



From manual to biometric: From miniaturization of the tools to the amplification of human power and its ethical implications

Soro Torna

Teacher-Researcher, Department of Philosophy, Félix Houphouët-Boigny University, Abidjan, Côte d'Ivoire

Abstract

This study analyzed the transition from manual activity to the use of biometrics and the ethical implications linked to the power granted to it by the tool of human action. From a historical, critical and phenomenological approaches, it highlights that the more the technological tool is miniaturized, the more man's power of action is amplified. This is explained by the fact that the miniaturized tool contains previous technological achievements. Also, it emerges from the study that important ethical problems are linked to the power acquired by the miniaturization of the tool. These evolve with the amplification of man's power and contain ethical problems arising from past stages of miniaturization. Thus, the transition from manual to biometric has led to the emergence or amplification of questions about social equity and equality, freedom and human dignity.

Keywords: Amplification of power, biometric, human, manual, miniaturization, technical tools, ethical issues

Introduction

Man recognizes certain characteristics that he uses to define himself. These characteristics have been theorized throughout the history of thought. Thus, he defined himself as *homo faber*, *homo sapiens*, *homo locus*, etc. Change in the living conditions of mankind is dependent on a combined use of these characteristics and continually improved man's natural endowments. One of the essential vectors of this change remains technoscientific progress. Technology governs the movement of humanity. However, technique is intrinsically linked to *homo faber*. Technical activity, if we understand it in its mechanical and productive sense, joins that of *homo faber*. Indeed, technique, from its Greek etymology *technè* – which means art, that is to say know-how, skill – refers to an artifactual handling based on mental procedural endowments. Handling in humans is essentially based on manual use and has the aim of producing goods that are profitable to humans. Because one of the main characteristics of human beings is their ability to skillfully use their hands to achieve objectives linked to their needs (H. Jonas, 2005, p. 65) [18]. The hand, therefore, is the basic tool of *homo faber* which constitutes the historical reality of man and manifests his intelligence which is none than what Bergson stated: “*the faculty of manufacturing artificial objects, in particular tools to make tools and to vary their manufacture indefinitely*” (H. Bergson, 1909, p. 151) [4].

If man originally used the objects provided by nature, these quickly proved limited in the face of the challenges that arose before him and his new needs. From the hand, man has equipped himself with artifacts in order to facilitate the resolution of the existential problems that present themselves to him, especially since he is extremely vulnerable in the face of nature (B. Pascal, 1972, p. 161) [31]. The design of artifacts allowed man to amplify his strength and gradually escape the dictates of nature, to a certain extent. From artifact to artifact, man has considerably reduced the direct intervention of the hand and the size of the artifacts, particularly in the initiation of action. From further miniaturizing tools, man is today at the biometric,

even sensitive, stage. The desired action can be performed from a simple sensor.

However, this miniaturization is accompanied by an amplification of man's power of action and the associated consequences. For almost a century now, Hans Jonas has noted this unprecedented power that human beings are endowed with (H. Jonas, 2013, p. 21) [19], while technological progress was just beginning the digital era. The new power affecting action and making is difficult to control after the fact. Because, as agreed on by Jonas, it raises new ethical problems at each stage. These ethical problems generate imbalances in the social body, until societies develop codes or frameworks to curb their effects. It appears necessary to closely analyze the ethico-social implications of the miniaturization of tools. This contribution analyzes, through a historical-critical and phenomenological approach, the main ethical issues of the transition from manual to biometric tools. To do this, on one hand, I make a historiographical study of the paradox of the miniaturization of the tool and the amplification of power. On the other hand, I analyze the problem of the inherent nature of ethical problems in the amplification of power.

1. The paradox of the miniaturization of the tool and the amplification of power

The transition to biometrics is an expression of the transformation of human action. This transformation can be understood through different phases, notably those of manual use of tools, mechanization and automation, digital, biometric and sensitive. But we can incorporate the sensitive phase into that of the biometric, since the identification parameters are similar in both cases.

