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Success, threats and potential dangers of GAFAMs

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Summary: GAFAMs dominate the world of information and knowledge highways. Their technological, economic and financial successes are remarkable. However, their quasi-monopoly situation constitutes a danger for the world, both by the power of their actions on the economic and political world, by their disinterest in financing public services, by their ability to use and reproduce information to their advantage and to produce important biases on political choices and freedom of expression.

Résumé : Les GAFAM dominent le monde des autoroutes de l'information et de la connaissance. Leurs succès technologique, économiques et financiers sont remarquables. Cependant, leur situation de quasi monopole constitue un danger pour le monde, à la fois par la puissance de leurs actions sur le monde économique et politique, par leur désintéressement pour le financement des services publics, par leur capacité à utiliser les informations et à les reproduire à leur avantage et à produire des biais importants sur les choix politiques et la liberté d'expression.

GAFAM, freedom, Monopole, Internet

GAFAM (Google, Apple, Facebook, Amazon, Microsoft) develop and use operating systems, computer equipment, telecommunication networks and data centers. They work on the Internet, with great creativity, but they do not have the paternity of the modern Internet, which was originally a public good, managed, for strategic military purposes, by ARPA's ARPANET (Advanced Research Projects Agency), part of the US Department of Defense. These technologies, based on a decentralized architecture, packet switching in networks, time-sharing and autonomous work, called into question the centralization of information and its dissemination. At the time, IBM and AT&T were mastodons that refused to invest in this IT sector at their own expense. At the beginning of 1980, ARPA withdrew from the project, which was taken over by the National Science Foundation (NSF), which took over this new technology by creating a "republic of computer scientists" financed by the American taxpayer (Smyrnaio, 2017). The idea was to apply these systems in the world of academic research, but also in the corporate world, in order to innovate and impose American standards on the world. The basic idea was to offer innovations free of charge and to prohibit the filing of patents. Private appropriation was not the choice of this community of ingenious computer scientists, which led to the design and implementation of the World Wide Web (www).

However, President Reagan embarked on a path of deregulation and privatization, convinced by his advisors of the famous "trickle-down" theory, according to which the rich eventually allow other citizens to improve their standard of living. This policy quickly fuelled hopes and market opportunism, especially from private firms in the digital economy. The growing demand for the Internet was of considerable economic interest. Digital goods and services are unrivalled, they lend themselves easily to storage, they process large amounts of data in a short period of time, they produce large and increasing returns to scale, they offer positive externalities and rapidly declining transaction

costs. Firms will implement a centralization of strategic functions and a matrix organization. The aim is then to satisfy the instantaneous desires of their potential customers, which has facilitated the implementation of processes of concentration and vertical and horizontal integration, a globalized production strategy, calling on the best "potential inventors" for software, but also on "low cost" workers for hardware, and the financialization of operations (Fontanel, Suscheva, 2018). Information "pools" lead to the concentration of activities. Thanks to their financial power, which enables them to invest in research and development and to buy up all the "start ups" likely to produce new services that are technologically and economically efficient, the GAFA, sometimes in internal competition, impose their standards and control over all digital products, services and software, and are thus one step ahead of the competition.

The GAFAMs have become examples of economic success in a liberal capitalism. However, their methods and services are beginning to be challenged. Snowden's revelations have highlighted their links with the NSA (National Security Agency) and US government intelligence agencies. The theft of strategic data by states allows the implementation of cyber warfare instruments (Fontanel, 2010; Delesse, 2016). In addition, they use private information on a large scale for profit, and the system could resemble or develop towards the establishment of a mass surveillance society. Today, few governments are in a position to develop safeguards against these forms of intrusion into people's private and public lives. Finally, they are setting up a selfish system, with little regard for its own public responsibilities, based on sophisticated forms of financial speculation and tax evasion and optimization, which states are only beginning to challenge. Some non-governmental organizations have seen in these actions a desire to control the movements of people's thinking (Bensahel, Fontanel, Corvaisier-Drouart, 2009). However, in order to avoid antitrust laws, the GAFAMs need the legislative support of states, which highlights their capacity to convince governments of their public service function.

Digital technologies are part of the new transnational space for the circulation of capital. While democratic institutions have never debated its privatization, the Internet has become a source of profit; it is no longer a public good. The GAFAMs have taken the current of the digital revolution and are shaping it more and more according to their own interests. However, criticisms and pockets of resistance are beginning to emerge.

