ESSAYS
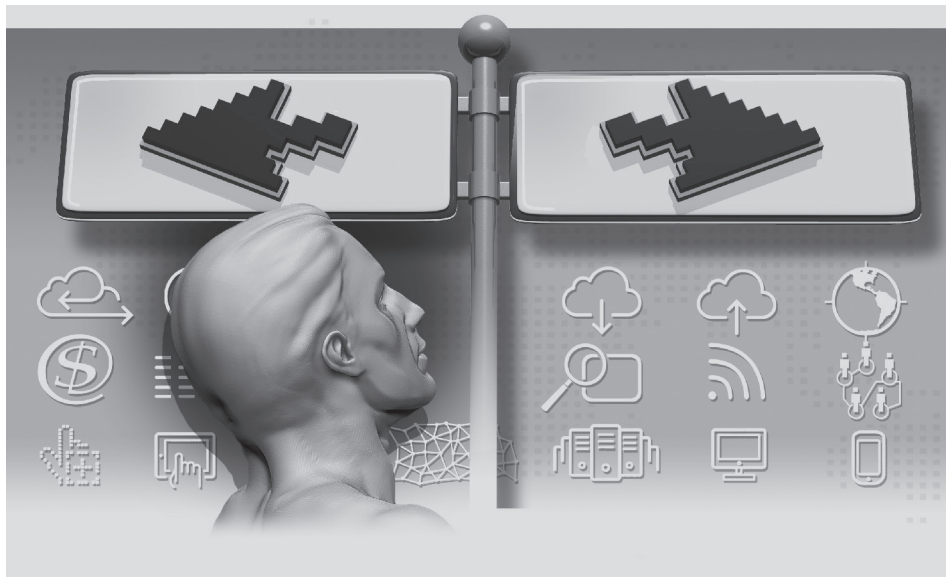
A DEEP STUDY ON THE CONCEPT OF DIGITAL ETHICS

From internet governance to teleworking, from digital exclusion to privacy and computer crimes (Di Guardo, Maggiolini, & Patrignani, 2010), there are various issues that can be listed as a part of what Digital Ethics - the "ethics of computer era" - is and involves. Before analyzing some of these issues of great importance and relevance nowadays, we need to ask if there is a common factor, a "unifying principle", for Digital Ethics.

About the essence of ethics

When we think of ethics, in all its senses, we assume that we are addressing the essential characteristic that distinguishes human beings from nonhuman beings.

I believe, according with many philosophers, that what really differentiates man, and that is at the root of his unavoidable ethical dimension, is not his rationality (reason) but his freedom. Such freedom is under many types of restrictions, but it exists, and therefore, it may be practiced. Without freedom, we cannot talk about ethics, but about biological or social historical determinism, and we could not talk about responsibility either, and consequently, ethics. Such responsibility is seen, according to Ricoeur (1955), directly in immediate (short) interpersonal relationships, or indirectly, in (last) relationships i.e. Intermediated by institutions or the environment.

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Need for new ethics

The second assumption involves the need to propose a base for research and the adoption of Digital Ethics. We could say, like Jonas (1979), that the "technological civilization" we live in – a really "new"

civilization, in which information and communication technologies (ICT) play a vital and increasing role – appeals to "new ethics" focused on the principle of responsibility".

Did people use to be less responsible and only now, for some reason, they should be more responsible? This reason would not be purely theoretical, given the increasing complexity of economic and social phenomena.

However, the reality is just the opposite. In the past, it was much easier to be ethically and socially responsible. Bauman (2002) says that our ancestry witnessed almost all consequences of their acts, because the facts and their consequences were rarely out of the visual field or their radius of direct action. According to Bauman (2002), "with the beginning of a new and increasing global network of dependencies and technology that is sufficiently capable to produce consequences at a global level, this morally satisfactory situation is over now".

