

# Transdisciplinary Management in the Gray Zones: A Dialogue between HPTD-M and Pioneers

*Pour citer la référence*

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## Abstract

This article fosters a dialogue between the Holopraxis Transdisciplinary Management theory (HPTD-M) and pioneer transdisciplinary authors. The works of Jung (Analytical Psychology), Nicolescu (Physics), Weil (Transpersonal Psychology), D'Ambrosio (Ethnomathematics), Max-Neef (Economics), and Loisel (Medicine) are presented. The main objective is to discuss management in the Gray Zones, where conventional binary logic fails. Introductory concepts for transdisciplinarity are explained. The study also aims at transdisciplinary managerial problem solving, including self-leadership, managerial concrete situations, consulting prospects, and extension courses. Considering the publications in six countries, the HPTD-M can help future research in transdisciplinarity applied to healthy managerial problem solving in public and private organizations, including universities.

**Keywords:** Transdisciplinarity; HPTD-M; Management; Gray Zones.

## 1. Introduction

This article explores how the Holopraxis Transdisciplinary Management theory (HPTD-M) can interact with six pioneer transdisciplinary authors. The works of Jung, Nicolescu, Weil, D'Ambrosio, Max-Neef, and Loisel are presented. All of them are deceased or retired authors.

The main objective is to discuss complex managerial challenges in the so-called **Gray Zones**, where conventional binary logic fails, given the blurred opposites – gray being the blend or mixture of **black and white**.

For readers unfamiliar with transdisciplinarity (TD), introductory concepts are explained. Examples: disciplinarity, multidisciplinary, interdisciplinarity, complementarity, duality, dualism, Included Third Logic, and Binary Logic.

The study also aims at TD managerial problem solving, self-leadership, concrete situations as a test for the HPTD-M, consulting prospects, and extension courses.

Finally, the text is divided into twelve sections:

1. Introduction
2. TD Concepts and HPTD-M

3. Carl Gustav Jung: Analytical Psychology
4. Basarab Nicolescu: Physics and TD Philosophical Methodology.
5. Pierre Weil: Transpersonal Psychology and Holistic TD
6. Ubiratan D'Ambrosio: Ethnomathematics and Holistic TD
7. Manfred Max-Neef: Barefoot Economics and TD Foundations
8. Patrick Loisel: The Sherbrooke Model for Management in Health.
9. Self-leadership and Management for Problem Solving
10. Management Situations
11. Consulting Prospects and Extension Courses
12. Conclusion

References

## 2. TD Concepts and HPTD-M

Some introductory concepts need to be presented to the reader unfamiliar with transdisciplinarity, aiming at a didactic understanding of the HPTD-M approach.

**Transdisciplinarity (noun)** and **Transdisciplinary (adjective)** are usually abbreviated as “**TD**” in international publications. TD is adequate when the complexity of human phenomena prevails in the problem-solving variables.

There are three basic international trends of TD:

- **Nicolescu**: Philosophical Methodology, the mainstream in Europe.
- **Zurich and Russia**: Focused on the epistemic way of Science (Zurich has no relation with Jung, the Swiss creator of Analytical Psychology).
- **Brazil**: Four epistemic ways in connection to Jung – Weil, D'Ambrosio, Roberto Crema, Mariana Thieriot, and this author. In this context, **HPTD-M** is a methodology based on **Quaternary Complementarities** and **Three Types of Logic** for managerial problem solving.

TD must not be confused with multidisciplinary and interdisciplinarity. In the HPTD-M view:

- **Disciplinarity**: the disciplines are studied separately by specialists (isolated disciplines).
- **Multidisciplinarity**: specialists in a meeting, working group, or research, with no interaction of disciplines (multi = several).
- **Interdisciplinarity**: interaction and interchange among or between disciplines in a meeting, working group, or research, which may even create new disciplines (inter = among or between).
- **TD**: the integration of understanding beyond and through the disciplines (trans = beyond + through). In international journals, there is still no formal classification for TD. Interdisciplinarity is the closest existing taxonomy. So, academics tend to confuse TD and interdisciplinarity, as if both were synonyms.

The management in the **Gray Zones** involves the transdisciplinary axiom of the Included Third Logic, as opposed to the Binary Aristotelian Logic. The Third Included represents the necessity of going beyond polarities and opposites. In a complex multipolar world, solutions cannot be based on mutually exclusive points of view, like ideological dogmatism or scientism. Dialectics is necessary as a first step.

In this study, **complementarity** is understood in a *lato sensu* transdisciplinary sense, distinct from its *stricto sensu* definition in physics. Here, it refers to a dialectical interaction between opposites, i.e., dialogue, rather than mutually exclusive categories. Duality and complementarity are closely related. Duality implies the dominance of one pole without excluding the other. This differs from binary logic dualism, which favors one side by excluding its counterpart. In this broader context, the text will explore

multiple complementarities, often using the abbreviation “vs.” (e.g., subject vs. object). Some TD examples of *lato sensu* complementarity:

- De Broglie's **wave-particle** duality. The wave-particle duality in physics is the *stricto sensu* example. Light behaves mostly like a wave, but it also has particle-like features — its wave aspect is dominant. A rock, on the other hand, has predominantly particle-like characteristics, although it also possesses wave properties.
- Einstein's **matter-energy** convertibility ( $E = mc^2$ ).
- Analytical Psychology's **subject-object** and **conscious-unconscious** (Jung), reflecting Bohr's view as a quantum physicist.
- Ancient traditions and philosophies, e.g., Taoist **Yin vs. Yang** and Plato's Cave Allegory: **world of senses vs. world of ideas**.
- The HPTD-M models, including dualities like **praxis vs. theory, soft vs. hard, analytic vs. synthetic, judgment vs. perception, synchronicity vs. causality**.

About the theory and praxis of HPTD-M, it comes from the experience in engineering, business management, international trading, and public management, including more than 30 years of research in dialogue with a quaternary approach evidenced in ancient traditions, Greek philosophy, Modern physics, and Jungian psychology. Articles have already been published in six countries: The USA, France, Canada, Romania, South Africa, and Brazil. The basic concepts of the theory are:

- **Four types of intelligence** that can dialogue with Analytical Psychology through Jungian functions and with the MBTI System of psychological types (Myers-Briggs Type Indicator):
  - **Intuitive Intelligence**: based on the **abstract**, the symbolic, ideas, meaning, innovation, insights, and foreseeing problems.
  - **Rational Intelligence**: based on the **objective**, linear, logical, Cartesian, and mechanistic.
  - **Emotional Intelligence**: involving the **subjective** ability to decide, self-control, and relationship skills, including the ethical perspective.
  - **Empirical Intelligence**: focused on the **concrete**, observation of facts, effective problem solving, and body conscience skills.
- **Four epistemic ways or disciplines** as an evolution of the Holistic TD approach of D'Ambrosio, Weil, and Crema (science, philosophy, religion, and art):
  - **Technoscience** (empirical and rational types of intelligence).
  - **Philosophy** (rational and intuitive types of intelligence).
  - **Tradition** (intuitive and emotional types of intelligence).
  - **Art** (emotional and empirical types of intelligence).
- **Three types of Logic**. This approach can dialogue with Nicolescu's Included Third axiom. However, it goes beyond. The application of the three types is integrated, depending on the level of complexity of the problem to be solved:
  - **Binary Logic**: based on dualism (true/false, yes/no, right/wrong). It is essential for structured, operational decision-making, for variables that behave similarly to machines in terms of simplicity. Example: the decision to go on or to stop a project.
    - **Feedback Logic**: emphasizing the interaction between cause and effect. It is commonly applied to living systems and cyclical processes, like biological homeostasis, a feedback self-regulating process. An example is the PDCA cycle of continuous improvement of processes in management (Plan, Do, Check, and Act).
    - **Included Third Logic**: the coexistence of apparently contradictory realities by introducing a third reconciling element. It is applied to dialectic processes and reflects the complexity of human phenomena. For example, in working groups, all participants must be listened to and express their

perspectives. That is how ideas can emerge for brainstorming, a first step in complex problem-solving processes.

— **Four types of paradigms:**

- **Mechanistic, Systemic, and TD:** connected to the three types of logic for problem solving (Binary, Feedback, and Included Third, respectively).
- **Synchronistic:** related to meaning, ideas, symbols, mythology, abstract concepts, before the problem-solving process. It refers to the Jungian idea of synchronicity, as opposed to causality.
- **Quaternary complementarities:** philosophically and symbolically inspired by Empedocles' four symbolic elements and Heraclitus' cycles of transformation. HPTD-M incorporates these ideas within the European Alchemical Tradition as an epistemic way, demonstrated in the Jungian four psychological functions and later in the MBTI System. Modern Physics provides a complementary lens to this quaternary structure. This sequence configures a psychosomatic engineering framework (physical, emotional, mental, and conscious). The main idea of quaternary complementarities is the combination of opposites inside the structure of four elements. As examples of this HPTD-M archetypal structure:
  - The four **archetypal symbolic elements** (earth, water, air, and fire).
  - The four **states of matter** (solid, liquid, gas, and plasma).
  - The four **Jungian psychological functions** (sensation, feeling, thinking, and intuition).
  - The four **types of intelligence** (empirical, emotional, rational, and intuitive).
  - The four **epistemic ways or disciplines** (technoscience, philosophy, tradition, and art). In this connection, TD is the dialogue between:
    - **Culture** (philosophy + tradition + art) and
    - **Technoscience** (technology + science).

### 3. Carl Gustav Jung: Analytical Psychology

Jung was a scientist and psychiatrist who created Analytical Psychology, involving complementarity as a principle not only in Modern Physics but also in Hermetic Philosophy, Taoism, Buddhism, Hinduism, Greek Philosophy, and European Alchemical Tradition.

Analytical Psychology is based on the dialogue between subject vs. object and conscious vs. unconscious. Variations of subject vs. object in Jung: introversion vs. extraversion and personal vs. collective. This means inner vs. outer. Jung created the terms introversion and extraversion, the concepts of personal conscious, collective conscious, personal unconscious, and collective unconscious.

