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Human being – organization homomorphism: between autopoiesis and allopoiesis

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Abstract

Purpose – The purpose of this paper is to discuss the condition of human beings and organizations producing goods and/or services as autopoietic and allopoietic machines, with the aim of establishing a functional homomorphism between the productive system of an organization and the productive system of human beings, a matter that involves reflecting on what human beings do that is distinguished as allopoietic by an observer.

Design/methodology/approach – Use is made of Ashby's concept of functional homomorphism to establish similarities between human beings and organizations. The definitions of autopoietic and allopoietic machine of Maturana and Varela are used to distinguish similarities and differences between what organizations do and what human beings do.

Findings – As a result of using the autopoietic/allopoietic viewpoint, it is proposed to homologate the human nervous system with the production system of an organization, defining the latter as a world-creating energy/communication processing system.

Research limitations/implications – A homomorphism is established here between a human nervous system and the production system of an organization; it remains pending the other homomorphisms that can be made between the systems of the human body and the organization.

Practical implications – A proposal is made to understand an organization as a world-creating energy/communication processing system, and it is estimated that this would imply displacing attention, at present strongly centered on the generated products and/or services, toward the sense that they have for both persons and society, restating the question on the world we construct/live in, from the organizational standpoint.

Originality/value – Human beings are seen as allopoietic machines, aiming to contribute to the discussion about what it is that we call human, homologating it with the work of an organization. As a result a new definition of organization is proposed.

Keywords Autopoiesis, Organizations, Allopoiesis

Paper type Conceptual paper

1. Introduction

Producing a good and/or service requires, until now, the participation of people, insofar as no completely artificial system has been built yet for that purpose. Therefore, even when other components are needed for their generation, we can understand an organization as an association of people governed by a set of regulations for some given purpose. It is stressed, therefore, that systems are human activity systems (Checkland, 1981), and their essential components are human beings; without them there would not be an organization producing goods and/or services.

Now, if we say that we think of an organization systemically, it means that we conceive it, necessarily, as a living being. This is a fundamental characteristic of the



displacement from the mechanistic to the systemic paradigm; the points of reference are no longer the mechanisms and closed systems and they become the organisms and open systems (Bertalanffy, 1987). From here, then, it is not strange for an organization to be thought of, treated, modeled, likened, equaled and metaphorized – the variety of qualifications is deliberate – as a living being (Morgan, 1991) and in particular as a human being (Beer, 1981; Tarride *et al.*, 2008; Tarride and González, 2014).

That is why, based on the definition of health by the World Health Organization, Tarride *et al.* (2008) defined a healthy organization as “an association of people governed by a set of regulations as a function of specific purposes, in a state of complete structural (physical), strategic (mental) and social well-being, not merely with the absence of disease, but with the capacity to develop its own potential to respond positively to environmental challenges.” Also, using Ashby’s (1972) concept of functional homomorphism, they associated the physical, mental and social dimensions with organizational functions, and the way an allopathic physician diagnoses a patient with the way in which an organizational analyst can also diagnose the health condition of an organization that is being studied.

The components of the physical dimension, that is the integumentary, skeletal, muscular, joints, nervous, endocrine, lymphatic, immune, cardiovascular, respiratory, digestive, urinary and reproductive systems, were homologated with the following 13 corresponding organizational functions: corporate protection and image; organizational structure; work force and strategic positioning; organizational coordination; information and decision making systems; management control; protection, recycling and cleansing; safety and protection; internal logistics; marketing, public relations, sales, budget, purchasing and distribution; input, internal and output logistics; quality control, maintenance, waste recycling and disposal; and ability to develop new enterprises (Tarride and González, 2014).

Similarly, the mental dimension, constituted by the language, perception, orientation, will, memory, personality, identity, emotions, ideation, conduct and conscience variables, was associated with the following eleven corresponding organizational functions: communication, publicity, public relations; market research; strategy-generating ability; closure; memory; culture; mission; climate; research, development and innovation; conduct; and organizational conscience (Tarride and González, 2014).