Intentionally or not, prior generations were aware of the consequences of their actions because they lived them in the time and space of their lives. As a result, they also had in their minds a cause-and-effect relationship between action and consequence and they were forced to consider it. Today, the situation is really different: the awareness of the effect of new technologies is missing. That happens since genetic modification through all new technologies, including those of information. Few of our actions in this globalized technological society are followed by awareness of consequences, and that does not allow an ethical reflection. Not even computer criminals know their victims (one example is phishing). For this reason, only a relatively small portion of our actions or omissions is guided by moral values and feelings. Few are capable to consider possible effects of their actions on others, unless they have a direct participation in these actions.

This situation is evidently unbearable. We are on the way towards a society of general social irresponsibility! However, it is not admissible that huge damages can be caused in such different moments and places – without even being aware of that – only because we are immersed in an interdependence that is out of control. The theoretician of risk society, Ulrich Beck (1992), says that we should be aware of the fact that there are no individual solutions for collective contradictions. The new Digital Ethics cannot be exclusively individual, but it should be, above all, a collective, public and professional ethics.

For a unifying principle for Digital Ethics

An overview of the information technology history can help establish a unifying principle for Digital Ethics, both in terms of creation and needs it should fulfill. The ethical and social challenges of new ICTs are created due to the same reasons for which such technologies have been disseminated, like cars, nuclear power, etc. The challenge also involves the creation of a favorable balance in inevitable dualisms: light – dark; advantage – disadvantage; or cost – benefit of technological development.

For comparison purposes, an example of the past: the invention of writing, the first information technology created by humanity (Maggiolini, 2010a). Just as any other subsequent information technology, writing allowed the access, dissemination and memorization of knowledge, increasing the capability of human memory. If we analyze the first uses and diffusion of computer technology, the analogy with writing is impressive. Today, computer technology is more used not in library management or elaboration of scientific data, but in the economic-financial field.

Likewise, writing was not originally created to write the Iliad, which used more the oral tradition, but to write… invoices!

Besides improving human memory, the dissemination of ICTs has, therefore, two origins: the control of increasing complexity, as we need more and more information and technology to manage such information; and the lack of trust generated by the opportunism and consequent need to control human relations, not only the commercial relations. In simpler societies, in which people get to know each other directly, the social control is easier and, therefore, requires less information (and ICTs), because there are other ways to control opportunism. In more complex societies, if there were more trust among people, it would be possible to have less control, and less ICTs as well.

Thus, the "unifying principle" that describes the use and dissemination of information technology and that allows to frame so-called Digital Ethics is based on two factors related to the need for information and its technologies: technical complexity and political complexity. The first is directly proportional to the level of process (and phenomenon) complexity that one wants to know and control, either in an organization, in the economy or in the society. The second is inversely proportional to the level of trust among the agents involved in these processes.

The ethical and social problems related to information technologies are strongly intertwined and increase as the technical complexity and political complexity increase. In other words, while the ICTs provide increasingly effective solutions to overcome technical and political complexities, they also create new challenges and ethical and social issues that are more serious and more difficult to solve.

An example is provided to explain it better: privacy. The increase of economic and social complexity (technical complexity) and the increased lack of trust in commercial and public relations (political complexity) in the post-industrial society (Maggiolini, 2010b) could be solved in two distinct ways. The first requires social responsibilities to be assumed with more awareness. The second involves increasing

direct and/or indirect control over people, which technology could certainly provide, but with violation of privacy.

Thus, with the possible benefit from increased control, an ethical and social problem is created with the increasing violation of privacy. That requires a proper ethics in relation to the ICT. In addition, the "technical" complexity requires a proper professional ethics from all agents involved, because the technical risks of failures are very high.

We may link the unifying principle of Digital Ethics to ethical issues of the "information society" (Di Guardo *et al.*, 2010). A society of increasing complexity, particularly in the economic field (due to globalization, especially in finance and production) generates and increases the need for information for the management and control of such complexity, at a lower or higher degree fulfilled by the ICT.

