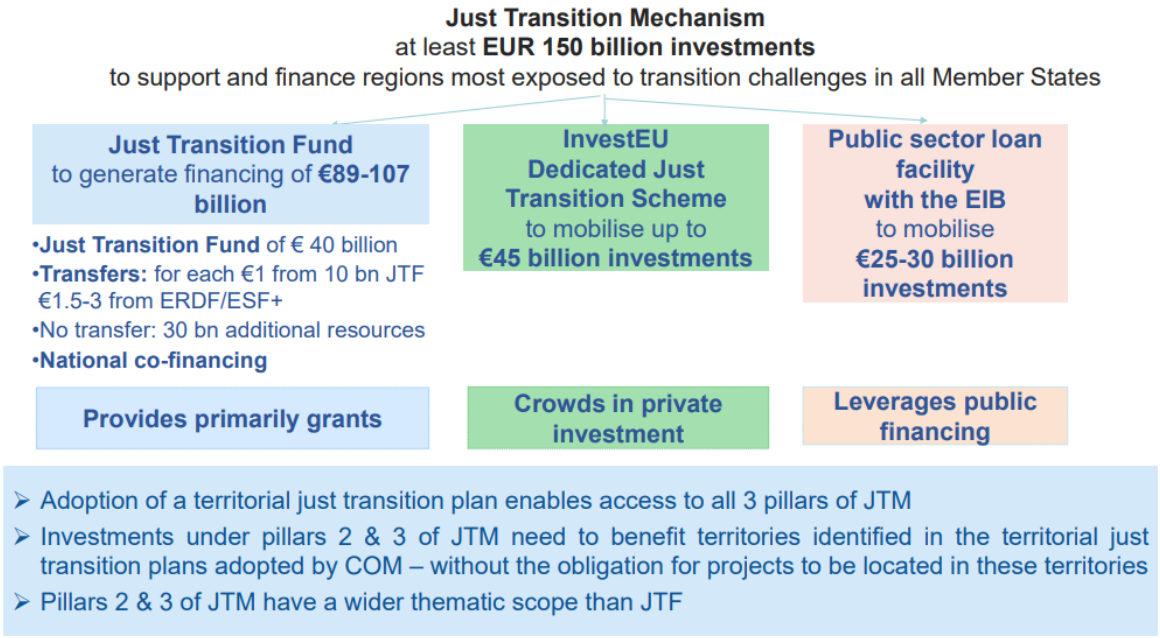

Figure 25. European Commission. 2020. Just Transition Mechanism.

As powerful tools for the sustainability transition, digital solutions can boost the circular economy, support the decarbonisation of all sectors and reduce the environmental footprint of products circulating in the EU market. Digital solutions, and data in particular, will also enable a fully integrated life-cycle approach, from design through sourcing of energy, raw materials deployment to final products until the end-of-life stage.

Yet it is also clear that the ICT sector needs to undergo its own green transformation. ICT equipment must become fully circular - designed to last longer, to be properly maintained, to contain recycled material and to be easily dismantled and recycled. The environmental footprint of the sector is significant, estimated at 5-9% of the world's total electricity use and more than 2% of all emissions[47]. Data centres and telecommunications will need to become more energy efficient, reuse waste energy, and use more renewable energy sources. They should become climate neutral by 2030, especially because the European Green Deal set the goal of becoming the first climate-neutral continent by 2050.

4.3.4 European Commission's Communication of 19.02.2020: Key actions for the third pillar

To develop a Smart Union, the Commission is revising rules to deepen the Internal Market for Digital Services by harmonising the responsibilities of online platforms and information service providers as part of the Digital Services Act package (Q4 2020). Moreover, it will carry out a revision of eIDAS Regulation to extend its benefits to the private sector and promote trusted digital identities for all Europeans (Q4 2020).

In line with the European Green Deal, the Commission is working on a new initiative, foreseen by 2021, to develop a high precision digital model of Earth (a "Digital Twin of the Earth") that would improve Europe's environmental prediction and crisis management capabilities: Destination Earth.

As mentioned, the digital transition of Europe cannot take place if digital technologies do not improve in the first place. By 2021, the Commission would work on circular electronics initiative to ensure that devices are designed for durability, maintenance, dismantling, reuse and recycling and to avoid premature obsolescence.

Finally, as we shall later see, the relevance of digital solutions in the health sector is massive. That is why the Commission is promoting by 2022 a European health data space, fostering the use of electronic health records based on a common European exchange format to give European citizens secure access to and exchange of health data across the EU.

[47] World Energy Forum: https://www.enerdata.net/publications/executive-briefing/expectedworld-energy-consumption-increase-fromdigitalization.html.

4.4 Europe as a global digital player – the international dimension

Creating a Europe fit for the digital age is a complex puzzle with many interconnected pieces – people, excellence, economy, democracy, trust, fairness, society, enforcement, internationality. As with any puzzle, the whole picture cannot be seen without putting all the pieces together. And for this reason, a strong digital presence in the EU's enlargement, neighbourhood and development policy will enable growth and drive sustainable development.

The European Union is committed to establish global standards for emerging technologies. In practical terms, for the Union to truly influence the way in which digital solutions are developed and used on a global scale, it needs to be a strong, independent and purposeful digital player in its own right. In order to achieve this, a clear framework that promotes trustworthy, digital interactions across society, for people as well as for businesses, is needed.

4.4.1 Foreign Policy

Leader of exports of goods and services around the world, the European Union is now exporting its way of managing the digital transformation so that it works to the benefit of all, in line with European values (WB, 2016). As more countries become inspired by the European digital governance model, European companies benefit from more opportunities to do business, and create new and more jobs for citizens in high-value added areas of the economy.

In geopolitical terms, the EU should leverage its regulatory power, reinforced industrial and technological capabilities, diplomatic strengths and external financial instruments to diffuse the European approach and shape global interactions. This includes the work done under association and trade agreements, as well as agreements reached in international bodies such the United Nations, the Organisation for Economic Co-operation and Development (OECD), International Organization for Standardization (ISO) and the G20, with the constant support of EU Member States. The European Union will remain the most open region for trade and investment in the world, provided that anyone who comes to do business here accepts and respects European rules. Certainly, the Commission will use all instruments at its disposal to ensure that everyone respects EU legislation and international rules to maintain a free and fair playing field in the digital sector.

A firm presence of digital topics in the EU's development policy will boost growth and drive sustainable development, in line with Europe's commitment to be a front runner in the implementation of the UN 2030 Agenda for Sustainable Development. Therefore, the European Commission cooperates with many countries, international organisations and is present in multilateral fora to represent Europe's interests and actively promote the benefits of the EU's digital strategy.

In a globalised and ever-connected world such the one we live in today, every country could be considered "a neighbour" of the Union, but EU neighbours are well defined in European political talks. In fact, the European Commission works closely with third countries in the neighbouring vicinity of the EU, namely the European Free Trade Association and European Economic Area members, candidates and potential candidates to join the EU, the Western Balkans, Eastern Partnership countries, the Middle East and North Africa region and Russia.

In particular, concerning the latter, the EU–Russia relations represent – according to the 2016 EU Global Strategy (EUGS)[48] – a key challenge for European security, given that, after the annexation of Crimea, Russia's approach in cyberspace has been progressively unfriendly. In fact, the Strategy emphasises the need to increase the EU's effort on cybersecurity and to improve its strategic communication. The overall situation raised EU's concerns, and among different actions taken by the Union, we recall its enhanced cooperation with the North Atlantic Alliance to implement the EUGS provisions on cybersecurity, as well as the creation of the above-mentioned Code of Practice on Disinformation, to improve the uniformity and rapidity of its communication system at the benefit of its public diplomacy (Amadio Viceré, 2019). Nevertheless, hacking activities linked to Russia have targeted the EU and its MS. For example, the Kremlin managed to spread fake news concerning the 2016 constitutional Italian referendum[49] or the Catalan crisis[50]. Consequently, a more efficient approach to the matter is expected by European citizens.

