

**ACCOUNTING AS A COMPLEX SYSTEM IN ORGANIZATIONS: A COUNTER-HEGEMONIC NEED**

**LA CONTABILIDAD COMO SISTEMA COMPLEJO EN LAS ORGANIZACIONES: UNA NECESIDAD CONTRA-HEGEMÓNICA**

**A CONTABILIDADE COMO UM SISTEMA COMPLEXO NAS ORGANIZAÇÕES: UMA NECESSIDADE CONTRA-HEGEMÔNICA**

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**ABSTRACT:** The modernist-colonial practices of the Accounting specialists are subordinated as anti-human, in most cases, predatory of the planet-earth and unethical; from which it is urgent to indiscipline traditional Accounting, its reductionism. With the transmodernist and transcomplex transparadigm project, the transmethodic research was carried out with rhizomatic deconstruction, fulfilling the complex objective of analyzing Accounting as a complex system in organizations as a counter-hegemonic need. In the reconstructive rhizomes, from the dis-linking of decoloniality and hegemonic systems into an inclusive, decolonial re-linking, Accounting with transdisciplinary groups, indiscipline its own statutes; it is renewed to gain new strength: new complex, transdisciplinary, ecosophic and anthropological open ways to exercise a human task that is not turning its back on humanity by making it urgent to civilize itself.

**KEYWORDS:** Accounting. Complexity. Organizations. Ecosophy.

**RESUMEN:** Las prácticas modernistas-coloniales de los especialistas de la Contabilidad se subordinan como antihumanas, en la mayoría de los casos, depredadoras del planeta-tierra y antiéticas; desde lo cual es urgente indisciplinar la Contabilidad tradicional, su reduccionismo. Con el proyecto transmodernista y transparadigma transcomplejo se realizó la investigación transmetódica con la deconstrucción rizomática, cumpliendo el objetivo complejo de analizar la Contabilidad como sistema complejo en las organizaciones como una necesidad contra-hegemónica. En los rizomas reconstructivos, desde el des-ligaje de la decolonialidad y los sistemas hegemónicos en un re-ligaje inclusivo, decolonial, la Contabilidad con los grupos transdisciplinarios, indisciplinando su propios estatutos; se renueva para cobrar nuevas fuerzas: nuevas maneras abiertas complejas, transdisciplinarias, ecosóficas y antropolíticas para ejercer una tarea humana que no está de espaldas al hacer en la humanidad urgente de civilizarse.

**PALABRAS-CLAVE:** Contabilidad. Complejidad. Organizaciones. Ecosofía.

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**RESUMO:** *As práticas colonialistas-modernistas dos especialistas em Contabilidade são subordinadas a anti-humanas, na maioria das vezes, predatórias do planeta-terra e antiéticas; da qual é urgente indisciplinar a Contabilidade tradicional, seu reducionismo. Com o projeto transmodernista e transcomplex do transparadigma, a pesquisa transmetódica foi realizada com desconstrução rizomática, atendendo ao complexo objetivo de analisar a Contabilidade como um sistema complexo nas organizações como uma necessidade contra-hegemônica. Nos rizomas reconstrutivos, da desvinculação da descolonialidade e dos sistemas hegemônicos para uma re-vinculação inclusiva e descolonial, a Contabilidade com grupos transdisciplinares, indisciplina seus próprios estatutos; ela se renova para ganhar uma nova força: novos caminhos complexos, transdisciplinares, ecossóficos e antropolíticos abertos para realizar uma tarefa humana que não está dando as costas à humanidade, tornando-a urgente para se civilizar.*

**PALAVRAS-CHAVE:** *Contabilidade. Complexidade. Organizações. Ecosofia.*

In any orderly scheme, which gives a pattern to the life of human beings, a certain dose of anarchism must be injected.  
Bertrand Russell (2004, our translation).

Among the latent problems in which human beings, countries, and the earth bleed with their consequences is undoubtedly the crisis of the world economy, the paradox of living in full development apparently, in the technological era, in full globalization and that many die for lack of such basic services as food, water, and housing is the irony in the face of the outdated policies of those who have power and have subverted it into authoritarianism. Milagros Elena Rodríguez (2020a, our translation).

