

The Metaphor Of Quantum Company

Celso Luis Levada⁽¹⁾, Huemerson Maceti^(1,2), Bruno Zaniboni Saggiore^(1,2)
Tábata Vidal^(1,2), Ivan José Lautenschleguer⁽¹⁾

(1) Fho | Hermínio Ometto Foundation - Araras / Sp - Brazil - Nucleus Of Engineering

(2) Colégio Puríssimo Coração De Maria - Highschool - Rio Claro / Sp - Brazil – Physics Teaching

ABSTRACT: Based on differences in interpretation of quantum mechanics, BOHM⁽¹⁾ (1952) created a theory that later led him to develop the idea that there is a holism (or totality) in the world. This gave reason to believe that, in recent years, quantum mechanics is also associated with the human sciences, mystical worldviews, spiritual and so forth. Some authors consider that using concepts of quantum physics in companies can be very useful in business dynamics. Although widespread, this approach is regarded by most physicists simply as a metaphorical use of quantum physics.

Keywords: Bohm, interpretation, quantum, company

I. Introduction

Quantum mechanics is one of the most important theories of the last century due to its complexity, comprehensiveness and difficulty of establishing a parallel between it and classical mechanics. It is often considered by experts from various areas of the knowledge as the definitive explanation for the most diverse phenomena: physical, political, economic and administrative, reaching even the spheres of religion and self-help.

CHIBENI⁽⁴⁾ (2007) states that quantum mechanics is the most comprehensive, accurate, and useful scientific theory of all time, but since its inception it has presented major problems of interpretation mainly in relation to the way in which theory relates to phenomena. Quantum physics describes well experiments with microscopic objects, such as atoms, molecules, and their interactions with radiation. On the other hand, the impression one has is that the theory is not well articulated with respect to the results of the measurements of a quantum event. Among the founders of quantum mechanics, some have argued for a position where the quantum description of the object is incomplete, while others have believed that the values of these quantities do not exist or are not defined before the measurement is made. We can say, then, that the quantum physics is interpreted in different ways and for each school of thought, the result of an experiment, while being the same, presents different visions. Here are some of the main lines of the quantum mechanics, which may be in some respects quite different from one another: a) wave interpretation-realistic, b) interpretation of complementarity also known as Copenhagen School, c) dualist-realistic interpretation and d) interpretation of many worlds. A complete discussion of these interpretive currents requires specialized knowledge (OSTERMANN and PRADO⁽¹²⁾, 2005).

Holomovement is a dynamic process of wholeness, a single and unbreakable integrity in flowing motion. Everything is connected to everything and in dynamic flow, every part of the flow, within this holistic structure, contains the flow as a whole. We can consider holism as the basic nature of reality. BOHM⁽¹⁾ (1952), from his rereading on quantum physics, says that the flow itself is in constant change, a fact that enlarges our view on the flow of all things. According to this important physicist, nothing is disconnected and everything connects to everything, in a dynamic flow where, holistically structured, each part of it flows and contains it in its totality (BEAUCLAIR⁽²⁾, 2011). The author developed this theory from his reinterpretation of quantum physics, although his reinterpretation requires that some variables have a set of "privileges" so that they are considered as in the classical case. There is no experimental reason to think that some variables are fundamentally different from others. This model is truly non-local: this non-locality is susceptible to contradictions with relativity as well as incompatible with modern visions of a quantum property called interlacing. This interpretation does not lead to new measurable predictions, so it is not really a scientific theory (FREIRE⁽⁸⁾ et al, 1994).