The human social dimension, constituted by: consolidation of family relations; autonomy; responsibility; social participation and projection; capacity of asking for help; acting as a positive model; and planning one’s future, was associated with the following ten organizational functions: sharing information with familiar companies, suppliers and clients; organizational autonomy; concern for its stakeholders; capacity of asking for help; relations with institutions of its kind and social institutions; acting with social responsibility; exerting positive leadership; participating in new enterprises; acting with continuous quality and improvement; and carrying out strategic planning, respectively (Tarride and González, 2014).

The observation of this set of systems and variables will allow the analyst to determine the health condition of any organization. To that end he must gather all the required information, and through comparison with normality points of reference, issue a judgement of healthy or not healthy (Tarride and González, 2014).

From a revision of that proposal (Tarride *et al.*, 2008; Tarride and González, 2014), here we are particularly interested in discussing the link that was established between the digestive system of a human being and the system consisting of the input, internal and output logistics of an organization, i.e., with its production system. And we want to do it

because we consider that although it is true that the resultant homomorphism is correct from the perspective of Bertalanffy's (1987) open systems, it is possible to establish another model from the standpoint of the autopoietic/allopoietic systems of Maturana and Varela (1994, 2003). In this sense, we agree with Mulej *et al.* (2004) on the importance that they give to specifying the standpoint from which one starts at the moment of performing the systemic act of looking for similarities between two or more systems.

We therefore state that human beings as well as organizations can be viewed as open systems that exchange matter, energy and information with the environment, in this way sustaining their metabolism, but at the same time they can be viewed as closed or conservative systems of their organization, in spite of the dilemmas (Valentinov and Chatalova, 2014) that both views can produce in practice.

2. Autopoiesis and allopoiesis

According to Maturana and Varela (1994, p. 69) living beings are autopoietic machines, i.e., "machines organized as a system of production processes of components linked in such a way that they produce components which: (i) generate the production processes (relations) that produce them through their continuous interactions and transformations, and (ii) constitute the machine as a unit in physical space." Autopoietic machines are homeostatic, autonomous, individual, unitary, closed systems. Homeostatic because they conserve their network of production relations, i.e., their organization. Autonomous because all their changes are subordinated to the conservation of their organization. Individual because the conservation of their organization allows them to retain their identity; unitary because their operations establish their own limits; and organizationally closed because even though they can be affected by external perturbations, the changes they undergo are related only to the conservation of their organization (Maturana and Varela, 1994).

To Maturana and Varela (1994) the concept of organization leads to the set of "relations that must exist or must occur for something to be." It is deduced that the material of which something is made is completely irrelevant to its organization. Notice that Maturana and Varela (1994), the same as Ashby (1972), use the concept of machine to refer to a system whose materiality is not at play: it can be metallic, wooden or plastic, or flesh and bones. The former are interested in the relations between the components, while the latter are interested in their functions.

Autopoietic machines (Maturana and Varela, 1994) from the standpoint of the conservation of their organization, are closed machines. This means that the environment is not involved in the dynamics of the structural changes that living beings undergo to maintain their organization, it only "triggers" them, but does not determine them; living beings are "structurally determined" systems (Maturana and Varela, 2003). However, at the same time it is possible to see in them a dynamics of chemical transformations that constitute their metabolism, through the exchange of matter and/or energy with their environment, without this meaning a contradiction; in this case they are treated as open (Bertalanffy, 1987) or allopoietic systems (Maturana and Varela, 1994).

Allopoietic machines are then those that "produce through their operation something different from themselves" (Maturana and Varela, 1994, p. 71). They are not autonomous, because the changes that they undergo are dependent on the production of something different from them. Their identity depends on the observer and is not determined in their operation, because the product is different from its organization. Their limits are set by the observer when the inputs and outputs belonging to their operation are defined (Maturana and Varela, 1994).