The basic concepts of Analytical Psychology are introduced in the book *Jungian Dream Interpretation: A Handbook of Theory and Practice*, by James Hall, M.D., psychiatrist and Jungian analyst:

- **Personal Conscious:** refers to the **EGO**, the individual center of awareness and consciousness.
- **Personal Unconscious:** Associated with the **SHADOW**, the hidden or repressed aspects. The shadow may hold traits that need to be integrated to create a more complete and balanced ego structure.
- **Collective Unconscious:** the objective or transpersonal unconscious, which contains archetypal images. Archetypes are universal patterns of emotional and intellectual behavior, independent of cultural influence.
- **Collective Conscious:** The shared cultural values, beliefs, and forms that unify a group.
- **SELF:** The central regulating force of the psyche, representing a fifth unifying function that transcends the four main functions of the psyche, i.e., sensation, feeling, thinking, and intuition.

HPTD-M considers Jung the transdisciplinary pioneer. At the beginning of the 20<sup>th</sup> century, Jung fostered dialogue among the four epistemic ways:

- **Technoscience:** as a medical doctor and psychiatric hospital director.
- **Ancient philosophies:** Heraclitus and Plato, among others.
- **Traditions:** Christianity and Alchemical Tradition. The Alchemical four elements (earth, water, air, and fire) inspired the empirical discovery of the four psychological functions in his patients: sensation, feeling, thinking, and intuition, respectively. The SELF can be related to the Alchemical quintessence or the fifth element.
- **Art:** through his calligraphy and symbolic/mythological drawings of *The Red Book*.

Roberto Crema agrees that Jung is the TD pioneer [24]. A transdisciplinary author and group therapist, the dean of UNIPAZ, and co-author of the principles of holistic transdisciplinarity with Pierre Weil and Ubiratan D'Ambrosio [10]. On December 20, 2024, Crema, the creator of the Fifth Force in Therapy, sent us a letter. To complete his understanding of the matter. He has been studying Jung for more than 50 years and pointed out that Jungians don't know TD, and TD researchers do not know Jung. Then he authorized us to publish his opinion:

*Regarding Jung, I have insisted that he had the merit of being not only the precursor of the humanistic and transpersonal movements but also of the transdisciplinary (TD) movement. More than 50 years before Nicolescu, he was already engaging in TD encounters—though not under that name, of course—at the renowned Eranos Circle, alongside notable representatives of the sciences, philosophies, arts, and wisdom traditions.*

*As for complexity, as the author of “Complex Psychology”. I consider the term “Analytical Psychology” reductive and inappropriate for the work of this 20th-century visionary. He also anticipated Morin by decades. I stated this in my lecture at the III World Congress of TD.*

*When I am in the TD context, I recall Jung, who is almost unknown in this field; when I am with Jungians, I focus on TD, which is practically ignored in this context.*

To understand Jung more deeply, the reader is suggested to study the following book. The full texts are available on the internet links:

- ***Memories, Dreams, Reflections***, an introduction to Jung's life and major ideas. [1]
- ***Man and His Symbols*** as an intermediate step before *Analytical Psychology*. This book, co-written by Jung and others, simplifies his concepts for a general audience. [2]
- ***Two Essays on Analytical Psychology*** for a comprehensive overview of his theories. [3]
- ***Synchronicity: An Acausal Connecting Principle***: a link between psychology with modern physics, establishing the difference between causality (cause and effect prevailing) and synchronicity (meaning prevailing). [4]
- ***AION: Researches into the Phenomenology of the Self***. Jung's more advanced and symbolic works. [5]

The management in the **Gray Zones** regarding Jung comes from understanding the interaction between subject and object, conscious and unconscious, including personal and collective. This is the basis of Jungian dream analysis, explained in his 1928-1930 seminars. [43]

We are never 100% personal conscious (EGO) or personal unconscious, considering the collective conscious (culture) and the collective unconscious. The same occurs to the subject and object. According to Dr. Marie-Louise von Franz, the most important Jungian pupil, about 85% of the dreams may be dominantly interpreted through the subject (symbolically), and 15% through the object, i.e., premonitions, like Jung detected in catastrophic and bloody dreams of his patients right before World War I. However, some dreams can be interpreted simultaneously through the subject and object perspectives. This aligns with Quantum physicist Niels Bohr: The subject and object are indissociable. [28, 29]

The basic idea here is the dominance of each opposite when dealing with the complexity of human phenomena. There are no exact numbers: Those references from von Franz are only for reflection in a broader and uncertain context.

The collective unconscious is also the “objective psyche” in Jungian terminology. From the HPTD-M perspective, consciousness development or awareness is like the “light” that can guide us through the SHADOW in personal (subjective) and collective (objective) levels. Furthermore, the SHADOW illustrates the levels of the collective unconscious, not only the personal unconscious, since there can be hidden or repressed aspects in the organizations, which need to be addressed to solve problems effectively. For example, in managerial situations of subsection 10.5: The organizational “ghosts” or “under the carpet” issues in TD Mediation.

#### **4. Basarab Nicolescu: Physics and TD Philosophical Methodology.**

Nicolescu is well-known for establishing the three axioms of transdisciplinarity, i.e., **Included Third**, **Complexity**, and **Levels of Reality**. Founder in 1987 of the Center for International Transdisciplinary Research and Studies in France, CIRET. [6]

The author started as a physicist and then developed an abstract and philosophical TD methodology. Nicolescu aligns with the Jungian complementarity of subject vs. object.

His concepts of **Disciplinarity**, **Multidisciplinarity**, **Interdisciplinarity**, and **TD** emphasize that the dialogue between disciplinarity and TD is fruitful.

Two references can represent a synthesis of his methodology:

- 2005: for the *II World Congress of Transdisciplinarity*, [7]
- 2010: Methodology of Transdisciplinarity - levels of reality, the logic of the included middle, and complexity. *Transdisciplinary Journal of Engineering & Science*, 1. [8]

The management in the **Gray Zones** is clear through the Nicolescu’s duality of the Included Third axiom, as opposed to the dualist and binary Aristotelian logic. Also, in the dialogue between disciplinarity and TD, besides the subject and object relation.

Since Nicolescu is very well-known internationally, we won’t go further into his approach.

However, the HPTD-M offers an expanded new approach to Nicolescu's three axioms:

- **Complexity vs. Simplicity:** These are complementary rather than opposing, in remarks like i) Da Vinci’s *simplicity is the ultimate sophistication*, ii) Newton’s *nature is fond of simplicity*, and iii) Einstein’s *everything should be made as simple as possible, but no simpler*. That is why HPTD-M considers three types of logic for problem solving, depending on the level of complexity of the variables involved. The simplest option is always the best choice, but it needs to be adequate.
- **Included Third vs. Binary Logic:** Problem-solving strategies range from the simplest (Binary Logic) to the most complex (Included Third Logic), with Feedback Logic in between. They depend on the complexity level of the variables: similar to machines, living systems, or human phenomena.
- **Levels of Reality:** Complementary perspectives illuminate different levels of reality. No single perspective captures the complete and whole “truth”, as psychological types and individual consciousness vary when perceiving reality. Not seen in Nicolescu’s approach, the **quaternary complementarities** can be considered for levels of reality.

A didactic comparison between Nicolescu’s triangle of the Third Included logic and the three axioms is in the HPTD-M schematic model for the dialogue between **mythology and types of logic**.

The model considers the three types of logic as an application for problem-solving, depending on the **level of complexity** and **reality** to be dealt with. The complete schema is published in Figure 2 of the article in the book *For an International Transdisciplinary Chair*. [20]

As an example of application of this model, a German organic chemist, Friedrich August Kekulé, discovered the formula for benzene in 1865, after hard work on the matter and a subsequent dream: A snake biting its tail, an ancient alchemical symbol (*Ouroboros*). The scientist woke up and worked out the formula for the molecule, as a closed chain of six carbon atoms bonded to six hydrogen atoms. This example shows that symbols can be a way to describe complex ideas with simplicity. The images emerging from the personal and collective unconscious can be important instruments for concrete solutions, if well translated into the experienced reality.

## 5. Pierre Weil: Transpersonal Psychology and Holistic TD

Human resources consultant for banks in the 1970s and creator of the Transpersonal Psychology chair for a federal university in Brazil (UFMG), Pierre Weil established the main principles of **Holistic Transdisciplinarity**, together with Ubiratan D'Ambrosio and Roberto Crema [10]. With the latter, in 1987, Weil founded an international transdisciplinary foundation in Brazil, the International University of Peace, UNIPAZ [12]. One book is almost a synthesis of his work, *The Change of Meaning and the Meaning of Change*. [13]. Weil also wrote about organizations from a holistic perspective. [14]

In the Holistic TD perspective:

— **Holistic view** = **Hology** (study of the whole) + **Holopraxis** (praxis of the whole).