Moving around the globe, European's interests are geographically and politically interconnected with Africa as well. For example, the conclusions of the EU-AU Digital Economy Task Force[51] will support the digital transformation in Africa, including the creation

[48] European External Action Service (EEAS). 2016. Shared Vision, Common Action: A Stronger Europe. A Global Strategy for the European Union's Foreign and Security Policy.
[49] Jacopo Iacobini, 2016. "The Russian Propaganda against Renzi: And Grillo's Web Backs It Up", in *La Stampa*
[50] Davide Alandete, 2017. "Russian Network Used Venezuelan Accounts to Deepen Catalan Crisis", in *El Pais*
[51] EU-AU Digital Economy Task Force

of an African single digital market, as funding becomes available under the EU's new Multiannual Financial Framework.

Taking a further step, from the other side of the Atlantic we discover the potential of the activities between the EU and the Americas. The digital economy and society are now firmly part of the agenda for the EU's relations with the Americas, from Latin America and the Caribbean (LAC), to Mexico, the USA and Canada.

To conclude our turn around the globe, we cite the region of the Asia-Pacific. EU's digital strategy includes initiatives and dialogues with a view to forge stronger links with the very diverse countries in this region including China, India, Japan, South Korea, Taiwan and the members of the Association of Southeast Asian Nations (ASEAN).

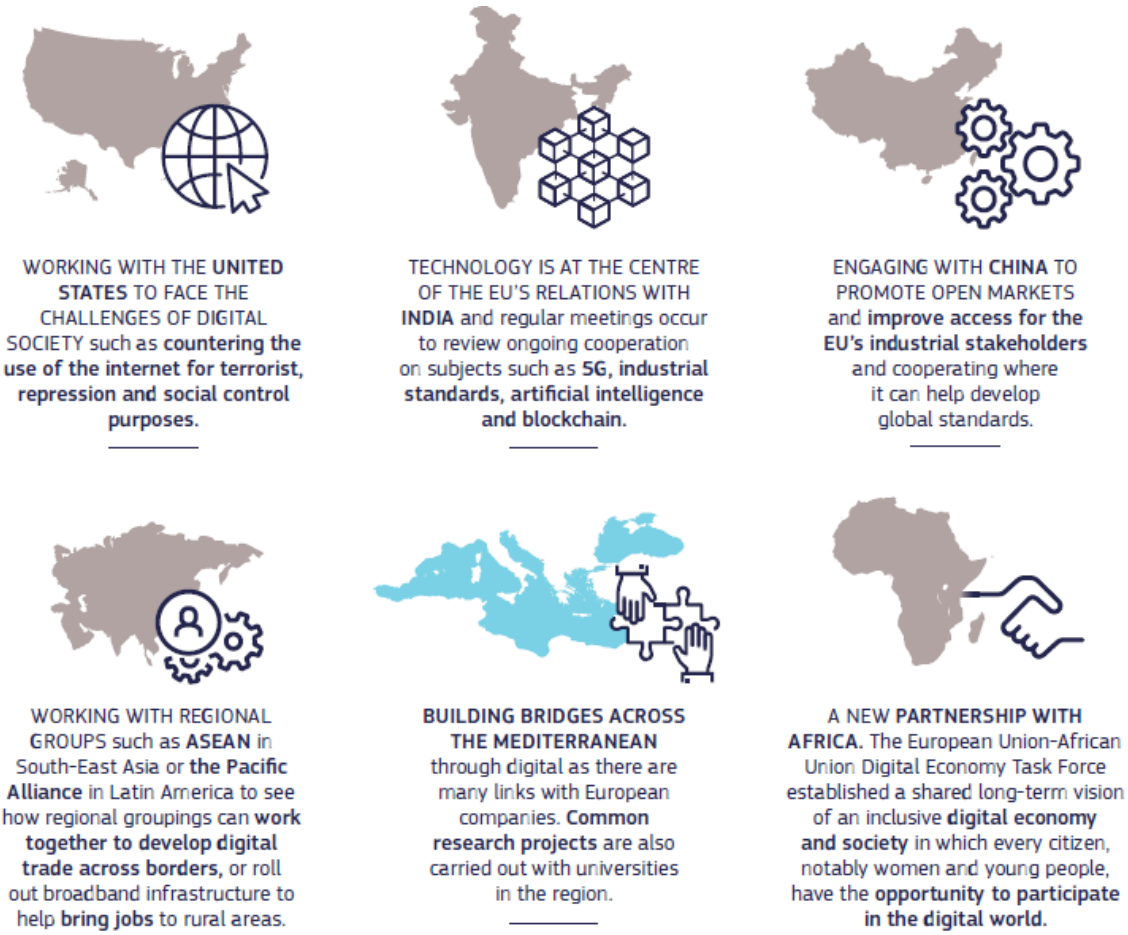

Figure 26. European Commission. 2019. Digital Single Market: INTERNATIONAL COOPERATION

Lastly, as we stated before, the European Union, acting as a unitarian, political entity, owns a place also in the international organisations and multilateral fora. The European model has proved to be an inspiration for many other partners as they seek to address policy challenges, and this should be no different when it comes to digital.

4.4.1 Standardisation and Next Generation Internet

Standardisation is the process by which specifications are set. A specification is a document that outlines the agreed properties for a particular product, service, or procedure. In ICT, specifications are primarily used to maximise interoperability – the ability for systems to work together. The majority of ICT specifications help ensure that devices, systems and services can connect and interoperate with each other, increasing innovation, and keeping ICT markets open and competitive. This allows consumers to have the widest choice of goods possible and gives producers the benefit of economies of scale. Thus, ICT standards are a cornerstone of the European Digital Single Market.

Europe is working closely with its international partners, such as the G7, to find common approaches with a view to developing international norms and standards. Many countries around the world have aligned their own legislation with the EU's strong data protection regime. Following this success, the EU should actively promote its model of a safe and open global Internet and support an effective, coherent and high-quality standardisation framework.

In terms of standards, different trading partners of the Union have joined the EU-led process setting global standards for 5G and the Internet of Things. Europe must now lead in the adoption and standardisation process of the new generation of technology: blockchain, supercomputing, quantum technologies, algorithms and tools to allow data sharing and data usage. Concerning trade and investment, the Union will continue to address unjustified restrictions for European companies in third countries, such as data localisation requirements, and pursue ambitious goals for market access, respect of intellectual property, R&D and standardisation programmes.

The Commission has adopted on 19th April 2016 a Communication[52] setting up ICT standardisation priorities for the Digital Single Market (DSM) as part of the above-mentioned initiative on "Digitising European Industry". The Communication proposes a two-pillar plan to prioritise and deliver an efficient and sustainable ICT standard-setting for the DSM in order to address the challenges of the digitisation of the economy.

Firstly, it identifies a list of building blocks for the Digital Single Market where improved ICT standardisation is most urgent, proposing actions and a timeline in different domains (5G, IoT,

[52] See COM(2016) 180 final

Cybersecurity, Cloud and Big Data). Secondly, the Communication proposes a high-level political process to deliver and ensure leadership through standards, fostering commitment from a broad stakeholder base, including industry, standard-setting organisations, and the research community, as well as EU institutions and national administrations.