GAFAM, the heirs and leaders of the digital revolution

The economic and financial power of the GAFAM is considerable. In terms of the financial capitalization of multinational firms, the GAFAMs occupy the top four places in the world, with Tencent Holdings Limited (China) narrowly surpassing Facebook in fifth place. They have a cumulative cash flow of \$550 billion and generate \$100 billion in annual profits. In 2018, Apple and Amazon have reached a financial valuation exceeding \$1 trillion. This wealth has only been made possible by the rise of network systems, the free acquisition of a considerable mass of information provided by Internet users and the development of commercial strategies on the Net, the economies of scale that have expanded with the globalization of economic activities (Fontanel, 2005) and above all the protection of patents, about which multiple questions could be asked.

With more than \$60-70 billion in cumulative R&D in 2018 (current R&D spending of \$52 billion for France as a whole), the GAFAMs have considerable innovative power that is transforming the daily lives of citizens and consumers. They have an excellent technological reputation, they benefit from numerous monopolistic niches, they are the world's leading advertising salesmen, and they use all their expertise in information processing and relations with political powers to engage in lobbying actions (more than \$100 million per year) aimed at avoiding the normal exercise of antitrust laws.

The GAFAMs have an undeniable influence on today's civilizations. "They extend their markets and their politico-cultural power throughout the world when territories do not regulate digital markets. In countries that want to maintain their capacity to manage information highways, Internet companies have been created (Yandex in Russia, Baidu for China). In China, Apple, Microsoft and Google are present by accepting the application of censorship procedures for certain negotiated information or applications" (Fontanel, Suscheva, 2018). The economic activities and revenues of the GAFAMs are very satisfactory, in great expansion for a decade, from 139 to 649 billion dollars in 2008, with real profits in the order of 10 to 20% of their turnover. They receive various revenues, but in the end quite low, advertising (86% for Google and 98% for Facebook), hardware (81% for Apple), online sales (82% for Amazon) and software (62% for Microsoft). The GAFAMs control the operating systems and data centers. Apple

dominates smartphones, Amazon dominates readers (Kindle), Microsoft dominates PC operating systems, Google dominates the Cloud (ahead of Microsoft and Amazon). Regarding computer equipment, they are still dominated by Samsung, Huawei, Lenovo, Sony or Dell, despite the productions of Microsoft and especially Apple. Similarly, if the telecommunications companies dominate the sector, the GAFAM are interested in the mobile access of their offers and in the computer connection. Microsoft has taken control of Skype and Amazon of Whispernet. Google, already owner of Fiber, has obtained an MVNO (Mobile Virtual Network Operator) license. In addition, Microsoft and Facebook are building Marea a new transatlantic communication cable that is more powerful and efficient than those in existence today.

The GAFAMs have their specialties, their strengths, even their monopolies, even if they also seek to cut into the markets of their counterparts. They are sometimes in competition, especially in new areas of innovation, such as electronic cars or artificial intelligence. However, each company in GAFAM has its own history, often characterized by extreme economic situations, with disappointing results that can lead to bankruptcy and fabulous profits earned in a short space of time.

- Microsoft (whose companies are today grouped together under the name "Azure") was founded in 1975 by Bill Gates and Paul Allen with the aim of developing operating systems and software for computers. The company did not belong to the GAFA at the beginning of 2010, but its turnaround has been spectacular, Microsoft operating systems are present on 90% of the world's microcomputers. Microsoft's capitalization (\$760 billion) has tripled since 2012. It has abandoned Windows Phone, bought several companies and sites (Nokia, LinkedIn, Github and Skype), invested in the technologies of the future (artificial intelligence), developed connected music services (Groove), created new tools and video games (Minecraft) and designed "cloud computing", which has become the world leader in the sector.

- Steve Job and Steve Wozniak founded Apple in 1975 in Cupertino. The company has gone through all the stages of development and crisis that have shaken the entire global digital economy. In 1997, Apple went through a very serious crisis, which resulted in the dismissal of a third of its employees and a \$150 million contribution from Microsoft, its main competitor. The return of Steve Job and the willingness to work on fewer products will contribute to the firm's recovery. Technological evolutions and

revolutions will then multiply at a high rate, with the modern design of the iMac, then the iPod (which transforms the music market), the iPhone (which revolutionizes the telephony market), the iPad tablet (which brings simplicity and comfort in the use of digital applications) or the rise of Apple Stores. For the past two decades, focused on the implementation of complete computer hardware, it has strongly participated (for good or ill) in the professional and intimate relationships of consumers and citizens. Its competitors remain powerful, notably Huawei (second largest in the sector) and Samsung. Apple also offers other goods and services, such as interconnected watches or a music offering (Shazam). Each year, in the face of competition and its greed for profits, Apple halts production and marketing of recent models deemed insufficiently competitive compared to other products, and programmed obsolescence is always considered from a financial point of view. It also protects its innovations by fighting against industrial espionage and protecting its patents. Finally, the company fights against industrial espionage and for the protection of its patents (it obtained, from the American justice system, 539 million dollars from Samsung, which copied the design of its iPhone