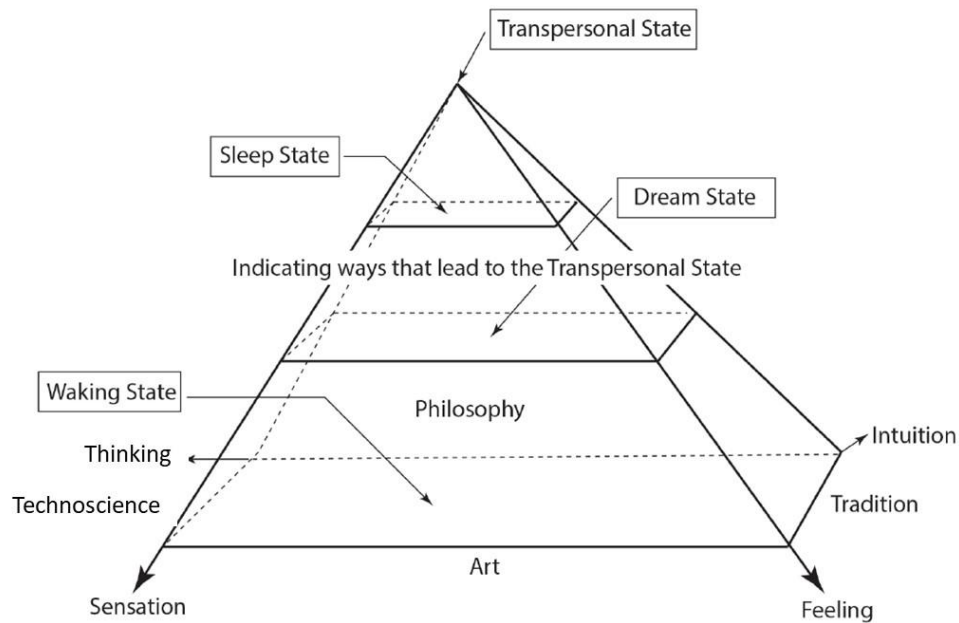
Weil, D'Ambrosio, and Crema correlated the four Jungian psychological functions with the fragmentation into disciplines, as follows:

- Between Reason and Sensation **Science** was born, based mainly on these two functions.
- Between Reason and Intuition came **Philosophy**, which uses one or both of these functions, according to the orientation of each school.
- Between Intuition and Feeling, **Religion** developed.
- Between Feeling and Sensation, **Art** was born.

These connections are relative since art has intuitive aspects, religion developed rational foundations, and science often begins its theories intuitively. Moreover, those authors point out the relationship of feedback between science and technology, making it difficult to separate science from technology. [10]

Figure 1 is our adaptation of Weil's pyramid [13], considering the HPTD-M perspective but keeping the same essence in the four epistemic ways of the pyramid base:

- **Thinking** instead of **Reason** (to make clear the Jungian psychological function).
- **Technoscience** instead of **Science** (given the feedback of Technology and Science).
- **Tradition** instead of **Religion** (Tradition involves more than Religion, Religion included, e.g., Alchemical Tradition is not religion).



**Figure 1:** Weil's Pyramid in dialogue with HPTD-M  
Thinking, Technoscience, and Tradition replacing Reason, Science, and Religion, respectively. *Source: a combination of the HPTD-M framework in the pyramid base and [13]*

An alternative way of representing the pyramid square base, connecting Technoscience, Philosophy, Tradition, and Art, is through the quadrants in a Cartesian Plane. It was published in Figure 2 of the article *Artificial Intelligence and the Transdisciplinary Human Mediation of HPTD-M*. [18]

Figure 1 also represents the states of consciousness, progressing from the base to the apex of the pyramid. Weil identifies four states of consciousness [22]:

- **Vigil** (wakefulness).
- **Dream** (sleep with dreams).
- **Deep, dreamless sleep.**
- **Super consciousness or transpersonal state** – This is an exception, occurring in individuals who experience expanded states of awareness. Although brain wave activity in this state resembles that of deep sleep, the experience is distinctly transpersonal.

A similar perspective is provided by the **Silva Mind Control Method**, which associates different states of consciousness with specific brain wave frequencies measured by an electroencephalogram:

- **Beta waves** (14–21 cycles/second): Correspond to wakefulness.
- **Alpha and Theta waves** (4–14 cycles/second): Associated with dreams and relaxed states.
- **Delta waves** (up to 4 cycles/second): Characteristic of deep, dreamless sleep.

In this Silva Method courses, participants can experience conscious relaxation, where brain waves shift to Alpha or even Theta levels, simulating dream-like states. According to this method, states of consciousness are categorized into three levels:

- **External conscious** – Beta waves
- **Internal conscious** – Alpha and Theta waves
- **Unconscious** – Delta waves

Relaxation with closed eyes (Alpha or Theta waves) can be harnessed for benefits such as visualizations and health improvement. Understanding these states of consciousness provides valuable insight into

practices like meditation and mindfulness. The latter is the technical and corporate equivalent of the ancient and traditional idea of meditation.

The quaternary structure of the pyramid interacts with the quaternary complementarities' models of HPTD-M. The schema reflects the four epistemic ways and their correlation with the Jungian psychological functions. The **Transpersonal State** at the top of the pyramid could also be considered the **Jungian SELF**, as the fifth function that regulates and integrates the other four, i.e., Sensation, Feeling, Thinking, and Intuition. Besides, this fifth element or quintessence can be considered in the archetypal context of ancient philosophies and James Hillman's Alchemical Psychology. [26]

Unfortunately, no Weil's publications are available in English. However, his Holistic Transdisciplinarity with well-structured schemas like Figure 1 influenced the development of the HPTD-M theory. Weil's work is comprehensive in theory and practice, considering his experience as a human resources consultant for banks.

Weil's approach carries an organizational bias, influenced by his background. In his book *Organizations and Technologies for the Third Millennium*, Weil presents an alternative perspective on Maslow's pyramid when proposing that humans first require **safety**, then **pleasure**, and afterward **power**, before ultimately addressing **spirituality**. [14]

Abraham Maslow, an American psychologist, is best known for developing the hierarchy of needs. Maslow's pyramid outlines a hierarchy of human needs, starting with basic survival (food, water, safety) and progressing through social connection and self-esteem to personal growth and fulfillment.

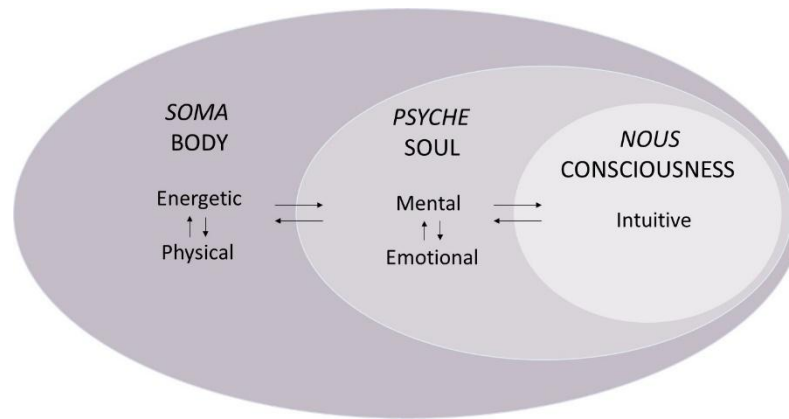
Weil has also influenced, as the dean of UNIPAZ, the creation and implementation of the Holistic Basic Training (FHB) in Brazil. A fruitful practice coordinated by Crema, his vice-dean, since 1989. [24]. We detailed the FHB course in the 2024 article on the TD Chair (p. 193):

*A 481-hour course on Holistic TD called FHB, i.e. Holistic Basic Training with 25 instructors. For any student or professional over 18 years old, those seeking a new way of being in the world, or those interested in the holistic transdisciplinary approach as a tool for improving personal and professional dimensions. The deans: Pierre Weil (deceased in 2008) and then Roberto Crema, Brasilia-DF, Brazil. Regarding the FHB course: Roberto Crema was responsible for implementing and coordinating its Pilot Group at UNIPAZ in Brasilia from 1989 onwards. [20]*

To conclude, HPTD-M has developed a psychosomatic engineering model for individual consciousness, in dialogue with the framework of Weil's pyramid base:

- Sensation can be related to the physical.
- Feeling to emotional.
- Thinking to mental.
- Intuition to consciousness.

In many traditions and philosophies, the concept of consciousness and psychosomatics (*Psyche* in interaction with *Soma*) can be understood in transdisciplinary terms beyond **physical**, **energetic**, **emotional**, and **mental** levels. Energetic also means vital (expressing vitality), not only the mere physical concept. Consciousness would then be close to the intuition and spiritual, the Greek idea of *Nous*. There is no intention to establish exhaustive definitions in this context. Binary logic and rigid taxonomies don't work in this realm of human phenomena. The development of consciousness involves a harmonious interaction of the levels in such a way that they function as a system of synergistic complementarity. Figure 3 presents this model through a schema.



**Figure 2:** The HPTD-M Psychosomatic Model for Individual Consciousness  
 Source: a combination of the author's idea and [19]

Management in the **Gray Zones** appears in Weil with no peremptory relation between epistemic ways or disciplines and Jungian functions. If we try to force clear relations, logical contradictions will emerge, like in Quantum Physics. Binary Logic does not work for human complexity. The relations established in Figure 1 and Figure 2 are like a compass, as in the example of dream analysis. This means those relations are just references for guidance.

## 6. Ubiratan D'Ambrosio: Ethnomathematics and Holistic TD

Besides being one of the signatories of the 1986 Venice Declaration (UNESCO) with Nicolescu [9], D'Ambrosio established the main principles of **Holistic Transdisciplinarity** in Brazil, together with Pierre Weil and Roberto Crema [10].

The core point in D'Ambrosio's framework is the idea of disciplines as "cages." Transdisciplinarity would be one way to free our conscience from those cages.

A 2007 lecture with 62 slides for Sherbrooke University in Canada illustrates a synthesis of his work, focused on the idea of "encaged" disciplines. [11]

In slides 34, 35, 36, and 37:

*Metaphorically, we may think of disciplines as cages: It is not possible to leave the cage (wires, as codes, impede), the search is limited to what is inside, it is not possible to see the color of the external painting! As a metaphor epistemological cages:*

- **Disciplines:** knowledge as "encaged". methods and results are specific to deal with well-defined questions.
- **Multidisciplines:** juxtapositioning of epistemological cages.
- **Interdisciplines:** doors between cages are open, allowing passage from one cage to another, eventually creating an "aviary", actually a larger cage.

*The inquiry is limited to what is inside, the methods are limited by the wires. The results tell practically nothing of what is outside.*

*The proposal of transdisciplinarity is a non encaged inquiry and search, open in quest and in methods.*

**Transdisciplinarity** is an open system of inquiry and search.

Those are close to what has already been discussed in the introductory concepts and Nicolescu's approach: Disciplinarity, Multidisciplinarity, Interdisciplinarity, and TD.