### **Rhizome introitus and transmethodology: the transmethod of research, rhizomatic deconstruction**

The slogans Russell (2004) and Rodriguez (2020a) that present the research, speak of the necessary subversion in the unchangeable fixed patterns of knowing, before the eminent failure of the overruling powers; hence we subvert ourselves before authoritarianism; and we promote freedom and with it *the foundation of all value: the dignity of the human being*. For this, planetary decoloniality is our north; a North with the South and the North, with the West and all continents; a permeation of respect for all forms of life; even the planet itself.

The reductionism of the modernist project, which reduces human beings to objects (MORÍN, 1999), has led politicians, judges and individuals to reduce themselves to their simplest, changing and radical psychological emotions; moreover, to act as a producer of capital; without taking into account their complex reality. It is for this reason that to get out of the crisis or chaos of the reductionist background and how she studies man, the author relied

on complex theories and on her definition of the ethics of man as an individual, society and species (MORÍN, 1999).

The needs of the moment, the dismantling of the world financial system in the face of the results is a fact that has been deconstructed in the sixties (60's) by the mathematician Benoit Mandelbrot who asserts that the behavior of the financial system is fractal, and so is that of Accounting, it is governed in a non-linear way; a fact that has faltered in the face of reductionist evidence, has demystified Accounting as part of this system. In this we are united before a fractal theory that surpasses linearity and encourages us to essential and complex contributions of the Accounting practice, of its praxis.

The father of this fractal theory is Benoit Mandelbrot, in his book *Fractales y Finanzas: una aproximación matemática a los mercados: arriesgar, perder y ganar*, where he studies the relationship between complex mathematics and the financial world, is who gives contributions to begin to study financial systems as a cycle and a sequence where sooner or later everything repeats itself again (MANDELBROT, 2006).

In particular, within and with the financial system, we know that the classic definitions of accounting often declare it as an information system, and as such it is responsible for "the recording, processing and communication of information, mainly of an economic and financial nature, required by its users for the rational adoption of decisions in the field of economic activities" (ALCARRIA, 2009, p. 8, our translation); but this statement of system is not assumed to be complex. Accounting is not only entrusted with the maintenance of accounting records, it also presumes the design of efficient accounting systems, the preparation of forecasts, the examination of transactions prior to recording and the exegesis of information.

We agree that accounting is the basis for management decisions, but that management together with the economic and financial system has dragged accounting to a simplified vision adjusted to a trade, making it impossible to communicate with the rest of the systems; they have permeated it with reductionism and the making of a trade to respond to the current globalized market.

In the framework of the theory of complexity, one cannot leave aside the science that is the legacy of humanity that precedes it, such as fractal order mathematics as part of an interpretation and a broader ramification of Euclidean mathematics and its linear approach to the economic world (MANDELBROT, 2006). Fractal mathematics is necessary to study the behavior of curves and movements that take place every day in the field of finance and accounting.

According to Quezada (2006), it can be asserted that when undertaking to work with complexity theory, the ideas encountered a great tenacity to change on the part of the more moderate sectors of science and even today there are some researchers who express opposition and apprehension to the great presence of non-linearity in the behaviors in nature and to chaos as a generic consequence of it. And accounting is part of this resistance, of this exercise of power.

The methods of research under the modernist paradigm have been the subject of criticism and the highlighting of their inadequacies in traditional research such as: reductionism, determinism, execrated buried knowledge, among others (RODRÍGUEZ, 2019). In this transcomplex research, which we confirm is complex and transdisciplinary conjunction and goes against the reductionist and parcelled hegemony it has realization outside the modernist/postmodernist-colonial project; transmodernity as worldview "episteme transfigures the scientific, cultural, economic, political, social and managerial environment; that is to say where a certain human action that favors change is developed" (GUZMÁN, 2014, p. 128, our translation). Thus, in the framework of this transparadigm, according to rhizomatic deconstruction as a transmethod, *accounting as a complex system in organizations is analyzed from a counter-hegemonic need as a complex objective of the research*.

