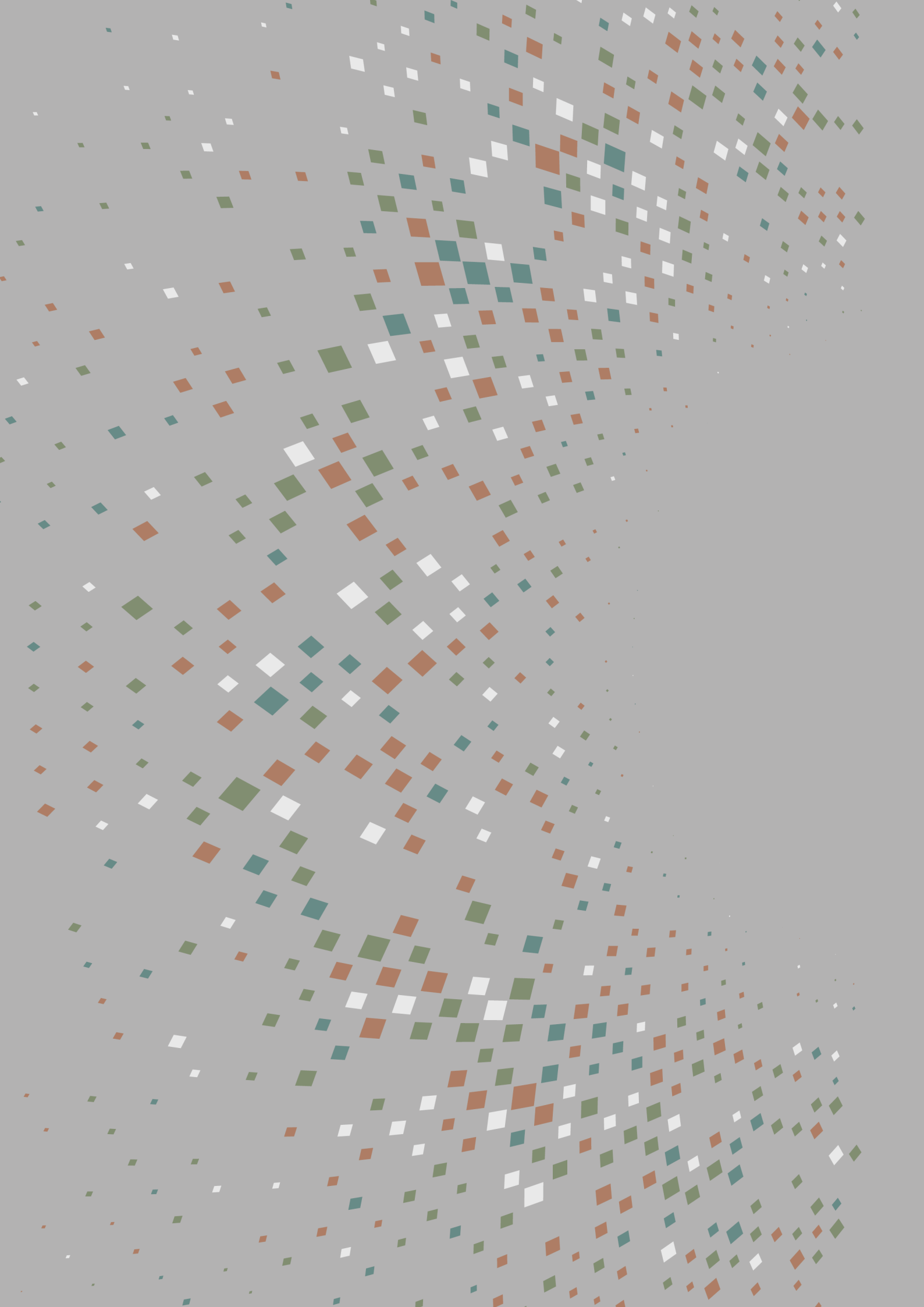




Digital Literacies and Digital Inclusion in Contemporary Brazil

BRIEFING REPORT





UNIVERSITY OF CAMPINAS
UNIVERSITY OF BRISTOL

Newton Fund Researcher Links Workshop on Digital Literacies
and Social Inclusion

Digital Literacies and Digital Inclusion in Contemporary Brazil

BRIEFING REPORT

São Paulo, 2021

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1 Presentation

Marcelo Buzato and Edward King

To debate the new context of digital culture, the Unicamp Institute for Language Studies, in partnership with the University of Bristol and funding from Fapesp and the Newton Fund/British Council, is organizing in July 2021, a workshop on Digital Literacies and Digital Inclusion in Contemporary Brazil.

The proposal focuses on the revision of the concepts “digital inclusion” and “digital literacy” currently valid in state institutions and in the third sector in Brazil. The updating of the two concepts should contemplate the current scenario of digital culture, that is, a scenario strongly marked by communication and relationship platforms, data, social algorithms, artificial intelligence, surveillance, digital populism, systematic disinformation, in addition to the occupation of civic and institutional spaces by business oligopolies.

Both the Brazilian government and NGOs have long recognized the importance of digital information and communication technologies (DICT) for economic development and the strengthening of citizenship. And while the State concentrates efforts on infrastructure and access, non-governmental entities focus on using the internet to give voice to underserved communities. Although these agendas continue to be important, they have been shown to be insufficient in the face of the new outlines of digital culture, such as, for example, exposure to misinformation or manipulation in social media by algorithmic systems and misuse of mass data, with the poorest populations being the most vulnerable.

Without an expanded definition of digital literacy that includes a critical understanding of these systems, digital inclusion will not effectively support social inclusion. The need for this change arose with particular force in the recent elections in Brazil, which were decisively influenced by social media campaigns aimed at the proliferation of fake news through social media bots and WhatsApp groups.

The event’s target audience is a group of researchers at the beginning of their careers (less than 10 years after their PhD) from the two countries involved, with the support of established researchers and specialists in the theme of each country, in order to encourage the formation of bonds of common interest for the exchange of ideas and joint research proposals that can benefit communities.

It is about promoting interdisciplinary research integrations among the participants, as well as contributing to a better social and digital inclusion in Brazil, in addition to generating guidelines for the search for funding and binational research collaborations. In the long term, the workshop will be a seedbed for collaborative projects that may take advantage of schemes to promote internationalization in the United Kingdom and Brazil. It is also expected to generate synergy between researchers, NGOs and public agents, increasing the chance of an effective social impact of the meeting.

2

Terms and concepts to be covered

Algorithms – sequence of instructions that tells the computer what to do (DOMINGOS, 2017).

Artificial Intelligence (AI) – field of study originated in computer science based on a statistical model of probability that uses data processing to become increasingly efficient, without the need for human intervention (KAUFMAN, 2020).

Big Data – term used to name unstructured data sets that require specially prepared systems (algorithms) to find, analyze and take advantage of the information generated. (GONSALES et al., 2017). It is characterized by the use of a wide variety of data types in large volumes, obtained and processed at great speed through advanced statistics and artificial intelligence.

Coding – “programação” in Portuguese, is the construction of coherent and valid algorithms for solving a problem (FREITAS JUNIOR, 2016).

Data – in Portuguese, “dados”, it is a set of information that will be processed by algorithms.

Datification – “dataficação” in Portuguese, is the collection, manipulation and representation, for “knowledge extraction”, of astronomical volumes of digital data (Big Data) about a citizen’s daily life (BUZATO, 2018).

Dataveillance – in Portuguese, “vigilância de dados”, is the practice of monitoring and collecting data and online metadata, user actions and communications (DIJCK, 2014).

Data literacies – in Portuguese, “letramento em dados”, can be defined as the ability to understand social practices based on datafication. According to the organization Data Pop Alliance (2015, p. 8, apud BUZATO, 2018 p. 85), “the desire and the ability to engage constructively in society through or about data”.

Data visualization – in Portuguese, “visualização de dados”, technique or practice arising from the confluence between computer science, statistics and semiotics. It consists of representing the statistical correlations obtained in the data analysis processes made by artificial intelligence and machine learning techniques, how to communicate these findings to the different interested audiences, how to aid in decision making (BUZATO, 2018).

Data ownership – in Portuguese, “propriedade de dados” is the act of having legal rights and complete control over a single piece or set of data elements. It defines and provides information about the rightful owner of data assets and the acquisition, use and distribution policy implemented by the data owner (AL-KHOURI, 2012).

Data commons – Co-location of data with cloud computing infrastructure that commonly uses software services, tools & apps for managing, analyzing and sharing data to create an interoperable resource for the research community (GROSSMAN et al., 2018).

Machine learning – field of study that gives computers the ability to learn to recognize and reproduce patterns from exposure to a large number of samples, without being explicitly programmed (SAMUEL, 2017). Such learning can occur in the following ways:

- Supervised - in which it is delimited for the AI what are the categories and labels of the data to be analyzed;
- Unsupervised - in which the machine needs to learn on its own what the data patterns are;
- By reinforcement - in which the machine scores positively the correct results and negatively the incorrect, adjusting the behavior to arrive at the best results.

A subfield of machine learning is deep learning, which seeks to mimic the functioning of human beings' biological neural networks, for example:

- Natural language processing, which aims to make automated processes capable of understanding human language and communication;
- Image recognition, which aims to allow machines to be able to understand and extract information from images and videos.

Open data – in Portuguese, “dados abertos”, is information that is available for anyone to freely use, reuse and redistribute to create new content, interpretations and applications, or simply consult them. It is essential that they are in non-proprietary technical formats, with licenses that allow their free reuse, by people and computers (GONSALES et al., 2017).

Open education – in Portuguese, “educação aberta” it is a historical movement that promotes equity, inclusion and quality through open pedagogical practices supported by the freedom to create, use, combine, change and redistribute educational resources in a collaborative way. It incorporates technologies and open formats, prioritizing free software; prioritizes the protection of digital rights including access to information, freedom of expression and the right to privacy (FURTADO; AMIEL, 2019).

Social network algorithms – algorithms responsible for making the posts on social networks stand out or not in other people's feeds; they rank according to the interests of users (identified from what they like, share and publish).

3 New context of digital culture

In 2011, the American activist Eli Pariser made the term *Filter bubble* world famous—or “filtro invisível” in the translation of his book into Portuguese—to designate the restricted universe of information that each person has in their online life, especially on social networks. He documented a new phenomenon of the web focused on relevance, based on the “personalization” of searches by Google, something that was quickly appropriated by all companies operating on the web, including journalistic ones.

This customization, however, happens in an arbitrary way based on the preferences and browsing habits of users, something that is almost imperceptible (PARISER, 2011). Not only do people not decide what should appear in their news feed but they have no idea what has been left out.

Pariser’s warning—ten years ago, which today seems trivial but continues to evolve—contrasts with the benevolent idea of connecting with the world that the internet brought with the emergence of the web.

Launched in the 1990s as a system that links pages accessed via the internet, *the world wide web* (www or web) is probably the most well-known application of the internet, since through it you can access most websites, platforms and social networks. One of the most important aspects of the web is that it is considered a public good, that is, a non-proprietary invention, free for all, making it possible, among other activities, to create websites without the need to resort to any type of licensing.

The study of new forms of communication and behavior generated by the diffusion of the web has become conventionally called “digital culture” or “cyberculture”. In the 90s and the first decade of the 2000s, the optimism related to the potential of the internet was always widespread in various sectors of society, including the academic one: new possibilities for connection, people being able to express themselves and receive attention for their ideas and not for the power over the means. It also eliminated the one-to-all transmission pattern, giving rise to the all-between-all model.

It is worth remembering, however, that internet access is not yet universal in Brazil. Currently there are 71% of households with access, but with strong inequality according to socioeconomic levels, as shown in the data from the ICT Households 2019 (figure 1):

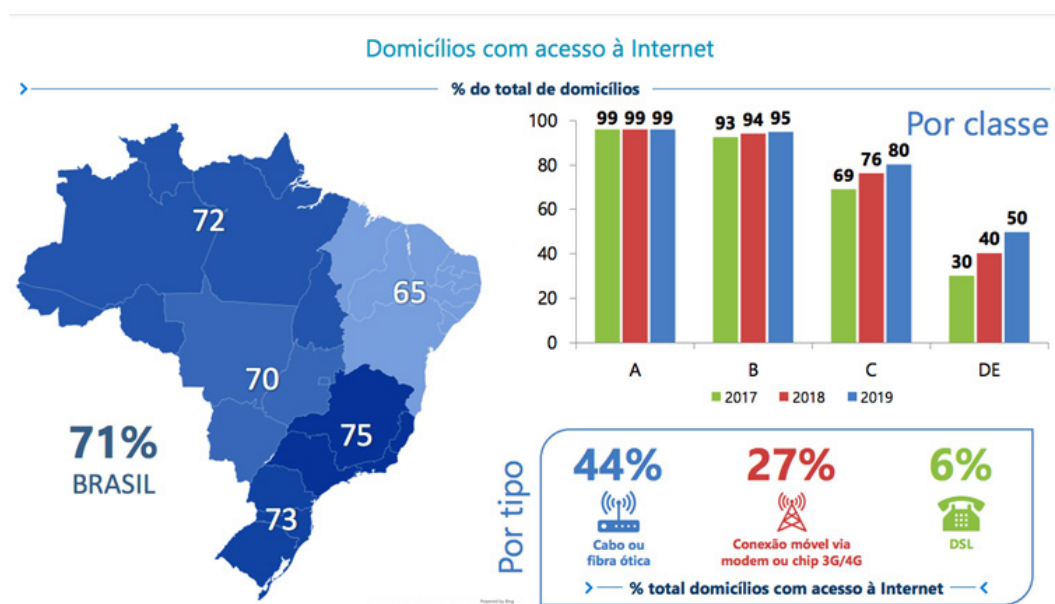


Figure1: https://cetic.br/media/analises/tic_domicilios_2019_coletiva_imprensa.pdf

The optimistic euphoria about the web, however, was not felt by everyone. In the early 2000s, Harvard professor Lawrence Lessig, one of the founders of the *Creative Commons*¹ open license system, already drew attention to a certain bleak future, as the commercial aspects began to take over the great network.

In the book *Code and Other Laws of Cyberspace*, the researcher analyses certain battles on the web, such as intellectual property, privacy, free speech and international law. He points out that the claims that cyberspace should be a free place, without regulatory intervention, are false and dangerous. Lessig already drew attention to the new architecture of the internet being traced by American companies with the silent and protectionist help of the United States government, to the detriment of the common user and other countries, such as Brazil (LESSIG, 2000).

In 2021, even though it is still possible for anyone to connect in an open and decentralized protocol, there is a dominance of access through platforms generated by large technology companies, the so-called *Big Techs*. For example, the person has a profile on a given social network and uses the same profile to be able to use any other type of service, even electronic government, without even questioning whether it is good or bad (*single sign on*).