The same unifying principle is also related to the theme of e-Government (Fugini *et al.*, 2005) and e-Democracy (De Cindio & Peraboni, 2010). E-Government (electronic government) is an attempt to have a public complexity government (a promise, more than an effective action). The "criminal" complexity, for security reasons, would also drive an attempt to control based on the ICTs, with all problems that it involves. E-Democracy (electronic democracy) responds and corresponds to that, in its role of control and democratic participation in increasingly complex processes of the government.

We can include the protection of intellectual property (Johns, 2009) in the unifying principle of Digital Ethics, as it appears as a question of (difficult) control against opportunism to take ideas from others to make money, either with assets of intellectual nature or with privatization of common intellectual assets. No wonder that Creative Commons have been proposed, which corresponded, in the Middle Ages, to public property, or a community property. In a market of ideas, the protection of intellec-

tual property is obviously surpassed on a large scale by intellectual assets based on reciprocity, such as in the cases of Free Software, Wikipedia, etc.

Ethical and social implications of ICT tendencies

We can consider three fundamental dimensions of the ICTs: elaborate information, memorize information and transmit information. Based on such dimensions, we can evaluate the main trends of ICTs, which already have ethical and social implications. These three dimensions in excellent development, and that used to be considered partially distinct, have merged, created new problematic questions, as quality is developed from quantity.

For decades, the calculation power of ICT devices keeps duplicating quickly, and such duplication is said to occur every 18 months. If the ICTs improve our memorization capability, the constant evolution of data analysis techniques directly implies the reduction of memorization costs. The network connections and the information transmission capacity have been continuously improved, particularly after the internet consolidation. These macro trends indicate that the economic, scientific and military activities, to name a few, show an increasing reliance on the ICTs, just like the reliance on electricity. By terribly increasing the reliance on information systems and, therefore, our vulnerability, the vital issues show to be related to backup, system security and how to protect from failures.

No wonder that the privacy protection laws were created after the ICT dissemination, and not hundreds of years ago. Although the concern about privacy appeared before the ICTs, it was the ICT dissemination on a large scale that originated the issue of privacy protection. And the perspectives in this field are increasingly

critical. For instance, with cloud computing, nobody knows where data are kept, people have to trust in providers that manage digital servers.

Such evolution makes intellectual property violation easier and cheaper than ever before, either by copying a movie, recording a song, getting full books. At universities, plagiarism has also become an unbelievable problem, exactly because it has never been so easy to copy.

The ICTs are revolutionizing work location. This delocalization (with consequent occupational problems), which used to be restricted to manufacturing activity, has become universal, including financial services. A typical example is a call center, in which a service provided in Italy may be originated in Hungary, Romania or Albania, a process that can be recognized by the accent of the agents.

Emerging problems of Digital Ethics

An interesting map of the main issues of Digital Ethics was proposed by Patrignani (2009). Besides the problems already mentioned regarding privacy, intellectual property, e-democracy and delocalization, we can highlight many other critical issues of Digital Ethics, such as internet governance, cyberwarfare, cyberterrorism and digital crimes.

The intention is not to detail every theme individually. We would like to select only three from the most important and less considered issues. The first is knowledge transmission: ethics of search engines. The second is the management of high frequency financial transactions (the so-called High Frequency Trading-HFT). The third is the problem of e-reputation, that is, electronic reputation, a very delicate and important problem that is not sufficiently discussed, especially with the very quick dissemination of social media.

Knowledge transmission and ethics of search tools

An absolute and crucial innovation is the ethics of search engines (Hinman, 2005), which are challenges for knowledge diffusion. The main instruments of access to knowledge, obviously in the sense of superficial or specific information, and not surely in the sense of deep analysis, wisdom, are the search tools.

The ethics of search engines and the transmission of knowledge are problems of reliability, search competence, and even cognitive capability of the user. The transmission of knowledge through search engines is today a great problem. We have millions of pages about a theme, presented in an order that follows unclear criteria.

