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Humanization of Objects and Objectification of Humans: Vilém Flusser's Philosophy of Apparatus and AI

I. Introduction

This article[1] examines two major trends in human civilization, namely the *humanization of objects* and the *objectification of humans*, through the media philosophy of Vilém Flusser. Here, *objects* broadly refer to all human-made items, but primarily indicate means of production (tools, machines, apparatus) in a narrower sense. Specifically, this article traces the historical tendency of objects increasingly resembling the human body and brain since the advent of humanity, and conversely, humans progressively resembling the objects they create. Among these tendencies, it particularly analyzes in detail the trends of the artificial intelligence era driven by apparatus: the *intelligentization of objects* and the *robotization of humans*. As specific examples for this analysis, the article presents photographic apparatus as the first apparatus, and apparatus-humans (photographers and spectators, all of us). Through this, the article aims to uncover the fundamental meanings of recently emerging academic paradigms such as *artificial intelligence* and *robot*, and reveal the deep-seated causes underlying contemporary human robotization.

Tools and machines, which have long driven human civilization, are today being replaced by apparatus dominating post-industrial society. Equipped with artificial intelligence, these *intelligent* machines are replacing all mental and physical activities previously performed by humans, consequently expelling humanity from the realm of labor. As a result, a culture of apparatus, previously existing only in fiction, is now appearing everywhere. Apparatus making coffee, delivering food, and conversing with humans have already become part of our everyday lives. Recently, police robot dogs have appeared, monitoring and even apprehending suspects in place of humans. Thus, apparatuses are transforming the industrial revolution era dominated by machines into an advanced artificial intelligence era ruled by robots. However, once invented, apparatuses do not leave their human inventors unaffected.Apparatuses return to humans, reorganizing human souls and gestures (actions) to resemble

[1] This article is an English translation and a newly revised version of my Korean-language article, "사물의 인간화, 인간의 사물화: 빌렘 플루서의 사진 철학을 중심으로," published in *Mihak (Aesthetics)*, Vol. 88, No. 1 (2022), pp. 43–73.

themselves, thereby *apparatusizing* or *robotizing* humans. For instance, humans invented the apparatuses of computers and smartphones, and these two apparatuses invented new human gestures. Human gestures such as typing on keyboards or touching smartphone screens never existed before in human history, fundamentally differing from gestures used in handling previous tools or machines. In turn, new modes of thinking have emerged alongside these new gestures — modes of thinking that may be called the thought of apparatuses or robots.

How, then, have the humanization of objects and objectification of humans unfolded historically from ancient times until today? Why are apparatuses, which ushered in the era of artificial intelligence, regarded as *thinking machines* or *artificial intelligence machines*? What specifically does it mean that apparatuses *apparatusize* or *robotize* humans? Why are gestures such as manipulating photographic apparatuses or typing keyboards fundamentally different from gestures associated with handling tools or machines? In what ways do apparatuses robotize human thought? Flusser is one of the philosophers who reflected most profoundly on this series of questions. He was the first to clearly articulate these two tendencies—humanization of objects and objectification of humans—occurring throughout human civilization: "One of the two trends tends toward the artificial simulation of living behavior in inanimate objects. The other tends toward the simulation of that simulation in human beings"[2] (Flusser 2019: 199). Flusser diagnoses that these two tendencies have converged in the post-industrial age, making it increasingly difficult to distinguish between humans and artificial entities. He further argues that it is challenging to differentiate human intelligence from artificial intelligence. In this respect, he represents one of the most radical thinkers regarding discourses on artificial intelligence and robots.

Despite its radical nature, Flusser's discussion can be considered particularly significant in several respects within the long history of discourses on artificial intelligence and robotics. First, Flusser can be regarded as a pioneering thinker who philosophically connected artificial intelligence and robots to key concepts of information science, such as programs and apparatuses. In particular, during the 1970s and 1980s, when discussions on artificial intelligence and robotics were mainly limited to scientific and technical perspectives, he was one of the earliest thinkers to explore these issues from a philosophical standpoint. Additionally, unlike many scholars who mainly emphasize advanced technologies or contemporary cultural phenomena surrounding artificial intelligence and robots, Flusser genealogically situates these phenomena within the long-standing historical trend of the humanization of objects in human civilization. He proposes that the phenomena of artificial intelligence and robotics

[2] All English quotations of Flusser's original texts in German and French are my own translations, assisted by AI.

generated by apparatuses are not sudden developments of the late twentieth century, but rather the outcomes of a tendency to humanize objects that has existed since the dawn of humanity. In this sense, his theory prompts historical and philosophical reflection on today's artificial intelligence era. Finally, while most thinkers mainly focus on the humanization of objects, that is, the developmental process of robots, they less frequently address the objectification (robotization) of humans. When addressing human robotization, they predominantly concentrate on physical transformations of the human body (artificial organs, artificial limbs, etc.). In contrast, Flusser examines how the mind and behavior of ordinary humans living in post-industrial society, without artificial organs or limbs, become robotized. Thus, Flusser's conception of human robotization is fundamentally deeper compared to other thinkers.