It should be noted that the manual phase can be extended to the use of bare hands and the use of tools. Indeed, helpless before nature, or at least being on the same footing as other beings of nature, man had only his limbs, notably his hand due to his standing stature (K. Bayertz, 2009, p. 118) [3]. This, as means to ensure its follow-up. He had to use what nature put at his disposal to defend himself against it. This is the time when man was most helpless and vulnerable in the

face of nature. The making of tools brought him more security and power, since the pieces of wood or stones he could use did not add much to his personal strength as their advent did. Indeed, the tool is distinct from objects provided by nature. It is an inert object manufactured artificially. The purpose which is to be interposed as a mediator, that is to say a means between the bodily organ which acts (most often the hand) and the object extracorporeal on which the action is exerted. » (H. Jonas, 2005, p. 64-65) ^[18]. It relates to the development of man with a view to an end that he has identified.

The first tools, according to the current state of knowledge, date back to the Paleolithic, particularly to the stone age then the advent of copper, bronze and iron (A. Leroi-Gourhan, 1973, p. 27; G. Comet, 2007, p. 74) ^[9, 23]. The constant threat of the vagaries of nature has led humans to find more sophisticated means of mitigating its influences on them. This is the beginning of the rise of human power against the rest of nature. In fact, it is even the beginning of the journey towards technology. Because the history of technological evolution begins with the first manual tools, where man exercised direct power over his environment. R. G. Klein (2009, p. 195) ^[21] specifies, in his study on the biological and cultural origins of man, that the first cut stone tools, dating from around 2.6 million years ago, allowed men to shape their world. Man gained power with tools. This allows it to mediate between itself and nature and amplifies the power of its members. This increased power allows man to take control of nature in the manual age. Indeed, the Stone Age marks the beginning of the manual era, where the first tools allowed man to master nature (R. G. Klein, 2009, p. 249) ^[21]. This mastery of his natural environment increases with what Hans Jonas calls second-degree mediations in man's commerce with the world, which multiply and also constitute a "mediation to a greater power" (H. Jonas, 2005, p. 65) ^[18]. However, man's power remains limited; which pushes him to continue improving his tools.

To the improvement of tools by means of others, the association of tools gives rise to complex tools which give humans more power and possibilities in the face of nature. However, the activities remain manual. The hand – or animal strength, tamed, or other elements of nature – is still essential to carry out tasks. The improvement resulted in alloys of tools allowing the same actions to be repeated, although the activity of the mechanisms was devolved to manual action. This allows man to free himself from certain constraints, to improve his living conditions compared to other beings of nature.

It is also a transition to automata in the existence of man. The appearance of automaton systems can be observed from Antiquity to modernity, including the Renaissance and the Middle Ages. But these automatons are essentially dedicated to fun activities (A. Rulli, 2010, p. 14) ^[35], watchmaking and educational tasks. Automata became really common in human activities from the industrial revolution onwards. The 19th century marks the golden age of automatons (C. Bailly and S. Bailly, 2003, p. 95) ^[2] This era marks a mastery of energy and its use at the service of artifacts to give them autonomous movement, after the first manual action. Human effort is then further considerably reduced, particularly manual labor. The 18th century, with the Industrial Revolution, transformed production through the invention of machines at the level of the cotton loom (D.

S. Landes, 1988, p. 41) ^[22]. At the same time, man is given greater capacity to act and many productive activities are profoundly changed. Thus, the introduction of mechanization marked an important shift in technological history, giving man increased power through machines. This is why D. S. Landes (1988, p. 41) ^[22] believes that the Industrial Revolution, through the emergence of machines and factories, increased human productivity exponentially and opened up new perspectives. Removing obstacles and amplifying man's power, the machine strengthens man's mastery over nature and its forces. Among the main events determining this mastery are the steam engine and the development of the engine. The constituent parts of these systems are much smaller than those used to develop human or animal powered tools. However, the power associated with these systems far exceeds that provided by manual activity. Additionally, completing tasks requires less strength and time.

The miniaturization of tools and the amplification of power reach an unprecedented level, when we move to the contemporary digital era in the 1930s and 1940s. – First of all, it should be noted that the concepts “digital” and “numeric” (that concept is not so used in English, but more in French) are often used interchangeably, even though they can have nuances of meaning in certain contexts. In general, they both refer to the representation and manipulation of information in the form of digits, numbers or codes. The term “numeric” comes from the Latin word “*numerus*” which means “number”. It is used to describe something that is based on discrete numbers or discrete values. Concerning the term “digital”, it has its roots in Latin *digitalis*, referring to that has the thickness of a finger (*digitus*). The word digital is often considered to come from the English “*digit*” which means “figure”. Digital and numeric are thus similar in French, and almost equal in English. In technology, “digital” is often used as a synonym for “numeric” (D. A. Mindell, 2002, p. 293) ^[27].