Generally, a necessary requirement in order to set successful standardisation policies is to accept and foster transparency among countries, in every subject and especially on the vast Web. This is the overall mission of the Next Generation Internet[53] (NGI), a European initiative that aims to re-imagine the internet for the third millennium and beyond. The European Commission's Unit E.3 is the centre of competence for Next Generation Internet and it predicts that the Information Age will be an era that empowers every user. Therefore, the Unit – and the overall European Union – wants to improve human potential, mobility and creativity at the largest possible scale, while dealing responsibly with our natural resources. The NGI will drive this technological revolution and ensure the progressive adoption of advanced concepts and methodologies spanning the domains of artificial intelligence, Internet of Things, interactive technologies and more, while contributing to making the future internet more human-centric.

The European Commission required a study to develop its vision for the initiative. The report on the study "Next Generation Internet 2025" was published in October 2018[54], and the main takeaway is that the NGI will require an enormous amount of coordination, very careful engineering at different levels of technology, rigid quality assurance and solid integration, just like the famous technology race to put the first person on the moon.

Upgrading Internet technology and services to a next generation while continuing to carry the weight of the global economy is probably the single largest collaborative effort in the history of technology. Clearly, the scale of this operation requires a long-term vision – and to be honest, a lot of persistence, adequate mechanisms to commit the right human talent, political determination and even a streak of luck. NGI has the potential to transform today's internet into the internet we expected in the first place. An internet that is itself robust and safe to use, that meets our collective needs, allows for diversity and growth, and reflects our core values. The NGI should develop the actual technology and tools that deliver those requirements.

[53] The NGI Initiative
[54] doi:10.2759/49503

4.4.3 European Commission's Communication of 19.02.2020: Key actions for the international dimension

Following the 2018 European Commission Digital Strategy[55], which envisioned a digitally transformed, user-focused and data-driven Commission, the Union is working on a "Global Digital Cooperation Strategy", forecasted for next year. The new project builds on European experiences in terms of technology, innovation and resourcefulness and it will put forward a European approach to the digital transformation that will mainly project EU values onto the international stage.

European international efforts will also reflect the EU's work in Africa and elsewhere with respect to the UN SDGs and the "Digital4Development[56]" policy. Moreover, a Digital for Development Hub will promote EU values and mobilise Civil Society Organisations (CSOs), financial institutions, expertise and technologies in digitisation.

Finally, the Commission is carrying out a mapping of opportunities to promote the European approach in bilateral relations and multilateral fora (Q2 2020).

4.5 Inclusion, Open-Government, Health

The last section of this chapter will investigate three important aspects of any well-functioning democracy – inclusion, (Open)government, health – and the impact that the digital revolution, and consequently the new Commission's digital strategy, will have on them among the EU Member States and the European Union community as a whole.

In his *Poliarchy*, Robert Dahl in 1971 stated that a key characteristic of a democracy is the continuing responsiveness of the government to the preferences (and nowadays we would say necessities, such as a well-functioning health system) of its citizens, considered as political equals. More importantly, in the eyes of Dahl, all full citizens must have unimpaired opportunities to formulate their preferences; to signify such preferences to other citizens or to the government by individual and collective action; to have their preferences weighed equally in the conduct of the government (with no discrimination of content or source of the preference).

[55] See COM(2018) 7118 final.
[56] See SWD(2017) 157 final.

This surely brings up the absolute relevance of the concept of participation and inclusion in any open, fair, diverse, democratic, and confident society – the kind that the EU tends to promote.

4.5.1 Digital Inclusion for a better EU society

As a first step, in order to guarantee digital inclusion for a better European society is necessary to make a heartfelt effort to ensure that everybody can contribute to and benefit from the digital economy. That is to say, help everyone move from not only full, but especially towards fulfilling lives. Indeed, within the European Union, the Commission supports different activities which make possible digital inclusion, such as: accessible Information Communication Technologies, which makes ICT more accessible for all and develops new methodologies for technological progress; assistive technologies, which provide the development of ICTs that support people with disabilities; skills and digital skills, which aim at fighting marginalisation and social exclusion and/or disinformation; social inclusion, which tends to increase the participation rate of disadvantaged people in public, social and economic activities.

A heavy concern for any agent in society, social exclusion is a widespread and growing phenomenon which carries with it a series of deteriorations in life paths like poor health, poor lifelong earnings and an increased risk of marginalisation. Tackling inequality will make our societies fairer and our economies stronger, and this is true in general, but always more important when dealing with digital innovations. There are many who are currently excluded from digital benefits for reasons of low income and education, location, culture, gender, age, trust and confidence levels or various disabilities.

In fact, too many Europeans never use internet either because they do not have a computer or it is too expensive, or they find it too difficult or not so relevant to connect digitally. An important factor is the type or level of cognitive or physical disability that prevents those affected to use ICT and Internet, and therefore, to stay informed in a digitalised world.

To this purpose, there are a number of EU funded projects that address especially the needs of disabled people. The European Commission's actions particularly address people with physical and cognitive disabilities, youth and the NEETs (Not in Employment, nor in Education or

Training), the economically inactive, immigrants and particularly the elderly through the 2014 Active and Assisted Living (AAL) Programme[57].

Needless to say, the internet is an essential way to access and provide information and services. So, web accessibility allows everyone to understand, navigate and interact with the Internet due to the rapid growth of information and interactive services provided on the web in the last years. Some examples could be online banking and shopping, but also keeping in touch with friends and relatives all over the world. Thus, the lack of web accessibility and/or technological impasse causes the exclusion or partial exclusion of many people from society.

Web accessibility is not only about technical standards, web architecture, user-friendliness and design. It is an issue of political will and of moral obligation, enshrined especially in the 2006 United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), to which the EU and its Members States are party, and that affirms, in particular, that appropriate measures must be taken to guarantee access for persons with disabilities, on equal basis with others, to information and communication technologies, including the Internet.

That is why, to build a social and inclusive European Union, the Commission's Web Accessibility Directive[58], in force since 22 December 2016, provides people with disabilities with appropriate access to the websites and mobile apps of public services, ensuring them with a full and active part in the digital economy and society. To help stakeholders implement this Directive, MS need to promote web availability by encouraging training programmes, by raising awareness among citizens and by taking measures to facilitate accessibility for all websites and mobile applications.

Finally, on the 2019 Global Accessibility Awareness Day, an awareness day focusing on digital access and inclusion for those with disabilities and impairments, the EU published an infographic presenting different situations that they encounter every day. In order to promote digital inclusion, the EU has taken measures in electronic communications, digital public services, audio-visual media services, ebooks, eCommerce and ICT equipment.