In slide 41:

- **Individual reality:** being conscious of one's sensorial, intuitive, emotional and rational dimensions.
- **Social reality:** acknowledging the essentiality of the other.

This is in line with the quaternary complementarities of HPTD-M, since individual vs. social is like subject vs. object or personal vs. collective in Analytical Psychology. Besides, the four Jungian functions sensation, intuition, feeling, and thinking are presented by D'Ambrosio as *sensorial, intuitive, emotional and rational*.

There are not many articles from D'Ambrosio available in English. However, his TD emphasizes:

— The knowledge in “engaged” disciplines.

— A proposal of transdisciplinarity as a non-engaged inquiry and search, open in quest and methods.

In D'Ambrosio's perspective, the engaged methodologies hinder new ideas and open systems of understanding reality. TD is the proposal to go beyond those limitations through concepts that are not initially clear. This could be another view of the **Gray Zones**.

## 7. Manfred Max-Neef: Barefoot Economics and TD Foundations

Economist and academic, he received the so-called “Alternative Nobel Prize” for his *Barefoot Economics* theory [16]. His article *Foundations of Transdisciplinarity* is insightful, mentioning Einstein and Goethe. [17]:

— Goethe's transit between science and art is not clear to the general public (we could say this is an example of **Gray Zones**):

*[...] it is interesting to note that Goethe, whose scientific contributions have been unjustly overshadowed because of his colossal achievements in literature and the arts, felt upset with what he believed to be the limitations of Newtonian physics. For Goethe, science is as much an inner path of spiritual development as it is a discipline aimed at accumulating knowledge of the physical world. It involves not only a rigorous training of our faculties of observation and thinking, but also of other human faculties which can attune us to the spiritual dimension that underlies and interpenetrates the physical: faculties such as feeling, imagination and intuition.*

— Referring to Einstein, Max Neef understands that formal knowledge is linked to reason, constructed according to the rules of method and causality, while understanding, more connected to intuition, regulates method and causality:

*Einstein [...] declared that "the intuitive mind is a sacred gift, and the rational mind is a faithful servant. We have created a society in which we honor the servant and have forgotten the gift."*

This intuitive vs. rational relation reminds the Jungian concept of synchronicity (meaning prevails) vs. causality (cause and effect prevail), as the two ways of understanding reality, respectively, the Eastern and Western. [4]

Max-Neef emphasized the analytical hypertrophy that generates several distortions in economic theories. He can provoke reflections about the limitations of economics as a hard science. Economics is a remarkable field of study, but tends to be a very Cartesian and mechanistic science, to be applied according to its scope, not more or less. He also expresses this key issue very well when he says that he spent a lot of time diagnosing and analyzing, but was not used to understanding:

*I was used to diagnosing and analyzing but not used to understanding [...] the idea [...] of demonstrating what economics looked like behind its mask of supposedly exact, mathematical, and judgment-free science. [16]*

The idea of **understanding** more than simply **knowing** is presented clearly in the HPTD-M framework, especially the quaternary complementarities model of the cross inserted in the circle. The complete schema in the Cartesian Plane was published in Figure 2 of the article *Artificial Intelligence and the Transdisciplinary Human Mediation of HPTD-M*. [18]

Finally, Max-Neef's TD could be synthesized in two aspects:

— Understanding is more than knowing.

— Analysing does not mean understanding.

- Formal knowledge involves causality.
- Understanding, more linked to intuition, regulates method and causality.

## 8. Patrick Loisel: The Sherbrooke Model for Management in Health.

The Sherbrooke Model, a transdisciplinary approach specifically addressing health issues, particularly in managing occupational back pain, was developed by Patrick Loisel and his M.D. colleagues at the Université de Sherbrooke in Quebec. [15]

A quote from Loisel, in the conclusion of an article on the Sherbrooke Model:

### *A transdisciplinary approach as a proposed solution*

*In my view, reconciling perspectives in science and policy requires a transdisciplinary approach, which involves bringing the different disciplines involved together. With this approach, scientists and policy experts would discuss implementation needs emerging from recent scientific evidence while sharing their knowledge and experience and ensure that the resulting policies will be scientifically supported and effective for the targeted populations. Transdisciplinarity, a term coined by Piaget (1972) and then diffused by Nicolescu (1996), is the art and science of bringing together thinkers from various disciplines and experiences to address complex problems that cannot be solved by one discipline or a limited vision of reality (Bernstein, 2015). Our international training program in work-disability prevention, supported by the Canadian Institutes of Health Research, trained high-level global trainees and young scientists (from health to law and policy) with this transdisciplinary perspective over 12 years (Loisel et al., 2008). More than 110 trainees and their 30 program mentors created myriads of transdisciplinary connections, and many continue to work together. I hope they will bridge scientific, political, legal and cultural realities to match science and policy in ways that can best serve the needs of work-disabled citizens globally.*

*Policy is a complex field that has to adapt not only to the topics at hand, but also to political issues, including diverse actors in a democratic society—much more complicated than an Admiralty decision in the scurvy case. Appropriate policies should facilitate agreement between the various actors of the work-disability field as well as facilitate and even sometimes enforce evidence implementation. I think we now need to train “return-to-work managers,” who will have the knowledge and skills of the science and politics related to work disability prevention and can guide disabled workers through the complex WDP arena (Loisel et al., 2005). This is the only way that the individual and societal burdens of work disability will be actually reduced. [15]*

Both the Sherbrooke Model and HPTD-M focus on healthy managerial problem solving. HPTD-M's psychosomatic organizational perspective seems to complement the medical-oriented Sherbrooke approach.

HPTD-M has created a new perspective of psychosomatic engineering, going beyond the so-called ESG

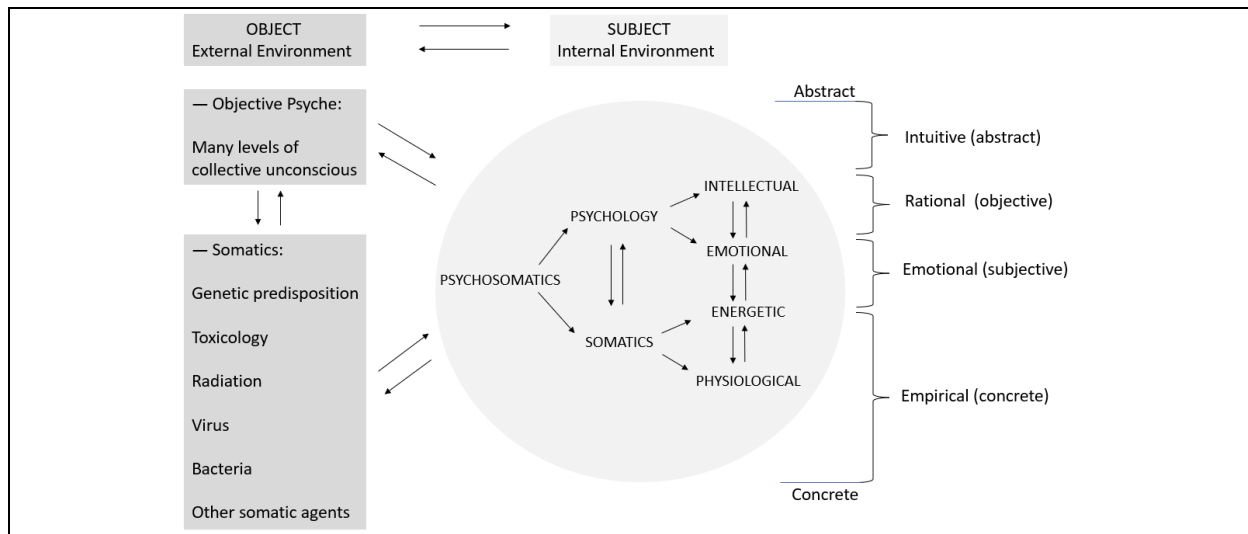
- Environmental, Social, and Governance, which tends to be focused on the object, respectively, physical-biological (E), society as an object (S), and internal management (G).

Levels of personal (subjective-inner) and collective (objective-outer) are demonstrated in the schema of Figure 3. This is the perspective of subject vs. object for organizational well-being.

Jung referred to the collective unconscious as the objective psyche because it exists independently of the subjective individual. Unlike the personal unconscious, which stores personal memories, the collective unconscious comprises inherited structures of the psyche that manifest universally through symbols, myths, and behaviors. Importantly, the objective psyche should not be confused with objective rationality shown in Figure 3, as the former relates to the collective outside the subject, while the latter involves the rational attribute of objectivity.

Psychosomatics can be understood as environmental engineering and management, not only at the personal level but also collective unconscious dynamics on many levels, like in families, organizations,

and other groups. For example, sick organizations provoke sick participants in a collective unconscious system, given absenteeism caused by psychologically unsustainable environments.