Distinguishing the autopoiesis of a system means treating it as a closed system, focussing the interest in the conservation of its organization as a living being, whereas referring its allopoiesis means treating it as an open system, setting the viewpoint on its inputs, transformation processes and outlets. They are different views; the first one refers to the condition of the observed system as a living being, while the second refers to what the system does. In the latter case, the identity of the system arises for the observer.

Notice that it is not possible to assign a specific identity to a system if we look only at its autopoietic condition. All we can say is that we are dealing with a living being, nothing else, because the homomorphism with which the distinction is made is of such high level that it only allows giving it class identity, distinguishing between what is alive and what is inert.

We understand that an autopoietic machine can be treated as allopoietic, but this does not reveal its autopoietic organization; it only allows its observer to distinguish what affects it – inputs – and the responses that it offers to neutralize those perturbations – outputs. Also, breaking down an autopoietic machine does not allow recognizing submachines or components of the autopoietic system that is being studied, since that is a condition that is expressed only by the interactions that materialize their autopoietic organization. We therefore state that every autopoietic machine is also allopoietic, but not all allopoietic machines are autopoietic; this will happen if, and only if, we are dealing with a living being.

3. Organizations: auto- or allopoietic?

An organization that produces goods and/or services is an allopoietic machine, since it produces something different from itself. For example, a furniture factory produces furniture, but it does not produce itself. However, if we pay attention to the components, relations and processes that allow it to remain as an organizational unit, it seems to satisfy the requirements for autopoiesis. However, this is not so because the factory is not producing its own components.

A key aspect of the definition of autopoietic machine – living being – is that the processes performed by the closed chain of components that constitute it have as their sole purpose to produce its own components. Then, for an organization that produces goods and services, defined as a group of people governed by regulations as a function of some purposes, as was done earlier, to be considered an autopoietic machine, it should become a closed chain of components – persons – that carry out processes whose results will be their own components – persons – which in turn would be incorporated into the set of components – persons – that constitute the organization. Clearly, this does not happen in our furniture factory. It may be conserved in some temporal horizon, adapt to the environmental conditions, but it does not do it producing its own components, i.e., the persons that constitute it.

Strictly, then, organizations that produce goods and/or services would not be autopoietic machines – living beings – a fact that certainly does not deny the metaphor established between living being and organization (Morgan, 1991), but rather reaffirms it as a metaphor[1]. The same happens with the cybernetic homomorphism established between human beings and organizations (Tarride *et al.*, 2008; Tarride and González, 2014), since it refers to a certain level of similarity that depends on the adopted viewpoint, by linking both systems through a multiunivocal transformation.

Organizations that produce goods and/or services can be seen, therefore, as allopoietic machines that conserve their organization as such, through endogenous and exogenous regulatory processes, depending on the viewpoint adopted by the observer (Tarride, 2006).

Autoregulation, in particular, refers to the set of processes carried out by the organization itself, deciding about itself, that allow it to conserve its identity. They are processes with an administrative character whose purpose is to provide continuity to their allopoiesis, as well as to eliminate or incorporate components to and from their environment.

According to the example mentioned earlier, the furniture factory will remain as what it is as long as it continues producing furniture, and this will remain like that if, and only if, all the regulatory processes that allow it to occur take place, including its capacity for decisional closure; this is an expression of autonomy.

From what we have seen, it can therefore be said that organizations are autoregulated allopoietic systems. But what happens if, after Luhmann (1998), we do not consider people as the components of this particular social system called organization, we leave them in the surroundings, and we consider communications as their components?

We can answer by saying that the organization is no longer a set of people coordinated to achieve an objective and it turns into a communication system with a particular sense. The organization becomes a "structuring of programs, tasks, posts, hierarchic positions, and defined networks of decision communications" (Rodriguez and Arnold, 1992, p. 159). Therefore, the components of this system/organization are its decisions – which are communicated – and they are articulated in a network that generates new decisions, manifesting in this way its autopoietic character. The organization dies when the decisions cease.

This kind of organization, in contrast with the previous one, is considered an autopoietic system; we recognize its class identity, but we aim to distinguish it at a higher degree of specificity that allows us to refer to it as a singular entity.