Accordingly, this study focuses on Flusser's philosophy concerning humans and objects. It first defines the relationship between them and traces how objects have gradually become humanized (II. Humanization of Objects). Next, it reveals how humans, in turn, have gradually become objectified or robotized. Within this, it first clarifies how humans handling apparatuses become robotized through the example of photographic apparatuses and photographers (III. Objectification of Humans: Robotization of Photographers). Subsequently, it presents how all individuals living within the world of apparatuses become robotized through the notions of the photographic universe and spectators (IV. Objectification of Humans: Robotization of Humans). Finally, it reviews the implications and reflections of Flusser's discussions (V. Final Considerations).

II. Humanization of Objects

Before tracing genealogically the tendency of the humanization of objects that has unfolded throughout human civilization, Flusser first seeks to uncover its origins by analyzing the relationship between humans and objects, or between subject and object. According to him, in non-Western cultures, humans are posited as beings within objects. The human mind and soul are described as *rarefied matter*, capable of materializing themselves as objects. Conversely, in Western culture, humans (subjects) are posited as beings external to objects and thus stand in opposition to them. Humans can materialize themselves not in naturally existing objects external to themselves but only in objects they create: "He [subject] can take material form only in works [objects]" (Flusser 2019: 199).

Flusser refers to such objects as *cultural objects*, contrasting them with natural objects, which exist independently of human intention from the beginning. According to him, cultural objects created by humans are never *pure* objects because human elements (intentions, minds) are inherently inscribed

deeply within them. These objects represent a fusion of human and object, subject and object, mind and matter: "The totality of works — culture — is the synthesis between subject and object; it is matter spiritualized and spirit materialized" (Flusser 2019: 200). Therefore, Flusser argues that all objects created by humans bear *shadows of the subject*. In this sense, it can be said that for him, the humanization of objects is comprehensive. Specifically, the humanization of objects appears on both sides of cultural objects — as consumer goods and as means of production. Furthermore, this humanization is not a recent phenomenon arising from advanced technology and artificial intelligence but rather an enduring trend since humans first started creating objects. In this context, Flusser focuses on cultural objects—particularly on the means of production such as tools, machines, and apparatuses—in order to trace historically the tendency toward the humanization of objects. This is because these means of production are objects that artificially imitate the human being. Which aspects of the human, then, does each of these means of production imitate, and in what manner?

According to Flusser, *tools*—the first means of production intentionally created by humans—simulate human body organs. Tools are extensions of human body parts such as fingers, fists, toes, and feet, simulating these organs *empirically*. For example, Flusser notes that arrows simulate fingers, hammers simulate fists, and hoes simulate toes. Why, then, did humans invent tools that simulate their bodily organs? Because "they [tools] extend, they reach further into nature and tear objects from it more forcefully and swiftly than the [human] body could" (Flusser 1983: 19). From this perspective, it can be interpreted that the humanization of objects began in earnest with the invention of tools modeled after human organs. Although tools are inanimate objects, they resemble human bodily organs in both form and function, and thus can be regarded as the first artificial organs created by humans.

These tools, which played roles analogous to human organs from ancient times, transformed into new entities with rapid scientific and technological advancements during modernity. Specifically, Flusser states that tools transformed into a second means of production called *machines* by absorbing new scientific theories, products of modern science. These new tools simulate humans *technologically* rather than empirically. Machines, materialized through applied scientific theories, are incomparably "stronger, bigger and more expensive" than tools. Thus, interpreting Flusser's discussion, although machines do not physically resemble human body organs like tools, they are objects deeply imprinted with human intelligence or human intention. As the method of human simulation by means of production shifts from empirical to technological, traditional societies undergo radical upheaval (the Industrial Revolution), transitioning into entirely new forms of society (industrial society) (Flusser 1983: 19).

With the invention of photography in the 19th century, machines further evolved into a third means of production called *apparatuses*, incorporating increasingly complex modern scientific theories. According to Flusser, photographic apparatuses—the first apparatuses—emerged from complex combinations of advanced physics, optics, and chemistry of the nineteenth century. Unlike tools or machines, apparatuses simulate human bodily organs neither empirically nor technologically but rather *biologically* or *neurophysiologically*: "Apparatuses can also apply neurophysiological and biological theories and hypotheses" (Flusser 1993: 71). Then, which specific human organ do apparatuses neurophysiologically simulate? They simulate the thinking processes of the human brain: "Apparatuses are simulations of [human] thought, playthings that play at 'thinking'" (Flusser 1983: 46). Summarizing Flusser's discussion, each means of production fundamentally differs in how it simulates humans: tools employ empirical simulation, machines technological simulation, and apparatuses *cognitive* simulation.

Because apparatuses simulate humans differently from tools and machines, the nature of their tasks also differs. Flusser argues that tasks performed by tools or machines constitute *labor*, the fundamental category of pre-industrial and industrial society. These two means of production extract natural objects and reshape their forms (*in-form*). However, tasks performed by apparatuses differ entirely; apparatuses do not physically alter the form of objects but rather symbolically endow them with meaning (*information*). To clarify the nature of the tasks performed by apparatuses, Flusser compares them with the forms of *symbolic labor* that existed prior to their invention. According to him, the task of the photographer—who operates photographic apparatuses—is to "produce, handle, and store symbols" (Flusser 1983: 20). Before the advent of photography, such symbolic tasks were carried out manually by individuals such as writers, painters, composers, bookkeepers, and managers, who produced symbolic objects like books, paintings, musical scores, balance sheets, and plans (Flusser 1983: 20). Flusser then asks how these objects are received by human beings. He argues that they are not physically consumed but rather function as "carriers of information": "[These] objects […] were not consumed but served as carriers of information. They were read, looked at, played, calculated, and used as the basis for decisions. They were not ends but means" (Flusser 1983: 20–21).

