

Marx and the moral depreciation of technology

Labor value as information

Introduction

For Marx, technologies are either tools or machines and both are physical things. He was interested in the study of their *intrinsic* labor value in the capitalist production process. He recognizes that the life of a machine depends first on two physical factors: 1) erosion by *use* and 2) corrosion by *abandonment*:

The material wear and tear of a machine is of two kinds. The one arises from use, as coins wear away by circulating, the other from non-use, as a sword rusts when left in its scabbard. The latter kind is due to the elements. The former is more or less directly proportional, the latter to a certain extent inversely proportional, to the use of the machine.¹

However, Marx recognizes also a third “moral”² factor that depreciates the productivity of a machine:

But in addition to the material deterioration, a machine also undergoes what we may call a moral depreciation. It loses exchange-value, either by machines of the same sort being produced cheaper than it, or by better machines entering into competition with it. In both cases, be the machine ever so young and full of life, its value is no longer determined by the labor actually materialized in it, but by the labor-time requisite to reproduce either it or the better machine. It has, therefore, lost value more or less. The shorter the period taken to reproduce its total value, the less is the danger of moral depreciation; and the longer the working day, the shorter is that period. When machinery is first introduced into an industry, new methods of reproducing it more cheaply follow blow upon blow, and so do improvements, that not only affect individual parts and details of the machine, but its entire build. It is, therefore, in the early days of the life of machinery that this special incentive to

¹ Marx, Karl. Capital ; A Critique of Political Economy. Volume I Book One: The Process of Production of Capital. Chapter 15: p. 273.

² Marx uses the term “moral” in the modern sense of “cultural”. The term is very common from the 14th Century and after, meaning “pertaining to character or temperament”, from Latin *moralis* “proper behaviour of a person in society,” literally “pertaining to manners.” (Online Etymology Dictionary).

the prolongation of the working day makes itself felt most acutely.³

For Marx, the productiveness of a technology is “inversely proportional to the value transferred by it to the product. The longer the life of the machine, the greater is the mass of the products over which the value transmitted by the machine is spread, and the less is the portion of that value added to each single commodity.”⁴ We discover here some inconsequence; Marx acknowledges the transference of physical energy and matter from the technological device to the product, which is clearly wrong:

In the first place, it must be observed that the machinery, while always entering as a whole into the labor - process, enters into the value - begetting process only by bits. It never adds more value than it loses, on an average, by wear and tear.⁵

When Marx talks about “transference of value” he is talking about physical erosion by use and corrosion by misuse:

By wear and tear (moral depreciation excepted) is meant that part of value which the fixed capital, on being used, gradually transmits to the product, in proportion to its average loss of use-value.⁶

From the point of view of the 21st Century, is easy to conclude that the problem with Marx’ view is that it is too narrow and that the only essential depreciation of value which is interesting for a theory of labor value is that of “moral depreciation”. Consider for instance the technology of a computer program; because it is not a physical thing, it will not erode or corrode; at the other hand, it would be its “moral life” the only intrinsic factor that decides its value. Considering only the moral depreciation of value, the productiveness of e.g. a computer program, depends on the time it is *irreplaceable*. In my terms, during that time it is a “whole technology” otherwise it would be a “broken technology”. To have full value, the computer program must be unique in the market. In other words, the condensed work power that it contains, depreciates as soon as a contender program *works better* (meaning “better” that it does the same work in a shorter time). Because we know that physical energy cannot be transmitted into the product, the question is if it is some transference of value, and in that case, which kind of value is it and how is it transferred.

Marx epistemology

During the years of Marx’ intellectual development, the consequences of the Kantian revolution and its differences with the precedent Cartesian revolution were not definitely established. It was necessary to wait until the work of Husserl to get this difference clear. As a consequence of this, Marx’ thought oscillates sometimes between the empiricism of Natural science (Marx and

³ Op.cit. p. 273.