Then the questions, made from the allopoietic standpoint, would be: what does this decisional communicative system produce that is different from itself? Which are its inputs, transformations and outputs?

We now answer, having recourse to the organizational "nine level," or "inforgetic" model in its "operation, information, decision" variant (Le Moigne, 1990), where the input of the decision is "representational information" and its output is "decision information." We postulate, then, that the decisional communicative system is an "information processor," in this way establishing the allopoietic identity of our organization.

Therefore, from the standpoint that considers organizations as a set of people coordinated for the achievement of an objective, they would not be autopoietic, but rather allopoietic self-regulated systems, while from the standpoint that considers decision-making communicative systems they would be autopoietic, and their allopoiesis gives them an identity as information processing systems. Notice that this does not involve a contradiction and both standpoints are legitimate.

In what follows, the challenge is to distinguish what it is that human beings produce, as allopoietic machines, that gives them identity and distinguishes them from the other living beings, in order to establish a homomorphism with the organizations that are producers of goods and/or services.

4. Human allopoiesis

Let us accept that everything done by human beings has to do with the conservation of their organization as living beings. Keep in mind that this is what an observer looking at human beings says when his viewpoint and interest are precisely in their organization as living beings. Something else happens when the viewpoint is set on the

transformation processes that occur in human beings as open systems; in this case their interest is in what they do, which is different from producing themselves, i.e., it refers to the allopoietic character of human beings. From this perspective, it is possible to observe them as systems that receive, process and deliver matter, energy and information to their environment. The solid, liquid and gaseous matter is transformed into different kinds of outputs, also solid, liquid and gaseous. For example, when breathing they incorporate air that is processed, putting the oxygen at the service of cellular conservation, while the carbon dioxide is expelled into the environment. In the same way, when ingesting solids and liquids, the human body transforms them, utilizing from them all the nutrients that allow it to contribute to its conservation, and what is not used is sent to the environment.

The same happens concerning energy changes. It is seen that the human body gets energy from the environment, processes it in the service of its conservation, and discharges into the environment what it does not use – allopoiesis. For example, the human body absorbs solar energy which allows it to synthesize vitamin D, absorb phosphorus and calcium, stimulate blood circulation, cause vasodilation, etc., eliminating the energy as heat through sweat. At the same time, having energy allows human beings to carry out actions on themselves, such as stroking one's face, and on their surroundings, such as picking a fruit from a tree.

It is also possible to distinguish human beings interacting informationally with their surroundings. From the cognitivist standpoint[2], they capture information from the environment through their inputs – senses – process it and deliver information to the environment through their outputs – language – in this case human beings are seen as “processors of information.” On the other hand, in the connectionist perspective[3] the processing occurs through simple component networks in interaction, capable of generating global, emergent behaviors, useful to represent more sophisticated cognitive abilities. Human beings are more like “makers of knowledge,” a “system that reasons.”

From the standpoint of enaction (Varela, 2005) and of the structural determinism of living beings (Maturana and Varela, 2003), human beings would receive stimuli from their environment that would “trigger” in them senso-effector correlations, which in turn are manifested in behaviors distinguished by an observer. If they are adequate for the circumstances, then the human beings are conserved and we say that they “know,” otherwise it can even happen that they disintegrate as living beings. Knowledge is effective conduct (Maturana and Varela, 2003).

Notice that in any of the three cases, cognitivism, connectionism and enaction, a human being, treated as a black box, can be seen as a system that “receives information from the environment,” “processes it” and “emits output information,” in spite of the difference established by the enactive explanation when opening the box to account for the cognitive processes.

So far, then, human beings can be seen as matter, energy and information processing systems. But all living beings can be seen that way, and furthermore, this is characteristic of any open system. In particular, all living beings produce solid, liquid and gaseous outputs. All living beings get, process, and discharge energy into the environment in different ways, they develop strengths, movements, actions. They also receive perturbations that trigger behaviors that are referred to as informational by meta-observers. None of this sets differences between human beings and the other living beings. The issue is, then, how to distinguish human beings, from the allopoietic standpoint, from the rest of the living beings, and then perform the homomorphism with the organizations that produce goods and services.