1. <https://creativecommons.org/>

The graph of the online statistics platform, Statista², from April 2020, shows the number of users connected to the most popular social networks in the world, highlighting by color those belonging to the same company (figure 2):

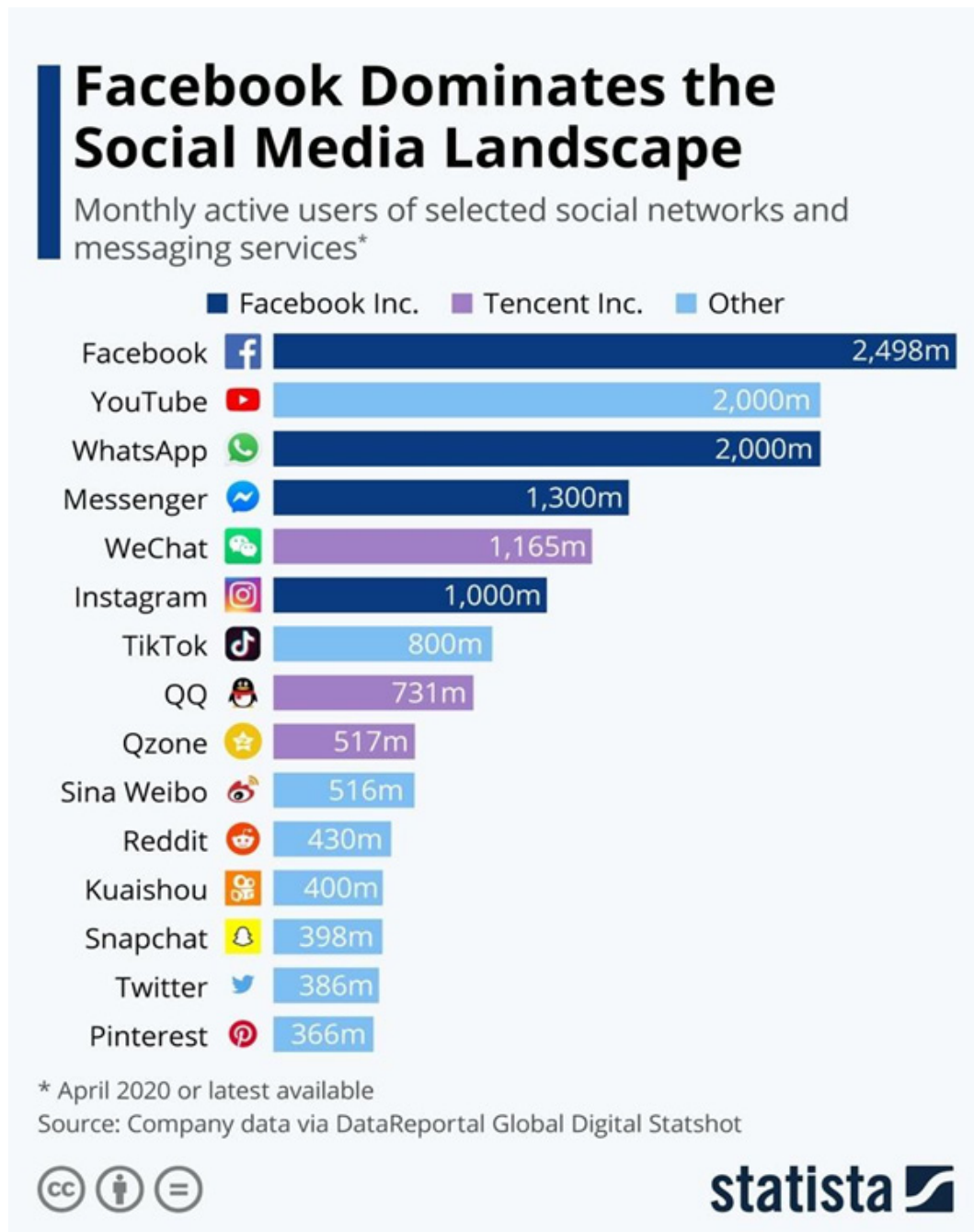


Figure 2: <https://www.statista.com/chart/5194/active-users-of-social-networks-and-messaging-services/>

2. <https://www.statista.com/>

The following image shows which social media platforms are most popular by country. It is worth noting the predominance of Whatsapp in Brazil and India (*figure 3*):

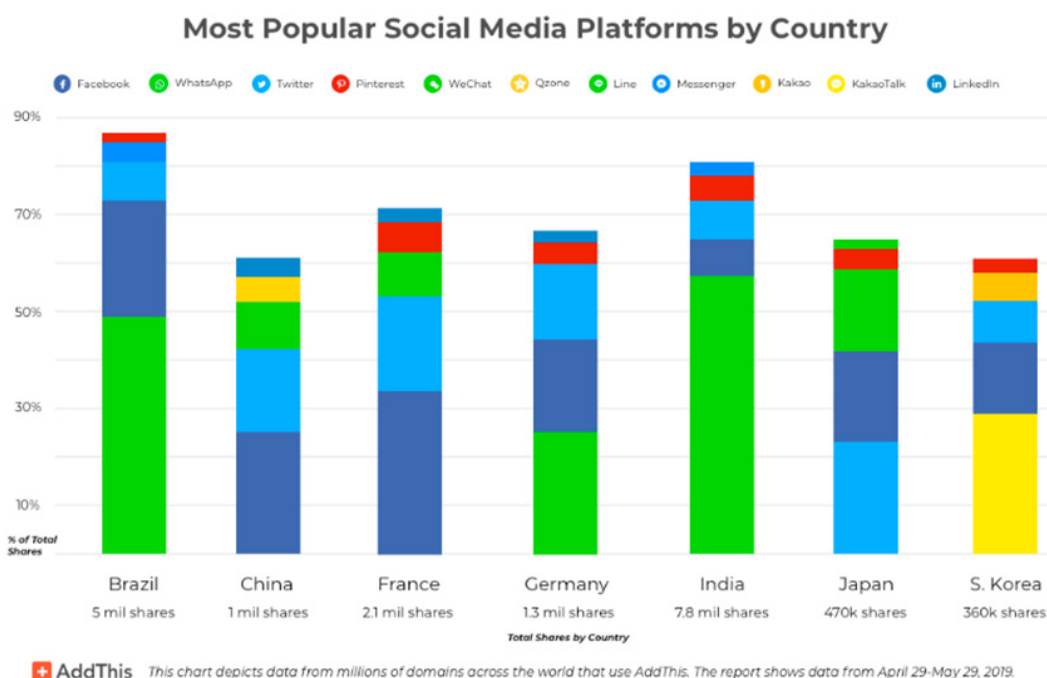


Figure 3: <https://www.addthis.com/blog/2019/06/06/most-popular-social-media-platforms-around-the-world/#.YCg5rJNKinc>

We will see below the proof of these data at a national level, by the ICT Households survey, on the main activities carried out on the internet by people who have access to the network are those related to communication and sending messages (*figure 4*):

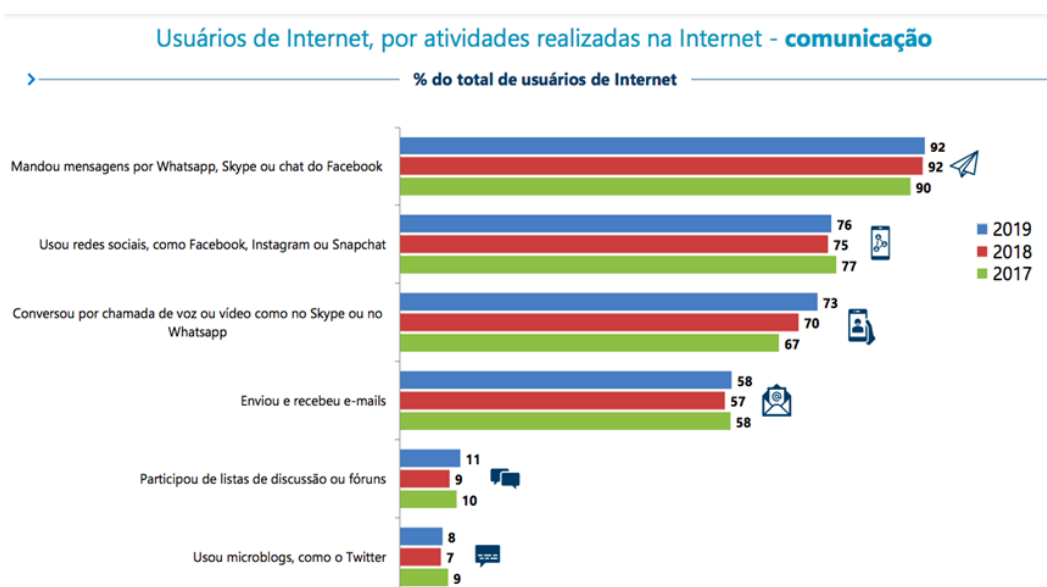


Figure 4: https://cetic.br/media/analises/tic_domicilios_2019_coletiva_imprensa.pdf

The lack of knowledge about what the internet actually is, is very significant in Brazil. For 55% of Brazilians, the internet is Facebook, according to a survey published in the *Internet Health Report* (MOZILLA, 2017). A high index of this perception was also registered in Nigeria, Indonesia and India, respectively, 65%, 63% and 58%. In the USA, the rate was only 5% (OLHAR DIGITAL, 2017).

The same report pointed out that Google is responsible for more than 75% of searches done on the internet and for 95.9% of searches made on smartphones, which creates an advantage for the company to get online advertising based on what people are looking for. This means that online searches update and “teach” *Big Tech*’s artificial intelligence algorithms, making it increasingly powerful on the scene.

Big Techs are also able to enter into agreements with internet providers and government agencies so that people can continue accessing social networks even when their data package ends (the so-called zero rating), considering that 85% of classes D and E internet users access the net exclusively by cell phone (figure 5):

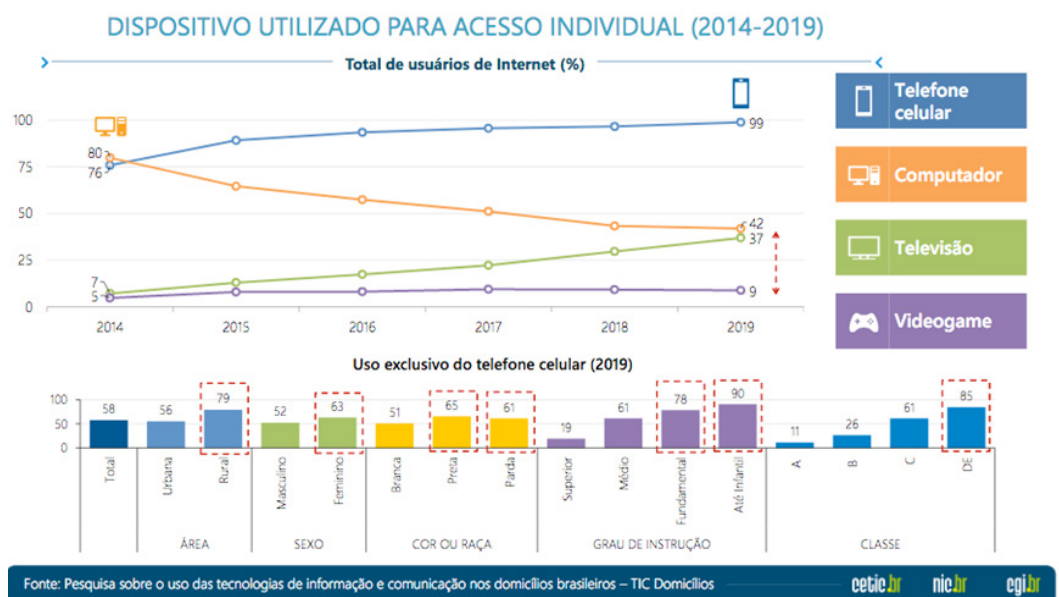


Figure 5: https://cetic.br/media/pdf/cetic/ceticbr_15anos_webinario_saude_digital_em_foco_23_novembro_2020.pdf

3.1 Artificial intelligence

In recent years, artificial intelligence (AI) has emerged as the promise for obtaining improvements in several areas, such as health, law, finance, transport, education, among others, through a vision that, invariably, reduces technology to a tool and a utility and neglects the risks and implications brought by it.

As a field of knowledge, AI formally emerged in Computer Science in the 1950s³, but it is only now in the contemporary world that it has gained repercussions through the development of algorithms capable of making predictions from huge amounts of data available online (*Big Data*). Instead of strictly following a code step by step, such programs and tools are able to understand what they need to do through experience.

This learning based on experience and tests carried out by the programs depends on a lot of data. It is from the analysis of a large amount of data that AI is able to build its intelligence. In order to simulate the way humans develop knowledge (neural network), these data can be the most diverse. Hence, the great challenge of AI is to understand meaning from unstructured data.

Structured data is easier to organize. This is the type commonly found in spreadsheets organized by columns and labels: like a spreadsheet with the number of cars sold by a company, which tells us which models are sold, which days they were sold, etc. Unstructured data, in turn, does not have a known organization a priori; its structure is flexible. This is the case with text documents, for example: for the most part, it is difficult to categorize each word in a text and relate it to its context, who wrote it and at what time.

AI aims to identify meaning in the face of available data, whether structured or not, building knowledge, deducing the relationships between them and offering forecasts. When dealing with a huge amount of unstructured texts published on social networks, for example, AI will seek to organically identify the relationships between the texts, extracting meaning. An AI that needs to learn to predict the climate of a region will use the largest possible amount of data on humidity, temperature, wind speed and origin, the frequency of rains and other information that may be relevant about the analyzed place. It is from the crossing and analysis of this large amount of data that the tool will be able to learn about the patterns of the region and provide more assertive predictions about the weather.

3. The term first appears at the Congress in Dartmouth, USA, <http://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html>

AI has long been no longer restricted to fiction and predictions of the future: it is visible in our daily lives. Even during the time after the first Industrial Revolution, there was tension about the automation of life, especially regarding the replacement of men and women by machines in their work. The Luddite movement⁴, for example, was a labor movement of the 19th century that, in addition to contesting the terrible working conditions of the time, questioned the space given to machines in the rising industry - including breaking them as a form of protest.

Automation, however, has been and is more and more a reality inside and outside the labor market, although it has different facets and advances in each historical phase. For example, now the technology is focused not only on the execution of previously manual tasks, but also on those that require an analysis of a large volume of data, incorporating intelligence in products and solutions. Currently, therefore, we have reached very high levels of technological progress, which becomes part of everyday life. Still, the reality of AI does not imply humanoid robots walking among us or ultra intelligent computers capable of thinking exactly as humans do. Many of the AI applications are simpler than you think.

In its social dimension, AI has been permeating personal and professional relationships, as well as mobility and ways of consuming, obtaining information and studying (LEE, 2019). In the economic aspect, the increasing use of AI has been reducing several jobs and, at the same time, demanding new functions for which there is no compatible training. In the political and legal dimensions, there are ethical, psychological, copyright, data protection, information security issues, among others.

If we do not consider AI as a field of study in all its multidimensionality, we may have in the near future setbacks in relation to freedom, creativity, innovation (HARARI, 2018).

According to Lemos (2019), the current context of cyberculture can be characterized by the acronym PDPA (in Portuguese) - platform, datafication and algorithmic performance — which calls into question the emancipatory and liberating trait of digital culture, since people's actions are all imbued in a structure of hardware and software. The “platforming” is concentrated in large companies known by the acronym GAFAM — Google, Apple, Facebook, Amazon and Microsoft (CRUZ et al., 2019), which dominate much of the internet from business models based on the wide collection and extraction of data.

The so-called “datafication” generates prediction and projection to serve a data-based economy. Social networks are customized according to the characteristics of searches and interactions, organized by AI algorithms. When posting on a social network, the user has no idea, for example, how long the post is visible, who it reaches, because the decisions are algorithmic, that is, the “algorithmic performance”.

4. <https://en.wikipedia.org/w/index.php?title=Luddite&oldid=998538805>

This “technologization” of life depends on the processing of a large amount of data to function. At the same time, as in a feedback stream, they also generate an enormous amount of data. Going back to the example of cell phone assistants.

A person with a cell phone, in addition to being able to interact with a virtual assistant, who responds to the voice commands, asking to check the fastest route to the desired destination, can make a video conference with a friend in Japan and publish a tweet complaining about a fact that happened. All this in an interval of a few minutes. In order for the person to be able to carry out all these actions, it was necessary for his device to use the technology embedded in it (built from data analysis) to make them feasible. At the same time, the user generated a plethora of new data about himself: where he was; where he was going and which way; who he spoke to in Japan and for how long; which app he used; what he said about the fact and what time etc (LEMOS, 2020).

Data collection, however, is not new: information has been stored long before there was even a computer. The technological and scientific evolution of recent times has increased the amount and speed in which new data are created, opening up greater possibilities for exploring information and generating business models based on data.

There have always been algorithms and software, but they were not always behavior modulators as they are now, which can boost the formation of bubbles, enhance the spread of misinformation and other issues such as surveillance capitalism (CRUZ et al., 2019), a surveillance that monitors the online behavior of a group of individuals, that knows how to extract data for a purpose arising from certain demands.

3.2 Pandemic, inequalities and strengthening of Big Techs

An Oxfam’s report⁵ released in January 2021 analyses the inequalities caused by the COVID-19 pandemic. For example, 112 million women are at greater risk of losing their incomes than men; in Brazil, the black population is 40% more likely to die from the virus than the white population.