Flusser argues that today these forms of symbolic manual labor have been replaced by apparatuses. He observes that the *information objects* produced by apparatuses are becoming increasingly efficient and more widely disseminated than those created directly by humans. Ultimately, if the nature of the tasks performed by tools and machines is labor, then the nature of the tasks performed by

apparatuses can be defined as information. While tools and machines artificially simulate human physical labor, apparatuses simulate human mental labor. From this perspective, apparatuses can be regarded as the first *thinking tools*—or *thinking machines*.

Then how do apparatuses, as thinking machines, operate? How do they perform thinking, a form of mental labor? To answer this, Flusser first explains how apparatuses *function*. According to him, the software of the apparatus, that is, its program, is composed of symbols. The way an apparatus functions is by combining these symbols. This is similar to how a word processor operates, combining words to produce information on paper. Here, Flusser introduces two types of apparatuses — static and dynamic — to explain their *automation* and *intelligentization*. According to him, word processors transmit information statically because the symbols (letters) they print on paper represent conventional sounds that can be heard. However, different types of apparatuses transmit information dynamically, because the symbols that apparatuses assign to objects signify specific movements — gestures of labor. Objects encoded with such dynamic information interpret these symbols and move automatically according to the given program. Flusser calls these intelligent, dynamic, autonomous apparatuses "intelligent tools" and predicts they will liberate humans from labor, transforming them into playful beings: "These 'intelligent tools' replace human labor and emancipate human beings from the compulsion to work: from now on, humans are free—to play" (Flusser 1983: 23).

Flusser emphasizes that the photographic apparatus clearly exemplifies these two outcomes of the automation and intelligentization of apparatuses — the robotization of labor and the emergence of the human of play. The photographic apparatus belongs to what he calls an "automated intelligent tool," in that it produces images automatically. Flusser points out that this automation fundamentally differentiates the photographer's work from that of the painter. Unlike the painter, the photographer does not need to concentrate intensely on his or her tools, since photographic images are produced automatically by the apparatus. Thus, the photographer engages in play rather than labor through the apparatus: "The tool side of the apparatus is 'done,' the human being is now concerned only with the play side of the apparatus" (Flusser 1983: 23).

What characteristics of apparatuses make their automation and intelligentization possible? It is due to the fact that apparatuses simulate not the human body but human thought. What kind of thinking, then, do apparatuses simulate? Flusser notes that the kind of human thinking simulated by apparatuses remained unclear for a long time, even after the invention of the first apparatus—the photographic apparatus. He argues that this type of thinking only revealed its true nature with the invention of the computer, the apparatus in which the essential characteristics of apparatuses are most fully

realized. This mode of thinking is what he calls *thinking expressed in numbers*, or *calculative thinking*. The core of this mode of thinking lies in the Latin root of calculative, namely *calculus*, meaning pebble or a stone of the abacus. In other words, such thinking operates by counting with discrete particles—pebbles.[3]

Therefore, the photographic apparatus—and all subsequent apparatuses—simulate human thinking through combinations of discrete symbols analogous to numbers. It is precisely here that the structure of apparatuses reveals itself as a *quantum structure*. This particulate structure operates in the same way as language or word processors, which combine discrete elements—words. According to Flusser, since the thinking embodied in apparatuses functions by combining such particles, it is calculative thinking. Consequently, all apparatuses are "calculating machines" and, by extension, forms of "artificial intelligence": "All apparatuses, and not only computers, are calculating machines and, in this sense, 'artificial intelligences'; this already includes the camera, even though its inventors could not have been aware of this."(Flusser 1983:29-30).

Flusser argues that apparatuses do not merely simulate human thinking but, through simulation, surpass the very capacity of human thinking. This is because calculative thinking—that is, thinking that combines symbols—can be performed by apparatuses far better than by human thinking: faster, more accurately, and with fewer errors. Consequently, Flusser foresees that as the intelligence of apparatuses continues to advance, humans will increasingly delegate their own thinking to them, become ever more dependent on them, and, without realizing it, gradually become *apparatized* and *robotized*.

III. Objectification of Humans: Robotization of Photographers

The humanization of objects that has unfolded throughout human civilization represents only one side of a dual process in which humans and objects become hybridized. Flusser insists that, simultaneously, on the other side, a process of objectification of humans has taken place. This is because, for him, the relationship between humans and objects is inherently *reciprocal*. When humans create objects modeled after themselves, these objects, in turn, transform their creators into beings modeled after the very

[3] Flusser explains that this "calculative thinking" began to emerge in the seventeenth century within the scientific discourse of Descartes. Descartes sought to align human thought with a world composed of discontinuous particles, believing that only numbers—discrete entities—could reconcile *res extensa* (the extended thing, the world) with *res cogitans* (the thinking thing, thought). Since Descartes, most scientific discourses have tended to encode thought into numbers, and this tendency was materialized in the first apparatus, the photographic apparatus.

objects they have produced. In other words, humanized objects inevitably return to affect humans, reshaping them in their own image. Flusser metaphorically describes this return of objects through the symbol of the primitive tool—the stick—as the *return of the stick*. He highlights the anthropological significance of this return by stating, "already the primordial lever, the stick, began to influence us [humans]" (Flusser 1993: 49). How, then, do the objects humans create specifically influence them? According to Flusser, these objects compel humans to imitate their own imitations. As a result, humans transform into peculiar beings who imitate their own simulacra: "Ever since we have possessed levers, we have moved our arms as if they were levers. We imitate our simulacra" (Flusser 1993: 49).