According to Carr (2008), in 1964, in the United States, 81% of the adults used to read the newspaper every day. In 2000, this number decreased 50%, because now people use other (digital) media to have information. Among young people, the number of printed newspaper readers have been significantly reduced (from 73% in 1970 to 36% in 2006), replaced by other information channels.

Newspapers with everyday information and general subjects are essentially a single package, an entity with several aspects, covering politics, sports, chronicles, finance, etc. Not everyone reads everything, but the newspapers are conceived as a single entity. The editor's purpose is to ensure that a complete package will attract the most heterogeneous group of readers and investors in advertising. The newspaper, as a product, is worth more than the sum of all its parts.

In the internet, what is the difference? In general, the information in online newspapers is also funded by advertisements, whose price depends on the number of views and clicks. Some publications are paid, especially in scientific journals (so far...) and in some renowned newspapers. Only a portion of the newspaper is freely accessible, but most online readers read the free portion only, which is directly funded by advertising.

The article of interest is found directly through search tools. Every article becomes a product itself. The online newspaper becomes the sum of portions that should individually justify in economic terms, because that is what will fund the newspaper. In this context, it is evident that quality articles are laborious, expensive and economically not very profitable.

Then, we will have what Carr considers "the great unpacking". In theory, we will not be forced to pay – even indirectly – for "waste to search for valuable things". That is, we are interested only in what the tool finds, selects and presents, maybe selected not only by filters with an (unknown) algorithm, but also personalized according to the user profile, progressively defined by the user's prior searches. We do not know how, but the search algorithm is user sensitive; therefore, instead of increasing the myriad of information provided, it increasingly concentrates the spectrum of searched information. Thus, it is true we have a large amount of information available, but, if the filters and mechanisms focus the information, we will have, at best, a vast culture, but of limited depth, because it costs, and long texts are not very appreciated in an online newspaper. Ultimately, we will have a focused culture.

In this case, we highlight the problem of authority or reliability of information or knowledge. Who validates and selects the information?

Before the internet, that was clear: opinion shapers (whose reputation was, at least, widely known) used to do that, including traditional media vehicles, such as newspapers, radio and TV stations, specialized magazines, but above all, the respective editors and journalists. Cultural institutions and experts, as well as publishers, selected and controlled information following an editorial line. These intermediaries had a reputation and should account to it, because that was the capital that funded their work.

With the internet, what happens? The selection of information and knowledge is mostly under the responsibility of the user. All information will be available, but the rest of the search result (90%?) will bring information whose origin is unknown. This search result, although authentic, and not absurd (as it happens sometimes, even in newspapers), can be completely misleading with respect to the original search.

The search tools, because of undesirable mechanisms, cause confusion, or even alterations to information; then, the information consumer is in charge of selecting and controlling it. In the formation of ideas, or simply in the formation, *tout court*, the situation is very different if there is a context, or a group, a school, where we are different, we are forced to confront and collide, to check one's own ideas with those of others, or we are in a group where everyone thinks the same way, has the same ideas, the same traditions. The importance of school – at all levels, including university – is clear and evident to allow such confrontation.

For sure, it involves positive aspects, like a focused search and the automatic exclusion of undesirable information, the possibility to have relations only with those that share our interests and ideals. But the negative aspects should be taken into consideration: the risks of a cognitive impoverishment, the loss of a shared common experience, and, above all, what we could call homophily, which indicates people who think alike. This phenomenon was studied in the past by a Nobel Economics Prize winner (Schelling, 1978), when there was no internet, but which has been expanded by social media with no control. That is not good: it leads to extremisms and radicalism.

High frequency trading

The second theme will be addressed as an invitation to thinking. I want to point out the

use of special programs in the field of finance called High Frequency Trading (HFT). This type of trading uses programs based on algorithms that automatically issues orders to sell or buy in a certain market.

The HFT programs process millions of orders in few seconds in a financial context, mostly in the stock exchange, but also in other contexts. The time required for an online acquisition is 0.03 milliseconds. Today, 48.6% of the volume of transactions in the stock exchange are made automatically with these programs.