Facing an adverse scenario that shook a good part of the market, as well as aggravating the existing social inequalities, the *Big Techs* were strongly benefited with expressive gains, as shown by the graph of the *Wall Street Journal* (WSJ, 2021) (figure 6):

5. <https://www.oxfam.org.br/justica-social-e-economica/forum-economico-de-davos/o-virus-da-desigualdade/> in English: <https://www.oxfam.org/en/research/inequality-virus>

Big Tech Got Even Bigger During the Pandemic

Market value of 2020's five biggest U.S. tech stocks, by month

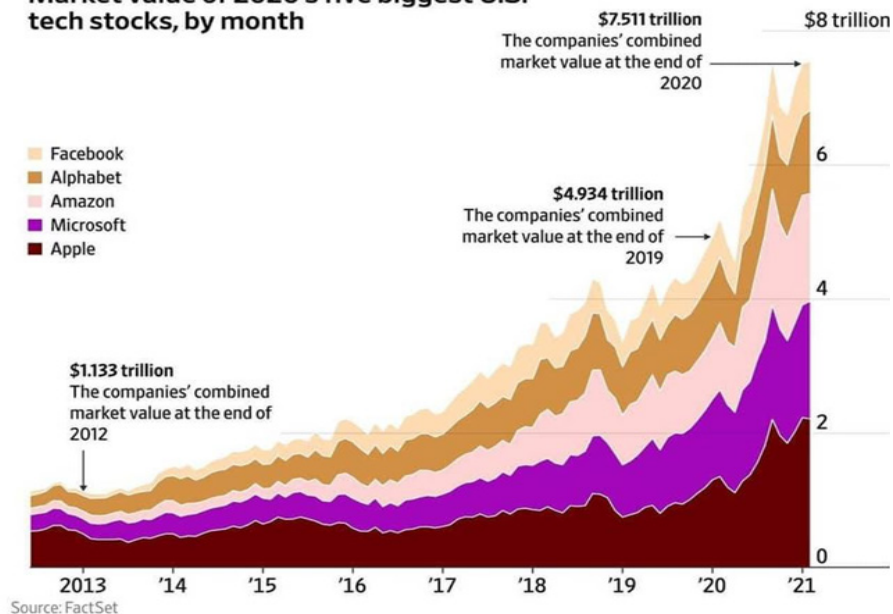


Figure 6: <https://www.instagram.com/p/CLKEeWMAXjW/?igshid=vz2zl7niwzq4>

The *Big Techs* saw their products and services being more requested by people and companies for work, study, consumption and leisure. The result was a dizzying growth for corporations and, consequently, the value of their shares. At a time when companies such as airlines and retailers were struggling to survive, the combined revenue of the top five US technology companies — Apple, Microsoft, Amazon, Google-parent Alphabet and Facebook — rose to \$ 1.1 trillion. And their combined market capitalization rose by half over the past year to an astonishing \$ 8 trillion.

Launched in December 2020 by the Dutch organization *The Center for Research on Multinational Corporations* (SOMO), the *Financialization of Big Tech* report⁶ presents an analysis of the financial numbers behind the operations of seven companies, five of them based in the USA — Alphabet (Google), Apple, Amazon, Facebook and Microsoft - and two in China, Alibaba and Tencent.

The publication aims to draw attention to the “financialization” of Big Techs, that is, companies outside the financial area are participating in financial narratives, practices and measures, behavior that is not compatible with the principles that were created to regulate corporate activities in the physical world. The speed with which the sector has

6. <https://www.somo.nl/the-financialisation-of-big-tech/>

evolved into a focal point in the stock market, in political communication, in geopolitics and in daily life contrasts sharply with the much slower pace at which civil society and decision-making bodies have been able to understand the transformative nature of these companies.

The graph in the next page (*figure 7*) shows the 20 most valuable technology brands in the world in 2020 and the growth of this value in relation to 2019. It is worth noting that, although Facebook shows a small decrease of -7%, Instagram, which is part of the company, had an increase of 47%.

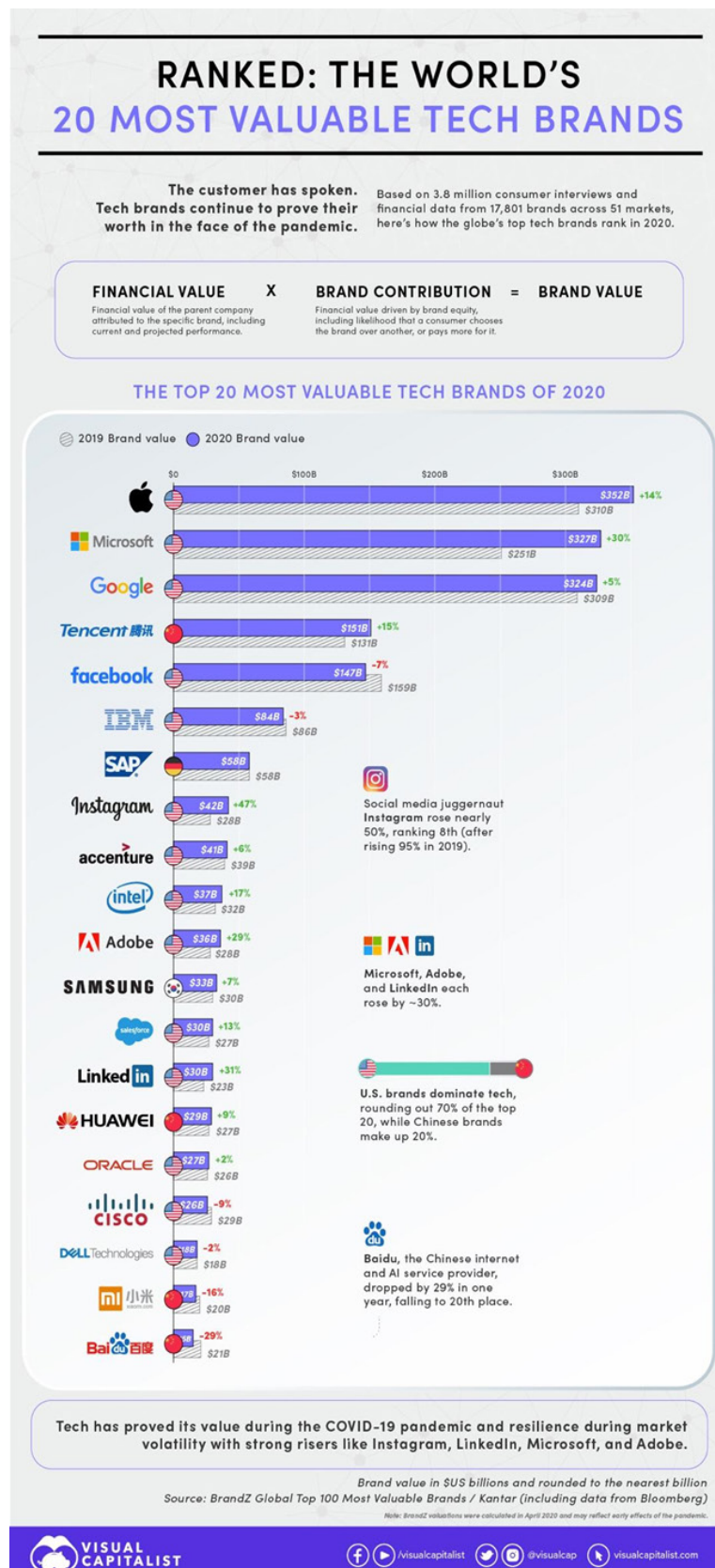
The emergence of the phenomenon of Big Tech has affected governmental and civil society players in Brazil. Big Tech's economic and political powers and their capacity to control the exchange of data on the Internet through their business models based on the extraction and analysis of data have been causing impacts in democratic processes, capitalist market economy, individual behavior, or in the emergence of new ways of work.

This scenario drives a new type of development that goes beyond the traditional capacity of states and organized civil society to conduct the necessary transformations based on the public interest.

Since 2021, the Brazilian Internet Steering Committee (CGI.br) — a multi-sectorial committee responsible for studying, debating and establishing a series of guidelines related to the development of the internet in Brazil — has created a work group totally dedicated to this issue. It has dedicated a great deal of time to debating the power of platforms, which are managed by companies within the digital economy that have reached an unprecedented market value, even more so in the pandemic, and have obtained a power that is still misunderstood.

In May, 2021, CGI.br organized a special seminar over 3 days with different experts to study the topic of global and national regulation, as well as to promote discussions and prepare technical notes and recommendations on the subject. The videos are available online in English audio⁷. The debates are fundamental to diagnose the functioning, the business model, and the international regulatory experiences in the sector. The regulation of technology multinationals in Brazil (a market of 200 million users) is an urgent agenda, not only because many of them are present in the daily lives of Brazilians, but also because they do not maintain factories or technology development in the country, which causes them to be guided only by the legislation of the territories in which their data centers are located.

7. https://www.youtube.com/watch?v=y26rN72Jmis&list=PLQq8-9yVHyOb6o0oRk55-KtDtgna_-qeL&index=4

Figure 7: <https://www.visualcapitalist.com/the-worlds-tech-giants-ranked/>

3.3 Social uses and appropriations of ICT

To analyze the use of the internet as an indispensable tool in the pandemic, the ICT research COVID-19⁸ brought, in three editions, information on how the use of the network has been made by Brazilians since March 2020. In general, the data confirmed the inequalities of access that traditionally become evident, that is, the higher AB classes increased the use of the web in the home environment on their various devices and the lower C and DE classes depend on the pre-paid data package on their cell phones.

As expected, e-commerce and online cultural activities increased by 66% in the period, in 2018 the proportion was 44%. The biggest increase was among women - going from 39% in 2018 to 70% in 2020. Meal orders via apps tripled in the period, jumping from 15% to 44%.

There was also a significant increase in relation to using habits, such as watching live broadcastings and other cultural transmissions by audio and video, 64% of internet users, especially in the upper classes, among women and people aged 35 to 59 years. Lives are watched by spectators from the highest AB classes, 76% and 47% in the DE classes. Payments for streaming movies and series services grew mainly in the lower classes, 43% in the case of films and series and 16% in the case of music.

The survey pointed out the concern with privacy and protection of personal data with the increase in the search for information and the realization of public services online: 72% of Internet users sought information or used public online services related to worker rights or social security, such as INSS, FGTS, unemployment insurance, emergency aid or retirement - a percentage that was 40% of the reference population in 2019. Other services most sought after or performed online were those related to personal documents (46%), public health (45%) and public education (37%).

Regarding the receipt of emergency assistance, 38% received it, 20% tried and did not receive it and 39% did not apply for the benefit. Among those who tried and did not receive, 73% said the request was not approved or was still under review. Among the barriers related to technology, 12% of users who requested and did not receive the aid said they were unable to use the bank app indicated by the government and 10% had no space on their cell phone for the app.

More than half of internet users searched for information about COVID-19 on websites or in apps to check symptoms and receive guidance on the disease. In these cases, apps from the public network were mostly used. The most widely used means of conducting online consultations was through apps such as WhatsApp or Telegram (50%).

8. <https://www.cetic.br/pt/noticia/cetic-br-lanca-livro-com-dados-sobre-os-habitos-de-uso-da-internet-pelos-brasileiros-durante-a-pandemia/>

Only about 30% of the users who made a teleconsultation used an SUS (public health system in Brazil) or health plan application. Among the main reasons for not having used this service, the concern with the security of personal data stands out (55%) - in the DE classes this reason was reported by 70% of internet users - and the lack of confidence in performing this service over the internet (34%). One third of the users indicated concern about identity theft and fraud and just over half said that the risks of making their personal data available on the internet to governments and companies outweigh the benefits.

While users seem to be concerned about data protection, a significant number, 60%, would certainly download apps that notify them about contact with people infected with COVID-19.

ICT and gender perceptions

Launched in April 2021, the report “Gender dynamics and use of digital technologies: a study with children and adolescents in the city of São Paulo”⁹ interviewed a group of adolescents between 15 and 18 years old who identify in an unconventional way in relation to gender and sexuality. From a qualitative point of view, the investigation was based on the contextual data of the ICT KIDS On-line survey (*figure 8*) and aimed to obtain an overview of the type of daily use of digital technologies and the intersection between youth, gender, race and social class and perceptions about self-representation, privacy and online violence.

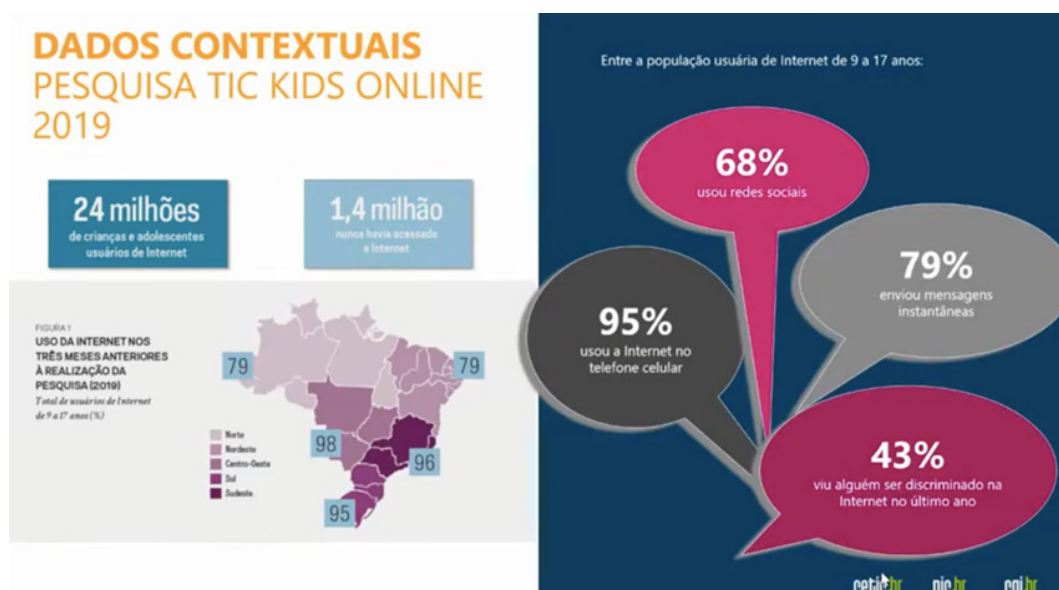


Figure 8: https://cetic.br/media/analises/tic_kids_online_brasil_2019_coletiva_imprensa.pdf

9. <https://cetic.br/media/docs/publicacoes/1/20210312095947/dinamicas-de-genero-no-uso-das-tecnologias-digitais.pdf>

The main result points to the paradox between the risks and opportunities of TDIC, that is, at the same time that the media propagate prejudices and discrimination, they are a powerful way to disseminate the importance of these issues. For example, girls recognize and perceive gender differences in exposure on social networks, they know that they are most vulnerable. There is a generational change that disapproves of “playing” with racial and gender issues, which admits the situation of prejudice.

If, on the one hand, TDIC offers possibilities for managing alternative identities to navigate in certain digital spaces safely, and also constitutes a welcoming space for people and groups in situations of violence, the practices are committed to the contracted data package, which gives unlimited access only to social networks.

In the context of a web that is permeated by platforms, the behavior of youths on the network is totally influenced in relation to expression, engagement in themes and socialization, in addition to raising concerns about online violence related to issues of gender, class, race and sexuality, highlighting structural social problems such as racism, homophobia and human rights abuse. Due to the growing presence of children and adolescents in the digital environment, it is becoming increasingly essential to protect the rights of these populations, as well as better support them with knowledge that can lead to healthier attitudes online.

There is a great deal of progress in the debate and in the implementation of practices to deal with situations of prejudice and discrimination, inside and outside the network, “so that young people who identify in an unconventional way in relation to gender and sexuality can better take advantage of their opportunities” (CEBRAP, 2019).

In this context, it is worth mentioning the work of researcher Tarcízio Silva (highlighted in chapter 8), who organized a timeline¹⁰ on how racism can be propagated by the AI algorithm.

10. <https://tarciziosilva.com.br/blog/destaques/posts/racismo-algoritmico-linha-do-tempo/>

4 Literacy and digital inclusion - background and reframing

Although closely related, the concepts — digital literacy and digital inclusion — must be understood distinctly, considering the changes in social and cultural contexts over the years. Quite associated with the field of education, especially for reading and writing skills, “literacy” gives amplitude to the literacy process, as Magda Soares tells us:

Having adapted to writing is different from having learned to read and write. Learning to read and write means acquiring a technology, that of encoding and decoding the written language. The literate individual is not only one who knows how to read and write, but one who uses reading and writing socially, practices reading and writing, adequately responds to the social demands of reading and writing (SOARES, 1998, apud BUZATO, p.84).

The idea of social practice as the focus of the literacy concept is also present in the Functional Literacy Indicator (Inaf), which measures, in Brazilian individuals between 15 and 64 years old, functional skills related to the reading / writing of small texts and numbers (AÇÃO EDUCATIVA; INSTITUTO PAULO MONTENEGRO, 2018 apud ROSA; DIAS, 2020). In 2018, Inaf pointed out that 29% of the Brazilian population can be considered functional illiterate, which is a very low literacy rate.

Literacy has also been cited in other fields of knowledge, such as communication, linguistics and information science, and has been highlighted in reports and documents by governments and multilateral agencies, as well as in the press during the pandemic period that used the term for highlighting the lack of skills of teachers in the handling of tools and platforms for remote teaching¹¹.

The adjective “digital” added to the word “literacy” began to be spread in Brazil in the early 2000s, with the popularization of the web, by researchers such as Ana Elisa Ribeiro and Carla Coscarelli (2005), from the Literacy, Reading and Writing Center (CEALE), from UFMG, emphasizing reading and writing practices:

Digital literacy refers to the social practices of reading and producing texts in digital environments, that is, the use of texts in environments provided by the computer or by mobile devices, such as cell phones and tablets, on platforms such as e-mails, social networks on the web, among others (RIBEIRO; COSCARELLI, 2014, online).