[57] AAL Programme

[58] See Directive (EU) 2016/2102

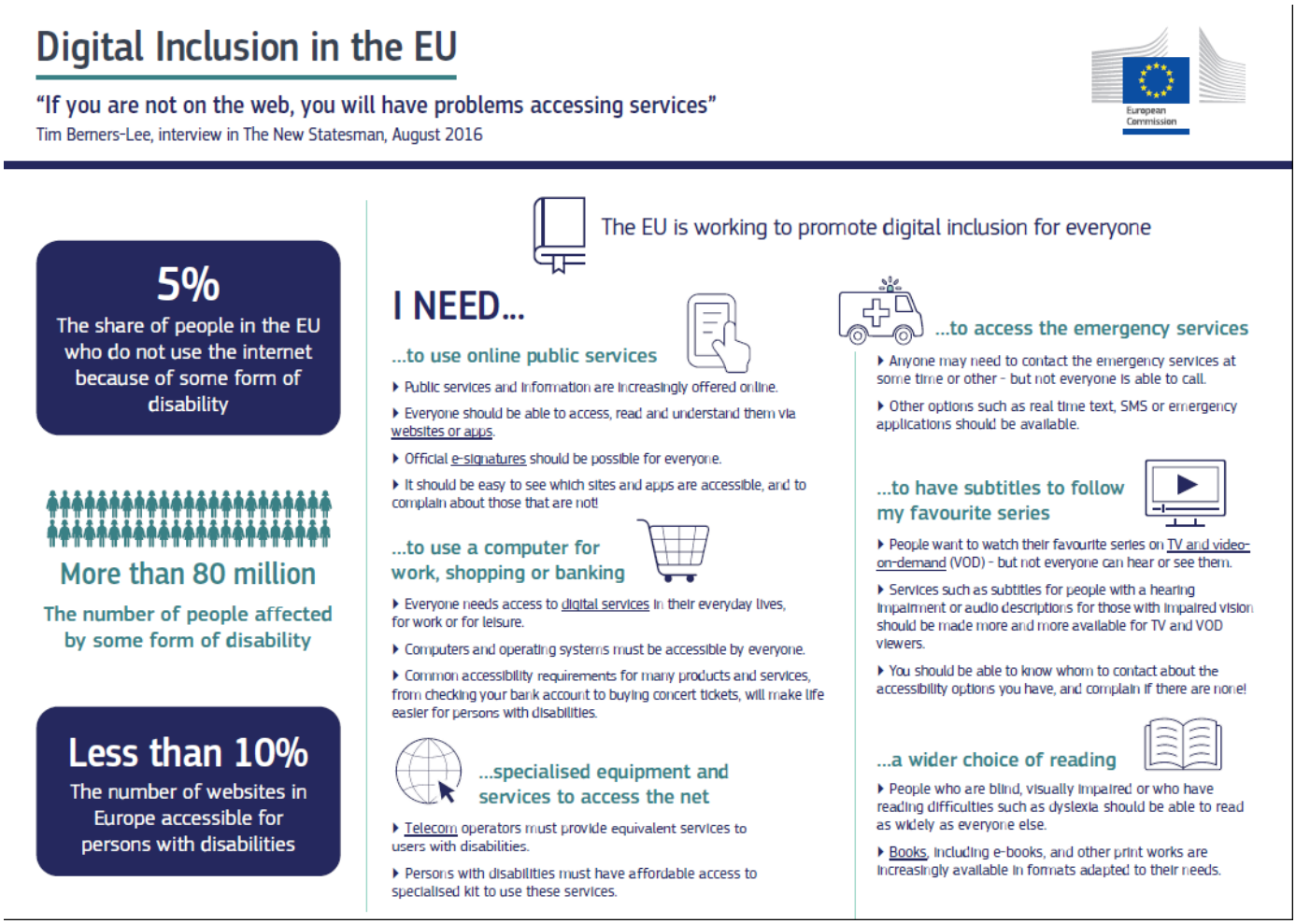

Figure 27. European Commission. 2019. Digital Inclusion in the EU – infographic.

Another measurement of inclusion for a society and especially for what concerns the digital development process of the European Union is the participation rate of women in ICT and the role they play in tech companies or digital activities. Overall, increased participation of women in the tech sector will boost the economy and allow for their full participation in society. At the European level, different Commission's initiatives encourage and empower women to play a more active role in the digital age. Among other initiatives at the European level, we recall the "No Women No Panel" Campaign, a movement with a goal to raise awareness on having gender balance in panels and public events, which is inspired by the *BrusselsBinder*[59], a database of female experts and a platform for women experts to connect.

Actually, contrary to common belief, fewer women are interested in participating in the digital sector, be it higher education, jobs or entrepreneurship. The Commission's study "Women in

[59] The Brussel Binder

the digital age"[60], carried out in 2016 and published in 2018, confirms this trend. The study reports that only 24 out of every 1000 female graduate on an ICT related subject, and only six choose to work in the digital sector, a trend that is even decreasing compared to 2011.

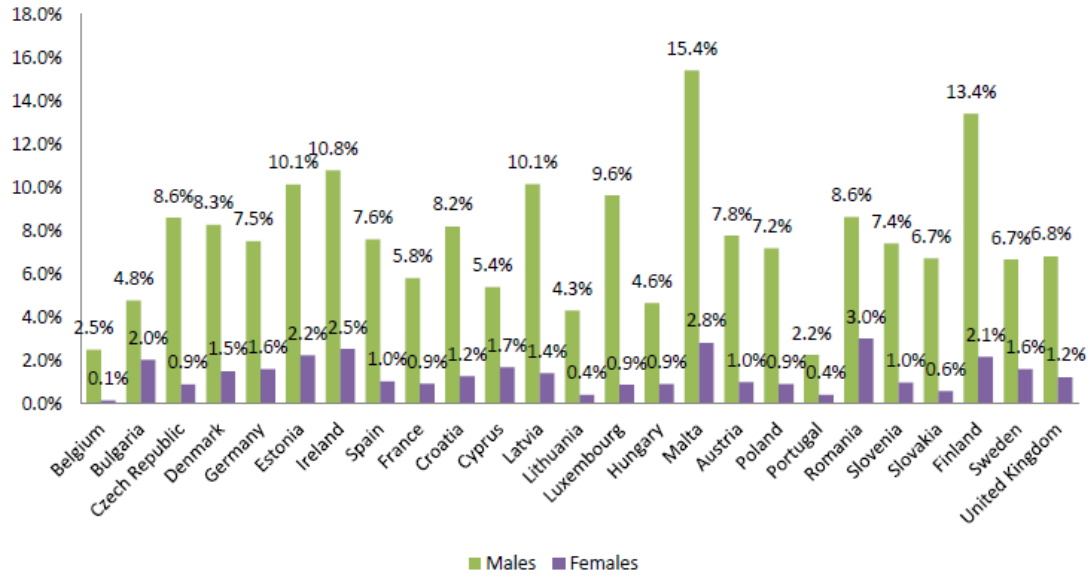

Figure 28. Eurostat. 2017. ICT graduates out of total graduates in 2015 by sex and country

In view of the findings from the study, the Commission outlined a strategy to increase women's participation in the digital sector, focusing on challenging digital gender stereotypes, promoting digital skills and education and advocating for more women entrepreneurs. The achievement of such goals is supervised through the Commission's Women in Digital (WiD) Scoreboard[61], which monitors women's participation in the digital economy. The scoreboard assesses Member States' performance in the areas of Internet use, Internet user skills as well as specialist skills and employment. Even though more people are going online, almost half of the European population have insufficient digital skills for today's work environment. Indeed, the skill gap persists at a time when more ICT specialists are needed than ever before. For example, as of 2020, the Women in Digital (WiD) scoreboard is an integral part of the Digital Economy and Society Index (DESI), and, for example, the latest data show that Italy ranked 25th out of 28 Member States.