Flusser argues that human beings are reborn as new kinds of humans according to the objects they create— especially the means of production such as tools, machines, and apparatuses. This is because such objects possess a *constitutive* power that reorganizes humans in a new way. To explain this historically, he first introduces the concept of *fabricate* (fabrizieren): "To fabricate means to manipulate and to transform something given into an artifact in order to apply it practically" (Flusser 1993: 69). What is crucial in this definition is the act of manipulating and transforming what is given into an artifact.

Flusser described "factories" (Fabriken) as spaces where what is given is manipulated and transformed into an artifact. According to him, over time, the factories become increasingly filled not with natural objects but with artificial, cultural ones, and consequently, the humans living there also become increasingly artificial: "They [Factories] are the places where human beings become less and less natural and increasingly artificial" (Flusser 1993: 69). Why is that so? Because "the manipulated and manufactured objects strike back at the human" (Flusser 1993: 69). What Flusser means by this "strike" is that the objects humans create—tools, machines, and apparatuses—reorganize humans into new beings that bear the characteristics of those very objects. Thus, factories are not only spaces where humans make artifacts but also ones where artifacts make humans. They are spaces in which human beings, by continually creating new means of production throughout the course of civilization, repeatedly remake themselves into *new means-of-production humans*: "Factories are places where ever new forms of humans are produced: first the hand-human, then the tool-human, then the machine-human, and finally the apparatus-human. This is the history of humankind itself" (Flusser 1993: 70).

Flusser argues that when the means of production change, not only do the forms of human beings change, but so does the *relationship* between humans and their means of production. For example, the human who uses tools and the human who operates machines are fundamentally different in the way they relate to their means of production. According to him, the tailor (the human) is positioned

at the center of the factory, surrounded by various needles (tools). Here, the human, who is far more valuable than the tool, is the constant, while the tool is the variable—because when a needle breaks, it can simply be replaced by another. In contrast, in the case of machines, the machine stands at the center of the factory, surrounded by several workers (humans). Here, the machine, which is far more valuable and durable than the human, becomes the constant, while the human becomes the variable—because when a worker is injured, they can be replaced by another. Flusser states that the relationship between humans and apparatuses differs from that between humans and tools or machines in that it is neither fixed nor stable, but variable: "They [Apparatuses] are no longer constant in their relationship to humans. […] the human–apparatus relationship is reversible" (Flusser 1993: 72). By "reversible," Flusser refers to a reciprocal functionality between humans and apparatuses: the apparatus functions (operates) through the human, but at the same time, the human functions through the apparatus. Flusser called this new kind of human being—produced by and engaged in a reciprocal relationship with the apparatus—the "functionary": "A new method of fabrication—namely, functioning—is in the process of emerging: the human is the functionary of apparatuses that function through his function. This new human, the functionary, is connected to apparatuses by thousands of partly invisible threads" (Flusser 1993: 73).

Because of Flusser's concept of "reversibility," the relationship between humans and apparatuses may appear reciprocal and equal, but in reality, it is not. The functionary who operates the apparatus is in fact thoroughly subordinated to it. To illustrate this, Flusser refers to the relationship between the photographic apparatus and the photographer. According to him, the photographer appears to use the apparatus according to his own intentions. However, in order to realize those intentions, he must necessarily go through the apparatus: "The photographer must adjust his apparatus […]. These adjustments are inscribed in the program of the photographic apparatus" (Flusser 1984a: 3).

Therefore, every gesture of the photographer is merely one that takes place within the limits permitted by the program of the photographic apparatus: "The practice of the photographer is subordinated to the program. The photographer acts only within the program of the apparatus" (Flusser 1983: 28). Since the photographer's gesture is thus bound to the program of the apparatus, Flusser called this gesture "programmed action," (Flusser 1983: 28) that is, action directed by the program itself. He also referred to the photographer's freedom with respect to the photographic apparatus as "programmed freedom" (Flusser 1983: 26). Ultimately, because all the photographer's gestures toward the photographic apparatus are governed by its program, the human gestures of the photographer closely resemble the gestures (operations) of the apparatus functioning according to its program. In

this respect, the apparatusization of human gestures can be said to have already begun with the gestures of the photographer.

Then what specific characteristics does the gesture of a human—such as the photographer—subordinated to the program of the apparatus exhibit? Flusser argues that this gesture reveals a *quantum structure*, a kind of gesture that has never before existed in the history of human civilization. To understand what he means by the photographer's quantum-structured gesture, we must first grasp the concept of "categories of the photographic apparatus," which are written outside the apparatus itself. This is because the photographer's gesture in operating the photographic apparatus—except in the case of a fully automated one—can produce a photograph only by adjusting these granular categories: "These categories divide the space and time of photography into quite clearly distinct regions" (Flusser 1983: 26). Flusser explains these categories concretely by dividing them into dimensions of space and time: "Space is divided into clear and distinct regions: close-up, panoramic, fisheye, etc. Time, too, is divided into distinct periods: fast exposure, ultra-fast exposure, medium exposure, long exposure, and so on" (Flusser 1984a: 3). Ultimately, the photographer's gesture that Flusser describes refers to the act of combining these discontinuous spatio-temporal categories, like particles. And this very act of combining such discontinuous photographic categories constitutes the first particulate characteristic of the photographer's gesture.