The stated question has been approached from various perspectives at different times of our history, with the philosophic viewpoint standing out among them. We can go back, for example, to the conception of human beings of Plato, who separated them into “body” and “soul,” attributing to the latter the characteristics of what was distinguished as “man”[4]. He held the finitude of the body and the immortality of the soul, in this way setting an absolute separation between these two entities (Ferrater, 1979).

To Aristotele, on the other hand, there was no such separation; his categories of analysis expressed as “matter” and “form” – body and soul – were indissoluble. Thus, if matter ceased, the form also ceased or changed. He distinguished three kinds of soul: one referred to the behavior of “man” assimilable to those of the plant kingdom; another referred to animal behaviors; and a third on that he called the “rational soul” and he linked with the intellect (Ferrater, 1979).

Similarly, Kant considered that what characterizes human beings is their rationality, which gives them sociability, autonomy and freedom (Ferrater, 1979).

To these philosophers, what is human is related to what is rational. Allopoietically then, human beings would be “reasoning machines” whose inputs would be data captured from the environment through their senses, and their outputs would be judgments, ideas, reasoning expressed through the language.

Husserl is not far from this idea when he states that “man” is distinguished from the other living beings by his capacity to know (Ferrater, 1979). On the other hand, Heidegger (1971) understands “man” as a being-in-the-world (Dasein), for death, for nothing, that has freedom, that exceeds himself daily, making and projecting himself [...] to death. This view seems to deny that “man” can be distinguished as an allopoietic system, but this is an essentially metaphysical, transcendent vision that we understand does not deny the possibility of observing that being which at every moment is making, exceeding himself, projecting himself, referring us once more to acts of reason.

From philosophic anthropology, Scheler (1964) agrees in understanding “man” in a manner similar to that of Aristotle, i.e., recognizing the body-soul unity, the similarities with plants and animals, to which he adds the idea of “spirit,” which together with “impulse” gives will, self-conscience and freedom to “man.” This spirit is nothing else than reason, a reason that involves “intuitions” and certain “emotional acts.” Once more, therefore, we distinguish human beings as rational systems.

More recently, Byung-Chul Han (2012) has referred to human beings as “subjects of performance,” “entrepreneurs of themselves,” “animal laborans” whose task is to maximize production, but not only that, because by negation they must also be considered “contemplative subjects,” which we understand as reflexive, even though the author holds that “passive” is the least that human beings are. Seen like this, human beings turn out to be animals that affect their surroundings through the production of goods and services, but that also reflect.

Based on these brief but important quotations, we can state that what distinguishes humans from the other living beings is their capacity to reason, to operate in the language, to be aware of themselves, to express ideas, reasonings, judgments, all of them key aspects that give them identity, to an observer who is observing it.

Consequently, from the allopoietic standpoint, we can consider human beings as “information processing” systems, agreeing with authors such as Ashby (1960), Turing (1950) and von Neumann (1958). However, this vision of human beings considered as processors of information, which falls within the framework of representational cognitive and connectionist tradition, requires being considered in the light of the enactive paradigm.

From the perspective of enaction, cognition “is effective action: history of structural coupling that enacts (causes the rise of) a world” (Varela, 2005, p. 109). It operates “through a network of interconnected elements capable of structural changes during an uninterrupted history” (Varela, 2005, p. 109). And it does it adequately “when it is transformed into part of a world of preexisting significance (as is done by the offspring of any species), or configures a new one (as happens in the history of evolution)” (Varela, 2005, p. 109). We no longer act with representations and “intelligence stops being the ability to solve problems to become the ability to enter a shared world” (Varela, 2005, p. 110).