[60] SMART 2016/0025. DOI: 10.2759/526938

[61] European Commission. WiD Scoreboard

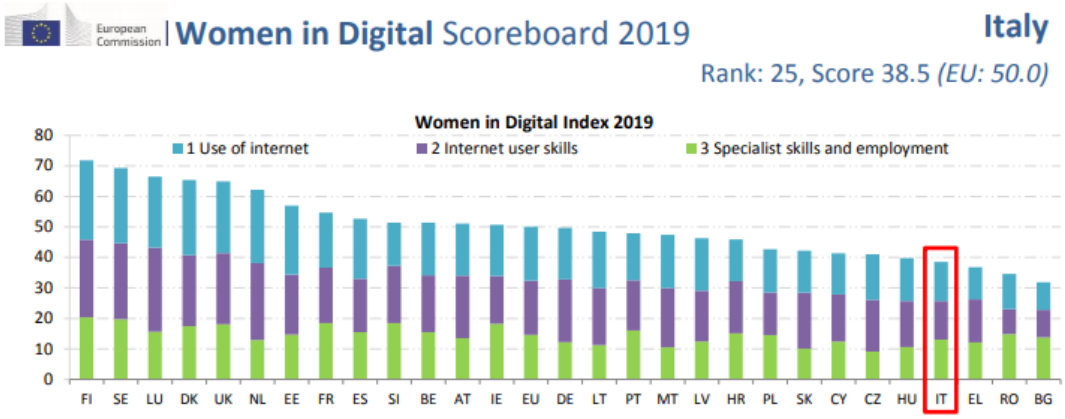

Figure 29. European Commission. 2019. Women in Digital Scoreboard - Italy

Finally, in order to respond to this gender gap, and to encourage women to play an active and prominent role in the digital and technology sectors, twenty-seven EU ministers and Member States' representatives plus Norway signed the Declaration of commitment on Women in Digital[62] at Digital Day on 9 April 2019. The aim of the Declaration is to raise the political priority of women's under-representation in the digital economy. Actions to take are: to encourage the media to create a positive public image of women in ICT; to establish a Europe-wide Girls & Women in ICT Day to take place on the same day across the EU; to promote a non-discriminatory work culture in companies; to advance compositional balance, where possible, of men and women in national and European bodies.

4.5.2 eGovernment & Digital Public Services

Digital administration, or electronic government (e-Government), has been described as the use of the Internet by government institutions as a means of communication with citizens, businesses and between different sectors of the administration (Duni, 2007; Mancarella, 2009). e-Government is embedded in combinations of political conditions as well as cultural, technological and organizational changes designed to support and drive a profound transformation in government units. A well-organized eGovernment can provide an extensive variety of benefits including more efficiency and savings for governments and businesses, increased transparency, and greater participation of citizens in political life.

[62] WID DD3 Declaration_Signed.pdf

In general, the e-Government concept covers four domains: e-Administration, e-Government services, e-Democracy and e-Governance. The four realms aim at improving government processes at a faster pace and at lower costs by using ICTs, delivering government services electronically, enhancing transparency and democratic decision making and deploying and enforcing policies, laws, and regulations necessary for developing cooperation, networking and partnerships between government units, citizens and the business (Duni, 2007). Here, it is fundamental to stress the difference between e-Government and e-Governance: the former is a system, whereas the latter is a functionality. e-Government means the use of ICT in government operations, as a tool to improve government; differently, e-Governance foresees the use of ICT to transform and support functions and structures of such system.

Nowadays, taking inspiration from the entrepreneurial world, ICTs are widely used by government bodies, but eGovernment involves rethinking organisations and processes, and changing behaviour so that public services are delivered more efficiently to people. Moreover, cross-border Digital Public Services allow achieving the DSM: in the European Union's internal market, people are able to move freely – either for work or for private reasons – so they need to be able to deal easily with public services (such as personal documents, tax claims, company registration or VAT) outside their home country.

Finally, the European eGovernment Action Plan 2011-2015[63] was designed to support the transition of government into a new generation of open, flexible and collaborative unified eGovernment services at local, regional, national and European level. The new eGovernment Action Plan 2016-2020 foreseen by the Digital Single Market Strategy aims to remove existing digital barriers to the DSM and to prevent further fragmentation during the modernisation of public administrations. Therefore, as part of its strategy for a connected continent, the Union is taking concrete actions for the development of Cross-border Digital Public Services. These include the creation of European interoperable platforms such as a common framework for citizens' electronic identity management (eID), eProcurement, eBusiness, eHealth and eJustice to engage public authorities, service providers and research centres across the EU.

[63] See COM(2010) 743 final

Figure 30. European Commission. 2016. European eGovernment Action Plan 2016-2020

On a more practical level, European policies have focused on three policy domains: policies on access to information, transparency and accountability; participation and empowerment policies; digital market policies and economic growth. In fact, eGovernment is strictly related to the topic of open government. Here, we deal with open, collaborative and digital based services characterised by a deliberate, declared and purposeful effort to increase openness and collaboration through technology to increase public value. In this sense, open government empowers, but also gives responsibility, to all actors in society – from politicians and public servants to civil society organisations, businesses, and individual citizens. That is why open *government* is based on the principles of transparency, collaboration, and participation; all functioning within an open *governance* framework (Mancarella, 2010).

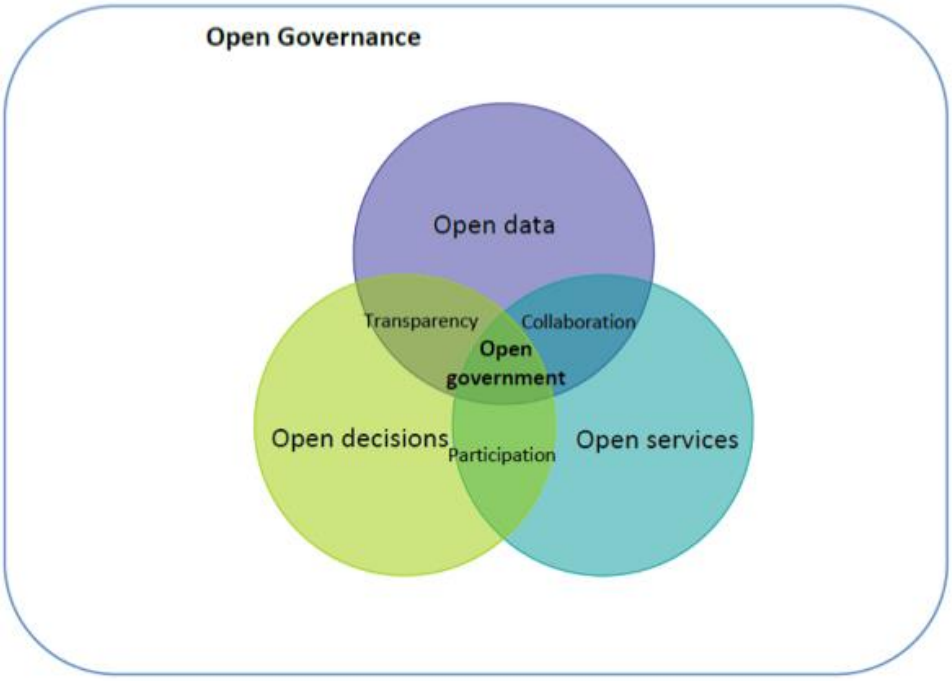

Figure 31. European Commission. 2014. Key dimensions of open government

The 2014 study of the value of new generation of eGovernment services[64] identifies three overall types of open eGovernment services: human services, which refer to services to citizens that provide concrete support, such as health, education, and culture; administrative services which includes services that are compulsory and necessary to the functioning of government; and participatory/policymaking services which refer to the open, participatory decision-making services. Moreover, the study recognises three key enablers for open government: Authentic sources and open data, reusable or shared solution building blocks, and standards and technical specifications. Finally, the study identifies both the drivers and the barriers for open government. The former are democratic values and better quality of service that enhances transparency of government, participation in policy making, and the collaboration on public services, while the latter are well-known barriers such as lack of leadership and financial resources, resistance to change and legal constraints.

To conclude, the key to success for an open government initiative often depends on the environment and the context. The centralisation and the trust that society has in its governments are probably the most important factors to take into account, yet there are some common policy objectives such as adjusting the institutional framework and designing clear incentives that are worth keeping in mind.

[64] SMART 2014/066

4.5.3 Transformation of Health and Care in the Digital Single Market

The European Commission is working to provide its citizens access to safe and top-quality digital services also in health and care.