**Figure 3:** The HPTD-M Psychosomatic Model for Inner and Outer Environment  
*Source: a combination of the author's idea and [19]*

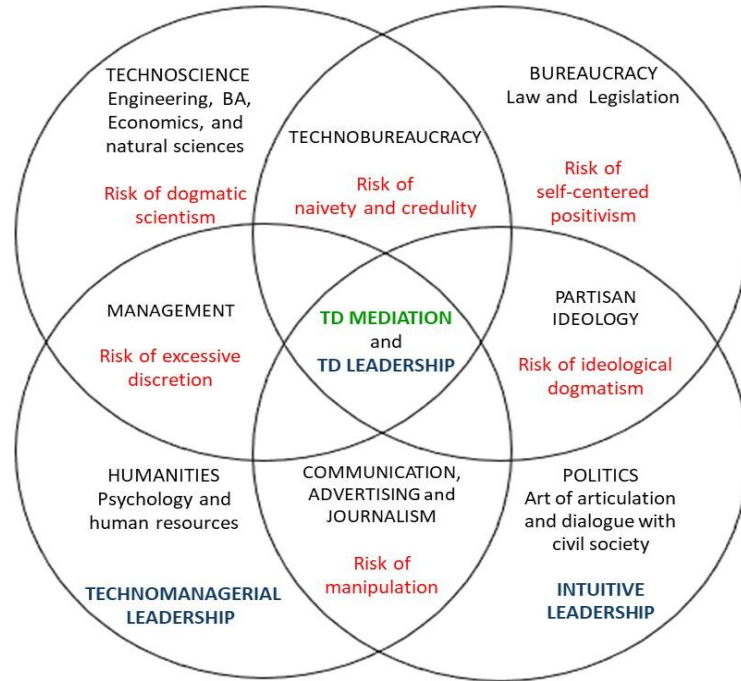
Furthermore, given the experience in public management as a public servant since 2009, the HPTD-M's perspective of Transdisciplinary Management and Leadership considers four disciplines related to Public Administration, i.e., **Technoscience, Bureaucracy, Humanities, and Politics**, including the **Transdisciplinary Leader: Technical and Intuitive**. Four disciplines interact in dialogue, involving two types of leadership to create the TD view of mediation and leadership in Figure 4.

Given Figure 4, the two most important disciplines for Public Administration are **technoscience and politics**. Hence, this dialogues with the Sherbrooke's proposal of **reconciling perspectives in science and policy**, as mentioned in the first sentence of Patrick Loisel's direct quote.

The center of Figure 4 provokes the discussion of **Gray Zones**: Is it TD Mediation or TD Leadership? The point is: It can be both, not mutually exclusive. Considering:

- **Governance** of the organization's (inner environment). It involves the dialogue between technicians and managers (expressed by **Technomanagerial Leadership** in blue).
- **Governability** (outer environment), politicians are legitimized by civil society as representatives (expressed by **Intuitive Leadership** in blue).
- **TD Leadership** is the mediation between technomanagerial leadership (governance) and intuitive leadership (governability).

This can be considered both leadership and mediation for problem solving, integrating the four main disciplines in the circles of Figure 4. This model is applied to public management, but some peculiarities can also be seen in general management. The main difference between public administration and business administration is the margin of discretion of the manager. The bureaucracy rules in public administration are much more severe than in business administration.



**Figure 4:** HPTD-M Transdisciplinary Mediation and Leadership for Management  
 Source: a combination of the author’s idea and [41]

Figure 1, at the base of the adapted Weil pyramid, presents the four epistemic ways – Technoscience, Philosophy, Tradition, and Art – which are one of the theoretical foundations of TD. On the other hand, the four disciplines of Figure 4 translate this foundation into four disciplines of public administration – Technoscience, Bureaucracy, Humanities, and Politics – thus representing the applied dimension of TD in managerial and institutional practice. So, TD is basically a dialogue and integration between Technoscience and other disciplines.

Also in health TD perspectives, Fernando Bignardi, M.D., is a Brazilian organizational consultant focused on mindfulness and integrative therapies. In a TD group meeting of 2025, after a mindfulness session, he emphasized that executives with constant meditation practice tend to make more sustainable decisions.

Mindfulness is a Modern Western technique (coming from **Technoscience**) that dialogues with ancient meditation, in Western and Eastern **Traditions**. Mindfulness or meditation practices activate the subtle and deeper level of **Nous** or **Consciousness** (Figure 2), which includes **intuitive** intelligence for new abstract ideas. The new ideas can be tested afterwards by the types of logic for concretization and troubleshooting. In the process, **emotional**, **rational**, and **empirical** types of intelligence also need to be addressed, in dialogue and feedback with the original idea coming from intuition. This is an example of healthy managerial problem solving, to be seen in Table 1.

There is a **Gray Zone** between Technoscience and Tradition, e.g., mindfulness and meditation, respectively. A Tradition can be empirically tested and become a Technique or even a Technology, although not understood or demonstrated by Science. For example, acupuncture has been practiced for thousands of years as part of Chinese Traditional Medicine. However, the mechanism by which it functions is unknown to Western scientific medicine.

## 9. Self-leadership and Management for Problem Solving

In the context of self-leadership and management programs for executives [30], the MBTI System – *Myers-Briggs Type Indicator* [31, 32] is used for psychological classification, an evolution of Jungian taxonomy of 8 psychological types shown as follows:

- Extraverted Sensation;

- Introverted Sensation;
- Extraverted Feeling;
- Introverted Feeling;
- Extraverted Thinking;
- Introverted Thinking;
- Extraverted Intuition; and
- Introverted Intuition.

Instead, the MBTI shows 16 types in four dualities based on individual preferences, a combination of four letters for each type (combination of 2 x 2 x 2 x 2): ESTP, ESFP, ENFP, ENTP, ESTJ, ESFJ, ENFJ, ENTJ, ISTJ, ISFJ, INFJ, INTJ, ISTP, ISFP, INFP, and INTP.

- Extraverted (E) vs. Introverted (I). Source of energy: interaction with people (**outer object**) or solitary activities (**inner subject**).
- Sensation (S) vs. Intuition (N). Way of perceiving the world: **concrete** (the five senses) or **abstract** (symbolic).
- Thinking (T) vs. Feeling (F). Way of evaluating, judging, organizing, and deciding: the criteria can be **objective** or **subjective**.
- Judgment (J) vs. Perception (P). Lifestyle: anticipated **planning** or adaptive **improvisation**

Also in this Jungian approach developed in the MBTI System:

- Perception (P) functions are Sensation (S) and Intuition (N).
- Judgement (J) functions are Thinking (T) and Feeling (F).

In this context, Analytical Psychology and TD are closely related. Jung considered **consciousness** like a **headlight** in the field at night: The illuminated part is the conscious. [43]

No one has the same headlight to illuminate the shadows, the unconscious. Levels of reality can be understood through the shadow concept, as the conscious vs. unconscious complementarity. The shadow is the consciously unperceived/unknown, or the unconsciously rejected/repressed part. Each personal shadow varies according to the 16 psychological types of the MBTI System. [21, 25]

Dominant functions illuminate the objects through the conscious, and weaker functions remain in the shadow, as per **the Blind Men and Elephant: An Indian traditional allegory**. An elephant, when encountered by six blind men for the first time, is perceived to be something different depending on which part of the elephant the men touch. Each blind man touches a different part: the trunk, the tail, the ear, the leg, the side, and the tusk, respectively. Based on their limited sensory experience, each blind man forms a different interpretation of what an elephant is like. This story illustrates the concept of levels of reality, depending on how each psychological type perceives it. [39]

The dominant function has its shadow in the opposite, considering the criteria of Judgement functions and Perception functions. If Thinking is dominant, Feeling is the shadow function. If Sensation is the secondary function in this context, the tertiary function is Intuition. According to Jung, there will always be the fourth function in the shadow: Nobody can consciously develop more than three functions. In the exemplified type, which is typical of the profiles in technobureaucratic organizations, the three functions to be developed are Thinking, Sensation, and Intuition, respectively, remaining Feeling always in the shadow, i.e., unconscious.

Now, a complete example: Introverted Sensation with secondary function of Feeling. This means the tertiary function is Thinking and the shadow is Extraverted Intuition. This approach works for both the Jungian and MBTI taxonomies.

From the perspective of self-leadership and management, the different MBTI types can be understood like “psychological DNAs”, since the type remains the same, independent of younger or older age. In

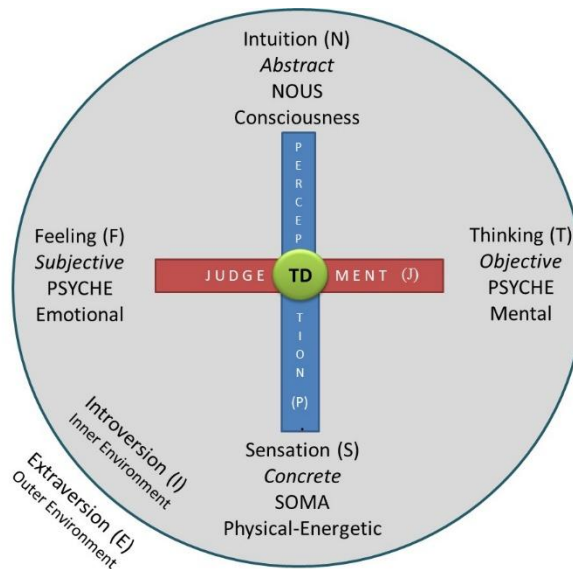
organizations, the leader needs to understand what the different profiles can give in the context of a synergic group, i.e., to maximize the potentialities of each one concretely, according to their strengths and skills based on the dominant functions.

Figure 5 establishes a dialog between the Consciousness Model of Figure 2 and the Quaternary Complementarities as a schematic way to understand the MBTI System. At the center, the view of TD as an integration of the four elements or the four Jungian functions, as a fifth element, like the Jungian SELF is.

All that said, Figure 2, Figure 3, and Figure 5 show different forms of quaternary complementarities:

- Figure 2: Physical-energetic, Emotional, Mental, and Intuitive (Consciousness Levels).
- Figure 3: Empirical, Emotional, Rational, and Intuitive (Types of Intelligence through HPTD-M).
- Figure 5: Sensation, Feeling, Thinking, and Intuition (Jungian Psychological Functions).

This can also be understood from a **Gray Zones** perspective: There are no exact models to describe human phenomena, only references for understanding the levels of reality to be dealt with.



**Figure 5:** The MBTI System demonstrated through the Quaternary Complementarities and Consciousness Models  
*Source: The HPTD-M framework*

Table 1 completes the quaternary complementarities approach through problem-solving.