11. <https://educacao.estadao.com.br/noticias/geral/com-pandemia-letramento-digital-vira-um-passo-para-a-pedagogia-do-futuro,70003449216>

Marcelo Buzato (2007), professor and researcher at the Institute of Language Studies (IEL) at UNICAMP, brings a reading of digital literacy integrated with language and the concept of digital inclusion, contemplating a sociocultural perspective of digital literacy, with a view to considering the complexity of constant social and economic changes over time:

If a vision of language is a vision of inclusion, also any vision or model of literacy is necessarily linked to a conception of language and a conception of society. [...] culture, technology and power are intertwined in the social practices of reading and writing, that is, in literacy practices, [...] the relationship between inclusion and literacy in the age of illustrated modernity and industrial capitalism with this same relationship today, in the era of network society and informational capitalism (BUZATO, 2007, on-line).

To mark not only the transformations (and instabilities) but also the diversity of possible meanings in the different social contexts in which each individual finds himself, Buzato starts to highlight the term in the plural, “digital literacies”, that can be understood as “complex and heterogeneous networks that connect literacies (social practices), texts, subjects, means and skills that interconnect, intertwine, contest and modify each other continuously and through the influence of ICTs ” (BUZATO, 2009, p. 22).

At this point, it is valid to point out the concept of digital inclusion, commonly linked to the issue of internet access, something that in Brazil has not yet reached 47 million Brazilians (CETIC, 2019). The Marco Civil da Internet (MCI, the Brazilian Internet Law Framework), in its article 4, recognizes access to the internet as a right, in addition to its importance for the promotion of human, economic, social and cultural development (BRASIL, 2014). Resulting from a wide mobilization of civil society organizations, the MCI is considered an essentially principled law because it protects the rights of all internet users in Brazil (freedom of expression, net neutrality and privacy) and for establishing a multisectoral configuration of internet governance — representativeness of academics, the third sector, government and companies.

Published by the Reference Institute for Internet and Society (IRIS), the *Marco Civil da Internet e Digital Inclusão* (2021) report talks about Brazilian public policies for digital inclusion from the end of the 1990s, which culminated with the creation of the Internet Steering Committee in Brazil, in May 1995. Increasingly, access to the internet is a condition for full access to citizenship, as the data from the ICT Household survey (2019) point out: 36% of internet users looked for public services related to workers’ rights or social security, 25% performed or sought services related to access to education, such as ENEM, ProUni and enrollment, and 28% performed or sought services related to the issuing of personal documents, such as ID, CPF, work card or passport. In addition, it

is worth highlighting the use of services such as opening a police report, which can be done online, as well as obtaining emergency assistance due to COVID-19.

The study also presents critical analyses from different perspectives on aspects of the MCI and emphasises that “the challenge of digital inclusion does not only concern how many people are connected, but also how they fit into the network” (DUARTE; GOMES, 2021). The authors put in evidence how Brazilian internet users are far from these reflections. Even without using the term “digital literacy”, the report highlights in its conclusion that the universalization of internet access must be linked to the human and social development of communities, providing communication, training and the exercise of rights.

Thus, for the purpose of this report, the combination “literacy and digital inclusion” shows that “any vision or model of literacy is linked to a conception of language and a conception of society” (BUZATO, 2007). For the author:

The vision of inclusion that guides me is based on the Bakhtinian conception of dialogism and, consequently, the intrinsic relationship between subject and language. [...] I consider that the speaker — the one who includes himself in a discursive community or in a social space of interest through language — is not an updater of a system that he cannot change (or subject him to), nor, even, the origin or the absolute and independent source of his words. He is, on the one hand, a historical being, open (in a continuous process of building his identity) and immersed in dialogue and, on the other hand, someone who supports / depends, to some extent, on the linguistic system at a given moment to establish the bridge, the contact with each other (BUZATO, 2007, online).

Recent studies by Buzato, in the field of Applied Linguistics, are relating literacy and digital inclusion in the perspective of critical-philosophical posthumanism, understood as a condition of rupture between the dichotomies — subject and object, mind and body, human and nature etc— to research the emergence of a new collective subject, which crosses culture, nature and technology and confronts the concepts of traditional humanism (BUZATO, 2020).

According to Bayne (2018), critical posthumanism is radically at odds with the understanding that emphasises that the technological “improvement” of the human body can occur without considering human subjectivity itself. For posthumanism, the subject is intrinsically involved in the system into which it is inserted, the human is irrevocably extended in the networks within which it is enmeshed, and as it is no longer possible to isolate the human conscience from its social and technological environment (HAYLES, 2006, apud BAYNE, 2018).

For the field of education, for example, it is a break with the traditional and ingrained idea of looking at digital technology in education — and, consequently, the “digital literacies” — only from an instrumental perspective, that is, the one that uses technology as a mere teaching “tool”. Perhaps for leaving aside the search for understanding the context and the new social configurations.

4.1 Some recent cases

We list below some recent cases, not all located in Brazil, that have generated intense debate on social networks and in the Brazilian governmental public sphere about inclusion and digital literacy. They highlight themes such as the heavy reliance on platforms in social life, AI algorithms promoting misinformation, public figures in politics being cancelled, and also the possibility of digital activism bringing down the stock market.

The repercussions of these events have led President Bolsonaro to create an illegal and unconstitutional draft decree¹², which may allow disinformation and hate speech to take hold on the internet. He wants to prevent the exclusion of content in any kind of service provided on the internet. If the decree is approved, a website could not, for example, remove abusive comments from readers without a court order. Mobile apps would not be able to exclude accounts of service providers who had serious faults (such as a harasser on Uber or AirBnB). Knowledge platforms, such as Wikipedia, could not edit entries with flagrant lies.

Block tech giants

In 2019, Kashmir Hill¹³, a New York Times reporter, experimented with disconnecting from the main platforms maintained by Amazon, Facebook, Google, Microsoft and Apple. The intention was to draw attention to the fact that a few companies have unprecedented access and without adequate regulation for the entire life of the person, especially due to the cell phones that are taken everywhere. The journalist produced a series of videos¹⁴ documenting the difficulty of the decision, as these companies are increasingly deeply ingrained in our lives.

With the support of activist and software engineer Dhruv Mehrotra, all of the journalist’s devices were connected to a central VPN installed on a contracted server

12. <https://direitosnarede.org.br/2021/06/08/tentativa-de-bolsonaro-de-proteger-a-difusao-de-odio-e-desinformacao-pode-quebrar-a-internet/>

13. <https://www.nytimes.com/by/kashmir-hill>

14. <https://www.youtube.com/playlist?list=PLx1Xbvfflc4zQgE5ohJA9EJ2NCcGc2QQ>

and technical adaptations had to be implemented so that they could measure the amount of data that was flowing for a given company during a specific behavior and interconnecting other functionalities. The report on Gizmodo website lists all the preparation details that had to be done¹⁵.

Welfare apps

The researcher at the Federal University of Rio de Janeiro Fernanda Bruno coordinated a research in 2019 on apps aimed at “emotional welfare”, with the aim of analyzing the language used in these apps and the data collection they make. The result can be obtained in the *Tudo por conta própria: aplicativos de autocuidado psicológico e emocional*¹⁶ (2020) report which brings an initial outline of *Economia Psíquica dos Algoritmos: racionalidade, subjetividade e conduta em plataformas digitais*.

During the pandemic, there was a significant increase in the number of “health” and “fitness” apps downloads that are aimed at the individual, self-care and self-monitoring. In general, they allow you to register mood, anxiety etc, show display graphs relating such sensations to activities performed. The extraction and sharing of “custom” data is invisible to the average user. The survey pointed out that Facebook and Google are the owners of 66% of the trackers present in these apps.

Youtube and the promotion of the extreme right

In 2019, a team from Harvard’s Berkman Klein Center, which included the Brazilian programmer Yasodara Córdova, started a research project¹⁷ on how YouTube collaborated in the distribution of extreme right content based on algorithmic recommendation techniques. The group prepared a server in Brazil to access a YouTube channel and follow the suggested recommendations and continue following each of them successively, in thousands of repetitions. The researchers were able to track how YouTube works and found that, after users watch a video about politics, the platform’s algorithms recommend content with conspiracy theories, building a high audience rate for these channels.

The survey was released by the New York Times¹⁸, which claims to have reached the platform and received feedback that the survey contradicts the company’s internal data, however it did not provide this data or other evidence to challenge the survey results.

15. <https://gizmodo.com/want-to-really-block-the-tech-giants-heres-how-1832261612>

16. <http://medialabufrrj.net/publicacoes/2020/relatorio-tudo-por-conta-propria-aplicativos-de-autocuidado-psicologico-e-emocional/>

17. <https://cyber.harvard.edu/story/2019-08/how-youtube-radicalized-brazil>

18. <https://www.nytimes.com/2019/08/11/world/americas/youtube-brazil.html>

Reddit and the Gamestop case

In mid-January 2021, a movement created through an internet forum managed to rock the financial market on Wall Street and showed how actions organized in a network on the internet still have their strength in the current digital culture scene. The action, which gained strong repercussions on social media, was considered a “trolling”¹⁹ of the stock exchange, a revolution in the financial market linked to the digital.

The share price of GameStop, a chain of video game retail stores, was plummeting. Participants in one of the Reddit forums, which has an agenda precisely about bets in the financial market, organized themselves to buy shares, as small investors, to generate an explosive high²⁰ and save the company. This caused a noise, as investors who expected the stock to fall in order to sell had to buy with the overvaluation. It all started with “saving” the store, but manipulating the share price, eventually it can be placed as market manipulation.

For lawyer Ronaldo Lemos, the episode, which triggered other similar movements, demonstrates the power of network articulation. Citing the cover of *The Economist*²¹ on the topic, he emphasises the fusion between financial and information technologies, which would be becoming one thing, in a more democratic model. “It is as if everything became information: infinitely divisible, accessible, circulable” (LEMOS, 2021, online).

Trump cancellation

The episode of the “cancellation” of former US President Donald Trump on social media, as a consequence of the invasion — encouraged by him — of Congress by his supporters resistant to the results of the elections, has been triggering debates around the world about freedom of expression. A state leader being removed, “de-platformed”, by a unilateral decision by the company that owns the social network, opens up, on the one hand, the overwhelming power of the platforms. On the other hand, it suggests the debate about the limits of online attitudes and how regulations should be.

In addition to the former president, Twitter has canceled thousands of accounts linked to QAnon, the far-right group linked to Trump, which had already been blocked on Facebook, Instagram and Youtube, and Amazon has suspended hosting an app used by the group (WALLACE, 2021).

19. Internet slang that means cheating, setting a trap, in Portuguese, a “pegadinha”

20. https://pt.wikipedia.org/wiki/Caso_GameStop

21. <https://www.economist.com/leaders/2021/02/06/the-real-revolution-on-wall-street>

Twitter President Jack Dorsey himself, in an interview with the BBC, said that closing Trump's account was the right thing to do, although it set a "dangerous precedent" (CLAYTON, 2021). But the executive considered that the company made a mistake in not avoiding the situation as a preventive measure, promoting healthy conversations.

5 Technology policies in education in Brazil

The use of technology in the daily lives of schools and students is an increasingly tangible reality. The spread of the benefits of technologies applied to pedagogical issues is common, either through apps that aim to facilitate student learning, or through administrative tools used by educators and managers.

However, students, parents, educators and educational managers are not always fully aware of the implications of technology for everyday life. Increasingly, technologies depend on our personal data to become more efficient and less dependent on humans. There is no other way to envision assertive social relationships, based on the constant advances and transformations generated by technologies, that do not involve education: understanding the risks involved and the way in which people's relationship with digital shapes reality.

It is a paradoxical context, that is, as technology can bring several benefits, it also brings threats. A Buckingham University Report on the ethical vision of AI in education (2020) highlights the need for caution in introducing AI into the learning environment, as technology can contribute to increasing access to education, enhancing learning in addition to expanding opportunities for training based on human values; however, it can also become a form of surveillance and control.

5.1 Brief history to the present day

Although the first initiatives related to the insertion of technologies in education date from the 1970s (VALENTE; ALMEIDA, 2020), it was only in the 1980s that the first public policies of the Ministry of Education (MEC) emerged: EDUCOM Project, Program of Immediate Action in Informatics in Education, National Program for Educational Informatics (Proninfe) and National Program for Informatics in Education (ProInfo).

The design of the policies, even under the military dictatorship, was marked by an intense collaborative and participatory process with public universities through specific seminars, which resulted in foundational documents for the launch of the EDUCOM Project in 1984 (ANDRADE; ALBUQUERQUE LIMA, 1993, apud VALENTE; ALMEIDA, 2020). Such policies were at the time of interest to the then Special Secretariat for Informatics (SEI), an organ of the National Security Council, since it aimed to computerize various segments of society, including education, as a way of increasing scientific and technological autonomy (MORAES, 1997).

The EDUCOM project financed, for six years, five academic research projects applied directly in the context of the public school. Among them, we highlight those of the Federal University of Rio Grande do SUL (UFRGS), under the coordination of Lea Fagundes, and the University of Campinas (UNICAMP), under the coordination

of José Armando Valente, which focused on cognitive development based on LOGO programming language, in partnership with Seymour Papert, at MIT.

The EDUCOM Project, completed in 1991, had the merit “of raising information technology in education practically from scratch to a point in which interdisciplinary teams came to understand and discuss the major issues in this field of study” (VALENTE; ALMEIDA, 2020).

After some other unsuccessful attempts, in 1997, in the second term of President Fernando Henrique Cardoso, MEC instituted the National Program for Educational Informatics (Proinfo) through the Distance Education Secretariat (SEED), which focused on the purchase of equipment for schools and training actions for educational managers in the education departments to promote the use of technology as a teaching and learning tool.

As a strategy, which continued in the administration of President Lula (Proinfo Integrado) and President Dilma Rousseff, Proinfo organized the so-called Educational Technology Centers (NTE) in the states and counties (NTM), with decentralized management and training of multipliers to act in these places. The program also created a web platform, eProInfo, to offer distance learning courses.

In practice, Proinfo’s actions had little integration with the classroom as activities were restricted to computer labs. It is also worth mentioning the creation of the International Virtual Education Network (RIVED) and the Public Domain Portal to provide digital pedagogical content. From 2002 onwards, ProInfo was integrated with TVEscola and Proformação, which aimed to bring teacher training to teachers who did not yet have a degree.

In 2007, MEC launched the project One Computer per Student (UCA) with the distribution of laptops directly to the student and adherence to an international program²². In 2008, the Broadband in Schools Program was created, with the objective of offering internet connection to all public schools. There were two other initiatives in the same year, the Teacher Portal, with the intention of providing learning objects and receiving contributions (lesson plans) directly from teachers, and the multimedia repository International Bank of Educational Objects (BIOE), in partnership with Latin American Network of Educational Portals (RELPE) and Organization of Ibero-American States (OEI).

In the 2016-2018 biennium, through a commitment on digital educational resources, in the 3rd Open Government Partnership Action Plan²³, MEC had to implement a new repository to make publicly funded educational resources available with an open license. The MEC-RED²⁴ platform was launched in 2016, to integrate the entire collection already available in previous initiatives (RIVED, BIOE, TV Escola, Teacher Portal etc.) and a decree on Open Educational Resources was presented within the scope of the Basic Education Secretariat (SEB)²⁵.

In the following year, 2017, MEC launched the Connected Education Innovation Program²⁶, inspired by the *Four in Balance* model, of a Dutch foundation (VALENTE; ALMEIDA, 2020), which is based on the following four dimensions (figure 9):



Figure 9: <http://educacaoconectada.mec.gov.br/o-programa/sobre>

Education with technology is also currently present in the general competence 5 of the Common National Curricular Base (BNCC), created to support the development of a syllabus based on competencies and school curriculum (figure 10):

22. https://en.wikipedia.org/wiki/One_Laptop_per_Child

23. <https://www.gov.br/cgu/pt-br/governo-aberto/a-ogp/como-funciona>

24. <https://plataformaintegrada.mec.gov.br/home>

25. https://www.in.gov.br/materia/-/asset_publisher/Kujrw0TZC2Mb/content/id/14729210/do1-2018-05-17-portaria-n-451-de-16-de-maio-de-2018-14729206

26. <http://educacaoconectada.mec.gov.br/>



Figure 10: <http://inep80anos.inep.gov.br/inep80anos/futuro/novas-competencias-da-base-nacional-comum-curricular-bncc/79>

5.2 Education in the pandemic

In 2020, more than 180 countries temporarily closed their schools due to the pandemic, leaving nearly 1.7 billion children and young people out of school. In the poorest countries, the pandemic deprived vulnerable children of up to four months without classes, compared with six weeks for children from high-income countries (OXFAM, 2021).