Then why does the photographer's gesture exhibit the particulate structure characteristic of combining photographic categories? Flusser points out that the structure of the photographer's gesture is subordinated to the particulate structure of the photographic apparatus that compels it: "The dialogue between the photographer and the photographic apparatus follows this quantum-arithmetical structure" (Flusser 1984a: 3). In other words, the discontinuous symbols—particles within the program of the apparatus—manifest themselves as the discontinuous categories of the photographic apparatus. And in order to produce a photograph, the photographer must inevitably combine these categories of the apparatus.

The photographer's gesture is particulate not only because it involves the combination of the discontinuous categories of the photographic apparatus. It is also because the photographer's *series* of gestures (decisions) are themselves discontinuous — segmented like a sequence of particles (for example, like the beads of an abacus), rather than continuous: "In his dialogue with the photographic apparatus, the photographer makes a series of clear and distinct, point-like decisions" (Flusser 1984a: 3). That is, in order to take a single photograph, the photographer inevitably encounters a series of *obstacles* — such as framing, shutter speed, and aperture — which each require a decision to be made. At every

such point, the photographer must choose one among the corresponding photographic categories: for instance, in terms of framing, a close-up, a medium shot, or a long shot; next, for shutter speed, a fast exposure, a medium exposure, or a long exposure; and then, for aperture, full opening, medium opening, or minimum opening. After these, yet another sequence of decisions follows. Flusser points out that this sequence of decisions made by the photographer consists of "quantum decisions," (Flusser 1983: 28) in which each decision is clearly separated from the next.

Moreover, each decision-making process that constitutes this series of photographic gestures is itself particulate. This is because, as Flusser puts it, the process of decision that the photographer undergoes whenever facing a series of obstacles—what he calls *doubt*—is structured as a discontinuous binary system of hesitation and decision: "The structure of the photographic gesture is quantic — a doubt composed of point-like hesitations and point-like decisions" (Flusser 1983: 29). This binary doubt unfolds in the photographer's gesture much like the yes/no sequence of a program flowchart: hesitation/decision, hesitation/decision, hesitation/decision… Consequently, every gesture performed by the photographer when handling the apparatus—the combination of photographic categories, the series of decisions, and each individual decision process—can be said to possess a particulate structure. From the moment the photographer acts in this discontinuous, particulate manner, interlocked with the program of the apparatus, their gestures begin to break away from those of the tool-human or the machine-human of the past. Such gestures, rather, approach those of the *robot-human* or even the *artificial intelligence-human*.

However, Flusser argues that this particulate structure appears not only in the photographer's physical gestures but also in the mental realm — in the photographer's *vision*. This is because the particulate structure of the photographic apparatus determines not only the photographer's gestures in handling it but also his perspective itself. According to Flusser, the photographer believes he is viewing the world from his own personal standpoint — as if he were freely choosing and capturing whatever he wishes. Yet, in reality, the photographer must see everything through the apparatus, that is, from the *standpoint of the apparatus*. This is because only through the apparatus can he obtain the desired image.

However, the vision of the photographic apparatus sees the world in a way fundamentally different from the human (photographer's) vision. In other words, the apparatus sees the world only through the discontinuous *spatio-temporal categories* mentioned earlier. Flusser states that these very categories of space and time, programmed into the apparatus, structure human vision: "This spatio-temporal structure, programmed into the photographic apparatus, imposes itself upon the world like a net,

structuring all human visions on both the individual and collective levels" (Flusser 1984a: 3). Therefore, the human who operates the photographic apparatus does not see the world through his own vision, but through that of the apparatus—that is, he sees the world by projecting the apparatus's discontinuous categories onto it. A human being who internalizes these discontinuous categories into his own thinking and perceives the world *apparatically*, and whose gestures while handling the apparatus are fragmented and particulate, can be said to resemble a robot.

IV. Objectification of Humans: Robotization of Humans

The apparatization and robotization of the human being do not appear only in the gestures and visions of the photographer — that is, of the particular human who operates the photographic apparatus. They also manifest in the physical and mental activities of all humans living within a post-industrial society dominated by apparatuses. To explain this, Flusser once again takes photography as an example. Through it, he analyzes how human beings living today in the *photographic universe* — a world governed by photographic apparatuses — are gradually being objectified and robotized. To understand this, we must first examine his concept of the photographic universe. According to Flusser, a universe is "the totality of combinations of a code" (Flusser 1983: 57). and the photographic universe refers to the totality of photographs produced by the photographic apparatus. In other words, it is the totality of realized photographs — the actualized images — that originate from the potential images contained within the program of the photographic apparatus.

What kind of structure, then, does this photographic universe possess? Flusser argues that the photographic universe also exhibits a granular structure: "In its deeper structure, the photographic universe is granular: it changes its appearance and color like a mosaic in which each small stone is constantly replaced by another. The photographic universe is composed of such small stones, of quanta, and is calculable (from *calculus* = small stone)—an atomistic, Democritean universe, a puzzle world" (Flusser 1983: 46). Why, then, is the photographic universe granular? Flusser offers two explanations. First, the photographic universe came into being through the photographer's gesture, which itself has a quantic structure: "The quantic structure of the photographic universe is not surprising, for it has arisen from the photographic gesture, whose quantic character has already been discussed" (Flusser 1983: 46). Second, the photographic universe is also produced by the photographic apparatus, which likewise has a quantic structure and compels the photographer to act in a quantic way.