If for cognitivism and connectionism the observer and what is observed are independent, in enaction they are not; they refer to one another mutually making a world rise. This productive interaction occurs as a consequence of the recurring human being/environment structural coupling. There we see human beings with a “powerful” nervous system that shows multiple and varied behaviors that seem “infinite” because of the “triggering” to which it is subjected by the environment. Some behaviors become stabilized in time as a result of this coupling. So the history of human beings plays a fundamental role in the construction of the world. From here, communication is not transfer of information, but “mutual modeling of a common world through a joint action: the social act of language gives existence to our world” (Varela, 2005, p. 111). Therefore, we can see human beings as “world creating machines” whose inputs take up the stimuli coming from their environment, which trigger in them configurations of their nervous system and generate outputs that we denote as human actions, in particular language. Do not forget that in the circularity of affectation, what comes out of human beings is transformed in turn into input.

Specifically, from the allopoietic standpoint, we conclude that we can distinguish human beings from other living beings by considering them as “information processing machines,” “reasoning machines,” “world creating machines.” What do these expressions have in common and what is different in them?

In the first case, we believe that the way in which a computer operates toward what is human is retaken, turning into a reduced way of appreciating human actions. In the second case, the semantic is added to the symbolism of the previous view, and since we are operating from reason, it is also necessary to keep in mind the dialogic of the unreason, the emotional, generating a system capable of capturing regularities from its environment – which is independent of it – and give them “sense,” including itself. This seems to be the common way in which human actions are understood, observing that it also contains the first. The third case adds to the second a highly telling aspect: everything that surrounds human beings is not independent of them, but does not arise from them. It is not a radicalized or solipsistic idealistic vision, but rather a compression of reality as a consequence of the interaction between a human being determined structurally and in an environment that “triggers” behaviors in it. The latter constitute what we call “its world.”

5. Human/organizational allopoiesis

When we talk about organizations that produce goods and/or services we refer to systems that make useful things[5] but at the same time generate wastes. We understand, then, that the expression “good” involves a positive value judgement for the observer that issues it.

It happens that us, meta-observers who auto-observe ourselves, distinguish ourselves producing goods and wastes. The difference between the former and the latter lies in the

usefulness that we attribute to them in the individual as well as in the social and environmental dimension. Therefore, to a large extent, everything material produced by human beings is considered waste. We say to a large extent because some of these products may be considered useful in some settings. It is even possible to relativize this idea, pointing out that we qualify as waste everything whose usefulness we have not discovered yet. Sweat, urine, feces, gases, sputum are considered wastes, while a theoretical construction, a speech, an encouraging word, an affectionate gesture, is considered by the community as something useful to it. But there are also bad theories, bad discourses, bad words that will be discarded, but only after being evaluated and qualified as such.

Going back to what has been said, from the allopoietic standpoint human beings would be producers of information, as well as of solid, liquid and gaseous materials. Similarly, a company producing goods and/or services produces information and solid, liquid and gaseous materials. From these, in turn, a given community of observers can distinguish between useful goods and/or services and wastes. Thus, for example, gases emitted by a chimney and thrown into the environment, liquid industrial residues thrown into the sea or a river, solid materials discharged in a dump site, are considered wastes, whereas a table, a chair, a vehicle, a computer just coming out of a factory, are considered goods, useful to society.

Keep in mind the circularity into which the search for the similarities between human beings and organizations puts us.

On the other hand, if we consider that the systems “are” what they “make,” then an observer will attribute a certain identity to the observed system, provided he distinguishes what he makes. For example, if an observer distinguishes tables in the output of a production system, then the organization acquires the identity of “table factory”; if it also produces chairs, desks, armchairs, sofas, then it will be a “furniture factory.” That is, the identity of an organization is linked with its allopoiesis, it refers to what it produces and the observer values positively. The outputs not linked with its identity are valued negatively and are considered wastes.

Similarly, the result of energy processing allows human beings to make different kinds of physical actions; some of them, such as moving the arms, hands, legs, allowing them to walk, run, jump, hold or move the jaw to let out sounds, do not define their identity as such, becoming discardable to an observer interested only in those that distinguish them as human beings.