II. Ideas Of Quantum Physics In Human Relations

Based on the above-mentioned divergences of interpretation, BOHM⁽¹⁾ (1952) created a theory that later led him to develop the idea that there is holism, or "wholeness" in the world. Inspired by Einstein view and his followers that quantum mechanics is an incomplete theory, some theoretical physicists have sought theories involving hidden variables for a complementation of quantum theory, as is the case with the BOHM⁽¹⁾ (1952) theory. This has given reason for quantum mechanics to be embodied in mystical visions of the world in recent years. Much has been written in the attempt to relate ideas of quantum mechanics and spirituality to human relations, but, for the time being, it is only nomenclature, since quantum theory is far from being understood in its entirety. These interpretations may imply that the physical universe is the product of a cosmic mind to which the human mind is connected through space and time. CHOPRA⁽⁵⁾ (1990) introduces the concept of "quantum healing", which suggests that we can cure all our ills by the application of mental energy. According to the concept of quantum healing, beliefs, thoughts and emotions create the chemical reactions that sustain life in every cell and the experiences of the human body is completely related to that perception. According to the author, this conclusion can be extracted from quantum physics, which can be interpreted in such a way that the human mind controls reality and that the universe is a connected whole. Although widespread, this approach is regarded by most physicists only as a metaphorical use of quantum physics.

In analogy to this, a "quantum administration" preaches a greater distribution of decision-making power and motivational techniques to increase workers' happiness, perhaps to make them work better as a team. However, the use of the term "quantum" has in fact no relation to the physics of quantum, developed by Max Planck and collaborators, except as an analogy, in the metaphorical sense. A reliable address to support these ideas may be, for example, the Indian philosopher and nuclear physicist GOSWAMI⁽¹⁵⁾ (2015) who has studied this type of problem a great deal. GOSWAMI (2015) has excelled in the media, advocating an "idealist" interpretation of quantum theory. This interpretation gave rise to documentaries that became very popular, such as "Who are we?" and "The Secret", which in turn yielded several works relating quantum physics and human happiness.

INACIO⁽⁹⁾ (2008) mentions that we need a "quantum" world view, that is, to observe the universe as a dynamic, unpredictable, subjective and self-organizing system and not as a predictable and objective machine. In this conception, each one must be guided by "quantum skills," abilities worked by the right side of the brain, which must work together with the left in order to obtain a complete analysis. Some authors consider that using concepts of quantum physics in companies can be very useful in business dynamics. NOBREGA⁽¹¹⁾ (1996), using simple language and a direct and colloquial style, shows how entrepreneurs can resort to metaphors and analogies with the world of science to achieve results in the complex and plural world in which we live.

III. Quantum Management

It is not necessary physics or mathematics in order to understand how quantum physics, chaos theory, and fractal theory reveal a totally unstable universe around us. The essence of this chaotic universe has been studied by the rigor of the calculations of the scientists, which can be translated to the laity through metaphors. The metaphorical artifice extends to many areas of knowledge from human behavior to the unstable environment of organizations and their market fluctuations (NICOLAU⁽¹⁰⁾, 2006). Quantum management, for example, encompasses capacities linked to workplace behaviors and skills, which are intended to transform organizations. ZOHAR⁽¹³⁾ (1990), quoted by INACIO⁽⁹⁾ (2008), describes the obvious path for an organization based on these quantum metaphors. The first ability is to observe the other, the company, the customer, the life, the family. After that, have the ability to think and analyze with real facts and then idealize, dramatize and give a final touch on situations that can be modified. Then we have to be able to feel really alive and vibrate with it, knowing that only those who are alive can make a difference. It is necessary to possess the capacity to develop intuition and through it can direct a result, an achievement, a new reason to fight. It is also necessary to be able to act responsibly and to think about what our actions can do to those around us today, tomorrow and in the future, and to be able to trust in life, in its power of accomplishment, in optimism and in strength of will.

Finally, the individual must be able to be and feel integral in all roles in life, with clear vision and attention to the challenges, allowing creativity and freedom of thought to flow (INACIO⁽⁹⁾, 2008). In order to achieve the objectives mentioned, it is also necessary to have openness to teamwork, to have discipline and control, to think in terms of support and feelings of security. The economic world lives in a climate of uncertainty, of risks, however, physical uncertainty based on the Heisenberg principle is completely different from the classical notion of uncertainty seen in terms of statistical fluctuations.