In order to maintain remote service, education departments and private schools in general used services offered as “free” by big technology companies, the so-called *Big Techs*²⁷, without outlining any concern regarding the transparency of the use of data by teachers and students by part of these companies, precisely because of the lack of knowledge about the operation of technologies and, importantly, the merely instrumental view to enable the continuity of traditional “teaching”.

27. A study found that 70% of public universities and state education departments are exposed to surveillance capitalism www.educacaovigiada.org.br

In an accusatory report²⁸, The Intercept shows that public networks would be using to broadcast live classes to their students the same cell phone app (IP.TV company, provider of the Mano app) used by TV Bolsonaro²⁹. In some networks that did not make the customization, access to TV Bolsonaro is easily available in the general menu of channels that the app provides. In order to use the application, which is granted “free” to departments, teachers and students have to agree with the privacy policies that include access and treatment of data.

In its article 26, the Marco Civil da Internet (2014), points out the need for education to work on digital citizenship, contemplating the responsible, safe and conscious use of the internet, issues that are still far from the educational agenda, as if the desired integration of technology into teaching and learning processes should be purely contentist (GONSALES; AMIEL, 2020). There are currently dozens of bills in progress³⁰ with the intention of amending the Marco Civil.

According to the TIC COVID-19 survey³¹, 74% of internet users aged 16 and over in the DE classes access the network exclusively by cell phone, a percentage that is 11% among users of the AB classes. Among those who attend school or university, the cell phone also appears as the tool most frequently used (37%) to attend classes and remote educational activities; 54% of users of classes DE, 43% of classes C and 22% of classes AB.

Among the barriers to remote education in the pandemic, it is highlighted the difficulty of communication with teachers (38%) and the lack or low quality of the internet connection (36%). In February 2021, the bill of law (PL) No. 3477, of an emergency nature, was approved by the Chamber of Deputies to allocate federal funds to public schools to purchase equipment, hire broadband and / or a cellular data package to enable students from disadvantaged communities, especially riverside, indigenous and quilombolas could have access to remote education actions. President Jair Bolsonaro, however, vetoed the PL, claiming that it would not impact the connectivity of schools, provoking a reaction from civil society organizations³² to pressure the overthrow of the veto by the congress. Congress overturned the veto in June 2021, but President Bolsonaro has taken legal action to block the transfer of funds.

28. <https://theintercept.com/2020/06/15/app-empresa-tv-bolsonaro-aulas-online-pandemia/>

29. An app channel with live videos from president Jair Bolsonaro's supporters

30. <https://porta23.blogosfera.uol.com.br/2019/04/23/doze-novos-projetos-de-lei-tentam-mudar-o-marco-civil-da-internet/>

31. <https://cetic.br/pt/noticia/celular-e-o-dispositivo-mais-utilizado-por-usuarios-de-internet-das-classes-de-para-ensino-remoto-e-teletrabalho-revela-painel-tic-covid-19/>

32. <https://direitosnarede.org.br/2021/04/14/nao-ha-educacao-sem-conexao/>

5.3. AI in education

The uses of AI in education can be scaled in two ways. The first is teaching through AI apps supported by technological platforms and tools. Among them, there are the so-called adaptive environments or platforms, which foster learning through the unique, personalized experience of each student or educator. For that, such solutions collect data about each user experience, such as their interests, difficulties and history, and generate learning paths adapted to each reality. The construction of such learning trails involves the collection of information not only from students, but from educators and pedagogical guidelines.

The second way is to understand the AI's own operating logic: by increasing the understanding of how the learning process takes place, identifying bottlenecks and obstacles faced by humans while learning. In this case, for example, AI can assist in identifying how the student's socioeconomic situation, her emotional characteristics, the very interaction with technology affects the understanding of knowledge, also identifying materials and formats that facilitate or hinder the learning process.

Since 1997, there has been the International Artificial Intelligence in Education Society (IAIED), an interdisciplinary community that unites the fields of computer science, education and psychology to promote research and development of interactive and adaptive learning environments for students of all ages and in all domains. The Society conducts conferences on the topic, the first of which took place even before the entity was formalized in 1983.

In the United States, the company Content Technologies³³ produces personalized books, potentially increasing study efficiency by editing books to make them more useful to each student. In Brazil, Saint Paul Business School³⁴, in partnership with other entities, created a platform that allows students to clarify doubts in real time 24 hours a day from the interaction with an artificial intelligence.

In India, the Mindspark³⁵ tool has a wide range of questions to assist in the process of learning mathematics. The tool recommends support material for students according to their mistakes when solving the exercises. Educators, in turn, can monitor student growth, exchange experiences with other educators and prepare lesson content.

With a global presence, Khan Academy³⁶ is a platform that has exercises and courses that aim to establish personalized learning for each student, allowing users to absorb content at their own pace and according to their interests. A similar feature is M-Shule³⁷ a platform

33. <http://contenttechnologiesinc.com/>

34. <https://lit.com.br/>

35. <https://mindspark.in/>

36. <https://pt.khanacademy.org/>

37. <https://m-shule.com/>

created in Kenya that also provides adaptive experiences built through AI to students, but via text messages (SMS) received on cell phones, which are independent of Internet access.

Each mentioned initiative has its own operating policies. Accurate analysis is needed on how the data used by the artificial intelligences above is collected and processed to find out how and if they act respecting the rights of users.

Most common examples of using AI

Personalized tutoring: creation of syllabus and specific activities for each student, adaptable according to the use, interest, talents, needs and learning of each one.

Collaborative learning: assistance in the most appropriate formation of work groups, mapping students and joining them according to interests or skills for the activity in question. Assistance in the automatic identification of the results of group discussions. An educator, for example, conducting group discussions with large numbers of students can rely on AI to summarize the results of the debates and identify groups that are shifting focus or making mistakes to give more attention.

Task correction: tools for scoring tests and activities in which a machine, when receiving input from corrections made by humans, automatically evaluate the material, making corrections more and more assertive through the collection of more data.

Behavioral mapping: support in the collection and analysis of data on the frequency of students and their responses to educational stimuli. For example, an AI can assist in identifying students at risk of dropping out of school or in generating forms of assessment that measure learning.

Virtual or Augmented Reality: Platforms that enable interaction during learning, placing students virtually immersed in scenarios that facilitate the visualization of content.

Educational chatbots and virtual assistants: Virtual pedagogical agents capable of interacting with students, answering specific questions, indicating content, giving feedback.

Aid for People with Disabilities (PCD): technological solutions to assist access to education by PCD. For example, resources that use the Natural Processing Language to transform spoken educational content into written content, and vice versa, or available in interactive tools on the computer.

Formation of pedagogical content: automated mapping of trends in educational resources and cataloging of themes for later curation and use by educators.

Exchanges among teachers: Platforms that act in the generation of lesson plans and teaching materials with suggestions adapted for each professional.

While the potential of AI and its benefits are evident, it also raises questions about fairness and equity. AI enthusiasts offer a world of possibilities, but it is vital not to be dazzled by technology and assess case by case when the implementation of technological tools is necessary, making conscious decisions about the risks involved in the massive use of such resources.

The Educadigital Institute, in partnership with IBM and PUC/SP, conducted in 2018 a workshop³⁸ with educators entitled “Possibilities of AI in Education”. The participants listed the care and opportunities that AI inspires, among them: “not allowing the results obtained from the AI to be used to categorize (label) people in a stereotyped manner; there must be an ethical responsibility in the use of the data, so as not to favor economic interests (not to commercialize the data) or biased / prejudiced information.”

5.4 Digital rights

It is not surprising, therefore, that the massive use of data has the potential to undermine rights such as access to information, protection of personal data and freedom of expression: all aspects of our lives are dated, and our autonomy and freedom can be held hostage by companies, states, entities that have access and control to data.

The Universal Declaration of Human Rights was promulgated by the UN in 1948, some years after the Second World War and presents 30 articles that emphasize values such as freedom, life and respect, considering the relationships of conviviality in society.

In 2016, the UN recognizes digital rights as an extension of the rights exercised by citizens and encourages countries to promote connection and ensure a secure digital environment, with freedom of expression, without discrimination and inclusive³⁹. Thus, Digital Rights are Human Rights considering the internet is increasingly present and mediating the forms of communication and coexistence between people. In this sense, the internet is also a space for exercising rights. One of those rights that has a lot of connection with Open Education is the right of access to information, essential for the construction of democracy.

In Brazil, the right to information is provided for in the Federal Constitution, that is, it has been a right since 1988. At the time of the military dictatorship, for example, there was no culture of transparency, on the contrary, the logic of the “national security” argument prevailed in order to keep matters related to the security and actions of governments in general confidential.

38. <https://www.ibm.com/ibm/responsibility/br-pt/downloads/e-book-IA-na-educacao.pdf>

39. https://www.article19.org/data/files/Internet_Statement_Adopted.pdf

In 2012, the Law on Access to Information was created, which determines that public information must, in fact, have a public space and be accessible to anyone, making public bodies facilitate access to this data. To this end, an online mechanism has been created that can be used by any citizen who wants to obtain public information by accessing the Access to Information Law⁴⁰ website and making a request to the government. The government has 20 days to respond to the request.

Other digital right, increasingly evident in the contemporary world, is privacy and data protection. In the online environment, the fact that everyone has the right to select which aspects of their personal life they want to share with third parties refers to the right to privacy. The right to data protection means that the person has the right not to have his personal information shared with other people or companies without authorization. Institutions, whether companies or governments, are responsible for ensuring the security of this data, including against attacks (digital security).

Education-oriented AI apps also collect and work with large amounts of data. A platform that studies the behavior of students in order to offer content, assessments and personalized assistance according to their difficulties and needs, may have precious information, such as the time that the student spends in the app actively studying, where he conducts his studies, from which device he accesses the app, what are the subjects and types of subjects he has the most difficulty in, what content he is most interested in accessing, what grades he receives in evaluations, what types of questions he asks teachers or virtual tutors.

The information available for AI tools concerns students' very personal issues and, therefore, raises questions about students' privacy, freedom of expression and autonomy. After all, what are the consequences of collecting, processing and storing that data? What ideology or purpose is behind this collection? Who owns the data, who can use it, for what purposes? Who is responsible for data security? Who profits from the data? How long will this data be stored for?

Children and teenagers who interact with technology from an early age are building a trail of data, a map of themselves that will be able to accompany them for a long time. Furthermore, the educator-student relationship tends to be immersed in a lot of mutual trust and sensitivity. The mediation of such a relationship through machines can expose the student to unwanted issues. For example, in assessments, exercises and essays, educators can ask sensitive questions on family or political topics. When answering such questions, students rely on the figure of the educator as the receiver and guardian of their personal opinions. There is uncertainty, therefore, about what can happen if these responses are stored in non-transparent tools about the security and use of the collected data.

40. <https://www.gov.br/acessoainformacao/pt-br>

Examining the negative impacts that AI may have on minorities, the InternetLab⁴¹ law and technology research center analyzed gaps and biases present in AI-based technologies that specifically harm the LGBTQ community.

When the teacher recommends using an app for a Math, Chemistry or Biology class, students need to register, sharing data with this app. Imagine if this application is sold? What if personal data is leaked on the network? This would be related entirely to the right to privacy.

In this sense, it is important that educators are aware of how digital tools collect data before choosing to use them with students. It is also worth mentioning that image and voice rights belong to digital rights field, that is, the person must authorize the use for some specific activity or even for dissemination. Any image, even if informative, that records an educational activity in which students, teachers appear, must be authorized to be used publicly, for example on the school website. Schools have the habit of inserting this aspect into service contracts. Likewise, students cannot take pictures or record classes without the teacher's consent.

It is important to differentiate between "personal data protection" and "privacy". Privacy is something that is not public, it concerns intimacy and private life and is covered by several Brazilian laws such as the Federal Constitution, the Civil Code and the Marco Civil da Internet. As for "personal data", it does not matter whether it is public or private so that it can be protected. In this sense, protection of personal data is related to the right to privacy, but goes further, as it concerns equality, access to information, freedom of expression, among other issues.

And what does data processing mean? The word treatment has a very broad interpretation in the General Data Protection Law (LGPD). It may concern crossing, statistical surveys, information extraction, archiving, distribution, processing, classification and sharing. It is precisely from the processing of data that the personal identity can be found.

It is very rare that we find any educational practice in Basic Education that has the intention of analyzing or discussing legislation, even if that legislation has such an impact on our citizen life, as is the case of the LGPD. One of the most important contents of this law involves the provision of the necessary conditions so that someone (controller of the information) can process the data of a person (holder of the information) through other people who will have contact with that data (operators of data processing information).

41. <https://www.internetlab.org.br/pt/liberdade-de-expressao/drag-queens-e-inteligencia-artificial-computadores-devem-decidir-o-que-e-toxico-na-internet/>

6 From tactical media to digital culture and contemporary collectives

Digital inclusion has always been a key term in Brazil when we consider the actions and projects of collectives and social organizations that practically launched the debates in society, influencing public policies that came to fruition in the first two decades in the 2000s, during President Lula's two administrations. Activism at the time had a strong emphasis on the critical appropriation of hardware and software technologies based on the free software movement that gained a lot of strength even as a federal public policy⁴².

One of the first initiatives was Mídia Tática Brasil⁴³, a cultural action around the idea of "tactical media"⁴⁴, a concept from the 90s, which emphasized the use of media equipment for authorial and alternative productions (in TV, radio, print, sites, performances, etc.) disconnected from market interests, especially from mega corporations. Enabling the voices of economically disadvantaged communities and ethnic and racial minorities to be heard was the main objective. Today Tactical Media focuses on the preservation and registration of files⁴⁵.

During the administration of Gilberto Gil in the Ministry of Culture, forums and festivals of digital culture were organized, in partnership with activists and artists, who brought all the intention of the tactical media. One of the most well-known movements was *Metareciclagem*⁴⁶, created in 2002. It was a decentralized network that was very active in the first two decades of the 2000s, especially in debates about critical appropriation of technologies based on the free software and open source movement. It received several mentions and awards⁴⁷, in addition to having its methodology used on a large scale in cultural public policies such as the Points of Culture.

It was a golden period of multimedia cultural productions, very much based on the democratic ideals of production and freedom on the internet, caused by the movements of openness in technology and education (UNESCO coined the term open educational resources in 2002). This scenario, however, began to change in the second decade of the 2000s, with the rise of digital social networks, especially Orkut and Facebook, with artificial intelligence technologies.

The Marco Civil da Internet developed in 2009 (but only approved in 2014) represented a victory for those years of activism in the early decades. The law has ensured the maintenance of the multisectoral character of internet governance, which has been fundamental at the present time - even though problems of universal access and connectivity persist - establishing fundamental principles such as net neutrality, freedom of expression and privacy, on which the current social movements are guided.

42. <https://www.tibrasil.org/2010/08/20/ti-software-livre-economiza-r380-milhoes-ao-governo/>

43. https://mtb.midiatatica.info/in_midiatatica.htm

44. <https://www.ufrgs.br/conectartbr/midia-tatica-entre-ativismo-e-arte/>

45. <https://aprra.net/article/view/121491>

46. <https://metareciclagem.github.io/og.html>

47. <https://pt.wikipedia.org/wiki/MetaReciclagem>

It is also worth mentioning the changes in the Brazilian political scenario that followed. In 2013, a series of popular demonstrations all over Brazil, which became known as “Jornadas de Junho”⁴⁸, profoundly marked the country’s political course, causing the escalation of conservative and even far-right sectors, and a series of consequences, such as for example, the political-institutional coup that led to the impeachment of President Dilma Rousseff in 2016 and, subsequently, to the election of Jair Bolsonaro in 2018.

Since taking office in 2018, the Bolsonaro government has done considerable damage in the cultural area, which is practically adrift, without public policy⁴⁹, something unthinkable in previous governments. As soon as he took office, in January 2019, Bolsonaro issued a Provisional Measure, later included in law (nº 13,844)⁵⁰ that extinguished the Ministry of Culture, reducing it to a Special Secretariat in the Ministry of Citizenship, losing administrative and budgetary capacity. Later, the secretariat was transferred to the Ministry of Tourism, an equally reductionist action by culture to the tourist utility. There were four secretaries in 18 months, one of whom was exonerated for having made a speech based on Nazi speech⁵¹.