It is also insufficient, to the observer, to attribute “intelligence” to some behaviors, to distinguish the human from the animal. Sophisticated conducts of adaptation to the environment are given in all of them. For example, birds build nests, beavers build dams, monkeys use branches to reach their food; the “tools,” understood as an artificial projection of the abilities of living beings, are not something exclusive to human beings.

But if to the above resultant actions we add something that we can call “sense” – as stated by Weber (2002) or Luhmann (1998) – valid for the community of observers, then we have outputs that we consider human products proper, like talking, conversing, writing, reading. Then the biophysical description is not enough to declare that a certain living being is a human being; the social valuation of its actions is necessary to give it that condition; what is human arises from the social. Therefore, from the allopoietic standpoint, human beings can be distinguished as a system producing communications, agreeing on this with Habermas[6] (1987).

But not only that, the value judgement made by the observer of what is a human being is related to the link that he establishes between human actions and their surroundings; all those actions whose consequence is the transformation of the environment and of itself

are human, through artificial devices produced by his own ingenuity – technology[7]. He is distinguished from other living beings because he is capable of generating devices from a deep knowledge, certainly incomplete and contingent, that he has of the world in which he is. It is true that some living beings, other than humans, use tools[8], but they do not achieve the degree of what has been called technology; the latter requires reason. In agreement with Maturana and Varela (2003) we can say that a tool, insofar as it is a physical or mental device, arises in the space of behavioral coordinations, whereas technology appears as the result of coordinations of behavioral coordinations, i.e., in the language, in this way placing it in the space of what is human.

Furthermore, this world creation mentioned earlier, performed by human beings through technology, should contribute to its own conservation from both the ontogenetic and the phylogenetic viewpoints.

According to the above, from the set of outlets observed in human beings, only some of them realize their identity, and others do not.

Consequently, human beings can then be viewed as “communicational energy processors that create world,” with respect to those actions that an observer considers and values as exclusive of humans and whose ultimate purpose is to contribute to their individual and collective conservation.

Now, from the standpoint of the structural determinism of living beings (Maturana and Varela, 1994), the human product would be nothing more than a trigger of behaviors in other living beings. Consequently, the usefulness value that would be attributed to this product would be given by the ratification of effective behaviors, with conservation and adaptation, in the framework of the recurrent structural couplings in which they are produced. Otherwise, the result is its destruction as living being or in some particular action domain.

So an organization that produces goods and services, when homologated with human beings, can be seen as a communicational energy processor that creates world. If these functions occur in human beings, mainly in their nervous system through the processing of information, communication transduction and action generation, then the productive system of an organization will be that in which these functions take place. From this perspective, a tangible good should be seen as a by-product of the communicational act that it involves. So the productive system of our furniture factory would be constituted by the communication processes that allow it to materialize a table, a chair, a sofa and the message delivered by the good to the community would be an input to the other organizations, setting in this way the world-creating interrelation.

Finally, we think that homologating the human nervous system with the productive system of an organization allows looking at the latter in a different way, displacing the look from the goods and services that it produces to the communicational processes that it unleashes, and with this the world construction that it makes. Therefore, the organization turns into a sense inquirer for both persons and society with respect to the world that we want to construct/live in.

6. Comments

In agreement with the initial statement made, which proposed discussing the autopoietic and allopoietic condition of human beings to then establish a functional homomorphism with organizations, it is concluded that both, human beings and organizations, are found in the space of the world-creating energy-processing communication systems, and that while the human productive system is associated with his nervous system, the organizational production system is linked to its network of communicational processes.

We state that every autopoietic machine is also allopoietic, but not all allopoietic machines are autopoietic; this happens if, and only if, we are dealing with a living being. We hold, therefore, that organizations, understood as sets of people coordinated to achieve an end, are not autopoietic systems – living beings – and consequently must be seen as allopoietic machines that conserve their organization through endogenous and exogenous regulatory processes, depending on the observer's point of view. Something different occurs if the organizations are seen as decision-making communicative systems that leave human beings in their environment; then they are autopoietic.