The recent, rapid and constant influence of the digital world on our society and habits requires a fundamental rethinking of our public health and social care systems as well. The systems should be purposefully designed and implemented in a cost-effective way, while the MS ensure that they remain fit-for-purpose. This means there is the necessity for arrangements which aim to continue to promote health, prevent disease and provide patient-centred care that meets citizens' needs, both at home or in the work place. Therefore, as any social structure influenced by this global, digital progress, even health and care systems need reforms and innovative solutions to become more resilient, accessible and effective in providing quality care to European citizens on a daily basis.

Digitisation can support the continuity of care across borders, an important aspect for those who spend time abroad for family, business or leisure purposes. Digital tools can help citizens remain in good health, thus ensuring that they do not become patients. They also have the potential to enable a better use of health data in R&D to deliver better diagnosis and treatments as well as to support personalised healthcare. As we mentioned, data is a key enabler for digital transformation. Health data may be available in various forms and languages, and it is not managed in the same way in all EU Member States or within national health systems. Given this organizational obstacle, health systems lack key information to optimise their services and to support cross-border use of health services. As a result, market fragmentation and lack of interoperability across health systems stand in the way of an integrated approach to disease prevention, care and cure responding to people’s needs.

Health and care authorities across Europe face common problems which require common solutions. To this end, the Commission has been working with the MS, regional authorities and other stakeholders to develop innovative solutions, while providing its support through funding and actions that promote policy cooperation and exchange of good practice, for example through the 2014 programme, *Horizon 2020*. This is the biggest EU research and innovation programme ever. It will hopefully lead to more breakthroughs and discoveries and by developing innovative great ideas. Private and public funds are available over 7 years, from 2014 to 2020 (EC, 2014b).

As a final remark, in line with the DSM strategy, the Commission published in 2018 a Communication on Digital Transformation of Health and Care in the Digital Single Market, empowering citizens and building a healthier society[65], driving EU activities in this field for the coming years. The Communication identifies three priorities aiming at improving Europeans' well-being.

The first priority involves directly the people: citizens shall be provided with secure access to their health data, also across borders within the Union, thus enabling residents to access their health data across the EU. The second priority foresees the development of personalised medicine through shared European data infrastructure, therefore allowing researchers and other professionals to gather resources (data, expertise, computing processing and storage capacities) across the EU. Finally, the third priority focuses on citizens' empowerment through the use of digital tools for feedbacks and person-centred care, where the main goal is to use digital devices to empower people to look after their health, stimulate prevention and enable feedback and interaction between users and healthcare providers.

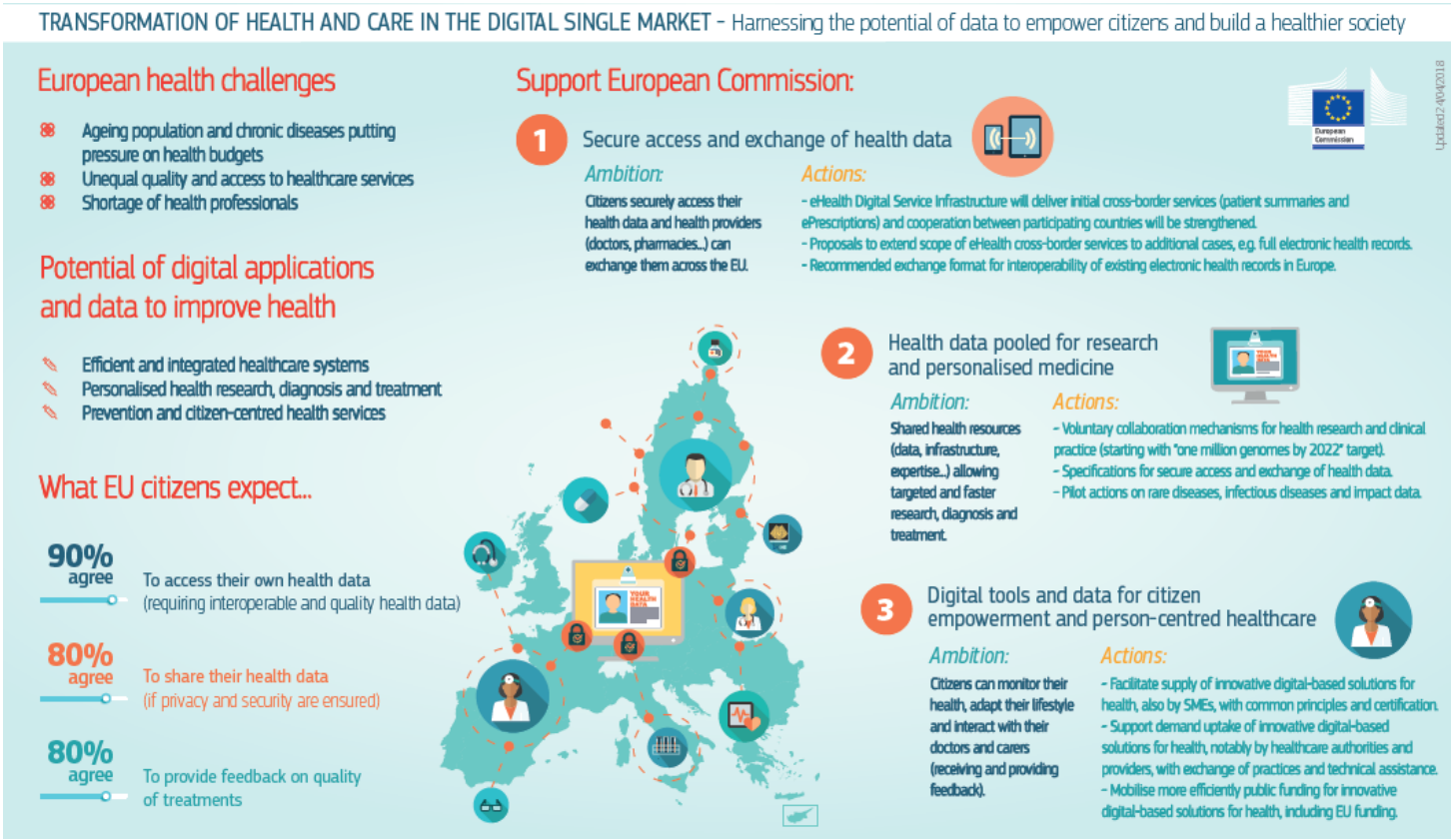

Figure 32. European Commission. 2018. Digital Health and Care: infographic.

[65] See COM(2018) 233 final

Conclusions

Throughout this chapter, we observed the three-pillars-structure of this 2020 European Commission's digital strategy, *Shaping Europe's digital future:* Technology that works for people; A fair and competitive digital economy; An open, democratic and sustainable digital society. Within each section we analysed some relevant elements and plans made by the Commission explaining how and why the Union decides to act in order to foster its digitalization process. Moreover, peculiar to each section is the presentation of the key actions taken by the EU in order to implement the respective pillar. Then, we saw that the Strategy further presents a fourth section, which is not a pillar *stricto sensu,* but it is equally relevant to the Commission and fundamental for a successful implementation of all the previous segments, that is to say, the vision of Europe as a global digital player. Lastly, as the daily importance of these topic is continuously expanding, a final examination of a fifth section has been added to this chapter, where we analysed the role of digitalization in three particular EU realms: Inclusion, Open-Government, Health.

"It would not be foolish to contemplate the possibility of a far greater progress still". –
John Maynard Keynes, *Economic Possibilities for our Grandchildren,* 1930[66].