We exemplify the complex and transdisciplinary connotation of transcomplexity as a subversive act before the denomination of: introduction, development, results and conclusions of traditional research; and we are going to complexify them in a coming and going with rhizomes; denotations of Biology that indicate that the stem goes to the root, to the leaves and these return to the root always in communication with the whole. In the rhizome "there is no real beginning but in the middle. There where the word "genesis" fully recovers its etymological value of "becoming", without relation to an origin" (ZOURABICHVILI, 2007, p. 95, our translation). Therefore, rhizomatic discourse is complex and does not obey static fixed structures.

We will see in the discourse "the multiplicity characteristic of a rhizomatic perspective, since this implies that there is no method and even less a single path, so it cannot be "disqualified a priori". These references on the rhizome are very important, since they stimulate a thought of multiplicity, insofar as rejection of a point of origin" (SICERONE, 2017, p. 91, our translation); hence this freedom that is not investigative libertinage in the construction does not attend to modernist/postmodernist-colonial judgments, it has its full realization in the planetary decoloniality; where we will stroll returning to the points of the rhizome; for example to the crisis; but we do not stay there, because we go to a hopeful

reconstruction of Accounting as a complex system; at the end returning to the crisis we will leave future research hinted of continuity of the line of research.

The author in this transmethod is an active research subject with her subjectivities and experience in the lines of research that converge to the continuation of inquiries. In this case this inquiry is *located in the research line: economy-administration-management- and transcomplex finances*.

### **Rhizome: the crisis of accounting as a reductionist system in deterministic organizations**

Traditional accounting responds to the capitalism system and the organizational structures of the company that emerge from it as forms of rationalization, this explains why accounting resorted to the invention of double entry, which is ascribed as a mathematical tool for apprehending reality and which is still maintained (IRAUSQUÍN, 2015). This reality has been overlooked in the crisis when we generally study the crisis of the world financial systems, and we dismantle the mathematical regularity they have been using; its linearity has failed in the face of the eminent complexity of the system. Thus, it is urgent, for example, in a subsystem of financial systems, to *call for transcomplex economists as strategists with ecosophical and anthropoietic principles* (RODRÍGUEZ, 2020a). In the same way this study alludes to accounting.

The world of finance wants to protect under the erige of technology, its systems; *what happens when the systems that are created to protect come hand in hand with perpetrators who can violate them?* "Under its aegis, globalization, development, westernization, three faces of the same phenomenon, have shown themselves incapable of dealing with the vital problems of humanity" (MORIN, 2011, p. 78, our translation). *What has accounting contributed to humanity in its global problematic, which is civilization and its crisis? Has it left its plot to make contributions in this regard?*

The basic purpose of accounting is to provide useful information about an economic entity to support the decision making of its various users, be they shareholders, creditors, potential investors, customers, managers, government, but also secret intelligence systems and the dominant global companies in the history of mankind; indeed, as accounting serves a diverse set of beneficiaries, it gives rise to diverse subsystems.

Let us see, according to the different needs of the reductionist conception of complexity, based on the different information needs of the different user segments, the total information generated in an economic organization is structured in three subsystems: the

financial information subsystem with financial accounting, the fiscal information subsystem with fiscal accounting and the administrative information subsystem with administrative accounting (GUAJARDO; ANDRADE, 2005). These subsystems must be interrelated; they must be considered transdisciplinarily with the contributions of the sciences; their epistemology must be broken; and go to the borders of these subsystems and weaken their abysmal thinking, in order to nourish them with the contribution of the rest of the systems of knowledge.

It should be noted that Accounting in its traditional basis has always been an organization, supposed, formal, algorithmic, of exegesis of the environment, which runs on a genealogy; its history and philosophy. Some authors work on a future liquid accounting, which is its antipode, without genealogy, it will be an open map, connectable in all its dimensions and directions, "dismountable, alterable, susceptible to receive constant modifications, connecting semiotic links of information, reticular organizations and in which the notion of unity will only appear when it occurs in a multiplicity of related circumstances" (MARTÍNEZ, 2008, p. 22, our translation). These are attempts to dismantle the crisis of accounting and its foundations; but the struggle is against the giants of finance that assume their profit and loss ratio at the risk of the planet's life system.