We are in the third decade of the 2000s, when access to the internet via cell phones is dominant, and the use of social networks grows exponentially. The table below is from the most recent survey, ICT Households 2019, highlighting the types of activities most common among internet users in Brazil (*figure 11*):

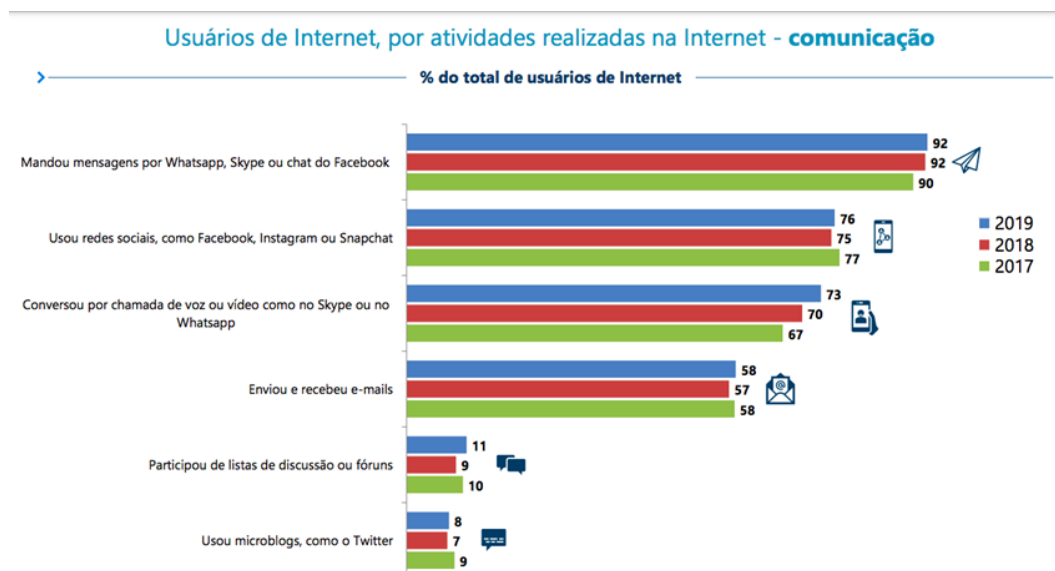


Figure 11: https://cetic.br/media/analises/tic_domicilios_2019_coletiva_imprensa.pdf

48. https://pt.wikipedia.org/wiki/Jornadas_de_Junho

49. <https://br.boell.org/pt-br/2021/04/01/politica-e-cultura-no-governo-bolsonaro-quaes-disputas-estao-em-xeque>

50. http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2019/lei/L13844.htm

51. <https://oglobo.globo.com/cultura/roberto-alvim-copia-discurso-do-nazista-joseph-goebbels-causa-onda-de-indignacao-24195523>

Social organizations and cultural activists who previously worked with hardware recycling, installing free software saw their “causes” hushed by the popularization of the internet by cell phone, leading to the need for new “causes” to emerge, now related to the promotion of human rights in the digital context. Themes that were already on the agenda, but less known to the general public, come to be highlighted, such as combating racism and female, gender, etc. representation, with the motto of freedom of expression.

More than expressing itself politically through artistic productions, the current moment calls for more attention to the legislative political incidence, in the face of an ultraconservative government. For this, it is essential to build networks and alliances to join efforts around social agendas. What stands out today are coalitions, such as the Coalition for Rights on the Net, the Black Coalition for Rights⁵², the Brazilian Coalition for Inclusive Education⁵³, the Coalition for Rights Are Worth More⁵⁴, the Coalition for Climate, Forestry and Agriculture⁵⁵, among others.

We highlight here some of the contemporary collectives (new or traditional) currently in evidence, organized by areas of activity, although some of them operate in more than one area simultaneously:

Feminism

Gênero e Número <http://www.generonumero.media/>

Release date: 2018

Objective: produces and distributes data-driven journalism and analysis on urgent gender and race issues, aiming to qualify debates towards equity

Highlighted activities: Reino Sagrado da Desinformação and Open box da Ciência

52. <https://coalizaonegrapordireitos.org.br/>

53. <https://inclusaopratomundo.org.br/>

54. <https://direitosvalemmais.org.br/>

55. <https://sustentabilidade.estadao.com.br/noticias/geral,leia-carta-da-coalizao-brasil-clima-florestas-e-agricultura-ao-governo-e-veja-quem-integra-o-grupo,70003674348>

Maria Lab <https://www.marialab.org/>

Release date: 2017

Objective: it acts at the intersection between politics, gender and its technologies, valuing self-care in digital media releases, taking technology to feminist spaces and feminism to technology spaces, building safe, virtual and physical environments, with social, ethnic or to understand that this is the only way to build learning through the exchange and accumulation of knowledge between all.

Highlighted activities: Cartilha para infraestruturas feministas and Cartilha servidoras feministas

Coding Rights <https://www.codingrights.org/>

Release date: 2015

Objetivo: *think (and do) tank* founded by the researcher Joana Varon, member of the cyberfeminist group DeepLab, that brings an intersectional feminist look to defend human rights in the development, regulation and use of technologies.

Highlighted activities: Safer manas and Das telas aos corpos - websérie

Preta Lab <https://www.pretalab.com/>

Release date: 2017

Objective: to encourage the inclusion of black and indigenous girls and women in the universe of new technologies.

Highlighted activities: Podcast Minas Pretas, Pesquisa mulheres negras no mercado de trabalho

Community networks

Coolab <https://www.coolab.org/>

Release date: 2017

Objective: cooperative laboratory of free networks - it is an initiative that brings together several people involved in community telecommunication projects to foster autonomous infrastructures, through technical training and community activation and, whenever possible, finance these projects.

Highlighted activities: Quilombo do Camburi, Aldeia Jaexa Porã among others

Instituto Bem-estar Brasil <https://ibebrasil.org.br/>**Release date:** 2008**Objective:** civil, social, cultural and educational association, not for economic purposes, focused on universalizing internet access as a human right, since its constitution, in its transversality it acts in consultancy and education focused on the areas of information and communication technologies, economies impact, social technologies, open government and digital culture.**Highlighted activities:** Comunidades digitais, Programa Ecotec**Uneafro** <https://uneafrobrasil.org/>**Release date:** 2009**Objective:** it brings together activists from the black cause, the anti-racist struggle, the cause of women, sexual diversity and the fight against all types of discrimination and prejudice; the cause of Popular and Libertarian Education, the dissemination of community protagonism and the fight against economic exploitation and political domination.**Highlighted activities:** Agentes Populares de Saude

Culture

Instituto Procomum <https://www.procomum.org/>**Release date:** 2016**Objective:** common goods (whether in nature, in the economy, in science, in education, in technology or in culture), which can only occur from the political action of women and men organized autonomously in communities and networks.**Highlighted activities:** Lab Procomum**Coletivo Digital** <https://coletivodigital.org.br/>**Release date:** 2005**Objective:** founded by Beá Tibiriçá, after a period of activity in the telecentre network of the city of São Paulo, aiming to continue to act with democratization of access to information and communication technologies based on free software.

Highlighted activities: Barulho Livre and Podcast Tecnopolítica, presented by sociologist Sergio Amadeu

Silo <https://silo.org.br/>

Release date: 2017

Objective: civil society organization that creates, welcomes and disseminates art, science, technology and agroecology in rural areas, peripheral and environmental preservation areas, encouraging the crossing between intuitive techniques and scientific knowledge.

Highlighted activities: Caipiratech Lab

Journalism

Agência Pública <https://apublica.org/>

Release date: 2011

Objective: Brazil's first independent, non-profit investigative journalism agency, received several awards, all reports can be republished for free under the Creative Commons license.

Highlighted activities: research on public administration at all levels of government and legislatures; social and environmental impacts of companies, corruption and anti-transparency practices; the Judiciary, its effectiveness, transparency and equity; and violence against vulnerable populations in the city and in the countryside.

Blogueiras Negras <http://blogueirasnegras.org/>

Release date: 2012

Objective: collaborative blog created and maintained by women of African descent with multimedia texts on feminism and the anti-racist struggle of black women. Online community with over 1,300 women

Highlighted activities: Guia autocuidado na rede

Énois <https://enoisconteudo.com.br/>

Release date: 2014

Objective: to cultivate a Latin American network of young local journalists, supporting communicators and vehicles to act with respect to diversity, representativeness and inclusion.

Highlighted activities: [Faça sua escola de jornalismo](#)

Coletivo Intervozes <https://intervozes.org.br/>

Release date: 2003

Objective: works for the realization of the right to communication as inseparable from the full exercise of citizenship and democracy

Highlighted activities: [Campanhas Mobilize](#)

ObjETHOS <https://objethos.wordpress.com/>

Release date: 2009

Objective: Observatory of Journalistic Ethics (objETHOS) is carried out by the Department of Journalism and the Journalism Graduate Program (PPGJOR) at the Federal University of Santa Catarina, Brazil. member of the National Network of Press Observatories (Renoj)

Highlighted activities: [Teses e dissertações](#)

Education

Centro Popular do Audiovisual <https://medium.com/cpa-centro-popular-do-audiovisual/centro-popular-do-audiovisual-a710025ff401>

Release date: 2016

Objective: training in popular and audiovisual communication of Amazonian youth beyond technical skills, with a human rights perspective

Highlighted activities: courses, training workshops and cinema club activities and in other cities in the Amazon works with training projects in conjunction with groups, networks and social movements.

Escola de gente <https://www.escoladegente.org.br/>

Release date: 2002

Objective: to put communication at the service of inclusion in society, especially for vulnerable groups such as people with disabilities. Center for the creation of innovative methodologies, programs and projects that promote accessible and inclusive practices.

Highlighted activities: Hiperconexão inclusiva and Vem Cá – plataforma de cultura acessível

Instituto Educadigital <https://educadigital.org.br> <https://aberta.org.br/>

Release date: 2010

Objective: new learning opportunities in a constantly changing society

Highlighted activities: advocacy and training of educators and managers in open education and digital rights Iniciativa Educação Aberta

Casa Hacker <https://casahacker.org/>

Release date: 2018

Objective: dedicated to putting local communities in control of their digital experiences and shaping the future of information and communication technology for the public good

Highlighted activities: Festival de ideias comunitárias

Garoa Hacker Club https://garoa.net.br/wiki/Garoa_Hacker_Clube:Sobre

Release date: 2009

Objective: open and collaborative that provides space and infrastructure for technology enthusiasts to carry out projects in several areas, such as security, hardware, electronics, robotics, model space, software, biology, music, plastic arts or whatever else creativity allows.

Highlighted activities: Eventos

Political participation

Me Representa <https://merepresenta.org.br/>

Release date: 2016

Objective: NGO formed by organizations of women, black people and LGBT + who seek to promote gender equality, anti-racist struggle and respect for sexual diversity and gender identity in politics

Highlighted activities: [Treta aqui](#)

Transparência Brasil <https://www.transparencia.org.br/>

Release date: 2000

Objective: to promote the defense of the public interest by building the integrity of the Brazilian State and combating corruption, contributing to the improvement of institutions and the democratic process.

Highlighted activities: [Transparência algorítmica](#)

Open Knowledge Brasil <https://www.ok.org.br/>

Release date: 2014

Objective: uses and develops civic tools, projects, public policy analysis, data journalism to promote free knowledge in the various fields of society aiming to make the relationship between government and society closer and more transparent

Highlighted activities: [Serenata de Amor](#)

6.1 Cases

Civic bots

Bots are computer programs designed to automate procedures, often repetitive. They are robots that only exist in the virtual world and that perform general tasks, such as sending personalized advertising to users on a website or maintaining computer security. Some bots make use of AI. For example, video games in which the human player competes against a machine use smart bots. Chatbots, bots capable of chatting with users (for example, to solve problems when purchasing on a website), have also been used, some with a high degree of “intelligence”.

Some bots are created for unethical purposes. This is the case of bots that are social media accounts created only to artificially increase the number of likes on a page or generate artificial content on a topic.

Others, in a very different line, are called civic bots⁵⁶, created for a social function of promoting citizenship, accompanying the provision of public services, as well as denouncing the violation of rights. The best known in Brazil is Rosie, the bot for the Operação Serenata de Amor⁵⁷ project, which uses artificial intelligence to audit public accounts.

“Rosie”, the operation’s virtual robot, identifies suspicious spending by lawmakers. This happens through algorithms, in an automatic work that checks if the data of the Quota for Exercise of Parliamentary Activity (CEAP) and other sources that map parliamentary expenses are in accordance with reality or present any abnormality. CEAP is a monthly budget of up to R\$ 45 thousand that each member of parliament is entitled to be reimbursed for expenses for which there is no need for bidding, such as food, transportation, accommodation costs.

Rosie observes spending by lawmakers who do not follow a pattern and points them out as potentially irregular. For example, a congressman who declares an expense of R\$ 150.00 to pay for a hamburger seems suspicious, while the expense of R\$ 30.00 for the same product is not. An expense made for a third party, and not for consumption by the parliamentarian himself, is also undue. After identifying such irregularities, Rosie publishes a post on her Twitter naming the parliamentarian involved and asking the society to help conduct an audit. Such an audit is important because, as the project’s website points out, “human investigation work is needed to confirm or dismiss the suspicion that our robot found”.

56. List of civic bots on Twitter: <https://onlyo.co/34GtH0j>

57. <https://serenata.ai/>



Another initiative for the social use of AI is the Glória Project, an app developed by a consortium of entities still in the development phase and which will allow the interaction between users and the artificial intelligence of the tool in conversations about domestic violence. Glória, character of the app, is being created to be able to chat with users using machine learning to improve her interactions with humans even more. Such use of AI uses Natural Language Processing.

The app will have two functions: welcoming and educating. Glória will present content on violence against women, offering data on violence by location, age and others. In the welcoming function, she will try to listen to the user and connect her with police entities, social protection organizations and shelters in her locality.

Rights in Network Coalition

Created in 2016, the Rights in Network Coalition⁵⁸ brings together a group of 43 Brazilian civil society organizations that work in the defense of digital rights (access to information, freedom of expression, privacy and data protection) with a strong advocacy action in the legislature, such as the mobilization for the drafting and approval of the General Data Protection Law (LGPD)⁵⁹, implemented in 2019 and valid from 2020.

58. <https://direitosnarede.org.br/>

59. http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/lei/L13709.htm

More recently, the Coalition has acted in the so-called “PL das Fake News (Fake News Bill)”⁶⁰, approved in 2020 by the Senate and which still needs some corrections⁶¹. In order to expand communication with society, the Coalition launched in 2020 the Digital Battles series⁶² with interviews with people from the network’s organizations on topics such as algorithmic racism, education surveillance, fake news, internet access, among others.

Since February, 2021, Coalition has been doing a strong advocacy work to overturn the president’s veto to an emergencial bill to allocate financial resources to schools in economically disadvantaged locations. If approved, schools can buy equipment for their poor students or contract broadband or even mobile data services. In Brazil, 4.8 million children and teenagers live in homes without internet access. This population is totally prevented from participating in any kind of remote or hybrid educational action that the educational systems are carrying out.

Education under surveillance mapping

Based on a script developed by researchers from the University of Brasília and the Federal University of Pará, mapping showed that 70% of the email servers of public universities and state and municipal education departments are under the control of large technology companies, mainly Google and Microsoft, without due concern for data protection, autonomy and surveillance. The project, called *Educação Viglada (Education Under Surveillance)*, has had a significant impact among researchers from academics and organizations involved with the theme and will become an observatory on surveillance in education, not only in Brazil, but also in Latin America.

By exponentially increasing the demand for online educational services, the COVID-19 crisis boosted the adhesion of educational institutions to these companies, making the data and metadata of teachers and students (including children and adolescents) available and free of charge to be used by companies in their business model.

Unfortunately, payment on personal data and strategic data from the country is ignored and / or unknown by most public managers when they simply “accept the conditions” of documents imposed unilaterally by companies, whose basic legislation is almost always not aligned with Brazilian legislation. Among the reasons to justify the preference for what is “free”, there is the argument of internal infrastructure being incompatible with the demands of the institution and the widespread individual habit of using these same platforms in their commercial versions.

60. <https://www.camara.leg.br/proposicoesWeb/fichadetramitacao?idProposicao=2256735>.

61. <http://plfakenews.direitosnarede.org.br/>

62. <https://direitosnarede.org.br/podcasts/>

Likewise, by giving part of the management of their information to these companies, the institutions end up moving information technology training actions away from their pedagogical process, preventing students and researchers from discussing and implementing topics such as governance on the network, challenges of data security, maintenance and improvement of virtual environments, among others, making national technological innovation more difficult.

Although Brazil already has a General Data Protection Law (LGPD), the culture of data protection on the part of institutions is not yet widespread, given the uncritical adherence to these services and the mistaken understanding that alternatives or other solutions are not viable (either by cost, maintenance, or other justifications).