3) Created in 1994, Amazon's initial objective was to sell books by mail order. It experienced a crisis in 2000, then another one in 2008. Since then, its price on Wall Street has been multiplied by a factor of 20. The recent acquisition of the Whole Food chain further strengthens its product range and financial importance. With annual revenues of \$178 billion at the beginning of July and a gross margin of \$66 billion, Amazon demonstrates its dynamism. Amazon is present in the cloud computing, pharmaceutical, media and food industries, it employs 550,000 people worldwide, often low-skilled, low-paying, applying simple tasks, with a monitored pace. In the United States, it employs poor, often part-time employees, a third of whom receive food aid in Arizona. Wage earners are paid \$15 per hour, with seasonal workers, prisoners, and retirees. The Stakhanovism of the 'Amazonians' is recommended, especially as Christmas approaches (Malet, 2013). Amazon engages in strong lobbying operations (3.5 million dollars) to counteract an image altered by its ability to avoid taxes, according to ethically questionable and strongly contested modalities. Until 2015, by playing on patent and trademark royalties, a subsidiary of the Amazon company employed 15,000 employees in the United Kingdom for zero profit, while 500 employees in Luxembourg made a considerable profit (National Assembly, 2013).

4) Google was born in 1998, offering an algorithm (PageRank) designed to facilitate Internet searches. It has developed an efficient advertising model, which has enabled it to carry out important commercial and financial operations. It has taken control of the web browser market thanks to its continuous innovation and its ability to buy the most promising start-ups. In 2018, Alphabet (a company that brings together all of Google's economic, financial and technological activities) will have nearly two-thirds of the desktop market share. Chrome serves as the software basis for the Chrome OS operating system for computers, but it has also become a platform accessible on Windows, MacOS, Linux, Android, and even iOS. In addition, the takeovers of Waze, DoubleClick, YouTube and Android have enabled exceptional financial growth for the firm. It also proposes to integrate the Android operating system in vehicles (notably Renault), as part of the autonomous car. It is therefore committed to the field of artificial intelligence, which requires major investments from fundamental research to the realization of new profitable products. Google is working on it. Google's business strategy based on selling a package of several products in one has been legally challenged, but it still forms the basis of its commercial success, thanks to effective lobbying. The firm has often been sued for "dominance" and "monopoly".

5) Facebook is the latest of the "Big Five". This orderly system of social networks operates on the basis of personal data provided by its users. The business model works through the sale of advertising space, through the sale of targeted messages, based on the information provided to it and which it synthesizes for commercial purposes. Facebook does not implement the protection of citizens' privacy (Powers, 2018). The companies of disinformation and supposed political manipulation with Russia (in favour of the Trump candidate) have created polemics that have called into question Facebook's image and reduced its potential for attraction as an advertising medium. The firm has been condemned by the European Commission to a fine of \$5 billion in 2017 for abuse of dominant position. The "fake news" that Facebook spreads (against its will) spreads a deleterious atmosphere in social networks that can lead to inappropriate reactions. The "Cambridge Analytica" case highlighted the recovery of information concerning 87 million social network users made available, in particular, to Donald Trump's team during the last US presidential elections. To bounce back, Facebook is now seeking partnerships with major U.S. banks to

implement the sharing of financial data of their subscriber customers as a new Messenger product. A vast lobbying operation is underway, notably with the national representations of the democracies.

II. The dangers of GAFAMs

The overly powerful GAFAMs are the subject of much criticism, particularly concerning their quasi-monopoly, treatment, copyrights, conflicts with staff and governments, and for ethical reasons in their international activities.