5 Concluding remarks

If we come to endorse the Aristotelian concept of the *Zoon politikon* (IV sec. B.C.), that is to say, literally, that man is a "civic" animal, a citizen-animal, we would convey that men (i.e. mankind) cannot live by themselves and it will prove them necessary to interact and, therefore, communicate. The famous expression is sometimes mistakenly translated as a political animal, but the adjective politikon is derived from the ancient Greek word polis, which actually means city. However, more generally, man is considered a social animal in Aristotelian terms. In fact, all individuals need to live together in groups, communicate and accept that they are part of the same, shared world. Thus, we posit communication at the very basis of people's lives and of their survival on earth.

Communication is the first tool we have at our disposal to connect with each other, exchanging basic codes of conduct, values, symbols, preferences, opinions and beliefs. When joining together, people build communities of mutual respect in the interaction of its members. The community will not reduce the essence of all individuals to some homogeneous quality common to all, but the group will highlight every personal characteristic by confronting each of them with the others, establishing relations of natural sociability within its members and efficiently developing everyone's skills and attitudes in order to bring novelty, growth and added value to those given groups and communities. Such social groups will eventually grow stronger and more united, and people will be more likely to cooperate in difficult circumstances while shaping their identities. For example, the world recently witnessed with the coronavirus pandemic how the stress of disaster brings people together, uniting individuals in despair while hoping for collective solutions.

The current global spread of the COVID-19 has not only challenged our health and economy, but our democracies as well. As the world took emergency measures to address the crisis, concerns began to emerge that some countries might take advantage of the situation to roll back civil and human rights. Coronavirus is also highlighting and aggravating structural

[66] John Maynard Keynes. 1930. *Economic Possibilities for our Grandchildren.*

inequalities – from inadequate health systems to social protection gaps, digital divides and unequal access to education; from environmental degradation to racial discrimination and violence against women – that are themselves threats to democracy. Since the beginning of the COVID-19 crisis, many countries have used the emergency as a justification to restrict democratic processes and the civic space. Indeed, the pandemic has come accompanied by a global info-demic that poses a direct threat to one of the columns of democracy: the right to access truthful information, because new forms of manipulation of information and electoral and democratic processes have emerged and were exploited by some through by digital technology and social media. Nonetheless, crisis can also be an opportunity to move ahead. Moments of destruction will eventually lead to improvements. In fact, in times of despair, governments have also improved their control over the quantity and quality flow of information in order to avoid the spreading of disinformation and "fake news", aggressive cyber-policing and sometimes some conspiracy theories. Moreover, thanks to the instant diffusion of digital photos and personal stories through social media, doctors and healthcare workers became national and international heroes, restoring faith in human capabilities, empathy and resilience.

Indeed, digital technologies, as advanced as they may be, are just a tool. They cannot solve all of our problems. Yet, it is undeniable that they are making possible things which were unthinkable (at least) a generation ago. However, as we repeatedly tried to underlined throughout this work, the key to success lies in the empowerment of people, and the consequent use they make of these tools. More than ever, it is true that “if you are not at the table, you are on the menu”, meaning that if you are not represented at the decision-making table, if you do not have the (digital) skills required by today’s society to prosper, you are in a vulnerable position, you get left out, or, worse yet, “you are on the menu”. Indeed, people’s empowerment, improved capabilities and their independence is fundamental for societies’ successful development.

That is why, the purpose of this thesis was to analyse to what extent the world community, and in particular the European society, is affected by the phenomenon of digitalization, and how we can move towards a smarter globalized era. Before focusing on this new digital European project – the 2020 strategy called *Shaping Europe's digital future* –, in the first part of this thesis, we investigated the world’s digital background, that is to say, we observed how the digital revolution has come to be the backbone of the latest, hybrid era in which we are now currently living, a mixture of the Information Age and the Digital Era. To this regard, we

underlined the relevance of the new Information and Communication Technologies (ICTs), while witnessing how people and countries have come to accept and acclimatise to this digital reality, one where a global revolution embraces local adaptations, with the presentation, for example of a peculiar phenomenon called "glocalization". Finally, we considered digitalization not as technological phenomenon, but rather as a social one, and the consequences it has on communities and on new sciences, such as digital anthropology.

In the second part of this work, from the digital revolution we went towards one of the major concerns in development theories brought by this digital novelty, that is to say the phenomenon of the digital divide. We highlighted the fact that what is known is gold, meaning that in today's society, the more you (i.e. people, governments, organizations) know, the more you are a valuable asset in the social order. Basically, the more you will economically and socially develop, given that today information, communication and digital adaptations are source of income and independence. Indeed, we tried to define an evolving concept such as the digital divide, and then observed to what extent globalization has affected or has been affected by the world digitalization, with a short focus on different regions of the world. Moving on, we witnessed how social and economic inequalities are strongly related to information inequalities, stating that in reality it is a matter of (or better, lack of) opportunities. To this regard, in the final section of this second part we pointed out some observations, and attempts, about closing this world gap of digital opportunities.

Finally, we arrived to the core of this work and we presented, as mentioned, the European Commission's strategy for a digitalization process. Of this new European policy, we studied its structure, how it is built on three main pillars – technological, economic and social implications for the well-being of European citizens – and the key actions foreseen for the achievement of each of these priorities. Concerning the first pillar, in order to highlight the fact that the Union is fostering a technology that works for people, we focused especially on the undeniable relevance that both material and artificial digital forces have on human lives, but then we also underlined the fact that human capital is the most important asset to invest in. Later on, concerning the second pillar, in order to highlight the fact that the Union is building a fair and competitive digital economy, we observed the functioning of digital platforms and the important role of data, then we presented the European efforts to established a well-digitalised European industry and concluded with the presentation of the DESI, a composite index which measures digital, economic and social performance of MS, with a national focus on Italy.

Finally, concerning the third pillar, in order to highlight the fact that the Union is promoting an open, democratic and sustainable digital society, we discussed about the constant European fight against disinformation and the efforts made to develop a truly inclusive, Smart Union.

Subsequently, the analysis of the Strategy followed the text itself of the Commission's Communication (EC,2020c) and we dedicated a fourth section to the role of the European Union as a global digital player, focusing on its foreign policy, standardisation rules and digital key actions. Finally, we concluded this work by observing the Union's efforts in addressing inclusion, health and governmental digital issues in order to improve people's lives. We saw how the EU promotes digital inclusion for a better EU society, how it is working along with MS to improve the mechanisms of eGovernment and the deployment of digital public services, and finally we observed some steps towards the transformation of Health and Care in the Digital Single Market. Generally, this last section has presented the path taken by the EU in order to transform this political, unitarian entity in a cutting-edge, digitally-innovative European Union.

Overall, it could be argued that the success of Europe's new digital strategy will be measured in how well we are able to put digital tools to work in delivering public goods to European citizens. This is a European approach to social and economic digital transformation, even with international dispositions, which demands and fosters the empowerment and inclusion of every citizen, while strengthening the potential of every business, and meeting global challenges with European core values. In fact, the data-agile economy and its enormous transformative potential will affect all of us and Europe stands ready to make full use of the advantages it will bring. Yet for this digital transformation to be fully successful, we will need to create the right frameworks to ensure trustworthy technology and to give businesses the confidence, competences and means to digitalise.

Coordination of efforts between the EU, Member States, regions, civil society and the private sector is key to achieving this and strengthening European digital leadership. Europe can own this digital transformation and set the global standards when it comes to technological development. More importantly still, it can do so while ensuring the inclusion and respect of every single human being. The digital transformation can only work if it works for all and not for only a few. It will eventually be a truly European project – a digital society based on European values and European rules – that can truly inspire the rest of the world.