Promoting Popular Health

Created by UNEafro Brazil — Union of Centers of Popular Education for Blacks and the Working Class — is a movement that is organized in nuclei that act in several areas. The movement acts in distributed centers, that is, groups that act in several areas, such as culture, capoeira, political education, sports, or any academic or social area. The UNEafro has become a militant social and popular movement where men, women, housewives, workers, young people, the elderly, blacks, northeasterners, and poor people in general are the real protagonists.

In the midst of the new coronavirus pandemic, UNEafro created the Popular Health Agents project, in partnership with several health professionals, to support the communities assisted by the movement. The purpose of the campaign (approved by Fiocruz) is to form a community help network in which anyone can guide their territory on how to obtain social benefits, prevention, risks of contagion, what to do when encountering people with symptoms, and self-care measures.

The initiative includes sharing informative booklets to form this support network, and collecting funds that will be used to purchase personal protective equipment, medical and health resources, and community actions to fight the pandemic of COVID-19. Training of popular health agents using the internet, training on how to monitor symptoms, care for people, seek medical attention when needed, all available as open educational resources. The organisation has created an online system under free software, also using his own server, to protect personal data.

7 Reflective considerations and issues

Portuguese researcher Pedro Domingos, currently a professor at the University of Washington, who has studied AI for 20 years, often says that even if you don't understand the mechanics of a car you need to know how it works, what are the mechanisms for driving the car and that the same should be done in the context of current AI (DOMINGOS, 2015). In this sense, it is necessary to understand the data beyond the idea of individual consent, since there is considerable difficulty in understanding what is being consented to (data literacy). People consent to be able to use, but it is not clear what will be done with the data collected.

Understanding the current scenario requires, necessarily, a multidisciplinary look, because one cannot fall into "technocentrism", the idea that everything is determined by technology and it is the fundamental cause of a social transformation. Other simultaneous factors must be considered, such as globalization, lack of regulation, unemployment, increased inequality, and all of this can lead to radicalisms.

Academic research in Brazil around the theme of this workshop begins to appear, timidly, focused on the trajectory of researchers, usually involved with topics related to digital culture, technology and society and internet governance.

The most robust example is Lavits⁶³ – Latin American network of studies on surveillance, technology and society, which brings together a group of researchers and activists linked to several universities. Another very active group within the scope of the Internet Steering Committee is the Internet Governance Researchers Network⁶⁴.

It is worth mentioning some recent surveys:

- **Fernanda Rosa** – on the concentration of power in infrastructure and surveillance from a physical, infrastructure perspective: <http://fernandarosa.net/doctoral-dissertation-global-internet-interconnection-infrastructure-materiality-concealment-and-surveillance-in-contemporary-communication/>;
- **Giseli Vasconcelos, Tatiana Wells e Cristina Ribas** – the group is organizing a special on-line archive with the objective of building a memory archive of tactical media actions from a feminist perspective <https://aprija.net/article/view/121491>
- **João Carlos Caribé** - algorithmization of networked social relations, belief production and reality construction. The idea is to understand, from the breakup of the concept of information, due to build a conceptual model (i.e. how the individual and groups process information, how it is mediated and assimilated): <https://ridi.ibict.br/bitstream/123456789/1040/1/DissertacaoJCRC2019.pdf>

63. <https://lavits.org/>

64. <http://redegovernanca.net.br/>

- **Anderson Fernandes de Alencar** - the proposal is to reflect on migration from proprietary software to free software. The work discusses the state of the art of technology in the present context through their reflections on the concept of technique and technology, the various attitudes towards technology, the criticism of technological dependence, the presentation of technology as the patrimony of humanity, the reflection on a possible “technological praxis”, a technology at the service of the causes of emancipation and social change and the defense of a conception of infoinclusion. <https://www.teses.usp.br/teses/disponiveis/48/48134/tde-08112007-150130/pt-br.php>

Some points for reflection:

a. Tensions and perspectives on the use of AI

Political theorist Langdon Winner profoundly impacted studies on the intersection of technology and society by publishing the article entitled “Do artifacts have politics?” (1980). Winner argued that technological artifacts are, in fact, political. While an argumentative line identified technology as neutral, pointing out that only its use, as an object, can be applied for political purposes, Winner demonstrated that technology, in itself, is political. Its conception involves human decisions that contain the worldview of the scientist or engineer. The way it works also has the power to define how it will be used.

When creating a technology, there is a decision to be made. Technology can go one way or the other, it can have one or the other functionality. These decisions are political and make technology itself to be too. In artificial intelligence, this issue is clear.

Is it possible to think of solutions, uses and ethical processes for AI, since the massive collection and processing of data may imply an increase in surveillance, in the restriction of the autonomy of individuals, in the reduction of freedom of expression?

b. Solution to escape the big techs

Would community solutions be able to replace the current services disseminated by Big Techs? Could alternatives based on free software and open source programs, open educational resources and federated server networks be widely adopted by educational institutions?

In Brazil, it is worth highlighting the work of the Open Education Initiative⁶⁵, which develops projects to promote open education, from the perspective of licenses, open technologies and digital rights. Among the projects, the Free Choice⁶⁶ stands out, which presents a commented guide of tools and applications that do not use personal data as business models.

c. Regulation X innovation and technological development

Is it possible to have regulation at an international level to stop the expansion and domination of Big Techs? It is necessary to consider discussions about the digital economy and trade treaties directly linked to the taxation or not of data flows, the sovereignty of countries and the increase in inequalities. The pressure is that there is really little regulation.

d. Protecting privacy in times of COVID-19

The year 2020 has entered into history for many reasons and offers practical examples of the uses of AI. We will see in three aspects how AI brings important and extremely current ethical issues that need to be considered for the proper functioning of technology. The COVID-19 pandemic changed many social relationships and suggested intense social isolation, boosted the institution of remote work and education, supported by technology, and stimulated the use of data-based solutions.

In the hope of helping to combat the pandemic, many states and countries, such as China, Australia and the United Kingdom, started to institute “contact tracing”⁶⁷ apps. They are apps that map people who have tested positive for coronavirus and alert other people close to them so that they take care or try to isolate themselves on their own to be safe. There are many methodologies used by such apps, such as the identification of Bluetooth signals between cell phones, the location by GPS, the location of purchases by credit card or even the provision of information by the user himself by filling out electronic forms.

With these apps, if you contact someone who is later diagnosed with COVID-19, you will receive an alert about the possibility of being infected as well. Although such use of technology can bring evident benefits for the containment of the pandemic, it also poses serious risks to the privacy of users.

65. <https://www.aberta.org.br>

66. <https://www.escolhalivre.org.br>

67. <https://www.sciencemag.org/news/2020/05/countries-around-world-are-rolling-out-contact-tracing-apps-contain-coronavirus-how>

There were protests against Israeli Prime Minister Benjamin Netanyahu after the announcement of a surveillance program that uses the country's home security agency to track the location of people potentially infected with the virus. South Korea, on the other hand, released detailed information about infected individuals — including their recent movements — visible through various private apps that send alerts to users nearby. In this case, users of the app received messages like “60-year-old woman was infected next to you. Find out more”, and were able to access content with many details about the infected person's private life. Such access to private information can foster discrimination not only towards the infected person, but also towards the commercial establishments through which he / she passed, even before the disease manifests itself fully.

The Massachusetts Institute of Technology conducted a research project⁶⁸ mapping all contact tracing apps on COVID-19, classifying each according to its collection methodology and issues related to the protection of personal data, transparency and the general functioning of the apps.

The current challenge, in the case of contact tracing apps, is to generate technological solutions that are not only effective in identifying risk zones for users who may have come into contact with contaminated people, but also in a respectful way regarding the privacy of people, increasing public trust. Such a challenge, by the way, is applicable to any and all technology. Assertive AI would be one that functions as a tool for enabling rights and services for humans, and not as a tool for control, surveillance and reduction of rights.

d. Prejudice and bias

At the same time as the pandemic ravaged the world, protests against racism flourished in the United States, in the light of the death of young black man George Floyd by a policeman, which spread to several countries. Such protests have strengthened criticism of systems and processes that could spread racism within police forces. It was against this background that IBM⁶⁹, one of the largest technology companies in the world, announced the closure of its entire area of innovation in facial recognition. The company announced that it would not only stop offering facial recognition services, as it had been doing mainly for the American police, but would also stop all research and development on the subject. According to the company's CEO, Arvind Krishna:

68. <https://www.technologyreview.com/2020/05/07/1000961/launching-mittr-covid-tracing-tracker/>

69. <https://www.theverge.com/2020/6/8/21284683/ibm-no-longer-general-purpose-facial-recognition-analysis-software>

“IBM firmly opposes and will not condone uses of any technology, including facial recognition technology offered by other vendors, for mass surveillance, racial profiling, violations of basic human rights and freedoms, or any purpose which is not consistent with our values (...) We believe now is the time to begin a national dialogue on whether and how facial recognition technology should be employed by domestic law enforcement agencies.”

The racial profiling cited by the CEO of IBM is not new or exclusive to technology. It occurs when people, especially public authorities such as police and the like, act in a discriminatory manner towards individuals based on their race, ethnicity, religion. Racial profiling points to a negative predisposition against certain individuals for their external characteristics.

For example, it occurs when police conduct searches without any basis simply because they identify a group of young black people and immediately regard them as suspicious. The problem is so real that the Office of the United Nations High Commissioner for Human Rights (OHCHR), still in 2017, held a meeting in Rio de Janeiro exclusively to debate the issue⁷⁰.

Some uses of artificial intelligence can intensify racial profiling, perpetuating racist and discriminatory practices. For example, MIT Technology Review, an independent magazine from the Massachusetts Institute of Technology, published an interactive game⁷¹ that analyses how fair the automated decisions of COMPAS, an algorithm used by US courts, are.

The algorithm acts in the risk assessment, helping judges to determine if a defendant should be kept in jail or awaiting trial in freedom based on the probability of, if released, executing any wrongdoing. COMPAS uses historical data from past defendants, trying to find correlations between factors such as age and criminal history and which defendants were arrested again when released. Thus, the algorithm predicts the likelihood of a defendant being arrested for a new crime during the waiting period for trial. As required by US law, COMPAS does not include the race of defendants in the calculation of their risk scores. Still, the tool can be biased against blacks.

As the game prepared by MIT is played, we realize that COMPAS cannot reach fully fair decisions. This is because predictions made by artificial intelligence reflect the data used to produce them. If black defendants are arrested at a higher rate than white defendants in the real world — although due to imperfections and systemic injustices —, they will also have a higher risk rate of imprisonment and will enjoy less of the possibility of responding in freedom.

70. <https://www.youtube.com/watch?v=IVMBMTwmqXc>

71. <https://www.technologyreview.com/2019/10/17/75285/ai-fairer-than-judge-criminal-risk-assessment-algorithm/>

Previously, judges had to make difficult decisions that sometimes generated injustices based on racial profiling. Now, however, through the use of the algorithm, it is increasingly difficult to challenge the data offered by the machine, supported by complex calculations and, often, protected by trade secrets. These inconsistencies and injustices in the use of algorithms occur not only in cases like the one mentioned above, about the criminal justice system, but also in several other applications, such as bank algorithms that make credit scores to define who to offer a loan to, for example. An AI application used in the educational context to provide a mapping of student profiles could easily incur prejudice and inequality as well.

Furthermore, the consequences of a biased AI go beyond racial profiling. For example, the page “list of cognitive biases” in the Portuguese Wikipedia contains 37 classifications of biases⁷². The “list of cognitive biases” page in the English Wikipedia contains 179 classifications⁷³. Buster Benson put 175 English classifications into groups (the number that existed at the time of the original text), creating a guide⁷⁴ that facilitates any curious person to better understand the universe of the subject.

As the CEO of IBM himself said, there are concerns about the violation of human rights and the potential for mass surveillance. Facial recognition technology, for example, if used to identify protest participants can generate a database for authoritarian governments and police forces. Once again, the need to think about the construction of AI as a catalyst for rights and ethical technological solutions is emphasized.

e. Dilemmas of automation

In early 2020, Microsoft laid off part of its editorial board responsible for the MSN.com⁷⁵ news site. The company also intensified the use of artificial intelligence to map and select content from other newspapers to be republished on the website, filtering information and even suggesting photos to go with the news.

In June 2020, the AI used by MSN.com selected a story about a member of the British musical group Little Mix that told the history of racism suffered by the singer. The group consists of four women, two of whom are black. However, the AI selected the image of the incorrect black member⁷⁶ to illustrate the content. The irony was, therefore, in the fact that AI confused and homogenized the story of two distinct black singers, and this in a report on racism. A human editor would act to avoid mistakes like this, even though she may incur occasional failures.

72. https://pt.wikipedia.org/wiki/Lista_de_vieses_cognitivos

73. https://en.wikipedia.org/wiki/List_of_cognitive_biases

74. <https://betterhumans.pub/cognitive-bias-cheat-sheet-55a472476b18#.2ezsqki3y>

75. <https://www.msn.com/pt-br/>

76. <https://www.theguardian.com/technology/2020/jun/09/microsofts-robot-journalist-confused-by-mixed-race-little-mix-singers>

The example demonstrates how a positive solution — the use of an AI to speed up the process of filtering and choosing content, can have wrong consequences — in this case, diminishing the story and personality of the person the news story is about. It is common for humans to make mistakes and what happened to AI on MSN.com could have happened if it was a human journalist responsible for selecting a photo of the singer.

Yet, many times, society buys the idea of automation and the massive use of technology to solve problems and reduce errors without considering the nuances and difficulties that such technology faces. Therefore, technology, ethics and transparency must go together.

f. Possible cultural uses and innovative appropriations

With the changes in today's digital society, with the proliferation of cell phone use, with communication through commercial platforms, what are the possible ways to maintain critical cultural actions with technology. If the metarecycling movement no longer has the power to act, how can we recreate effective community solutions that transform realities?

The free software movement gains in this context a more strategic role related to web security and the guarantee of human rights, especially for the most vulnerable communities. How can academic research contribute in this direction?

g. AI in inclusive and safe education

Some principles that deserve to be considered in the use and development of AI:

- **Privacy:** how education can value the right to privacy. The protection of personal data must accompany AI solutions, especially in the case of tools used in the field of education, generally associated with the data of children and adolescents;
- **Proportionality:** how the AI is being “fed”. What is taught to machines and the data provided to them impact how they will work. Technologies must not collect data that is not strictly necessary for the application to function; such collection must be proportional to the purpose of the AI.
- **Autonomy:** How can AI serve as a catalyst for human creativity and development? Some AI solutions end up limiting the information that people receive. For example, a program that learns what type of content an individual likes to read and thereby only provides similar content. AI can restrict information that reaches people, potentially limiting autonomy in learning;

- **Transparency:** how to enable society to know how AI resources work, clearly understanding and having broad access to what data is used, how it is processed and what results are possible. This knowledge must involve all those affected by the technology. In the case of AI tools in education, parents, students, educators and managers need to be educated about the importance and implications of this topic. AI cannot be a black box, difficult to access and understand. Free tools, open to use, adaptation and redistribution can also be encouraged;
- **Social Control:** how can the population follow the development and functioning of AI, paying attention to potential violations of rights and misuse of technology? In addition, making citizens stewards of their own data, with control over the uses and collections of the information that concerns them. Should this process start early, as schools are important spaces for the literacy of children and young people about their digital rights?
- **Human Rights:** how to obtain an AI that respects Human Rights, that carries with it an inclusive perspective, that works in favor of freedom of expression?

h. The urgency of new digital literacies

Activists, researchers and experts are being “invited” to compose advisory boards at Big Techs. The first to inaugurate this strategy was Facebook, with the Oversight Board⁷⁷ in May 2020, with the participation of Brazilian lawyer Ronaldo Lemos. In 2021 it was the turn of Tik Tok, with the Security Council of Brazil⁷⁸, inviting lawyers and activists who fight against the algorithmic bias.

Somehow, these companies’ initiatives point to the debate that emerges in society in relation to the context of datification. Do they have the potential to foster literacy and digital inclusion in society? What should be the role of education and teaching systems in the development of competences and skills that include the necessary digital literacies updated for the current context?

77. <https://itsrio.org/pt/artigos/o-oversight-board-do-facebook/>

78. <https://newsroom.tiktok.com/pt-br/tiktok-apresenta-seu-conselho-consultivo-de-seguranca-do-brasil>

8 Some contemporary critical authors

Evgeny Morozov, “technological solutionism”

When criticisms about the high levels of fat or salt appear in the products of the large food industries, to increase consumption, such criticisms are rarely associated with a position against Science. However, if the focus of criticism is the social networks that show their products and services to stimulate people’s anxiety, it is quite common to hear adjectives such as the person being “technophobic” and an opponent of progress.