In contrast to the hegemonic views of the environment, which, as we have already seen, have tried to place the environment in the logic of capital, reducing it to a factor that promotes growth, globalization or development; as synonyms of the same crisis, new perspectives have emerged, in which the hegemonic notion of environment is deconstructed and a new one is built from the complexity of reality (QUINTERO; RAMÍREZ, 2016).

In this sense, it is urgent to touch the formation of the accountant, *who is the accountant as a citizen before the world?* It would seem that the accountant, like all professionals with modernist-postmodernist-colonial training, exercises its functions being loyal to the capitalist system; demystifying the consequences; thus its exercise is that of an anti-ethical, anti-political citizen who breaks with the same conception of citizen of the world; one who disassociates itself from its old hegemonic practices.

We want to define de-linking and re-linking as a necessity to advance to decoloniality and as a need to go to transepistemes in the transmodern project. To cover these needs and to try to include them always as possibilities of improvements, we need a re-linking as an urgency of transmodernity (RODRIGUEZ, 2019b), it is about unlinking from the old patterns of accounting and going to the planetary decoloniality as a possibility of coexisting scientific

knowledge and the complexes that are emerging in the reconstruction of knowledge in general.

Re-linking by first unlinking, can make us see how it is necessary to realize that no one has the only truth, and that nevertheless, the biopolitical power of the moment does not lose the opportunity to exercise its convenience in false accounting policies, which are disguised as decolonial (RODRÍGUEZ, 2020b).

*The accounting system is the set of elements or components that interacting in a coordinated manner provides useful information and control for management decision making in a company; that is its general functionality.* This system operates and is part of the complex compound of elements that make up an organization or company, so it is observed that in the same way in which organizations change in their modernist structure to perfect their global patterns, ways of relating internally and externally and to operate in terms of loss and profit, maximization of production, hegemonic dominance; Thus, the accounting system has changed, since it operates with the information and data coming from all the units that carry out, directly or indirectly, financial transactions, and it must provide them with information and control tailored to their needs and processes of change (DE NOBREGA, 2011).

Thus, it is notorious that this change has not obeyed to the complex conception, to the political ethical function of the citizen accountants; nor to the needs that are imposed and revealed; the needs of the world crisis of the economy, which has permeated all systems; and has put to the test the ignominy in the formation of the accountant indifferent to such crises. It is a matter of deconstructing in accounting

Its conceptual domain is given by the systematized knowledge that Accounting presents regarding its ontology (the need to control wealth to order the economic system, with methodological and operative criteria of financial rationality), a pragmatic and prescriptive gnoseology (based on empirical knowledge) with rules that determine informative objects used in decision-making processes and an *ethos* of practical application under certain expectations of social equity (GIL, 2020, p. 96, our translation).

We know that the dismantling of traditional accounting has other edges to be treated and interwoven; we will continue to study them in the following, but we will also begin to reconstruct with the subjectivities of the author, inclusive right of the transmethods that gives the research subject, who brings in first person her analysis.

## **Rhizome reconstruction: accounting as a complex system in organizations as a counter-hegemonic need**

We are in the reconstruction as part of the rhizomatic deconstruction. Accounting, understood as an information system and as an element of a communicative action, must ensure that all information is the seed of communication; that is, that the communicative action is satisfied, taking into account the elements: a) of producing a rational message, b) of similar codes, c) expressive of the sender's interiority and accepted by the interlocution as true, due to the possibility of interaction of the receiver (HABERMAS, 1987). *Is this reality fulfilled in today's accounting?*

It should be noted that, Accounting as a complex system that is immersed in financial and economic systems must consider that fractal mathematics is responsible for overturning the false belief that the financial market was a linear and continuous system always growing and for bringing to the studies of economics the premise that economic systems have behaviors with diverse forms, and gives the property of cycle to financial systems. Hence, "current systems of analysis are useless, and that the only way to understand the functioning of the financial system is to use chaos theory and fractals" (MANDELBROT; HUDSON, 2006, p. 102, our translation). Therefore, the consideration of complexity in chaos theory and the contributions of fractal studies is urgent in Accounting as an emerging complex system.