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7. Summary

One of the key aspects defining the historical character of the 20th century was the revolution in communications technology and digital developments that made the world a smaller place, sometimes threatened the power of governments and other institutions that traditionally controlled ideas, and created entire new methods of economic production. The television, the Internet, cellular phones and digital computers are part of a longer list of communication technologies that did not even exist in the last century, especially at the beginning of the 1900. However, by 2000 it was difficult to conceive of a functioning, innovative world without them, and by necessity, an ever-connected international society was created by these new technologies. New digital innovations required a reconsideration of the very concept of "community", where the old notion of communities being associated to geographic location began to be replaced by communities linked by interest regardless of where their members might be on earth. In this regard, new challenges were posed, especially those of regulating such technologies and devising and enforcing rules for how they should be used.

This thesis aimed at analysing to what extent the European community will be affected by the phenomenon of digitalization over time, and how it decided to deal with it. In fact, there is a new European project aiming at a digital transformation that will benefit everyone, a new European digital strategy: *Shaping Europe's digital future*. This is an approach to social and economic digital transformation, even with international dispositions, which demands and fosters the empowerment and inclusion of every citizen, while strengthening the potential of every business, and meeting global challenges with European core values. However, before focusing on this digital European project, in the first part of this thesis, we studied the changes brought by the digital revolution, the third industrial revolution of human history. Then, we moved towards one of the major concerns brought by this digital novelty in development theories, that is to say the phenomenon of the digital divide, trying to highlight the fact that what is known is gold. Personally, this means that nowadays, the more you know, the more you are a valuable asset in society. Basically, since information, communication and digital adaptations today are source of income and independence, the more you have access to them, the more you will economically and socially develop. Finally, we studied the structure, pillars, key actions and plans of the 2020 European digital strategy, which aims at the improvement of people’s lives, transforming this political, unitarian entity in a cutting-edge, digitally-innovative European Union.

Overall, the first chapter of this thesis has focused on the impact that both the Third Industrial Revolution (also known as the digital revolution), and the more recent Fourth one, have had on different aspects of people's lives. First of all, we have underlined how the use of the term "revolution" is not accidental, but rather it was chosen to highlight the parallel idea of the colossal social changes previously brought about by the agricultural revolution and the industrial revolution. Once the relevance of the concept was outlined, we moved towards the presentation of the era in which we live this revolution, something we call the Information Age, which is strictly connected to the Digital Era. We argued that if the Information Age is characterized by the speed and amount of data circulating globally, producing new benefits socially and economically speaking, especially thanks to the new technologies, the Digital Era can be seen as the development of an evolutionary system in which knowledge turnover is very high and also increasingly out of the control of humans (some content is chosen and displayed for us even when not requested). However, we argued that we are living in a hybridization of the two eras: Information management is crucial in all aspects of the new digital economies and global revolutions and it is moving towards the intersection of the digital and the physical – the bits and the atoms. From this standpoint, we made a further step towards some technical explanations of the "driving wheels" of this digital revolution, all the technological innovations known as Information and Communication Technologies (ICT). Subsequently, we discussed about globalization in correlation with information, digital and cultural content. Indeed, we argued that the rapid globalization, and the resulting immediate sharing of information during the digital era, has brought about two phenomena: homogenization and heterogenization. The former explains how a local culture becomes more like another (usually the “dominant” one), while the latter consists of local values living in concomitance with other communities’ values, but emphasising the local culture, making it more diverse. In our thesis, the general hope is that the Information Society becomes an open and multi-cultural society which will promote, rather than disrespect, the expression of different cultures. In this regard, we presented the phenomenon of *Glocalization* (a combination of globalization and localization) – the concurrent occurrence of both universalizing and particularizing tendencies in contemporary social systems. Finally, we observed the crucial focus of this work, that is to say digitalization seen first and foremost as a social phenomenon, with its ups and downs. Positively speaking, digitalization brought greater interconnectedness, easier communication and circulation of information that in the past could not circulate so rapidly and freely. Negative cases may include information overload, diffusion of fake news, Internet sociopaths, forms of social isolation, and media saturation. We concluded this chapter with a brief presentation of digital anthropology,

the new branch within the scientific study of human beings, given the strong relation and interdependence between digital innovations and human life.

In general, the potential of new technologies cannot be realized if entire segments of the population lack access to them. Even in contexts of broad access, the use of new technologies can exacerbate inequalities. For example, gaps in education can widen if new technologies improve the learning outcomes of children in wealthier households but not those living in low-income families. Consequently, reducing inequality requires the closing of the digital divide between and within countries. Thankfully, a number of countries, including some in the developing world, have made progress in extending the necessary infrastructure to rural and remote areas and in expanding education and training in the use of digital technologies, but national and international efforts are still required. Indeed, in the second chapter of this thesis, we investigated the relevance of one of the most discussed topics when dealing with development theories: the digital divide, following the belief that what is known is gold, and therefore not accessing (digital) information and skills represents both a social and economic disadvantage. We firstly tried to define such an evolving concept, since this "divide" has multiple acceptations, depending on the angle of study (a digital, economic, social, cultural, gender divide and so on). Then, by being digitalization a global phenomenon, we observed the digital divide related to globalization, with a presentation of this topic in relation to some different regions of the world: Europe, United States, Japan; BRIC; Eastern Europe; Middle East; Latin America, East and Central Asia, sub-Saharan Africa. Furthermore, we considered the issue of digital and information inequalities, where we saw how the whole discussion of the digital divide actually turns around a different divide: there is a high degree of inequality, a gap of opportunity of access and skills, which eventually cause all the other divides. Finally, we investigated such gap of digital opportunities, underlining in this regard the current situation faced under the coronavirus crisis, and enumerated some of the efforts made to narrow this divide, especially in the international realm and within the framework of the new UN Sustainable Development Goals (SDGs).

Finally, in the third chapter, we arrived to the core of this work and we presented, as mentioned, the European Commission's strategy for a digitalization process. Of this new European policy, we studied its structure, how it is built on three main pillars – technological, economic and social implications for the well-being of European citizens – and the key actions foreseen for the achievement of each of these priorities. Concerning the first pillar, in order to

highlight the fact that the Union is fostering a technology that works for people, we focused especially on the undeniable relevance that both material and artificial digital forces have on human lives, but then we also underlined the fact that human capital is the most important asset to invest in. Later on, concerning the second pillar, in order to highlight the fact that the Union is building a fair and competitive digital economy, we observed the functioning of digital platforms and the important role of data, then we presented the European efforts to established a well-digitalised European industry and concluded with the presentation of the DESI, a composite index which measures digital, economic and social performance of MS, with a national focus on Italy. Finally, concerning the third pillar, in order to highlight the fact that the Union is promoting an open, democratic and sustainable digital society, we discussed about the constant European fight against disinformation and the efforts made to develop a truly inclusive, Smart Union.

Subsequently, the analysis of the Strategy followed the text itself of the Commission's Communication (EC,2020c) and we dedicated a fourth section to the role of the European Union as a global digital player, focusing on its foreign policy, standardisation rules and digital key actions. Finally, we concluded this work by observing the Union's efforts in addressing inclusion, health and governmental digital issues in order to improve people's lives. We saw how the EU promotes digital inclusion for a better EU society, how it is working along with MS to improve the mechanisms of eGovernment and the deployment of digital public services, and finally we observed some steps towards the transformation of Health and Care in the Digital Single Market. Generally, this last section has presented the path taken by the EU in order to transform this political, unitarian entity in a cutting-edge, digitally-innovative European Union.

In conclusion, coordination of efforts between the EU, Member States, regions, civil society and the private sector is key to achieving this and strengthening European digital leadership. Europe can own this digital transformation and set the global standards when it comes to technological development. More importantly still, it can do so while ensuring the inclusion and respect of every single human being. The digital transformation can only work if it works for all and not for only a few. It will eventually be a truly European project – a digital society based on European values and European rules – that can truly inspire the rest of the world.