With respect to human beings, we have stated that from the allopoietic viewpoint they can be seen as a system processing matter, energy and information. In particular, processing matter is fundamental for their metabolism, but does not distinguish it as such from other living beings, and it is consequently subjected to the processing of energy and information. These two, in turn, from a general viewpoint, do not either allow to make the difference, and it is necessary to observe their outputs in a more specific manner to get to distinguish what we consider human.

We therefore conclude that what distinguishes humans from the other living beings is their reasoning ability, of operating in the language, of having awareness of themselves, of expressing ideas, reasonings, judgments, all of them key aspects that give them identity to an observer who observes them. Thus, from the allopoietic standpoint we say that we can distinguish human beings as “information processing machines,” “reasoning machines,” “world creating machines.” If the second conception contains the first, and the third in turn contains the second, then there is no error whatsoever in saying that human beings can be seen as information processors or a system that reasons; it is just a matter of reduced judgments. However, if we consider them as world creators, we account for them in a more integral way, since it contains the other two; here we agree with the viewpoint of enaction.

Allopoietically, this “world creating machine” picks up through its “inputs” the stimuli coming from its environment, “triggering” in itself configurations of its nervous system that generate “outputs” that we call human actions; recursively, what comes out of human beings is in turn transformed into input.

Consequently, human beings can be seen as world-creating communicational energy processors, with respect to those actions that an observer considers and values as exclusive to humans and whose ultimate purpose is to contribute to their individual and collective conservation. In a homomorphous way, we therefore define an organization as a world-creating communicational energy processor whose purpose is to contribute to its individual and social conservation.

Notice that this proposal in no case denies or contradicts the powerful offer made by Beer (1981) with his Viable System Model, where he homologated the human nervous system with the administrative systems of an organization, using the expression “the brain of the firm.” In this case, the viewpoint was on the government, on the control of the processes, on the recursive decisional autonomy of human beings and not on the possibility of treating them as allopoietic systems, as we have done here.

Notes

1. The Merriam-Webster Unabridged Dictionary defines it as “a figure of speech in which a word or phrase denoting one kind of object or action is used in place of another to suggest a likeness or analogy between them (as in the ship plows the seas or in a volley of oaths): an implied comparison (as in a marble brow) in contrast to the explicit comparison of the simile (as in a brow white as marble).

2. Cognitivism holds that cognition is “information processing: manipulation of symbols based on rules” [...it operates...] “through any device that can represent and manipulate discrete physical elements: the symbols. The system interacts only with the form of the symbols (their physical attributes), not their meaning,” [...and it is adequate...] “when the symbols represent appropriately an aspect of the real world, and the processing of the information leads to a happy solution of the problem set to the system” (Varela, 2005, pp. 43-44).
3. For connectionism, cognition is “the emergence of global states in a network of simple components” [...it operates...] “through local rules that govern the individual operations and exchange rules that govern the connection between the elements” [...and it is adequate...] “when we see that the emergent properties (and the resultant structure) correspond to a specific cognitive aptitude: a happy solution for the required task” (Varela, 2005, pp. 76-77).
4. The Merriam-Webster Unabridged Dictionary defines “man” as “a member of the human race: a human being; usually used of males except in general or indefinite applications with collective adjectives or in the plural.”
5. The Merriam-Webster Unabridged Dictionary gives as one of the meanings of produce “to make economically valuable: make or create so as to be available for satisfaction of human wants.”
6. We refer to the concept of “communicative action,” understood as mutual understanding between two individuals that interact in the language.
7. The Merriam-Webster Unabridged Dictionary gives as one of the meanings of technology “the science of the application of knowledge to practical purposes.”
8. The Merriam-Webster Unabridged Dictionary gives as one of the meanings of tool “an instrument used by a handcraftsman or laborer in his work,” but its use is wider, extending to the sphere of the abstract by considering it also as a mental device at the service of the development of a task.

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