As defined, digital has an origin much further back than the 20th century. Because we can observe digital systems among the Babylonians in Antiquity (J. J. O'Connor and E. F. Robertson, 2000) ^[29], mechanical devices for digital calculation in the Middle Ages (A. Turner, 1985, p. 256) ^[42] and a strengthening of the formalization of numerical concepts in the 17th century with the introduction of positional numbering systems, including the decimal system used today (G. Ifrah, 2001, p. 69) ^[16]. But we had to wait until the second half of the 20th century for digital technology to flood people's daily lives. Indeed, the 1970s and 1980s marked the commercialization of the first microprocessors, such as the Intel 4004 and the Intel 8080. This led to the popularization of personal computing and small-scale digital systems. With the rise of the computer industry, in the 1980s-1990s, significant advances were made in digital storage, network connectivity and user interface, establishing the foundations of modern computing. These advances in digital technologies have given humans the power to “manipulate and store enormous amounts of data” and process information on an unprecedented scale (M. Campbell-Kelly *et al.*, 2023, p. 357) ^[7]. These possibilities simplify and facilitate decision-making.

These new facilities offered by digital technology amplify human power and relieve them from a number of tasks. The advent of digital technology makes possible to the summary

of the execution of tasks in a digital system. One of the first aspects to be revolutionized is communication and access to information. The methods of these aspects have been profoundly changed. According to M. Castells (2010, p. 207) ^[8], “digital technologies have created a global communication space where information circulates instantly, abolishing the constraints of time and space”. The search for information, purchases, transactions and even personal organization of or professional agendas are simplified and facilitated by digital platforms. This makes man more efficient and productive.

Additionally, digital systems amplify the power of mechanical systems. The coupling of the former with the latter optimizes the functioning of the latter, promotes efficient use of inputs and generates optimal outputs that are more adapted to market requirements (K.-D. Thoben, 2017, p. 13) ^[39]. From a manufacturing point of view, manual labor has remained almost residual at certain levels and simplified overall. A single finger performs tasks that once required Herculean strength on the part of man, a multiplicity of hands and an extremely significant amount of time. One of the charms of technological power is that it can be used at any scale, both at the individual and collective levels, at the personal, professional or institutional level. Also, one of the advantages of digital technologies is that they are discreet and can go unnoticed. This power of concealment and discretion increases the freedom of individuals, on the one hand, and amplifies the capacities of institutions in accomplishing their missions, on the other hand. All through the use of miniaturized resources. The digital coding of biometric parameters constitutes another factor in amplifying human power.

Going back to Alphonse Bertillon (1893) ^[5], through the notion of anthropometry, the use of biometric characteristics in the context of identification reveals its true potential with the advent of digital codification of said characteristics. The introduction of biometric technologies has, in effect, added a new dimension to human power, using unique biological

characteristics for authentication and identification. Biometric use for authentication presents itself as an additional and more reliable level of security with digital media. Digital systems are linked to the people who have access to them. This function of biometrics is made possible by the use of the human body as an access key (A. K. Jain and A. A. Ross, 2016, p. 19) ^[17]. The body – the fingerprint, the voice, the face, the retina, etc. – being used as code, the system becomes less fallible. The biometric authentication method is more within the reach of individual uses. The second method, that of identification, although it can be used by everyone, is generally used more at institutional levels for the security and control of people frequenting an environment.

Presenting itself as a system of access to the digital system, biometrics can completely dispense with any manual use. Linked to digital and mechanical systems, accompanied by intranet or internet connectivity, the biometric system ensures the possibility of carrying out tasks without direct action. But the impacts are the size of the combined power of mechanical (chemical) and digital systems. The means of action become extremely small, but the power they contain is enormous. Furthermore, through multiform recognition (facial, digital, voice, etc.) made possible by biometrics coupled with digital databases, humans have the power to identify and locate any human being almost instantly. This gives him significant power in the management of human and professional companies and in his capacity for action, both from a temporal and spatial point of view. Man is today endowed with an unprecedented power which he applies to the transformation of his environment and to himself (H. Jonas, 2013, p. 85) ^[19]. Thus, biometrics extends the power of digital by integrating digital into itself or by integrating with it. The arrival of biometrics makes manual use obsolete, through the amplification of power. The transition from manual to biometric can be reflected in *Figure 1* below.