The monopolistic dangers of GAFAM activities

Amazon has become a giant in consumer e-commerce, but also in cloud computing, an activity in which it is the world leader even before Microsoft. Google has a virtual monopoly in the field of search engines, but it also has other activities within the framework of Alphabet, including the famous You Tube. Apple offers computers, telephones, tablets, but also connected watches. GAFAM is also very present in the sectors of finance, artificial intelligence and in the production and distribution of information. They buy the most innovative start-ups and competing companies. For example, Google now owns DoubleClick and WhatsApp's Facebook. While antitrust laws may be implemented in some countries, at the international level their application does not have the same value as law. Firms have more and more hybrid activities, with a widening of production lines, to make it even more difficult to apply the laws that control quasi-monopoly situations. This is why the organization of lobbying is so important from a legislative and judicial point of view for GAFAM.

Today, the competition is mainly born out of the Chinese economy. "It will be difficult in the short term for Europe to rise to the level of the Chinese "BATX" for Baidu (internet, technologies, artificial intelligence), Alibaba (e-commerce, artificial intelligence, internet, technologies, retail), Tencent (internet services, entertainment products, artificial intelligence and electronic technologies) and Xiaomi (smartphone, applications for mobiles, electronic products) and even more to hope to challenge the American leaders" (Fontanel, Suscheva, 2018) ". However, in the face of GAFAM, media and information groups are concentrating, which is neither good for democracy nor for true freedom of expression.

Copyright

The digital world plays an essential role in modern society, but its functioning and its consequences are not lacking in questions. The print media in particular is concerned both about the gradual loss of advertising revenue and about the use by the GAFAMs of the information published in their newspapers. This is an unjustified appropriation of the distribution of works, analyses and journalistic information without any compensation. The European Parliament wants to amend the 2001 European directive on copyrights in order to achieve a fairer sharing of advertising messages. This measure has been much discussed and contested, in the name of freedom of expression and cultural pluralism. Proposed by the Brussels Commission in September 2016, MEPs, influenced by Edima (an association that brings together the members of GAFAM), rejected the copyright directive concerning the pure and simple presentation of articles published in newspapers by digital platforms, which is dangerous for democracy.

On September 13, 2018, the European Parliament voted on the draft directive on the protection of copyright in the face of the digital invasion, with a view to ensuring real remuneration for creators and publishers in the Internet world. The text is still criticized by the major Web firms and defenders of digital freedoms. For the rights holders the text is not sufficient in terms of protection. The fight of the lobbies is therefore not yet over on this issue, at least in Europe.

Taxation and non-compliance for public goods

The actual prices and costs of transfers of goods and services within the value chains of multinational companies are protected by "business secrecy". The GAFAMs make significant profits by recruiting experts in comparative taxation, which enables them to reduce to the optimum the tax or social charges imposed by the States. Within this framework, the States must position themselves on their tax system and in their value chain to grant tax advantages to companies, which has the effect of increasing profits in favour of shareholders and managers of companies. The fragmentation of production transforms the reality of national comparative advantages. GAFAMs show the maximum added value in the most fiscally attractive countries (notably Luxembourg, Ireland or the Netherlands for Europe). In 2017, they would pay less than 10% corporate tax in Europe, compared with an average of 23% for small businesses, thus improving their own relative competitiveness.

They take advantage of this to invest their money in tax havens, allowing them to buy all the new companies and innovations in their fields of excellence at any time.

The interests of the European partners are often divergent. Some are reluctant to make GAFA pay taxes in exchange for jobs and important activities within their countries. However, the GAFAM have often been prosecuted in court for tax fraud, for nearly \$26 billion, including \$13 billion in tax aid to be repaid to an Ireland that did not want it (Fontanel, Sushcheva, 2019). Note also the 36 billion dollars returned to the United States as a result of the US law on the repatriation of cash from GAFAM members. A solution should be found to reduce their potential to avoid the financing of public goods of which they are rarely assumed beneficiaries. The European executive recommends taxing at 3% the revenues generated by the operation of digital activities, for the largest digital companies, thus sparing SMEs. This tax will undoubtedly be passed on to consumers.

The EU seeks to reduce the potential for anarchic tax competition between member states through efficient and fair taxation of the digital economy. Multinational firms would be required to make a single consolidated tax return within the EU. However, such a procedure would require political unanimity among EU members with an update of the operating conditions of the digital economy. Several European states are opposed to this solution, despite the existence of the BEPS (Base Erosion and Profit Shifting) of the OECD (Fontanel, 2016b). Tax treaties could modify the distribution of profits. However, it seems legitimate for firms to pay their taxes where they create their added value. Yet, Washington considers that the profits of GAFAM should be taxed in the United States, and in this context it could take coercive measures in the event of European taxation of the profits of excess American companies. An "economic war" cannot be ruled out between these two traditional allies (Fontanel, Bensahel, 1993). The GAFAM are primarily concerned with their shareholders and very little with the financing of public infrastructures, free education or the fight against poverty.