Accounting must conceive a policy of the human being on the planet, a policy of earthcountry responsibility (RODRÍGUEZ, 2020a), "a multidimensional policy, but not a totalitarian one. The development of human beings, of their mutual relations, of the societal being, constitutes the very purpose of the politics of man in the world, which aims at the pursuit of hominization" (MORÍN, 1993, p. 166, our translation). This multidimensional policy examines in a responsible way the accounting professional's exercise as a citizen; it nestles an ethical exercise as a citizen of the world. This is one of the main urgent re-linkages to build under the conscience of responsibility of the urgency of our contributions.

It is an exercise of service to humanity from the practice of accounting; this exercise examines the disparate historical experiences, particularly of the dominated groups, marked by deep social and economic inequalities, socio-racial discrimination, violence and the dynamics of exclusion typical of the dominant Western-Northern system perpetuated in globalization; it is about facing humanity in its inhumanity. The groups of accountants are also part of the subalterns that model forms of political subjectivity and social memory; they must self-correct in their decoloniality by evaluating their own praxis; their subjugating dynamics and their conformity as human beings on earth.



This urgent moral-ethical regeneration from anthropopolitical thinking, in order to recognize that it is not about an excluding moral order favoring the dominant system; it is not about a deep inclusion based on generating a conscious and unconscious stagnation of the collectivity. It is a revival in which the excluded are taken into account in their potentiality.

The modernist-colonial Accounting (RODRIGUEZ, 2019b) must be unlinked and relinked, the modernist project invites them, retracts them from their outdated profession; it is to carry out a scrutiny of the scientificity of Accounting, where we must bet on the transdisciplinary collaborative exercise of professionals; that will deconstruct the dangerous accounting disciplinary project focused only on the scientific look, under the developments defined by modernity.

Accounting then with transdisciplinary groups, undisciplining its own statutes, renews itself to gain new forces; new complex, transdisciplinary, ecosophical and anthropological open ways to exercise a human task that does not turn its back on doing in the anti-human humanity. Yes, accountants will then be imbricated in a task of the three ecologies that make up ecosophy: social, spiritual and environmental ecology (GUATTARI, 1996); where Accounting has much to contribute.

*How is this complex wisdom of living on the planet included as an urgent need: ecosophy in accounting?* Accounting in a transdisciplinary dialogue, in civilizations can provoke a state of awareness of our actions in the world, the needs of both individual and planetary identity, to know how to live and coexist from the love for our creation in a single earth-homeland; with relevant knowledge; training for proper decision making; it is inclusion is urgent.

It is necessary to de-eliticize, re-link, de-link with the disciplines by combining them, undisciplining the disciplines; breaking their boundaries outside the abysmal thinking that separates them, the social responsibility of the teacher as a citizen, and the very essence of being human; one transversalizing it to the knowledge of Accounting; which are simply and greatly knowledge of the world and for the world. It is a motive of the continuation of the research line that we provoke the ecosophical inclusion in the transepistemologies with the ecosophical fields, for future research: that is: scientific, emotional, practical and spiritual. Thus, the conceptions of ecosophy are the unitive bridge of knowledge in general where mathematics always has its contribution; let us make this sense a reality in Accounting under complex conceptions.

*Under ecosophical conceptions, what are the challenges of complex complexity?* The challenges are worthy to be assumed; while its outdated epistemology is drowned in

indifference to the problems that surround them; it breaks the accounting the reduced quantitative thinking and go to work in the qualitative, socio-critical, rhizomatic, in a transmanagement; beyond the traditionality; enriching it of dynamic configurations of knowing; it is the management of information and control under new representations of thought in complex social-political organizations.

In the qualitative aspect, it is urgent to demystify the notion of numbers in accounting; because this does not mean only quantitative quantity; it is a relation of social, legal, economic, political, ecological transcendences that come from the character of production; and that if taken into account would be giving way to the mathematics of complexity and the transdisciplinarity of its conceptions to the fractals; just as we indicated happens with the numbers in the accounting systems.