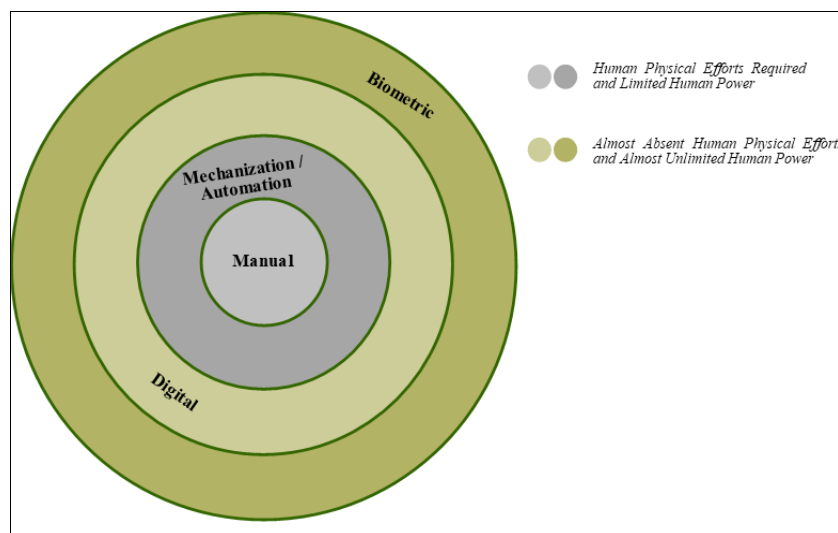


Fig 1: concentric stages of tools miniaturization and human power amplification

The analysis shows that the transition from manual to biometric action is characterized by a miniaturization of tools. Paradoxically, this reduction in the means of action rhymes with an amplification of man's power in his actions. Moreover, as shown schematically in *Figure 1*, each stage

of miniaturization contains the antecedents. It is the reality of dialectic, highlighted by Hegel, which is manifested here. This overcoming-conservation in technological processes has endowed man with such power that, what he can do today with a single finger or a simple biometric

characteristic, his multiplied hand cannot claim to do. But it still remains necessary to take a step back, in order to analyze the ethical implications of this unprecedented power with which man finds himself endowed with the miniaturization of his tools of action.

2. From the Inherence of Ethical Problems to the Amplification of Power

The amplification of man's power is accompanied by ethical problems. Each phase of the miniaturization of tools and the increase in human capacity for action has also seen ethical issues arise. Thus, from manual use to biometrics, new ethical challenges have emerged. The ethical problems encountered in this evolution of technoscientific progress could be grouped into two main types. The first type is related to socio-professional questions. These ethical questions concern human relations in society, in the distribution of resources and in the workplace. These ethical problems are then of a social order. The second type is linked to questions relating to the being of humans in their existence and in their nature. At this level, we are dealing with what we can call ethical problems of an ontico-ontological order.

Ethical problems of a social order are essentially observable in the era of manual and mechanization and automation. The manual era encounters ethical concerns related to the distribution of tasks, social relations within communities and equity in the distribution of resources (A. Sen, 1973, p. 51)^[38]. The question of the distribution of tasks is linked to natural inequalities between individuals. Not everyone having the same strengths or natural powers, tasks requiring more strength were assumed naturally by those who were capable of it. These natural inequalities ended up establishing social inequalities, social hierarchies, elite classes and classes responsible for carrying out chores. Because natural inequalities have allowed certain individuals to accumulate resources to the detriment of those less naturally endowed and to build up, over generations, wealth and then social classes (E. P. Thompson, 1966, p. 57)^[40]. Thus, social inequalities emerged and are accentuated from problems of equity resulting from natural inequalities between individuals. This is also how gender-base socio-professional roles were formed in the pre-industrial era (J. W. Scott, 1986, p. 1063)^[37]. This type of social categorization also limited the education of the so-called working classes. This categorization, an expression of social inequalities, appears particularly with the advent of the development of artifacts, especially from the use of iron. In this sense, Rousseau indicates that the advent of property induced a new law, which establishes inequalities and differs from natural law which granted everyone equal access to resources, based on natural inequalities. For this philosopher of contract, Things in this state could have remained equal if the talents had been equal, and if, for example, the use of iron and the consumption of foodstuffs had always made an exact balance but the proportion that nothing maintained was soon broken; the strongest did more work; the more skillful one made better use of his; the most ingenious found ways to shorten the work; the plowman had more need of iron, or the blacksmith had more need of wheat; and by working equally, one earned a lot, while the other barely got by. This is how natural inequality unfolds imperceptibly with that of combination, and how the differences of men, developed by

those of circumstances, become more sensitive, more permanent in their effects, and begin to influence in the same proportion on the fate of individuals (J.-J. Rousseau, 1867, p. 101-102)^[34].