For Belarusian researcher Evgeny Morozov, “we continue to consider data as if it were a magical and special commodity that, alone, could defend itself against any evil genius who dared to exploit it” (MOROZOV, 2018 p. 28).

In his book, *Big Tech*, he criticizes the dynamics of “technological solutionism” imposed by Silicon Valley companies, that is, the idea that technology can solve all social problems. The researcher stresses that it is possible to be in favor of technology and at the same time criticize large corporations. According to him, Silicon Valley promises more freedom, but delivers more control, since the networks automatically organize an auction of advertisements based on the searches carried out and “sell” the anxieties and insecurities of its users.

He recalls that Facebook launched the *internet.org* initiative with the discourse of promoting digital inclusion in developing countries, but in reality what is at stake is to force internet providers to release their platform regardless of data packet. The exchange unit (payment) involves data, something that is not understood by users who end up materializing their personal and social lives.

Shoshana Zuboff, “surveillance capitalism”

Harvard Business School researcher and professor, Shoshana Zuboff, coined the term “surveillance capitalism” in her 705-page book, *The age of surveillance capitalism*, launched in 2019 and which has just been translated into Portuguese. Since then, the term has been widely used by several specialists and researchers in the field. The central idea of the work is to show the rise of a digital industry that not only extracts data to sell behavior forecasts to advertisers but also needs its prognosis to be accurate, which leads to provoke and induce human conduct.

Human private experiences today have become commodities for datification, since such data flows come from all types of interfaces: from online searches, mobile apps, cameras, various devices, sensors, and all of this in homes, automobiles, in cities.

The accumulation logic that would guarantee Google's success appears clearly in a patent filed in 2003 by three of the company's top computer scientists, entitled "Generating user information for targeted advertising" [...] Google would no longer be content to extract behavioral data to improve its services. It would read the thoughts of users in order to match the ads to their interests, which, in turn, would be deducted from the collateral traits of online behavior (ZUBOFF, 2019, online).

The consolidation of this new market, according to the author, was the entry of Google on the Stock Exchange in 2004. "Surveillance capitalism quickly established itself as a model of information capitalism on the web, gradually attracting competitors from all sectors" (ZUBOFF, 2019, online).

Today, it is known that this model is not limited to advertisements for consumer goods, but has repercussions in the field of politics, as happened with *Cambridge Analytics*. In March 2018, a New York Times⁷⁹ report revealed that the collection was of 50 million Americans due to a free personality test on Facebook, which benefited the Trump and Brexit campaigns, as shown in the documentary *The Great Hack*⁸⁰.

Yuval Harari, "who controls who controls the data?"

Internationally famous for his trilogy, *Sapiens* (2014), *Homo Deus* (2016) and *21 Lessons to the 21 Century* (2018), Israeli historian Yuval Noah Harari has sold 27.5 million copies in 60 languages⁸¹. He was in Brazil for the first time in 2019 giving a series of lectures and interviews on what he regards as the three main global challenges: nuclear war, climate change and artificial intelligence.

Such challenges, according to the author, correspond to direct threats to the human species and can only be solved in a cooperative way between the different countries, especially those that, like Brazil, are not leading what he calls "technological disruption".

This is exactly the aspect covered extensively in *21 Lessons to the 21 Century*. The book is based on the ideas explored in the previous two volumes (reflections on the past of humanity and perspectives for the future from technological development) and highlights ways to better understand political, technological, social and existential issues that are interrelated and impact human life across the planet.

As highlighted by Gonsales (2019), the book brings in a specific chapter some warnings for the area of education. The first of them related to the spread of "learn programming", proclaimed by educators and education systems as the "new" literacy.

79. <https://www.nytimes.com/2018/03/17/us/politics/cambridge-analytics-trump-campaign.html>

80. <https://www.netflix.com/br/title/80117542>

81. <https://www.ynharari.com/about/>

For the researcher, this is not the most important thing. It is understanding how the technology works and is currently being developed, considering the political, economic and social contexts. For example, understanding that data from everyone in the world is being collected and accumulated in two locations: USA and China.

Another alert would be to open space for the unpredictable in educational practices, forming flexible minds. And a third emphasises promoting self-awareness, including awareness of one's weaknesses:

If, however, you want to maintain some control over your personal existence and the future of your life, you will have to run faster than the algorithms [...] and get to know yourself better than they do (HARARI, 2018 p. 330).

Cathy O'Neil, "weapons of math destruction"

Data scientist Cathy O'Neil, who also participated as an interviewee in the documentary *The Social Dilemma*⁸², has just had her book *Weapons of Math Destruction* translated into Portuguese. In it, O'Neil (2020) discusses how much of the decisions about human lives are being guided by mathematical models, something that, theoretically, should lead to fairer results, and is not what is actually happening.

If mathematical algorithms are initially developed from a given intentionality, then they learn from human behaviors online. In these behaviors there are biases and prejudices and, as they perform automatically on social networks, for example, they end up generating several problems for living in society. The researcher exemplifies with credit assessment algorithms, public security, legal area, among others. A black person who lives in an economically less favored region, but is able to fill a vacancy, is not even part of the selection because the person is already discarded by the algorithm. Nursing job openings end up being directed only to women.

Many companies use a credit score in the selection process. The person may not have a good score at the moment because he does not have a job and, consequently, does not get the new job because the score does not correspond to the expected. This is often accompanied by the region of residence, socioeconomic level, among other factors that keep people away from job opportunities.

O'Neil reports cases of teachers who were fired due to evaluation systems that used an algorithm that combined the progress or decline of student learning with the performance of teachers. More than 200 teachers were dismissed for having a score lower than that determined by the algorithm. Several of these teachers, however, had always been highly rated by the bosses and the parent community.

82. <https://www.thesocialdilemma.com/>

For the author, the algorithms must be permanently evaluated by their developers and data scientists, to check if they are fulfilling the purpose for which they were created. External audit for algorithms would also be recommended by the author.

Pierre Levy, “web giants are the new state” / “platformstate”

One of the most prominent exponents in cyberculture studies, always with a progressive and hopeful look at “intelligence technologies” and “collective intelligence”, the French philosopher Pierre Levy recently started to raise concerns about the current scenario.

In an interview with Valor Econômico newspaper, which he regretted not being made available openly⁸³, Levy compares *Big Techs* and their platforms to the power of a nation-state. Companies such as Google, Apple, Facebook and Amazon today influence the lives of billions of people, with the ability to manipulate wishes and votes and, thus, constitute “platform states”, advancing in traditional state areas and functions. “He points out that currently 60% of the inhabitants are connected to the network, where, apart from the information, fanaticism, pedophilia and other ailments proliferate” (LEVY, 2020, online).

It is a vision that challenges pre-established concepts. If a nation-state is understood as the “political-legal organization of a society to achieve the public / common good, with its own government and determined territory” (LOPES, 2010 p.4), could the virtual territory, which subjects people to certain rules, be considered?

There are nation-states, however, blocking entire platforms (for example, China), they have jurisdiction over those platforms. Court decisions may compel platforms to act outside their regulation, such as, for example, returning content that had been withdrawn⁸⁴.

For the philosopher, the only possible remedy against the abuse of the “platform state” is education, that is, the development of critical reading to train intellectually autonomous and conscious people. Citizens who are enlightened about how these platforms operate will not give in to domination or addiction, since they consider digital platforms to be tools of communication and productivity.

83. <https://twitter.com/plevy/status/1319602726859378696>

84. <https://www.uol.com.br/tilt/colunas/helton-simoes-gomes/2020/12/06/seios-a-mostra-sao-1-caso-do-brasil-avaliado-pela-tribunal-do-facebook.htm>

Sergio Amadeu, “digital cage”

The sociologist and professor at the Federal University of ABC, Sérgio Amadeu da Silveira, has long been a critical activist in the digital world. In his book *Tudo sobre tod@s: redes digitais, privacidade e venda de dados pessoais* (2017), he draws attention to the issue of personal data constituting itself as a financial niche for large technology corporations, that is, the information society leading to a transformation of capitalism.

Silveira points out the discourse of privacy being presented as an outdated value in the current context. In this way, it justifies the combined and complete offer of communication and productivity services, taking capitalism to an immaterial and cybernetic form, “cognitive capitalism”. Those who only consumed information started to also produce and share, through websites, blogs, posts in general, generating the need for a dispute for attention, of being present and noticed in the networks.

The author highlights the persistence of collaboration sites and the internet as a fertile environment for the development of creativity and experimentation. However, he emphasises the growth of the “data market”, formed by four layers: collection and storage; data processing and mining; analysis and sample formation; and modulation. For the author, society is placed in a “digital cage”.

Cédric Durand, “techno-feudalism”

French economist, professor at Sorbonne, Cédric Durand, coined the term “techno-feudalism” to characterize the rise and dominance of mega platforms, which are creating more control than at the time of the industrial revolution. Contrary to what was proclaimed, technology would not be generating human progress, but restoring monopolies, dependence, political manipulation, privileges and a task of global predation are the true identity of the new economy:

[...] we live in a feudalism proper to modern times, very far from the freedom and equity promised by new technologies. Under a rhetoric of progress and innovation, the purest and oldest scourge of domination lurks. New technologies are quite the opposite of what they promise (DURAND, 2021, online).

The researcher published the book *Technoféodalisme: Critique de l'économie numérique*, in which he argues that capitalism was renewed by regressing, settling in the “medieval”, but using “modern” tools, generating more cruel forms of domination and submission. For him:

The Silicon Valley myth melts before us: scandalous accumulation of profits, techno-dictators, unabated social inequalities, chronic unemployment, millions of additional poor people and a handful of techno-oligarchs that accumulate fortunes never seen before. The much talked about “new economy” has given way to an economy of domination and inequality (DURAND, 2021, online).

Like Pierre Levy, Durand also speaks of “digital territories” to explain the dominance that digital platforms establish and how it comes close to feudal logic. As more services emerge, more dependence they generate — the strategy of the companies is the conquest of these territories (obtaining more and more data), without any competition, the basic idea of capitalism.

He points out that there is no individual solution to the situation, although people are not innocent. “The challenge is to find solutions that involve political intervention that subject the operation of these platforms to the logic of public services” (DURAND, 2021, online).

Yuk Hui, “technodiversity”

With a book recently launched in Brazil, the Chinese researcher Yuk Hui presents in several articles a new look at technology with the concept of *Tecnodiversity*, through which technology must be understood as a result of cultural aspects, that is, of a set of knowledge associated with a given territory. Hui disputes the idea of technology as a universal phenomenon, because “our brain is shaped according to our experience of learning a language, which synthesizes different ways of thinking” (HUI, 2021, online).

According to the researcher, traditional Western thinking about technology, as a mere instrument, has prevailed due to the history of colonization and globalization. He criticizes the widespread idea of singularity (increasingly intelligent machines take precedence over humanity) and that of “homo deus”, by Yuval Harari, because for him it is a partial truth:

To be able to inquire about the future of the human or the posthuman, we will have to confront, in the first place, a nihilism of the 21st century. Otherwise, we’ll just be herds participating in campaigns by biotechnology companies and book publishers (HUI, 2021, online).

Regarding the documentary *The Social Dilemma*, the researcher highlights that the major problem that the film brings is not the issue of manipulation, but the lack of alternatives:

The problem I see today is that we are not able to provide real alternatives. When you are tired of Facebook you switch to another Facebook, which may be different only in your data and ownership policy, but you end up doing the same things there and suffer from the same problems on these new platforms. Creating alternatives is also part of what I call technodiversity (HUI, 2021, kindle).

Byung Chul-Han, “hell of the same”

An article in the newspaper El País (2019) presented the ideas of the South Korean philosopher Byung-Chul Han about the contemporary behavior of society in completely alienating itself in environments or around what is known to it, the same, excluding what is different, favoring neoliberal logic. “Today the person explores himself thinking that he is fulfilling himself; [...] It is “the alienation of oneself”, which in the physical field can be translated into anorexia or binge eating or the excessive consumption of products or entertainment (GELI, 2019, online).

For him, the current dataism shows that the human being is no longer in charge of himself but is instead the result of an algorithmic operation that controls him without him realizing it. Like Shoshana Zuboff, Chul-Han points out the urgency of regulation and also emphasises the need for a basic income for the professions that will be devoured by new technologies.

Author of several works, such as *A Sociedade do Cansaço* (2014), *A Sociedade da Transparência* (2017), *Agonia do Eros* (2017) and *No Enxame: reflexões sobre o digital*, Chul-Han is considered viral (GALINDO, 2018), although the networks are responsible for disseminating his ideas conveyed in interviews and news stories. “It is almost ironic, because Han attacks the role of networks harshly and wonders if in the end it will be the algorithm that builds the man and not the other way around” (GALINDO, 2018).

Carissa Véliz, “privacy is power”

Professor at the Institute of Ethics and Artificial Intelligence at the University of Oxford, Carissa Véliz launched the book *Privacy is power* (VÉLIZ, 2020) in which she defends the abolition of data-based business models, as highlighted in the BBC interview:

As long as the data is profitable, there will be abuses. Some people may think that it is radical to make a call to end the data economy. But the radical thing is to have a business model that depends on the massive and systematic violation of our rights (VELASCO, 2020, online).

According to the author, the magnitude of the current “data economy” is not yet something widely known to people, however, there are more and more warnings and

complaints about the abuse of virtual platforms in relation to privacy, they can end up in the “dark web”⁸⁵ (VÉLIZ, 2020). She recalls the recent case of the Whatsapp policy change, forcing users to accept data sharing with Facebook. The episode caused the migration of a large part of people to the competitors Telegram and Signal, which led the company to postpone the mandatory measure.

Tarcízio Silva, “racialized digital materialities”

Researcher, cultural producer and fellow of the Mozilla Foundation, Tarcízio Silva has been working in digital security and defense against algorithmic damage. He organized the book *Comunidades, Algoritmos e Ativismos Digitais: olhares afrodiaspóricos*, with the intention of collaborating with the “increasing complexity of thinking about digital communication and the internet resulting from the diversification of views and speeches in academic spaces” (LITERACASA, 2020, online).

Authors from Brazil and from countries in Aphrodispora (Congo, Ethiopia, Ghana, Nigeria, Colombia, United States and United Kingdom) address in 14 articles the relationship of digital technologies (algorithms and social networks) with race, racism, blackness and whiteness (SILVA, 2020). The opening chapter, for example, by Ruha Benjamin, activist and professor at Princeton University / USA, speaks of the so-called “prison imagination” intertwined in Western technologies, from slavery to today’s facial recognition. Fernanda Carrera, on the other hand, reports how racist representations take place in a survey on popular image banks such as Shutterstock, Stockphotos and Getty Images: results of searches imbued with valuation in contemporary society, such as “boss” or “secretary” and “poverty” are analyzed in their racial representations and visibility on the websites in question (SILVA, 2020).

Eduardo Magrani, “utilitarianism X deontology for AI”

The lawyer, professor and researcher Eduardo Magrani, currently a consultant in privacy and data protection for the German government, was one of the first Brazilian authors to speak of a “bubble filter” in his book *Democracia conectada* (2014), and to call attention to hyperconnectivity through devices, *Internet das Coisas* (2018).

More recently, he addressed ethical issues involving artificial intelligence in the book *Entre dados e robôs* (2019), highlighting two antagonistic views to understand the ethical field of AI: utilitarianism and deontology. The utilitarian view emphasises how much pleasure and well-being a given action provides an individual than if the action acted according to certain principles or rules. The focus is on the consequences

85. “The dark web is a part of the internet that isn’t visible to search engines and requires the use of an anonymizing browser called Tor to be accessed”

of actions, that is, if the amount of benefits generated for most people is greater than the amount of harm, it is possible to talk about a positive result.

The deontological view, in turn, points out that there are rights and duties to be observed and fulfilled, regardless of the consequences. The focus is on the agent of the action and not on the consequences. “Deontology fits into the domain of moral theories that guide and evaluate what we should do, [...] judge the morality of the choices individually, by a parameter not oriented by the results” (MAGRANI, 2018 p. 93). It is through the deontological view that one can think of fundamental ethical principles to regulate the development and use of artificial intelligence, understanding the human being as an end in itself, so as not to harm certain groups or individuals.

Magrani is also an activist for the freedom of access to knowledge and, therefore, for the flexibility of copyright. His works, even those sold by publishers, are all available under *Creative Commons* licenses on his website⁸⁶. The author brings a critical perspective in the legal field, highlighting, for example, the lack of a critical eye on the use of technology by Latin American countries compared to European countries. In Germany, there is a data protection regulatory agency by region in the country.

86. <http://eduardomagrani.com/>

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