⁴ Marx, Karl. *Capital ; A Critique of Political Economy*. Volume I Book One: The Process of Production of Capital. Chapter 15: p. 272. <http://www.marxists.org/archive/marx/works/1867-c1/ch15.htm>

⁵ Ibid. p. 264-265.

⁶ Capital. Volume II; Chapter VIII ; p. 100.

Engels were clearly influenced by the epistemology of Natural Sciences) and the embryonic phenomenological methodology that they could find in Kant and Hegel. For that reason, I believe that some of Marx' ideas about labor value must be revised. One is that I would call the "container theory of value" according to which he understood the condensed labor in a commodity as *residual static labor* from a past time. The labor value of a commodity for Marx is inside the commodity which acts as a labor-container. A second idea to be revised has to do with Marx' own contribution to the field of philosophy: the concept of *praxis* or "knowledge in action". Marx distinguished between "commodity" and "technology" and did not see that *any commodity is a technology* and therefore, that they are both the medium and the consequence of praxis in labor. A theory of intrinsic value then must be a dynamic theory of value liberated in action. A consequence of this is that in the labor process only cultural products are involved to produce new cultural products; no matter if they are machines, tools or *materia prima*. For example, both "air" and "water" are cultural products from a phenomenological point of view. Being phenomenologically consequent, there are no "natural", pure objective items outside knowledge and it is therefore impossible to differentiate "intrinsic labor" from "labor as action proper". If a machine does the work of 200 men, then, there must be as 200 men "working inside the machine". The labor value is not "saved or condensed value", is always "active value". Marx' mixing of different perspectives of analysis, changing unexpectedly from empiricism to phenomenology and vice versa, affect also other aspect of his theory as the understanding of concepts as "exchange", "value" and "price". For Marx "value" is sometimes a *natural magnitude* (empirical fact) and sometimes a *moral multitude* (cultural phenomenon). In some part of Marx' discourse, his materialism become physicalism.

Information is the substance of labor

Let us here, study closer which kind of "substance" is labor. It cannot be considered a natural substance, as if it were natural "energy", because the physical energy involved in the physical act of labor is completely consumed in the labor act. If some labor energy can be found into the product of labor, it cannot be of a physical nature. We can conclude then, that the physical and the moral spheres of reality are independent from each other. If labor cannot be a physical substance, the only open alternative is that of considering it as *information*. Let us be more specific because the concept of "information" is used in different contexts. It is used in connection with natural sciences and technology with a specific technical signification and in social and human sciences with among others meanings: advise, reportage, testimony, communication, explanation, advertency, inquire, etc.⁷ The term comes from Latin and originally meant "to form" something. It can be found already in Publius Vergilius Maro and after him in Augustine and Thomas Aquinas. Later it appears again in Descartes and the new philosophy showing already the two main different meanings, at one hand, "to form matter" and to the other hand "to communicate something to someone". In our times, the

⁷ A complete study of the history and the definitions of the term can be found in: Capurro, Rafael and Hjørland, Birger: *The concept of Information*. Annual Review of Information's Science and Technology. Ed. Cronin. Vol. 37, 2003.

term became fixed in association to the theoretical and technological developments in the fields of mathematics, communication technologies and computer science and to the names of men of science as Norbert Wiener, John von Neumann and Claude Elwood Shannon. Especially important is the book by Shannon *A Mathematical Theory of Communication* from 1948. Shannon distinguished the meaning of the term “information” from that of the term “meaning”. According to Shannon, “information” does not need to be meaningful. “Information” to Shannon is the measure of a “difference” between signals. The binary difference between “yes” and “no” is the simplest of all possible contents of information. This measure defines a binary unit or “bit”. The richer the open alternatives, the richer will be the content of information in the message. I will follow in this article a meaning of information defined by Wiener according to which information is the expression of at one hand “organization” and “order” and at the other hand a measurement of “communication”.