In this sense, Flusser asserts that everything related to photography — the photographic apparatus, the photographer's gesture, the single photograph, and the photographic universe — is quantic. However, the ultimate cause that renders everything related to photography quantic lies in the quantic structure of the photographic apparatus itself. Then why does the photographic apparatus, and indeed all apparatuses, possess a quantic structure? It is because, as previously discussed, apparatuses were born by imitating human thought — specifically, the Cartesian model of particulate thinking. In other words, thought is composed of clear and distinct elements (concepts), and the process of thinking proceeds through the combination of these elements (particles). Ultimately, the quantic structure of the apparatus—modeled after the quantic structure of human thought—compels the photographer's quantic gestures, and through the quantic structures of both the apparatus and the photographer's gestures, the quantic structure of the photographic universe is brought into being.

Then, what is the relationship between the photographic universe, which has a quantic structure, and the photographic apparatus program, which likewise possesses a quantic structure? According to Flusser, this relationship is *bi-univocal*—a one-to-one correspondence. The photographic universe is composed of a multitude of distinct and separate photographs, and each individual photograph corresponds precisely to a clear and distinct element (a potential photograph) within the program of the photographic apparatus: "Each program point corresponds to one photograph, and each photograph to one program point." (Flusser 1983: 47). Flusser argues that the photographic universe, which maintains such a one-to-one correspondence with the apparatus program, *programs* the human beings who live within it. Because of this programming, every human attitude is determined by photographs: "To exist within the photographic universe means [for human beings] to experience, to perceive, and to evaluate the world in terms of photographs" (Flusser 1983: 48). Moreover, Flusser points out that each individual photograph composing the photographic universe also serves as a "magical model" (Flusser 1983: 48) that shapes the attitude of the person viewing it. For this reason, every physical and mental attitude of an individual can be broken down into the series of photographs they have seen: "[An individual's] every single experience, every single piece of knowledge, every single value can be broken down into the individual photographs that one has seen and interpreted. And every single action can be analyzed in terms of the individual photographs used as its models (Flusser 1983: 48). To sum up, the one-to-one relationship between the photographic apparatus program and the photographic universe is reproduced in the relationship between the photographic universe and human attitudes. Ultimately, every mental and physical attitude of human beings corresponds one-to-one with the elements of the program.

Flusser describes this mode of human existence — in which all human experiences, knowledge, value judgments, and actions are decomposed into particulate elements or, in his terms, "fragments of information" — as the mode of being of robots, or the "property of robots." He writes: "This reduction of all phenomena of human life—both physiological and mental—into 'fragments of information' is, evidently, the property of robots" (Flusser 1984b: 4). In this sense, why does the reduction of human thought and action to "fragments of information" (here referring to the photographs in the photographic universe, or the symbols of the apparatus programs that produce these photographs) constitute a property of robots? Although Flusser does not provide an explicit answer, it can be interpreted that this is because the thinking and actions of robots themselves can also be reduced to the elements (codes, symbols) that constitute the programs operating them. In other words, every thought and action of both robots and humans within the photographic universe can be reduced to a program, that is, "a game of combinations with distinct and discrete elements" (Flusser 1983: 57). From this perspective, both robots and human beings in the post-industrial age are *programmed beings*, and the boundary between them becomes blurred: "Objects programmed to simulate living beings [humans], and functionaries programmed to simulate that simulation, both operate according to a program […]" (Flusser 2019: 201).

It is precisely for this reason that Flusser explicitly states that the photographic apparatus and the universe of photographs it produces make human life and human society function like robots. First, regarding the photographic apparatus, he insists that "the camera will reveal itself as the ancestor of all those apparatuses that robotize every aspect of our lives" (Flusser 1983: 49). Next, concerning the photographic universe, he asserts that "the photographic universe, like all universes of apparatuses, robotizes human beings and society" (Flusser 1983: 48). Then how, concretely, do the photographic apparatus and the photographic universe robotize human beings? They transform not only the gestures and thoughts of photographers but also all human gestures and thoughts into a quantic structure like that of robots. Flusser diagnoses that in post-industrial society, human gestures often already display "robotized gestures": "The new, robotized gestures can already be observed everywhere: at bank counters, in offices, in factories, in supermarkets, in sports, and in dance" (Flusser 1983: 48). He adds that human thought, like human gestures, has become "robotized thought," possessing the same quantic structure: "Upon closer analysis, the same staccato structure can also be recognized in thinking — for example, in scientific texts, in poetry, in musical composition, in architecture, and in political programs" (Flusser 1983: 48-49).