The HFT programs helped expand the volume of business in all stock exchanges worldwide (164% more in Wall Street, since 2005). Goldman Sachs, using the HFT programs, keeps daily transactions of hundreds of millions of dollars.

In fact, there few operators who know the procedure in detail used in the operations of such programs. Even for experts, if there are experts in this field, the reliance on machines is very strong. The HFT programs do not make stable variations of financial amounts; instead, they increase such variations. These programs are considered one of the factors that originated the recent financial crisis, not only speeding up and enhancing its path, but also through authentic speculative manipulation of markets.

The HFT programs have positive effects, such as increased liquidity and efficiency of markets and reduced costs of transactions. However, the negative effects, such as market manipulation, volatility, information asymmetry, loss to small investors, cascade and procyclical effects, may be greater than the benefits.

A classic example is the speculative manipulation. Essentially, so many purchase orders are processed at the same time in relation to a series of bonds, worth millions, which increases the demand for these bonds and their prices. But they are not purchased, because soon after they are issued, the orders are cancelled, thanks to the impressive speed of transactions. And as the transac-

tions do not effectively occur, no payment for the platform use is made. The high costs of this ICT platform utilization are assumed by those who actually made the transactions, and they pay for the whole process. In addition, the operation of attracting the demand for some bonds, making their volume increase, causes the reduced volume of others, allowing speculation to fictitiously increase or reduce their values.

With the HFT programs, it is possible to focus on a promising bond, buy it, sell it, support it or simply use it, speculate it and then throw it out. All these actions in milliseconds, short intervals that can decide the destination of a company, ensuring high gains to speculators. To investors, they cause great losses. Speculators can use them in a stock exchange, making a bond into a simple number.

Decisive variables, such as potential for industrial growth, financial situation or dividend possibilities, become irrelevant. This phenomenon is already known, and stock exchange managers are trying to regulate the use of HFT programs, because they are a great risk to financial markets.

E-reputation and right to forgetfulness

Now, we will talk about the third theme, e-reputation (electronic reputation), and its right to forgetfulness (Mayer-Schöneberger, 2009).

The e-reputation, although a serious and delicate issue, is usually underestimated. Apparently, it seems to be a theme linked with privacy, but only to a certain extent, because privacy essentially involves access to personal information that have not become public knowledge. The e-reputation is linked with someone's public information, published in the web by this person or third parties. It could be a picture or a opinion, not necessarily manipulated. And the effects of (bad and distorted) electronic reputation can be traumatic, devastating.

For example, the case of Stacy Snyder (Rosen, 2010), who was studying to become a teacher and published on MySpace.com a photo in which she appears in a party wearing a pirate hat and drinking from a plastic cup. Her university accused her of promoting underage drinking and refused to grant her teaching certificate.

The delicate aspect is that this study on e-reputation is frequently conducted by headhunters. The departments of Human Resources systematically use the information obtained from the web to evaluate applications for a job. That causes an inevitable problem when the information from the web does not match what candidates say about themselves. The e-reputation does not ensure the job, but it can cause someone to lose an opportunity. Some departments of Human Resources say that, when in doubt, the candidate's e-reputation can speak louder.

The theme becomes even more important with the creation of instruments (such as Knout) that would measure the e-reputation, based on an algorithm that combines more than 50 indicators of social media activities into a single numerical value. In parallel, manipulation processes are initiated, in which the "observed" users take specific measure to increase the value of their own reputation.

Some considerations are provided about two particularly interesting cases. The first one is about Marc L. A very engaged magazine in France (Le Tigre) wanted to show how it would be easy to find many indications about one person, by using proper search, for example, photos, information about professional and private, all public information, which it would use to create a very precise and accurate biographical profile. In 2008, the magazine published the profile of Marc L. (Meltz 2008, Meltz, 2009). The fact caused huge repercussion in French media. The person in question made a complaint (and mentioned the problem of right to forgetfulness) and had some changes in the published profile, cancelling everything that had been published in the web by him-

self. But, at this moment, his e-reputation was completely degraded!