**Table 1:** The Quaternary Complementarities for Managerial Problem Solving.  
*Source: The HPTD-M framework*

Jungian Psychological Function	Intuition	Feeling	Thinking	Sensation
MBTI view of the Function	Abstract	Subjective	Objective	Concrete
HPTD-M Type of Intelligence	Intuitive	Emotional	Rational	Empirical
Methods	-	-	Deductive	Inductive
	Synthetic		Analytic	
Synchronicity vs. Causality	Synchronicity		Causality	
Type of Skill	Soft		Hard	
Troubleshooting Requirements	Meaningfulness	Reasonableness	Rationality	Feasibility
Problem-Solving Attributes	Dialectics	Sustainability	Simplicity	Effectiveness

A complete and comprehensive schematic model of problem solving is shown in Figure 5 of the article published in the book *For an International Transdisciplinary Chair*. [20]

Considering the elements of Table 1:

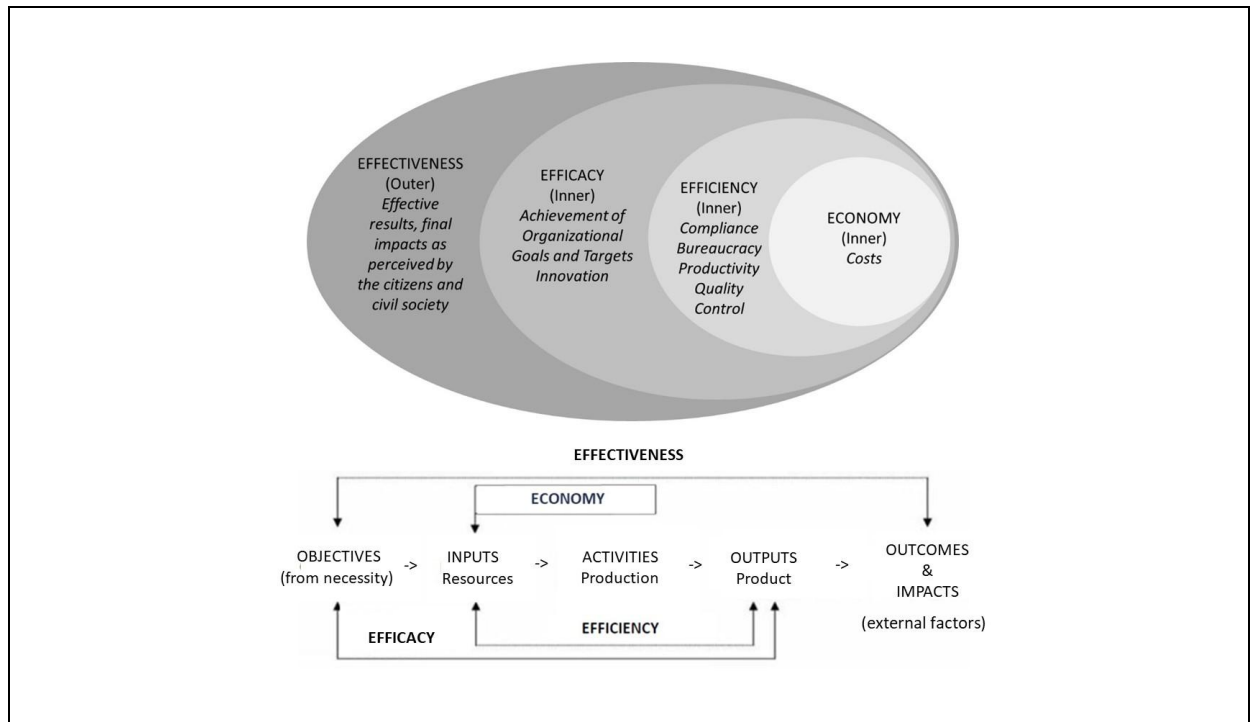
- **Rational vs. Empirical** types of intelligence through **Deductive vs. Inductive** methods: deductive means through published scientific models or deduced modeling, mathematically or rationally. Inductive, in the HPTD-M framework, is related to the process of transforming something mapped empirically and concretely, such as a mechanism or process. As a historical example for illustration: The Romans were very good at empiricism and induction, in engineering and law. However, when they needed mathematics and philosophy for deductive rational models, they consulted the Greeks.

Other examples of the inductive method:

- An engineer, by experience, uses his empirical formula for project sizing, which cannot be deduced mathematically.
- A physician prescribes to his patient off-label medication, given the few calculated side effects and his professional experience in similar/analogous concrete cases.

In another context, some philosophers may also use “inductive” as the process of turning an intuition, insight, or idea, into something rational, like Kekule’s discovery of the Benzene formula through an oneiric image of the Ouroboros.

- **Synthetic vs. Analytic, Synchronicity vs. Causality, and Soft Skills vs. Hard Skills.** Those three approaches are similar, considering i) a dialogue between the synthetic integration and the analytic separation, ii) the meaningfulness of synchronicity and cause-and-effect, and iii) human and technical skills.
- **Troubleshooting Requirements** in the process of problem-solving.
- **Meaningfulness:** The idea needs to make sense before being tested.
- **Reasonableness:** The approach must be ethically acceptable, including the means proportionality, adhering to common sense.
- **Rationality:** The idea needs to be adequate through a logical perspective.
- **Feasibility:** The approach must be concretely viable.
- **Problem-Solving Attributes**, i.e., the features to be addressed in the proposed solutions.
- **Dialectics** (abstract, intuitive, synthetic): through the friction of opposites in a discussion, the abstract idea is polished until it reaches its mature point of realization, given that all actors (stakeholders) must be involved, heard, and not excluded.
- **Sustainability** (subjective, emotional, synthetic): the final balance of economic and environmental resources, considering the sociological realm, and especially human psychological well-being at personal and collective levels (human resources at the personal and organizational levels).
- **Simplicity** (objective, rational, deductive): a consequence of discussions with all stakeholders and studies to transform the complexity of human phenomena into simplicity as the ultimate sophistication, which should not be confused with simplism.
- **Effectiveness** (concrete, empirical, inductive): more than the mere Efficacy of internal results of an organization or the Efficiency of the economy (costs) and conformity of processes (compliance and bureaucracy). Effectiveness means the management results as perceived by civil society: external environment impacts. So, Effectiveness is broader than Efficacy and Efficiency. Economy is part of Efficiency (Figure 6).



**Figure 6:** Effectiveness, Efficacy, and Efficiency in the Organizations through HPTD-M  
 Source: a combination of this author model [42] in dialogue with TCU [44] and ECA [45]

## 10. Management Situations

TD is an emerging perspective for problem-solving tools. The multipolar world faces complex issues that require effective solutions. The mediation of conflicts seems to be beyond the Western idea of globalization, which nowadays tends to be replaced by the multipolar aspects of the local in dialogue with the global. This type of opposites interaction is also applied to smaller organizations in terms of the personal vs. collective levels. The following examples regarding this author's professional experiences can serve as a test for the HPTD-M framework.

### 10.1 International Trading

Exporting eucalyptus charcoal to Europe and the U.S. (1993-2008), using various logistics in 40' containers, i.e., in bulk, big bags, and paper bags. Also, an economic-financial viability project for a charcoal briquettes plant in Brazil was made.

This activity demanded not only technoscientific expertise but also attention to different cultures regarding the countries to which the exports were made. Since it was a small company, this author was in charge, at the same time, of the price budget, logistics, and client assistance when visiting the charcoal production sites. So, the business involved technoscience and culture in the **Gray Zone**.

### 10.2 Urban Development

A Brazilian urban development project that created the district *Vivendas Santa Mônica*, starting from a 170-hectare rural area to a cottage district of 1,100 lots, an economic-financial viability study, business plan, environmental impacts report, law assistance, project approval by the authorities, construction and selling agreements (1996-2002). This means a TD project, involving planning and execution, considering the various disciplines involved. This author was a business partner in the enterprise and participated in technical solutions.

The **Gray Zone** can be understood through technoscience and art for the best engineering and economic-financial solutions involving marketing research. Furthermore, the political challenge of convincing the municipality to approve the project, considering the state guidelines for urban planning and environmental issues. [33]

### 10.3 Public Finance – Brazilian federal funds taxonomy.

The Brazilian Federal Funds are a type of financial resource management. A fund is neither merely a segregated account in the Federal Budget nor a public administration organization such as a department, autarchy, foundation, or state-owned company.

In 2010, there were no federal guidelines for a comprehensive classification, envisaging law bills. Given the complexity, an informal workgroup of public servants helped develop one taxonomy. During the process, this author noticed that participants used the same words to express different meanings. Therefore, the first proposed step was to align concepts before addressing the classification itself.

The result, in 2011, was a comprehensive view of the types of federal funds through a conceptual framework harmonizing Financial Law, Finance, Economics, Federal Budget, Public Accounting, and Fiscal Management. A transdisciplinary diagnosis and a proposal for taxonomy of the Brazilian federal funds as a way of administrating public resources, given the financial law bill to replace the Federal Law 4.320/1964. This author's monograph received an honorable mention in the Brazilian Federal Budget Secretariat context of 2011 [34]. Two more articles with this taxonomy focus (2012 and 2017) were published in the series of texts for discussion in the National Treasury of Brazil, representing only this author's opinion, not necessarily the view of that institution. [35, 36]

Finally, the publications are the result of articulations with public servants from different sectors in an informal workgroup. The first point noticed was the need for conceptual alignment, because different areas were using the same words for different meanings, a **Gray Zone** first step for those works. People from different organizations and cultures may interpret the same word differently.

### 10.4 Public Management – Quality of Public Spending.

Some transdisciplinary tools were proposed in the 2020 book *Public Spending: An Amplified Perspective*, published in Portuguese.[37]

This framework configures an approach for the Brazilian federal administration, showing the trade-off between compliance (controls including corruption prevention) and mismanagement (due to managers' inertia).