IV. A New Truth Of Administration?

As COHEN⁽⁶⁾ (1998) reports from the analysis of David Ruelle's book about chance and chaos there is a difficulty in transposing the conclusions of some theories to the human sciences, mainly due to the lack of equations that apply to human systems, by the imprecision of their description over of time and the changing character of systems. Even so, progress is possible. The direct application of these new knowledge branches in human areas, however, is a field that is still crawling. But in reality, what matters is the degree of mutual trust and motivation of those involved in any project or venture. The best results have been obtained in participatory management that also functions as a collective learning process in which everyone feels co-responsible and no one owns the absolute truth (COHEN⁽⁶⁾, 1998).

V. Are We Facing A New Concept In Administration?

COHEN⁽⁶⁾ (1998) mentions the pioneering work of physicist and philosopher ZOHAR⁽¹³⁾ (1990) who deals with a business management model based on the ideas of quantum physics, theories of chaos and complexity. The quantum organization is holistic and should care less about process control and further encourage the relationship between leaders, employees, and between divisions. The quantum organization must be flexible, walk the edge between order and chaos. This means adopting functions not so specific for professionals, adapting to the sometimes contradictory needs between individuals and teams. According to ZOHAR⁽¹³⁾ (1990), today's organizations are studied compared to Newtonian mechanics, where certainty and predictability stand out. These institutions are managed by considering that the system as a whole functions from the sum of its parts with strict rules of discipline and hierarchy prevailing and control is the essential attribute at all levels in a standard process. In the quantum model, all positions are valid therefore there is no imposition of ideas. The true "science of administration" (quantum administration) is not in absolute, centralizing power, but in dialogue. However, there is no mathematical formalism as it does in quantum theory and chaos, treated as exact sciences. Here we are considering the subject in the realm of metaphors. According to Predebom, cited by NICOLAU⁽¹⁰⁾ (2006), the metaphor is a symbolic language that involves emotional areas much more linked to our right hemisphere, whose structure of thinking is non-verbal, so meanings acquire greater consistency and amplitude. CAPRA⁽³⁾ (2002) states not only that quantum has brought a conception of mind but also that language, product of mind, constitutes metaphoric thought.

VI. Final Considerations

Quantum mechanics, a reasonably well established theory of the past century, has been the favorite focus with possible applications in many areas, for one very simple reason: it brings uncertainty and with it the possibility of exploring the incomprehensible (or little understood) for most people. However, the theory holds true on a well-established scale, that is, on very small scales. In the microscopic world there is the possibility of a subatomic particle arising from "nothingness" and, again, disappearing. However we will never see a car appear "out of nowhere" in a room, given the macroscopic scale of the car. Physical uncertainties do not exist day to day. In fact, there is nothing in quantum mechanics that can be applied directly to business management. Some caution is needed before using the quantum term indiscriminately. TRIPICCHIO⁽¹⁴⁾ (2008) writes that Niels Bohr one of the founders of quantum physics and his collaborators had described a new science so subtle, so profound and so new in its concepts and language that they themselves had not well understood what they had created.

Bohr, Einstein and other pioneering scientists could not fully understand the implications of quantum theory. Then how can consultants, management theorists, psychologists, doctors and writers apply quantum theory and chaos in recent years to clarify how to manage companies? That is a difficult question to answer. On the other hand, considering the metaphorical meaning of quantum interpretation, COVOLAN and GONZALEZ⁽⁷⁾ (2009) find in JUNIOR⁽¹⁶⁾ (1985)'s work a transdisciplinary and interdisciplinary proposal, when the author uses concepts of quantum physics, biology and natural sciences to conceive what he calls quantum law. The term quantum law is the name created by JUNIOR (1985), aiming to point out that the laws are timely cultural expressions of underlying, silent and perennial genetic dispositions of Mother Nature. To this natural dimension of the human being, JUNIOR⁽¹⁶⁾ (1985) adds the historical dimension. For him, the real man determined by culture and intelligence is a historical phenomenon (COVOLAN and GONZALEZ⁽⁷⁾, 2009). Anyway, even before CAPRA⁽³⁾ (2002), CHOPRA⁽⁵⁾ (1990), ZOHAR⁽¹³⁾ (1990) and GOSWAMI⁽¹⁵⁾ (2015), the Brazilian JUNIOR⁽¹⁶⁾ (1985) did a wonderful job.