Internal criticisms of the GAFAM

The employees of the GAFA have an influence on the management of the GAFAM; they hold their management accountable. In particular, they denounce the dissemination of private information to commercial agencies, contrary to the ethical and moral principles publicly defended by their employers,

especially when the technologies are used for military or police purposes (Tech Workers Coalition). In 2018, some GitHub programmers (Microsoft) decided to stop using the Azure development management platform (Cloud services) if Microsoft continued its collaboration with the federal immigration agency, with the provision of facial recognition software (Rekognition) to the United States police forces. At Google, several engineers do not want to get involved in contracts concerning artificial intelligence, cloud computing or cloud computing. They refused to participate in a software project to build the U.S. Army's drones. The same was true of artificial intelligence for Alphabet for a contract for drones for the US Department of Defense. Seven principles have been adopted in the opening up of new technologies (Sterling, 2018), namely the interest for society, the inclusion of a responsibility for the company, the need to take into account the needs of the company's customers, and the need for the company to be able to take the lead in the development of new technologies.

Freedom of expression

The GAFAMs have not escaped criticism for their relative disrespect for freedom of expression and respect for the privacy of subscribers. Economic conflicts exert a considerable influence on civilizations (Fontanel, Arrow, Klein, Sen, 2003). Today's digital economy and technologies are not lacking in danger in the face of the clash of robotics, "fake news" and insufficient control over the respect of freedoms and human rights. The real relations between the GAFAM and the US government administration remain important and often secret, especially with the National Security Agency and US intelligence institutions (Delesse, 2016). Strategic information is often transferred to American intelligence agencies.

At the World Economic Forum in Davos, George Soros strongly criticized the practices of Facebook and Google, accused of being obstacles to innovation and an immediate threat to today's society (Solon, 2018). They exploit the social environment, seeking to orient the thinking of men, preferably young people. In this context, information is filtered, transformed and polluted by commercial and advertising messages that reduce the readers' ability to concentrate and encourage addiction to information provided in a continuous flow. Providing "genetically modified" information then endangers democracy. Power is concentrated in the hands of fewer and fewer people or commercial interests. By maintaining their strategies to their term, the commercial giants sometimes constitute an obstacle to any innovation that is not theirs, which

also constitutes a brake, a danger, for freedom of expression and human liberation. It is freedom of thought that is in danger.

Political conflicts

Surprisingly, Donald Trump, although eager to provide information on his political decisions on Twitter, feels unloved by the giants of Silicon Valley and especially by the GAFAM, whose channels would have been used to promote his election. He publicly asked Bill Gates (Microsoft) to shut down the Internet on terrorism issues. He demanded that Tim Cook repatriate his factories in China and, before his election, he called for a boycott of Apple products reluctant to provide his access codes in a terrorism case. He harshly criticized Jeff Bezos (Amazon) for taking advantage of overly favourable rates from the U.S. Post Office, for not paying taxes, for harming small business and for not respecting antitrust laws. He called on Google to shut down certain Internet networks on the issue of terrorism. As for the GAFAMs, they are reluctant to oppose US immigration policy, they contest trade disputes initiated by the White House and they oppose taxes imposed on Chinese or Western imports (Fontanel, Suscheva, 2019). The problems with Europe and China are beginning to highlight their dominant role in the dissemination and use of information, which constitutes a danger for all countries and people who do not share the same ideas.

Without sufficient collective control, because of their international character, the support in fact (if not in words) of the federal and federated American administrations, their influence and lobbying on state powers, their capacity to generate considerable financial results and their popularity, the GAFAMs have considerable and growing societal power. They benefit at the same time from quasi-monopolies of numerous industrial and intellectual properties, reinforced by free trade agreements. They thus receive "rents" thanks to patent and trademark protection. On the other hand, their sub-contracting companies, their employees and the territories that host them receive a decreasing share of the value generated.

The power of the GAFAMs is in line with the continued leadership of the United States (Fontanel, 2017) in a context of economic conflicts that point to the danger of wider economic wars (Smith, Fontanel, 2008). Challenges are clashing with US private and public interests. The "Big Five" must then defend today's products and prepare for other innovations that will escape control. Yet, like China and Russia, states should react to this fascination

with the technological dynamism of the GAFAM, whose power justifies inequalities, injustices, environmental crises, dependence and even submission (Fontanel, 2019b).

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