Messages are themselves a form of pattern and organization. Indeed, it is possible to treat sets of messages as having entropy like sets of states of the external world. Just as entropy is a measure of disorganization, the information is a measure of organization.⁸

One of the most important consequences of the modern use of the term “information” had some importance to Marx materialism:

The mechanical brain does not secrete thought “as the liver does bile”, as the earlier materialist claimed, nor does it put it out in the form of energy, as the muscle puts out its activity. Information is information, not matter nor energy. No materialism, which does not admit this, can survive at the present day.⁹

Rafael Capurro introduced a very interesting connection between the technological meaning of information and the phenomenological field of philosophy¹⁰. According to Capurro, information is *fragmented intentionality*. Capurro understands the modern age of informatics as postmodern phenomena, which can be found already in the philosophy of Husserl and Heidegger. Another important difference is that communication of information leaves behind the opposition between object and subject and substitutes it with inter-subjectivity and context; in the new reality the informational content is not attached to a subject.

Confusing the levels of order and of communication

Following the history of economic thought since the time of Aristotle, Marx distinguishes between use-value and exchange-value. The distinction is highly relevant from the point of view of a theory of labor as information. Use-value corresponds to the concept of information as order, and exchange value correspond to the concept of information as communication. However, Marx tried mistakenly to reduce these two to a common labor value. Further, it follows from the definition of

⁸ Wiener, Norbert. *The Human Use of Human Beings. Cybernetics and Society*. New York, 1967.

⁹ Capurro, Rafael och Hjørland, Birger: *The concept of Information*. Annual Review of Informations Science and Technology. Ed. Cronin. Vol. 37, 2003.

¹⁰ Capurro, Rafael. *La Hermenéutica y el Fenómeno de la Información*. Cuaderno de psicoanálisis freudiano 8, 1987.

labor as information that it is inadequate to express its materiality in time-units. It must be expressed in information units and in the frame of a theory of human action and human communication. In another work¹¹, I have studied the relationship between action and introspection and found that during action *the limit of the level of information tends to 1* while in introspection (and thinking in general) *information tends to 0*. I concluded that information becomes action when it grows to be almost identical with certainty and conversely, information is the measure of organization when the application of a device is unpractical and we are skeptical about the device usability. In other words, action demands higher levels of information, is then when the embodiment of technology takes place and when information becomes pure action. This is the moment of production, the moment of embodiment. Productive labor can only happen during embodiment, *when information becomes certainty*. On the contrary, reflection demands a low level of information occasioning the disembodiment of technology and the emergence of the device as an artificial item in the world of things. This is the moment of exchange and communication, the moment during which the device is disconnected from its use-value. It is also important to understand the relation between information and probability. The less likely a fact the more information it supplies. According to information theory the information of an event is a function of the *inverse of the probability of occurrence of the same*. This means that productive labor and in general the use and consume of things (information tending to 1) is a very unlikely event while exchange and communication in general is very likely event because it is possible when the level of information tends to 0. In other words, embodiment processes as productive acts, demands huge amount of information to occur.

Property as information

Alfred Sohn-Rethel wrote in 1978 that the use of commodities and the exchange of commodities are in time mutually exclusive processes.¹² That happens because during the exchange process, the establishment of exchange value demands that the material status of the commodity remains unchanged. About this dichotomy, Alfred Sohn-Rethel wrote:

The point is that use and exchange are not only different and contrasting by description, but are mutually exclusive in time. They must take place separately at different times. This is because exchange serves only a change of ownership, a change, that is, in terms of a purely social status of the commodities an owned property. In order to make this change possible on a basis of negotiated agreement, the physical condition of the commodities, their material status, must remain unchanged, or at any rate must be assumed to remain unchanged. Commodity exchange cannot take place as a recognized social institution unless this separation of exchange from use is stringently observed. This is a truth, which need only be uttered to be convincing, and I regard it as a firm basis on which to build far-reaching conclusions.¹³

¹¹ *Broken Technologies. The Humanist as Engineer*; Lund, 2008.

¹² Sohn-Rethel, Alfred. *Intellectual and Manual Labour. A Critique of Epistemology*; 1978.

¹³ Op.cit. p. 24.