Interindividual relationships were thus forged at the rate of ever-reinforced inequalities, in the era of every manual thing. *Manuality* then sees problems of social ethics appear. This, in the case of unjust laws (J.-J. Rousseau, p. 108)^[34]. These are amplified with the advent of mechanization and automation of human activity, particularly productive activity. Indeed, this phase of the transformation of the tools of human activity begins by gradually eliminating human beings from production chains. This had a direct impact on jobs and created an unemployment problem. J. Rifkin (1995, p. 6-7)^[32] argues, in this sense, that mechanization has caused the loss of jobs for human workers, particularly in sectors where machines replace manual tasks. For this phase, despite its advantages in terms of productive efficiency and costs, it is unsafe, because it needs few workers (J. Rifkin, 1995, p. xvi)^[32]. The first result of this massive job loss is the strengthening of economic and social inequalities to the extent that certain populations are disadvantaged in having access to jobs linked to new production methods. Because, beyond the question of employment, wealth is concentrated in the hands of those who supply the raw materials (K. Marx, 1872, p. 80)^[26] and an elite of machine owners, further widening the gap between rich and poor (M. Ford, 2015, p. 46)^[12].

This accentuation of socio-economic inequalities results from the fact that automation gives rise to the exploitation of labor which is engaged in for cheap wages (K. Marx, 1872, p. 199; K. Polanyi, 2001, p. 112)^[26, 31], given that the supply of labor is more abundant than the demand. The lack of jobs and the low level of income of workers leads to a precariousness of their living conditions. Overall, part of a capitalist system, this transformation of the tool raises questions about the rights of workers to their impoverishment in the face of the new competitor that is the automaton. The inequalities inherited from exclusively manual activity are amplified and coupled with serious violations of human rights (K. Polanyi, 2001, p. 96)^[32]. Most of the workers' struggles are devoted to the search for conditions for the protection of workers' rights and an improvement of their social situation. But, much more than questions of social ethics, encompassing those of the safety of the working environment and the deterioration of the natural environment, automation has caused a degradation of the freedom and dignity of the worker. This trans-social dimension of ethical problems becomes more evident with the advent of digital technology and biometrics.

Without completely eliminating ethical problems of a social order, the digital era accentuates and reveals ethical problems of an ontico-ontological order. The advent of digital technology meets the results of social struggles. Thus, it coincides with the legally established principles and rights of protection of workers and their dignity, improvement of working conditions, limitation of working hours, non-discrimination on the basis of gender, etc. However, questions of social inequality persist, new inequalities emerge and problems of freedom seem to be amplified. Indeed, with digital technology, social inequalities are not called into question, given that digital technology presents itself as a factor of production and an instrument of governance amplifying factors of production

and economic exchanges. It has no fundamental impact on the economic system and the distribution of capital in society. The socio-economic principles remain and individuals struggle to position themselves through the accumulation of resources necessary for their subsistence and then for the domination of their world.

Social inequalities are doubled by those linked to mastery of the use of digital technology. The digital divide creates inequality in access to employment and a society operating at two paces. This is why Mr. Gates (2019, p. 124) ^[13] believes that the significant gap for digital access is on the verge of establishing a two-speed society, in which some benefit from the advantages linked to digital and others are left behind. Thus, the digitally illiterate are disconnected from the opportunities offered by the new world, on the one hand, and are excluded from technology-intensive jobs, on the other hand. This creates a dislocation of the labor market. According to K. Schwab (2016, p. 26, 50) ^[36], what should be called the fourth industrial revolution is causing major disruptions in the labor market, through automation and artificial intelligence. These impacts of digital technology on the professional world, marked by an increase in the destruction of jobs, have repercussions on society as a whole and make it more unequal.