To this end, accounting as a complex system re-links tasks in "the new way of thinking faces the divergent, convergent, deconstruction, fragmentation, heterogeneity, deterritorialization, codification, decoding, the one and the multiple, in short, complexity" (UGAS, 2008, p. 37, our translation). This is a titanic task, of ecosophical awareness of inhabiting the planet under social responsibility. The main challenge for accountants, for the practicing comptroller and its own critics, is deservedly to achieve a configuration in the execution that "considers concepts, ideas and principles of complexity, nonlinearity, change, dynamics, chaos, uncertainty; it is the recognition of the organization as a complex system and of the accounting system as part of it" (DE NOBREGA, 2011, p. 55, our translation).

The deterritorialization of accounting as a complex system is urgent; its territory of numbers is invaded by the regularity of the sciences; and the accountant goes to them to become more complex in his transgressions of calculations, functions and analysis. It, complex accounting, by de-territorializing itself, enlarges its own territories; it does not abandon its functionality; on the contrary, it enlarges it; it widens the lens of its gaze and commits itself to permanent re-linking.

Therefore, the conformation in mathematics of complexity, complexity transdisciplinary and complex studies are essential in the accountant in training; they will not have an important way out, if they do not decolonize their own task as an exercise of very first de-linking (RODRIGUEZ, 2019b). In this, transdisciplinary approaches will allow specialists to go beyond their own edges of transdisciplinary views; they can collaborate effectively with other sciences; and go to the embrace of knowledge.

It should be noted that the contribution of new theories, such as complexity, computer science and colonial unveilings, contribute to the essential substance of complexity so that its counter-hegemonic struggle can be successful with serious advances.

The conceptual domain of accounting marches towards the elaboration of hypotheses on socio-environmental issues related to sustainability as much as on global productivity; its internal epistemic domain moves towards new methodologies such as qualitative measurements, the integral social balance and the value-added table; the derived epistemic domain puts its interests not so much in Finance as in Sociology, Political Economy and Ecology (GIL, 2020, p. 96, our translation).

In this sense, embracing the concepts of complex science Accounting we see that its complex conception would lead to recognize environmental goods and services, leaving the idea of monetary price and emerge in values of attributes and non-market characteristics. The social ecology of complex accounting can help to contribute with more integrative and decolonial solutions in a framework of transdisciplinarity in the face of the social demands of cognitive-affective responsibility of humanity and technologies.

### **Concluding rhizome: accounting as a complex system in an urgent evolution**

With the transmodernist project and transcomplex transparadigm, the transmethodic research was carried out with rhizomatic deconstruction, with the *complex objective of analyzing accounting as a complex system in organizations as a counter-hegemonic need*. Located in the research line: *economy-administration-management- and transcomplex finances*. It has been bearing fruit and continues in the ardor of inquiry.

To think of accounting as a complex system in organizations as a counter-hegemonic need, is to think of the unbinding and re-binding in the praxis that leads us to evaluate ourselves and in the search for colonial lags that make us resist to the necessary counterhegemonic confrontation in the face of the mutations of the current systems with new artifacts of overlapping.

The ecosophical re-linkage tends to variants of the citizen accountant that emerge in the midst of complex systems: an anthropolitic par excellence that gives him belonging to his noble task; but entangled with the knowledge of the world, by the quality of the number, the quantity of its risks; and the complexity of the needs to tend in the convulsed world of knowledge cut short by inhuman capitalist interests.

If it is a matter of not repeating the same mistakes that seem to be the norm in the face of obeying the predatory system of lives, not only human; the life of the planet. With the transmethods rhizomatic deconstruction we have tried to give a first complex look at accounting from the transmethods; we have already cited researches that erect the complex system in accounting; the difference is the marked need for decoloniality; we cannot sow in the same infertile ground of coloniality; there we cannot germinate transepistemes for accounting.

We continue in the ardor of decoloniality looking for longed complexities of contributions of the line: *economy-administration-management- and transcomplex finances*. We continue in it, counting on eager minds of change, in the understanding that the research subject cannot be execrated from the investigations; that is why the transmethod is excellent in the rescue and safeguard of the main essences of every human being: his affectivity, subjectivities of responsibilities before the planet earth: as we aspire it from the complex accountants.

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