Although Flusser presented several examples of the robotization of human beings, he did not explain in detail why each case constitutes a robotized gesture or mode of thought. However, in *Vom Stand der Dinge – Eine kleine Philosophie des Design* (*The Shape of Things: A Philosophy of Design*) (1993), he provides a few additional examples and elaborates a little further: "Young people dance like robots, politicians make decisions according to computerized scenarios, scientists think digitally, and artists draw with plotters" (Flusser 1993: 49). Let us analyze this statement in more detail. It can be interpreted that Flusser, observing the robot culture and robotic dance that were popular in Western mass culture during the 1970s (for example, Michael Jackson's dance style), concluded that even human dance was beginning to imitate the movements of robots. Likewise, politicians no longer think (decide) independently but rely on the reasoning of computers—thinking robots. Similarly, scientists execute their thinking by simulating the calculating mode of thought of the apparatus. Finally, the artist, simulating the robot that automatically draws on a plotting table, also paints as if a robot, producing drawings mechanically on the drafting table.

After presenting such various examples of the robotization of human beings, Flusser states that the apparatus penetrates deeply into the human body and the innermost self of the person living in the post-historical age, thereby robotizing them. The apparatuses are robotizing human beings "from external gestures to the innermost realms of thinking, feeling, and willing" (Flusser 1983: 49). Ultimately, he diagnoses that, since the invention of the photographic apparatus, at the basis of all cultural phenomena, the linear structure and the mechanical structure of the historical age have been replaced by the *staccato structure* and the cybernetic structure — the structures of the robot — of the post-historical age. For this reason, Flusser concludes that, in post-industrial society, the central task of new cultural criticism lies in decomposing and dismantling all human actions and thoughts, in order to reveal the "mosaic elements" — the elements of the robot (the apparatus, the program) — that have deeply infiltrated them: "The task of contemporary cultural criticism is to analyze this restructuring of experience, knowledge, valuation, and action into a mosaic of clear and distinct elements from each individual cultural phenomenon" (Flusser 1983: 49).

V. Final Considerations

Taking a step back from the preceding discussion on Flusser's reflections concerning the objectification of humans and the humanization of objects, this section briefly examines the implications and limitations of his thought. The most significant and insightful aspect of Flusser's discussion lies in his

view of the relationship between humans and objects as not unilateral or linear, but rather as *mutually influential*—that is, humans make objects, and objects make humans. In other words, the objects created by humans do not exist independently or indifferently outside of human life; they come back to affect, constrain, and even reshape the human being. This observation represents a crucial insight from the perspectives of philosophy of media and philosophy of technology.

Nevertheless, Flusser's relational understanding of humans and objects (tools, media, technologies, etc.) is not an entirely original position, but one that has its roots in the tradition of German media philosophy. For instance, Günther Anders, in his famous essay "*The World as Phantom and as Matrix: Philosophical Considerations on Radio and Television"* (1956), argued that no medium should be understood as merely a neutral means, a view strikingly close to Flusser's position. That is, the tools created by humans do not remain as mere tools; rather, they act back upon humans, transforming their creators into new kinds of human beings. Even earlier, Walter Benjamin's discussion in the 1930s on the relationship between technology and human perception[4]—that is, his argument that the technologies of mechanical reproduction reorganize human modes of perception toward the world and art—is likewise closely related to Flusser's relational thinking.

Among Flusser's discussions, perhaps the most compelling for reflecting upon today's age of artificial intelligence and robotics is his claim that apparatuses increasingly *granularize* and *robotize* the gestures of the humans who operate them. This claim vividly resonates with the fragmented and peculiar gestures of human beings living in the late industrial society, in which new apparatuses infiltrate everyday life. Humans today go beyond the earlier discontinuous act of striking discrete elements—numbers or letters—on a keyboard. They now perform particulate and segmented movements before various unfamiliar apparatuses—such as self-ordering machines or automated document-issuing kiosks—installed throughout everyday spaces like restaurants, cafés, fast-food outlets, convenience stores, department stores, banks, schools, and public institutions, moving as if following the sequential flow of a robotic program chart. It is a significant insight of Flusser's thought that, as early as the 1980s—more than forty years ago, when the concepts of artificial intelligence and robotics were still unfamiliar—he had already diagnosed and anticipated the *robotized* and the *to-be-robotized* gestures of human beings—an insight that remains remarkably relevant in understanding the human condition in our contemporary technological society.

[4] On this point, one may refer to Walter Benjamin's well-known article, "*L'œuvre d'art à l'époque de sa reproductibilité technique*" (dernière version 1939), in *Œuvres III*, Paris: Gallimard, 2000.

In this sense, Flusser's reflections acquire renewed significance in the age of artificial intelligence. Artificial intelligence should not be understood merely as a technology that assists, supplements, or replaces human beings. Rather, it should be seen as an apparatus that transforms the very relationship between humans and objects. Artificial intelligence is not a neutral tool external to human life. It is an object modeled on human thought and action, yet it also reorganizes human thought and action according to the forms it can process. Human beings create artificial intelligence by modeling their own cognitive and practical capacities, but artificial intelligence in turn reshapes the ways in which human beings think, speak, judge, create, and act.

At this point, Flusser's idea of the humanization of objects reaches one of its most radical forms. Contemporary artificial intelligence no longer merely replaces isolated human functions. Programmed artificial intelligence imitates mental activities such as language, image production, judgment, prediction, reasoning, and dialogue, while physical artificial intelligence imitates bodily actions such as movement, manipulation, and response. When these two dimensions converge, artificial intelligence appears as an object that thinks and acts like a human being. In certain domains, it even functions more rapidly, efficiently, and precisely than humans, processing vast amounts of data, making calculations, generating images and texts, and performing physical operations with a degree of speed and accuracy that exceeds ordinary human capacities. In this sense, artificial intelligence may be understood as an extreme form of the humanization of objects.