Moreover, beyond inequalities, we must note that digital technology strengthens the individualism of industrial society. Interhuman relationships are more mediated with communication technology tools. Direct human-to-human contact is becoming more and more optional. Because the development of digital technology has made distance communication, both at a professional and interpersonal level, quite close to face-to-face exchanges. Hologram technology is one of the most illustrative expressions of this. There thus emerges, gradually, a redefinition of the meaning of relationships. This remodeling of intersubjective relations does not leave intact the axiological content governing human exchanges. If according to E. Levinas (1987, p. 51, 54, 57) ^[24], the epiphany of the face is the stimulating vector of the obligation of moral action of man towards his fellow man, the transformation of human relationships or their technological mediation attenuates or eliminates this call from the other man's face and renders it inaudible. As a result, the moral and ethical sense in man tends to die out. Feeling, the bearer of the morality of human actions (D. Hume, 1993, p. 68) ^[15], is essentially linked to human interactions. With a reduction in the interactive dimension of human relations, the risk is to witness a progressive disappearance of the sense of morality or the emergence of individual moralities, developed by individuals according to their relationships with humans and artifacts. The traditional conception of intersubjective relations and morality is gradually modified and adapted to *digitality*.

In addition, digital technology, without inventing deception, makes it easier and more subtle. Various technological tools, without being designed to deceive, can be used for this purpose (R. Keyes, 2004, p. 156) ^[20]. There are now multiple uses of digital technology for disinformation purposes with digital content creation tools, allowing combinations of visual, sound and graphic information from various origins. This makes populations vulnerable, because it takes a certain level of digital knowledge to disentangle fact from fiction. Which raises the question of truth in this highly technological society. This problem becomes more acute, with the possibility of biases inherent in the

algorithms governing the operation of digital devices. Even if, *a priori*, technology is supposed to be neutral and only respond to the ends of the user, *a fortiori* it contains the inclinations of its designer, especially in terms of algorithms which can be biased by the developer. This is what C. O'Neil (2016, p. 156, 184) ^[30] says that the algorithms made available to users are not neutral. Rather, they embody the values and prejudices of those who develop them. The question of human manipulation resurfaces and poses the problem of the freedom of the digital user or the human in the face of digital. The technical tool, equipped with digital technology, escapes human control. S. Turkle (2015, p. 400) ^[41] even believes that man is controlled by technology and removes humanity from conversation to plunge it into silence. The emphasis on digital technology, man's dependence on technology and the biases of technological systems raises the old question of human freedom.

Finally, in addition to the uncontrolled nature of digital algorithms, the application of digital technology to human daily life also raises ethical issues linked to confidentiality and private life. One of the conditions for access to digital platforms is the recording of personal data, likely to identify the user. Also, the use of said digital spaces requires the user to submit to the collection of information relating to their habits. This entire set of personal data can be exploited for various purposes, including tracing what could be called *digital routes* and identifying the user, as necessary. *Digital itineraries*, being the accesses made in the search for information, including (especially) those which are not directly linked to the main search, make it possible to track a user and direct towards him the contents which have caught his attention in the previous accesses – or which appear in its *digital itinerary*. The individual's life is infiltrated by algorithms and is constantly spied on for commercial purposes. Privacy is violated and consent is limited to acceptance of system entry access obligations, called usage policies and privacy policies. Digital technology opens the way to a new dimension of surveillance of individuals. They can be monitored both from the point of view of a natural person, as well as from the point of view of behavior and consumption habits and on a psychological level. The abusive exploitation of personal data thus raises new ethical problems which, previously, were unsuspected (L. Floridi, 2014, p. 15, 117, 148) ^[11].

The use of digital biometrics in identification increases the ethical problems of surveillance. It introduces real questions about freedom and privacy in this more digitalized world. The life of the population is now presented as a public life, which can be accessed in the smallest details of movement and speech. Biometrics, making facial, voice, retinal, digital recognition, etc. possible, presents itself as an amplifier of all the ethical problems generated by digital technology. Which is logical, since biometrics is incorporated into digital technology and pushes back its limits in action and simplifies action processes. As a result, we are witnessing an amplification of surveillance, if not a systematic and omnipresent control of everyone (H. Abelson, 1997, p. 251) ^[1], violations of the principle of consent, inequalities transformed into discrimination (J. Buolamwini and T. Gebru, 2018, p. 4) ^[6], etc. The ethical questions of biometrics then integrate those of digital technology. Furthermore, one of the ethical aspects linked to all stages of miniaturization and artifactization is the development of

human thought. The elimination of manual activity has, in fact, a considerable impact on human development. Beyond the social impacts, the cognitive aspect remains the real challenge, given that manual activity is determining for its development. According to P. Ludick (2013, p. 95) [25], the hand is essential to the conduct and development of thought. Total elimination of the hand then risks being detrimental to

learning. Because, “the intelligence of children reaches a certain level without the use of the hand; with the hand, it reaches a higher level, and the child who uses his hands has a stronger character” (M. Montessori, 1949, p. 216) [28]. The hand then remains irreplaceable at certain levels; the technical tool only completes it. But this does not alleviate the ethical problems raised by human power.