A study in Italy published in 2009 concluded that 100% of public spending waste is divided, roughly, into active corruption (17%) and passive mismanagement (83%). The article title: *Active and Passive Waste in Government Spending: Evidence from a Policy Experiment*. [40]

The Brazilian Latin culture, law system, and bureaucracy are similar to the Italian ones. So, the reaction of public managers in Brazil and Italy is supposed to be similar in this context. A Brazilian study was made, based on an analogy with the 2009 Italian article. Excessive bureaucracy, while combating corruption, can demotivate well-intentioned managers and provoke inertia. The results were published in Portuguese through a monograph: *Quality of Public Spending in a Transdisciplinary Approach: A Survey with Managers, Academics, and Auditors in 2020 and 2021*. [41]

Considering this **trade-off** of 17-83 proportion, **benefit-cost equations** were conceived and presented in a 14-hour course for public managers in Brazil [27]:

$$S_{final} = S_{initial} (1 + \Delta S)$$

$$\Delta S = 0.17x + 0.83y$$

Where:

$E_{final}$  = final spending keeping the same quality

$S_{initial}$  = initial spending

$x$  = variable representing the *positive effect*

of control and anticorruption efforts ( $x < 0$ )

$y$  = variable representing the *negative effect*:

inertia, fear, and lack of incentives to be proactive ( $y > 0$ )

**Coefficients 0.17 and 0.83** represent the respective weights on the total spending of 1.00 or 100%, considering countries with similar bureaucracy and culture, based on the **case study in Italy on active and passive spending waste**. [40]

Example: If control and anti-corruption efforts results in  $x = -30\%$  and  $y = 6.14\%$ , what would be the final effect?

$$\Delta S = 0.17 x - 30\% + 0.83 x 6.14\% \sim 0 \quad (S_{final} = S_{initial})$$

This means (x) and (y) are not mutually exclusive. While control measures are beneficial, resulting in positive effect (x), they inadvertently can impose burdens that reduce the public managers' initiative, increasing costs and resulting in negative effect (y). The goodwill managers become afraid of taking initiative and implementing new ideas, due to the risk of being held personally responsible in a bureaucratic context of excessive controls.

Just as a warning: The equation is not a type of advocacy for leaving corruption as it is. The question is how the control mechanisms and corruption prevention need to consider a possible backfire in mismanagement, due to inertia and lack of incentives for goodwill managers. So, bureaucratic incentives for innovation and proactiveness are essential, in dialogue with controls and corruption prevention.

This is a **Gray Zone** when interactions between compliance (controls in excess) and mismanagement (due to inertia) need to be addressed. Those respective proportions of 17% and 83% are only a reference, like a compass. The numbers are not exact, considering the uncertainty of the variables inherent to the complexity of human phenomena. The framework reminds the 85% and 15% proportion of subject and object already seen in Jungian dream analysis, given the complementarity.

### 10.5 TD Mediation

**Gray Zone** problems reflect the need for mediation between opposing points of view. Since 2011, skills of articulation and mediation have been developed, with experience in the public sector coordinating working groups of generalists and specialists, fostering effective problem-solving through the transdisciplinary approach. This was possible as Executive Secretary of the following management boards:

- PIS-PASEP, the management board of a Brazilian workers' savings-account fund (2011–2020).
- CCFCVS, the management board of a Brazilian public special fund for liabilities from subsidies in housing loans: FCVS (since 2022).

Through this experience, four possible dimensions of the manager, mediator, and leader were developed by HPTD-M (Figure 4):

- **Generalist**: an articulator of many **specialists**.
- **Peacemaker**: a facilitator like a **fire extinguisher**, avoiding costs for the organization. The exercise of "**being in another's shoes**", finding an **honorable way out for everybody**.
- **Ghostbuster**, e.g., looking for the "**ghosts**" or problems "**under the carpet**". Developing this expertise includes putting the right people in the right positions for organizational synergy and a healthy psychological environment.
- **Welcoming**: through different forms of intelligence:
  - *Bureaucratic listening (empirical intelligence)*: facts and procedures.
  - *Rational hearing (rational intelligence)*: binary logic and reasoning.
  - *Acceptance (emotional intelligence)*: everybody feels comfortable discussing new ideas.
  - *Integration (intuitive intelligence)*: inclusive, dialectical solutions where everybody feels part of the group.

**Note:** The solution is to **focus on the groups, never taking anything personally**.

## 11. Consulting Prospects and Extension Courses

The widespread use of HTPD-M in consulting activities can be considered in the context of organizational mediation. Shadows damage the healthy collective consciousness from the perspective of psychosomatic engineering. The problems of efficiency, efficacy, and effectiveness can be mapped. This could be operated through two consultants with complementary profiles, like soft and hard, synthetic and analytic, intuitive and empirical, or rational and empirical, so that they could listen to the organization and understand where the bottlenecks are. The operational solutions, however, must come not from the consultants but from the organization members, if they genuinely accept and consciously agree to the points the consultants propose for discussion.

This consulting approach can be completed with extension courses that may provoke insights for the organization's members, including the ones for managerial training. The application of HPTD-M was corroborated by a 14-hour pilot course given in Brazil for the National School of Public Administration (ENAP). The course received positive feedback from the 44-year-old participants (on average), as reflected in the final question of the Reaction Evaluation form: *Considering all aspects evaluated globally, what SCORE would you give to the course/subject on a scale from 1 to 10?* The average score was 8.61 out of 10, very good for a pilot course at ENAP standards. So, the course was successful and well-evaluated by the participants. [27]

## 12. Conclusion

**Scientism** applies only for mechanisms. **Technoscience** involves feedback process between Technology and Science, i.e., systemic processes. **Transdisciplinarity** is the dialogue and integration of Technoscience and other disciplines: A Quaternary Complementarity with Philosophy, Tradition, and Art. **Human complexity** can not be reduced to biological systems or mechanisms for the effect of problem-solving processes. **Numbers and data** out of context do not mean anything, since they are relative in human complexity, like a compass. Troubleshooting requirements of meaningfulness and reasonableness need to be addressed by **understanding, not only knowing**.

Transdisciplinarity implies generalists in effective dialogue with specialists: It is an answer to complexity in managerial problem solving. The management in the Gray Zones, as applied to transdisciplinarity, can show the prolific dialectical process between Included Third Logic and Binary Aristotelian logic. Not necessarily an opposition, given the complementarity principle involving dualities. It is a matter of adequacy, depending on the complexity of the problem to be solved and the nature of its variables: mechanistic (machines), systemic (living systems), or TD (human phenomena).

The HPTD-M is published in six countries and appears to provoke a meaningful dialogue with the works of the six discussed pioneers: Jung, Nicolescu, Weil, D'Ambrosio, Max-Neef, and Loisel. The self-leadership through Jung and the MBTI completes the theoretical part with the problem-solving concepts.

Managerial situations in international trading, urban development, and public management corroborate the application of the theory.

About consulting prospects, organizational mediation and extension courses are promising, including the ones for managerial training. A 14-hour pilot course given to public managers in Brazil was a successful experience, well-evaluated by the participants.

Finally, this framework can help future research in transdisciplinarity, for healthy managerial problem solving in public and private organizations, including universities.

## References

- [1] Jung, C. G. (1961). *Memories, dreams, reflections* (A. Jaffé, Ed.; R. & C. Winston, Trans.; Rev. ed.). Vintage Books. <https://antilogicalism.com/wp-content/uploads/2017/07/memories-dreams-reflections.pdf>
- [2] Jung, C. G., et al. (1964). *Man and his symbols*. Anchor Press. <https://antilogicalism.com/wp-content/uploads/2017/07/man-and-his-symbols.pdf>

- [3] Jung, C. G. (1966). *Two essays on analytical psychology*. Princeton University Press. <https://jungiancenter.org/wp-content/uploads/2023/09/Vol-7-two-essays-on-analytical-psychology.pdf>
- [4] Jung, C. G. (1973). *Synchronicity: an acausal connecting principle*. Princeton University Press. <https://s3.us-west-1.amazonaws.com/luminist/EB/I-J-K/Jung%20-%20Synchronicity.pdf>
- [5] Jung, C. G. (1959). *AION: Researches into the phenomenology of the self*. Princeton University Press. <https://ia800606.us.archive.org/11/items/collectedworksof92cgju/collectedworksof92cgju.pdf>
- [6] CIRET: Centre International de Recherches et Études Transdisciplinaires. (n.d.). <http://ciret-transdisciplinarity.org/>
- [7] Nicolescu, B. (2005). *Transdisciplinarity, past, present and future*. II World Congress of Transdisciplinarity, Vila Velha/Vitória, Brazil. <https://www.tercercongresomundialtransdisciplinariadad.mx/wp-content/uploads/2019/08/Transdisciplinarity-past-present-and-future.pdf>
- [8] Nicolescu, B. (2010). Methodology of transdisciplinarity: Levels of reality, the logic of the included middle, and complexity. *Transdisciplinary Journal of Engineering & Science*, 1. <https://www.atlas-tjes.org/index.php/tjes/article/view/9>
- [9] UNESCO. (1986). *Symposium on science and the boundaries of knowledge: The prologue of our cultural past*. Venice. <https://unesdoc.unesco.org/ark:/48223/pf0000068502>
- [10] Weil, P., Crema, R., & D'Ambrosio, U. (1993). *Rumo à nova transdisciplinaridade: Sistemas abertos de conhecimento [Toward the new transdisciplinarity: Open systems of knowledge]*. Summus Editorial. Published in Portuguese: <https://www.amazon.com.br/Rumo-Nova-Transdisciplinaridade-Pierre-Weil/dp/8532304427>
- [11] D'Ambrosio, U. (2007). *Transdisciplinarity*. CIHR Strategic Training Program, Université de Sherbrooke, Canada. 62 slides.
- [12] UNIPAZ: Universidade Internacional da Paz [International University of Peace]. (n.d.). <https://unipazdf.org.br/>
- [13] Weil, P. (2000). *A mudança de sentido e o sentido da mudança [The change of meaning and the meaning of change]*. Rosa dos Tempos. Published in Portuguese. <https://www.amazon.com.br/Mudan%C3%A7a-Sentido/dp/8501057363>
- [14] Weil, P. (1991). *Organizações e tecnologias para o terceiro milênio [Organizations and technologies for the third millennium]* (2nd ed.). Record. Published in Portuguese. <https://www.amazon.com.br/Organiza%C3%A7%C3%B5es-Tecnologias-Para-Terceiro-Mil%C3%AAnio/dp/8585363282>
- [15] Loisel, P. (2018). Reflections on the Sherbrooke Model and the way forward for work disability prevention. In *The science and politics of work disability prevention* (Chapter 2, 11 pages). Routledge. <https://www.taylorfrancis.com/chapters/edit/10.4324/9780429443398-2/reflections-sherbrooke-model-way-forward-work-disability-prevention-patrick-loisel>
- [16] Max-Neef, M., & Smith, P. B. (2014). *La economía desenmascarada* (1st ed.). Icaria Editorial. Published in Spanish. Sample of 15 pages available at: <https://www.traficantes.net/sites/default/files/pdfs/9788498885576.pdf>
- [17] Max-Neef, M. A. (2005). Foundations of transdisciplinarity. *Ecological Economics*, 53, 5–16. [https://nova.org.za/assets/max\\_neef\\_2005\\_foundations\\_of\\_transdisciplinarity.pdf](https://nova.org.za/assets/max_neef_2005_foundations_of_transdisciplinarity.pdf)
- [18] Costa, L. S. G. M. (2024). Artificial intelligence and the transdisciplinary human mediation of HPTD-M. *Transdisciplinary Journal of Engineering & Science*, 15. <https://doi.org/10.22545/2024/00243>
- [19] Costa, L. S. G. M., & Loisel, M. T. (Eds.). (2024). *Artificial intelligence and human mediation*. ATLAS Publishing. <https://doi.org/10.22545/2024b/B2>
- [20] Costa, L. S. G. M. (2024). The HPTD-M proposal for a TD Chair: A paradigm shift. In *For an international transdisciplinary chair: About the dialogue between culture and technoscience* (pp. 152–200). ADJURIS. <https://doi.org/10.62768/ADJURIS/2024/2/08>
- [21] Costa, L. S. G. M. (2024). The transdisciplinary chair and the mainstream shadow: An analysis starting from the ADJURIS Volumes 1 and 2 through the HPTD-M theory perspective. In *For an international transdisciplinary chair: From knowledge to the future, Volume II* (pp. 137–163). ADJURIS. <https://doi.org/10.62768/ADJURIS/2024/4/10>