Yet the more decisive issue arises in the opposite direction. As artificial intelligence comes to resemble human beings, human beings also come to resemble artificial intelligence. In using artificial intelligence, humans increasingly reformulate their thoughts in ways that artificial intelligence can understand and process. Thoughts become prompts, judgment becomes the comparison of options, and creation becomes the modification and recombination of generated outputs. Although humans may believe that they are freely thinking, choosing, and commanding, their thought is increasingly segmented, formalized, and arranged according to the operational requirements of artificial intelligence programs. In this process, human thought is gradually transformed into calculable, combinable, and processable units of information.

This transformation is also visible at the level of human action. The human beings who use artificial intelligence no longer acts only within a continuous flow of intention and execution. Rather, they move through a sequence of segmented operations: commanding, waiting, selecting, correcting, and commanding again. The action may begin with human intention, but the way in which this intention is realized is mediated by the structure of the artificial intelligence program. Human beings instruct

artificial intelligence what to do, but at the same time they adjust their demands according to the forms in which artificial intelligence is able to respond. Thus, in interaction with artificial intelligence, human action increasingly comes to resemble the logic and rhythm of the program.

In this regard, the human beings in the age of artificial intelligence are not simply users of artificial intelligence. Rather, they increasingly internalize the operational logic of artificial intelligence through continuous interaction with it. Artificial intelligence learns human language, images, and patterns of behavior in order to respond in a human-like manner; but humans, in turn, learn to speak, write, ask, judge, and create in ways that artificial intelligence can more easily process. They increasingly speak like commands, think like data, and decompose problems in ways that are legible to algorithms. At this point, human thought and action are reconfigured according to the forms of artificial intelligence programs. This may be called the artificial-intelligencization of the human.

Therefore, humans create artificial intelligence, and artificial intelligence, in turn, reshapes humans. In this reciprocal process, the humanization of objects and the objectification of humans no longer appear as separate tendencies. Artificial intelligence is a humanized object, while humans who use artificial intelligence become, in a certain sense, an artificial-intelligence-formed humans. The object thinks and acts like a human being, while the human increasingly thinks and acts according to the logic of artificial intelligence. It is precisely at this intersection that the boundary between human and object, natural intelligence and artificial intelligence, living being and artifact becomes increasingly unstable.

For this reason, the age of artificial intelligence may be understood as the moment in which Flusser's concepts of the humanization of objects and the objectification of humans converge most clearly. The humanization of objects that Flusser analyzed finds a new form in the humanization of artificial intelligence, while the objectification of humans finds a new form in the artificial-intelligencization of human thought and action. In this sense, Flusser's thought remains highly relevant today. Indeed, the age of artificial intelligence may be the historical moment that most clearly reveals the contemporary significance of his reflections. His thought can therefore be regarded as an important theoretical resource for reflecting on the changing relationship between humans, objects, and apparatuses in contemporary technological society.

However, despite these meaningful achievements, Flusser's thought also reveals certain ambiguities and internal tensions. Most notably, the concept of the *apparatus*—the central category of his media philosophy and the cornerstone of his thesis on the humanization of objects and objectification of humans—appears surprisingly unclear. Flusser defines tools and machines as things that physically

transform the world, while apparatuses are things that produce information. According to this definition, an apparatus refers to a symbolic-working object, namely, an object that produces, processes, and stores information (for example, technical images or computers). Yet, when he later refers to *dynamic apparatuses* as intelligent tools, Flusser seems to describe them not as producers of information but as performers of *labor*. As he writes, such apparatuses carry out "movements of labor," thereby liberating humans from the need to work: "there are also apparatuses that inform dynamically: the symbols they press onto objects signify specific movements (for example, movements of labor), and the objects thus informed decipher these symbols and move according to the program" (Flusser 1983: 23). This raises the question of whether the apparatus, in Flusser's sense, should be understood solely as an information-producing entity, or whether it also includes intelligent tools that perform labor. In today's context, would highly programmed advanced machines that do not necessarily produce information—such as self-driving cars or autonomous robots that shape steel plates into cars—count as *apparatuses* for Flusser, or would they remain mere *machines*?

Flusser's thought, while often illuminating, is at times ambiguous and occasionally difficult to accept. For instance, his claim that photographic apparatuses granularize the gestures of photographers is convincing; yet, his further assertion that the *photographic universe* itself *granularizes* and *robotizes* human beings is far less persuasive. Moreover, his argument that all human actions and thoughts in the photographic universe can be decomposed and reduced to a series of individual photographs that one has experienced is even more problematic. Can the complex, multilayered structures of human thought and gesture truly be reduced to the series of discrete photographs one has seen? Furthermore, Flusser claims that all technical images following photography—film, television, video, digital images, and so on—also *granularize* human physical and mental attitudes. Yet, even if the photographic universe, composed of countless discrete elements (individual photographs), could, to some extent, fragment human perception, it remains questionable how the universe of moving images, which in human perception appears as a continuous flow, could granularize and segment human thought and behavior. This series of arguments in Flusser's thought, therefore, seems to stem from an excessive theoretical ambition to reduce all the thoughts and attitudes of apparatus-bound humans in the post-industrial society, through the apparatus universe, solely to elements of apparatus programs—thereby making his thought somewhat schematic and *a priori*.

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