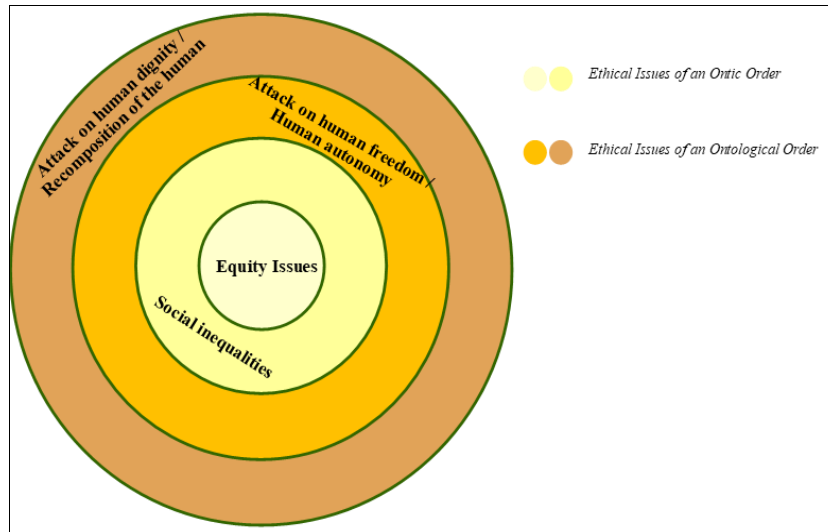


Fig 2: Evolution, Entanglement and amplification of Ethical Issues related to Human Power

It thus appears that the miniaturization of man's tools of action has gradually generated and amplified ethical problems. Ethical problems seem inherent to the amplification of the power of human action. This is also what Hans Jonas demonstrates, in *The imperative of responsibility*, who ends up holding that power entails responsibility. Furthermore, it can be observed, as illustrated in Figure 2, that each level of ethical problem incorporates the previous level and presents itself as an amplification of it. A sort of dialectic also appears here, but which we can call a dialectic with negative impacts, which extends and makes the miniaturized artifact prevail with unprecedented ethical impacts. However, despite the consequences, society gradually embraces the technical system and internalizes it, both at the individual and state level. “This convergence between state logic and the structure specific to the technical Macro-System can mean that the process of reification of society has reached its end and is sufficiently internalized to no longer raise debate” (G. Dubey, 2008, p. 265) [10]. In other words, society assimilates the movement of technologization of its daily life to the point where the ethical problems inherent in it no longer give rise to questions.

Conclusion

In short, from this analysis, it emerges that human existence is now combined with the omnipresence of the artifact. H. Bergson's (1909, p. 150) [4] observation that “our social life revolves around the manufacture and use of artificial instruments” gains much more meaning. The technique is deployed and miniaturized. It's as if one miniaturization calls for another. However, this shift to smaller is paradoxically accompanied by greater complexity and greater power. Thus, we have moved from acting by hand to action by simple biometric recognition, with more complex technologies containing the previous ones which are at the

origin of the new ones. The achievements become the basis of a new stage of miniaturization. It is the expression of what Gourmont (1908, p. 67) [14] describes in these terms: “one act generates another, then another, then another again and the last, despite its complexity, is only the logical result of the first, a result perhaps inevitable”. Likewise, consequences beget new consequences.

Therefore, although the power with which humanity has endowed itself is a blessing for it, its ethical implications are not negligible. Ethical problems have evolved with technoscientific progress and have also become more complex. Thus, from manual to biometric, man has moved from social problems of social equity and equality, to ethical questions of an ontic and ontological order, in this case those of freedom and dignity of the human being. However, the first ethical problems are no longer non-existent. In reality, recent technology contains and amplifies previous ethical problems and generates new ones, just as it contains past technical and scientific achievements. As Jonas says, man's power today imposes on him an obligation of responsibility. Through this responsibility, it must ensure the well-being of humanity, through the application of miniaturized tools which amplify the extent of ethical problems.

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