According to Sohn–Rethel the separation in time of use and exchange is a fundamental law of civilization, because it is the law which makes society work as a regulated unconscious mechanism. This separation is built on the concept of *property*, which works socially as a law:

The concept of property is itself only a conceptualization of the factual necessity of keeping use and exchange separated. The need to exempt from use objects entered for exchange is a simple fact of experience; if it is ignored exchange must cease.¹⁴

The theoretical problem we are confronted with is that historically, the sociology and political economy of Marx invaded and eclipsed the ontological levels of labor as order (in production as action) and labor as communication (as information and cognition).



Consumer

Vendor

Presentation 1: The consumer and the vendor. Judith Weller's *Garment Worker* from 1984 give form to “use–action” while Baca Rossi's, *Fish vendor* from 1976 shapes the “exchange–action”.

I believe that this split is the necessary consequence of the oscillation of the amount of information in social life, permitting the shift between the communicative mode when small quantities of it are present, to the consummative mode when a huge amount of information are present. “Property” is the accumulated information controlled by the self in a cognitive-communicative state. “Property” is always the “proprietorship of something”, more or less material but always a medium for action, a “technogonomy” (from *gnomy* from the Greek *gnomon*, “means of judging or interpreting”). This displacement of meaning will be achieved following a simple rule which is the main terminological rule of this article avoiding the suffix “logy” to stress the informative character of the medium for action.

¹⁴ Op.cit. p. 40.

The technognomic character of the lifeworld

A common point of departure to define “technology” has considered the activities, directed towards the satisfaction of human need and wants. This definition includes then as technology every possible item with use-value. It is important to distance ourselves with the old fashioned understanding of technology as tools and machines present only in a capitalist productive environment. Technologies are present in every aspect of the lifeworld, as clothes, food, medicines, entertainment, education, sport, etc. From our point of view, when we consider the “substance” of these technologies and discover that their substance is information, technologies become “technognomies”, reservoirs of experience and knowledge, administrated as individual and social “properties”. This conclusion have two consequences: first, *extend* the problem of the moral depreciation of technology from the case of tools and machines to every item participating in the productive process. Secondly, make obsolete Marx division of the production process into:

The elementary factors of the labor-process are 1) the personal activity of man, i.e., work itself, 2) the subject of that work, and 3) its instruments.¹⁵

Instead it is necessary to study the participation of the different technognomies in the productive act. Notice that some technologies are at the center of the action; I will name these as *initiatory*. A technology is initiatory if it is the point of departure of a human action and essential for the performing of that action. Otherwise, it is *receptive*. Beside these two action-roles we find artifacts that are indirectly connected to human action and call it *complementary* if its role in the implementation of an action is secondary to the one that is initiatory. Otherwise, it is *participative*. In general terms and beside this particular technognomic context, studying action implies the engagement of the four technological powers. For example, studying the action of ‘nailing a shelf to a wall’, we find that the hammer is the *initiatory* artifact and the shelf is the *receptive* artifact; the nails are the *complementary* artifact and the wall where the nails go into to hold the shelf, is the *participative* artifact. We can thereafter define four fundamental heuristic powers of the human action with respect to industrial production. In the scenario of the industrial production process that Marx studied, the machines and the tools are *initiatory* and/or *complementary*; the *materia prima* of production are the *receptive* items and the industrial building is the *participative* item.

¹⁵ Op.cit., Chapter 7, p. 124.

Depending of human action: An artifact is 'Initiatory' if it is the point of departure of a human action; otherwise it is 'complementary'.			
Independent of human action An artifact is 'participative' if it acts directly upon another artifact and it is 'receptive' if it receives the action of another.		Initiatory -A	Complementary -B
	Participative -a	Initiatory/ Participative	Complementary/ Participative
	Receptive -b	Initiatory/ Receptive	Complementary/ Receptive

However, what happened with the Marxian "worker" in the production process? There is no human labor involved in it? Of course, but the human labor force is indistinguishable from the technognomic process.