Bibliographic References

- [1] BOHM, D. A Suggested Interpretation of the Quantum Theory in Terms of Hidden Variables. *Physical Review*, v. 85, n. 2, 1952.
- [2] BEAUCLAIR, J. The Subjectivity of the Learner: Contexts, Presence, Holomovements, Presence and Hope, available in <http://br.monografias.com/trabalhos915/subjetividade-aprendenteshtml>, access em 20/01/2019
- [3] CAPRA, F. The Hidden Connections: Science for a Sustainable Life, publisher Cultrix, SP, 2002. Text available in https://edisiplinas.usp.br/pluginfile.php/112938/mod_resource/content/1/FritjofCapraAsconexesocultas.pdf, access in 22/02/2019
- [4] CHIBENI, S.S. The Interpretation of Quantum Mechanics, Silvio Seno available in <http://www.comciencia.br/reportagens/fisica/fisica04.htm>, acessado em 26/01/2019
- [5] CHOPRA, D. *Cure Quantum*. Best Seller Publisher, SP 1990, 302 p
- [6] COHEN, D. Do I Have to Know Quantum Physics? Text available in <http://www.perspectivas.com.br/r22.htm>, access in 20/11/2018.
- [7] COVOLAN, F.C.; GONZALEZ, E.T.Q. The Legal Culturalism of Goffredo Silva Telles Junior, text available in http://www.conpedi.org.br/manaus/arquivos/anais/bh/everaldo_tadeu_quilici_goncalves.pdf, acessado em 20/01/2019
- [8] FREIRE, O.; PATY, M.; B, ROCHA; A. L. David Bohm, his Stay in Brazil and Quantum Theory, *Advanced Studies Journal*, v.8, n.20 São Paulo, 1994, available in <http://www.scielo.br/scielo.php>, access in 20/12/2018.
- [9] INÁCIO, S.R.L. Quantum Management, article available on the site <http://www.artigonal.com/authors/58664>, access in 10/01/2019
- [10] NICOLAU, M. Quantum Metaphors applied to Modern Organizations, *Thematic Electronic Journal*, available in <http://www.insite.pro.br/2005/33Asmetaforasquanticasaplicadasorganizacoesmodernas.pdf>, access in 19/01/2019
- [11] NOBREGA, C. *In Search of Quantum Enterprise*. Publisher: Ediouro Rio de Janeiro, 1996, 384 p.
- [12] OSTERMANN, F.; PRADO, S.D. Interpretations of Quantum Mechanics. *Rev. Bras. Teaching Fís.* vol.27 no.2 São Paulo, 2005, available in http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1806, access in 30/12/2018
- [13] ZOHAR, D. *O Quantum Being: A Revolutionary View of Human Nature and Consciousness*, New Physics Based, Translation Maria Antonia van Acker, 1990. Best Seller Publisher Copyriht 1990, available in <http://www.profdoni.pro.br/home/images/sampledata/2012/pdf/livros/oserquantico.pdf>, access in 30/05/2019
- [14] TRIPICCHIO, A. The Quantum Enterprise, 18 Aug 2008, available at <http://www.redepsi.com.br/portal/modules/soapbox/article.php?articleID=465>, access in 23/04/2019
- [15] GOSWAMI, A. *The Quantum Activist: Principles of Quantum Physics to Change the World and Ourselves*, Translation Marcello Borges, 2015 available in <https://www.amazon.com.br/ativista-quantico-Principios-fisica-quantica/dp/8576572761>, access in 12/03/2019
- [16] JUNIOR, G.T. *Quantum Law - Essay on the Ground of the Legal Order*. São Paulo, Max Limonad Publishing House, 1985.