Now, the case of a priest (and a Santa Claus!) from Novara that I personally saw and that is, in my opinion, a very typical case.

This priest, not so young, before Christmas in 2008, said to children from a Catholic school in a mass that "Santa Claus was an invention", a fable, like Cinderella and Snow White.

One mother negatively commented the fact with a local journalist, who, to attract the attention, published in a local unpretentious newspaper a report titled "Santa Claus was killed". The report, considered particularly "curious", was then replicated by Italian agency ANSA and, according to ANSA, by the BBC correspondent in Rome (Willey, 2008a). At this moment, the mother in the case had been transformed into "dozens of parents" who protested. In a few days, the number of web pages talking about the priest from Novara (referring to him by his name Dino Bottino!) increased from less than 100 to more than 10,000, in more than 20 languages, including Icelandic, Estonian, Lithuanian, Hungarian, Albanian, Chinese, Vietnamese, Indonesian, Norwegian, Swedish, Polish, Russian, Romanian, Slovak, etc., in web pages worldwide, in more than 40 countries, including Fiji, New Zealand, Australia, East Timor, Indonesia, Vietnam, China, Azerbaijan, Kazakhstan, South Africa, Angola, and even in Brazil (Willey, 2008b), the Unites States, Canada and in many European countries. All types of comments were seen: catholic people accusing the priest from Novara of being the worst pedophile and extreme Neo-pagans – the Raelians – who defended him!

This case brings important lessons. In the internet, news go from one website to another without any control, and change the original context, in general, not mentioning the source. When the legend is more interesting than the reality, everyone prefers the legend! The role of comments in news is essential in this case: many times there are many comments, even in the simple case above. Blogs are also import in this replication. For sure, the traces about this person will remain in the web for a long time, where he will be known as "the priest who killed Santa Claus" (with the respective consequence of insults, threats, sarcasms...).

The problems of e-reputation and the right to forgetfulness are becoming crucial to people and organizations, especially in labor and criminal contexts. Regarding the e-reputation of organizations, the case of TripAdvisor is a good example. This portal that provides hints to travelers has recorded innumerous cases of intentional manipulation of (positive and negative) comments about hotels, restaurants, etc. (Hickman, 2010).

CONCLUSIONS

In short, what is the role of "information technology ethics" (which includes, but goes beyond, Digital Ethics)? Based on Plato's Phaedrus, we could use what the King of Egypt says to Theuth, the God that invented writing, the first information technology of humanity:

When they talked about writing, Theuth said: "This is a segment of knowledge, O king, which will make the Egyptians wiser and will improve their memories; for it is an elixir of memory and wisdom". But the King replied: "Most ingenious Theuth, one man has the ability to beget arts, but the ability to judge of their usefulness or harmfulness to their users belongs to another; and now you, who are the father of letters, have been led by your affection to ascribe to them a power the opposite of that which they really possess".

Every new information technology surely provides a step forward in the history of human civilization. And its "inventors" (and in general those who have interest, especially of economic nature, in its adoption and dissemination) compliment it, emphasizing its benefits, advantages for the economy, for the society, for the whole humanity. But someone, a "King of Egypt", with critical awareness and ethics of humanity, before potential damages are irreversibly caused, or are too expensive to be fixed, could or should "judge of their usefulness or harmfulness to their users" and disseminate such awareness.

The evolution and dissemination of technologies happen really quick, as we have seen; therefore, the critical awareness should be alert and become similarly quick. The idea (or "legend") that, thanks to the ICTs and web, it would be possible to "restore" (?) direct democracy has expanded. For those thinking this way, I recommend the prophetic book written by Morozov (2011), The net delusion.

We should not nourish illusions: beyond the unarguable potentiality at the service of politics (that is, the life of polis) of Internet & Co., we should unmask the "naivety" of many expectations, to prevent net delusion from taking away the hope and faith in the miracles of Information and Communication Technologies.

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