The cyber-worker

From our point of view, the worker is the "I" in a technognomic process. Don Ihde developed a typology of technologies, from the point of view of post-phenomenology.¹⁶ Ihde's typology makes visible the goal of labor, when it is powered by technology. One of the types studied by Ihde is that of the *embodied* technology:

Embodiment is, in practice, the way in which we engage our environment or 'world' and while we may not often explicitly attend to it, many of these actions *incorporate the use of artifacts or technologies*. I take it that Heidegger's hammer, Merleau-Ponty's lady's hat feather or blind man's cane, are examples of what I call *embodiment relations*. These are our relations to an environment which incorporate material technologies or artifacts which we *experience as taken into our very bodily experience*. Moreover, it does not alter our sense of incorporation if the instrument is simple or complex, modern or ancient, in all these cases, it enters into my bodily, actional, perceptual relationship with my environment. The technology 'withdraws' as Heidegger says, it becomes *quasi-transparent* as I say, and thus the technology here is not 'object-like.' It is a *means* of experience, not an object of experience *in use*. I have formalized this relationship as follows: (human-technology) -> environment. The artifact is symbiotically 'taken into' my bodily experience, and directed towards an action into or

¹⁶ See Ihde, Don. *Technics and Praxis* (1979) and *Technology and the Lifeworld* (1990).

upon the environment.¹⁷

The industrial device is embodied by the worker-subject as the pair of eyeglasses is; as the eyeglasses, industrial technologies are means of experience as well as means of production. During the productive process, the technology ‘withdraws’ the worker as subject into the working process becoming *one with it* and losing its ‘object-like’ properties to be a part of the labor power of the labor-subject.

Don Ihde’s typology applied to industrial devices		formula
Technologies of embodiment	In wearing eyeglasses, perceptions changes. The perceived World seen through the eyeglasses become the real world.	[I-glasses]-world
	<i>The device in the factory, engaged in productive work as enhancements of the worker-subject’s body.</i>	<i>[I - (the worker-subject)-device]-world</i>

That is how Marx concept of “productive forces” can be understood. These forces would be the consequence of the withdrawing of the labor-subject into the labor process through the enhancement of the device which is working as an *historical enhancement instrument*. In this case, the industrial device enriches, improves and augments the labor power of the workers in such a manner that the device has not only a *multiplicative* effect on the human capabilities but it is the expression of a *cyber-worker*, a *kind of cyborg-subjectivity*. The productive forces are the consequence of the withdrawing of the workers-subjectivity into the working process through the enhancement of the device. Besides to the physical properties of some devices (which are submitted to the wear of tears of erosion and corrosion), every technological device is working as an *enhancement instrument*. In this case, the industrial device, enriches, improves, augment, the labor power of the worker through the implementation of an informative content which is the expression of the update knowing how in that matter. The device has in fact a multiplicative effect on the human capabilities because through the actual worker, the device liberated the accumulated knowledge of the actual historical period. In other words, the device itself *creates labor value*, because the device itself is an historical component of the subjectivity of the actual labor force. In other words, to implement a device, *the worker must belong to the subjective time of the device and conversely the device is objectivized human subjectivity*. Education, training, learning, etc. are components of the subjective field to which the device and workers belong together. As an example, older computer programs, programmed in older computer languages, are more or less inaccessible to the group of up-to-date programmers. The field of knowledge in which these old programs were created, is gone together with the device itself.

¹⁷ Ihde, Don. “Introduction to Postphenomenology and Technoscience: The Peking Lectures.” Unpublished manuscript.

So, contradicting Marx, the application of the device increases the *labor value*. Here is the point in which the discourse of Marx is clearly wrong. Marx followed the track of materialism as “physicalism” instead of the track of materialism as phenomenology. In a contradictory manner, physicalism led Marx to confuse the physical process of production with the cultural (“moral” in Marx terms) process of production. Devices are *technognomies*, acting in cultural scenarios and there is no point-zero to which abstractly refer the comparison. *There is no abstract human labor at all.*

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