- [22] Costa, L. S. G. M. (2022). HPTD-M: The Holopraxis Transdisciplinary Management Theory. *Transdisciplinary Journal of Engineering & Science*, 13, 127–128. <http://atlas-tjes.org/index.php/tjes/article/view/272/229>
- [23] Costa, L. S. G. M. (2023). The mediating manager for effective troubleshooting in organizations: A transdisciplinary view from HPTD-M. *Transdisciplinary Journal of Engineering & Science*, 14. <https://www.atlas-tjes.org/index.php/tjes/article/view/619/342>
- [24] Crema, R. (2024). Understanding: Convergence between knowing and being. In *For an international transdisciplinary chair: About the dialogue between culture and technoscience* (pp. 136–151). ADJURIS. <https://doi.org/10.62768/ADJURIS/2024/2/07>
- [25] Costa, L. S. G. M., & Thieriot, L. M. (2024). Transdisciplinary management and leadership: A new interpretation of the 1994 TD Charter and 1996 Delors Report (UNESCO). Presentation, World Celebration of the 30th Anniversary of the TD Charter. <https://doi.org/10.13140/RG.2.2.24077.76003>
- [26] Costa, L. S. G. M. (2023). A stress test for the HPTD-M transdisciplinarity through alchemical psychology. *Transdisciplinary Journal of Engineering & Science*, 14. <http://dx.doi.org/10.22545/2023/00222>
- [27] Costa, L. S. G. M. (2023). *The mediating manager: A 14-hour course of transdisciplinary tools applied to organizations, based on the HPTD-M theory*. ENAP: Brazilian National School of Public Administration. <https://suap.enap.gov.br/portaldosaluno/curso/2136/?area=16>. English summary and certificate: <http://dx.doi.org/10.13140/RG.2.2.28025.54884>
- [28] Franz, Marie-Louise von & Boa, Fraser (1988). *The way of the dream*. Windrose Films. 9h54min documentary in English available on YouTube: [https://youtu.be/2AGJJ7W\\_XX4?si=YXHqni9XRxfVofea](https://youtu.be/2AGJJ7W_XX4?si=YXHqni9XRxfVofea). Book available in Portuguese at: <https://clinicapsique.com/wp-content/textos/Marie-Louise%20Von%20Franz%20-%20O%20Caminho%20dos%20Sonhos.pdf>.
- [29] Franz, Marie-Louise von (1980). *Projection and re-collection in Jungian psychology: reflections of the soul*. Open Court Publishing.
- [30] FDC - Fundação Dom Cabral (2017). Programa Autoliderança e Gestão: MBTI [Self-Leadership and Management Program: MBTI]. November 29-30, 2017. *Fundação Dom Cabral (FDC)*. Nova Lima-MG, Brazil.
- [31] INSPIIRA (n.a.). O Modelo das Preferências Individuais [The Individual Preferences Model]. <http://inspiira.org/teoria/modelo-das-preferencias-individuais/>
- [32] Cherry, Kendra (2021). An overview of the Myers-Briggs Type Indicator (MBTI). Medically reviewed by David Susman, Ph.D. *Verywell Mind website*. <https://www.verywellmind.com/the-myers-briggs-type-indicator-2795583>
- [33] Costa, L.S.G.M.C. (1996). Vivendas Santa Mônica Project: Urban development applied project which was part of the author's post-graduation degree in engineering economics at the 48th Class of Fundação Dom Cabral (FDC), 1996. <http://dx.doi.org/10.13140/RG.2.2.21666.71368>
- [34] Costa, L.S.G.M.C. (2011). *Fundos Federais: um diagnóstico [Federal funds: A diagnosis: Monograph]*. Honorable mention at a monograph contest from the Brazilian Government: IV Concurso de monografias SOF – Secretaria de Orçamento Federal. <https://repositorio.enap.gov.br/handle/1/4690>
- [35] Costa, L.S.G.M.C. (2012). Uma visão sistêmica dos fundos federais [A systemic vision of Brazilian federal funds]. *Série de textos para discussão do Tesouro TD n. 7/2012*. <https://repositorio.enap.gov.br/handle/1/4268>.
- [36] Costa, L.S.G.M.C. (2017). Fundos federais: Abordagem transdisciplinar diante do Projeto da Lei de Finanças Públicas [Federal funds: Transdisciplinary approach considering the Brazilian federal public finance bill]. *Série de textos para discussão do Tesouro TD n. 29/2017*. <https://repositorio.enap.gov.br/handle/1/4541>
- [37] Costa, L. S. G. M. (2020). *Gasto público: Uma Perspectiva ampliada [Public spending: An amplified perspective]*. Clube de Autores, 225 p. <https://clubedeautores.com.br/livro/gasto-publico>
- [38] Costa, L. S. G. M. (2021). Quality of Public Spending and Transdisciplinarity. *8<sup>th</sup> Annual International Conference on Law and Administrative Justice from an Interdisciplinary Perspective*. Bucharest, Romania. <http://dx.doi.org/10.13140/RG.2.2.23501.72169>
- [39] See Figure 1 of the Conclusion (p. 161) in Costa, L. S. G. M., & Loisel, M. T. (Eds.). (2024). *Artificial intelligence and human mediation*. ATLAS Publishing. <https://doi.org/10.22545/2024b/B2>

- [40] Bandiera, Oriana; Prat, Andrea; Valletti, Tommaso (2009). Active and passive waste in government spending: evidence from a policy experiment. *American Economic Review*, Vol. 99, No. 4, pp. 1278-1308, 2009. <https://www.aeaweb.org/articles?id=10.1257/aer.99.4.1278>
- [41] Costa, L. S. G. M. (2021). *Qualidade do gasto público em abordagem transdisciplinar. Levantamento com gestores, acadêmicos e controladores em 2020 e 2021 [Quality of Public Spending in a Transdisciplinary Approach: A Survey with Managers, Academics, and Auditors in 2020 and 2021]*. ResearchGate. Monograph, 104 p. <http://dx.doi.org/10.13140/RG.2.2.19988.99201>
- [42] Costa, L.S.G.M. (2022). Effectiveness and styles of leadership in Public Management: Quality in the context of transdisciplinary HPTD-M Theory. *Integral Leadership Review*, vol. 22, no. 1, Dec. 2022. <https://ilr.scholasticahq.com/article/57734-effectiveness-and-styles-of-leadership-in-public-management-quality-in-the-context-of-transdisciplinary-hptd-m-theory>
- [43] [Jung, Carl Gustav (1984). *Dream analysis: notes of the seminar given in 1928-1930*. Princeton University Press, 757 p.
- [44] Brazilian Court of Auditors – TCU (2020): *Diagram of Economy, Efficiency, Efficacy, and Effectiveness*. In Brazil, the concepts of efficiency and efficacy are expressly stated in Art. 74, II of the Federal Constitution, in the context of internal controls of federal entities. <https://apoioauditoria.tcu.gov.br/auditoria/auditoria-operacional-2>
- [45] European Court of Auditors – ECA (2023). *Guide to our methodology*. The ECA is the independent institution of the European Union responsible for auditing the EU's finances, ensuring that public funds are properly accounted for and used in terms of Economy, Efficiency and Effectiveness. The concept of Efficacy is not considered. [https://www.eca.europa.eu/Lists/ECADocuments/ECA\\_methodology\\_guide/ECA\\_methodology\\_guide-EN.pdf](https://www.eca.europa.eu/Lists/ECADocuments/ECA_methodology_guide/ECA_methodology_guide-EN.pdf)