

Evaluation of Quality of a Project Management & Scientific Publications Based On a New Wisdom Framework

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Abstract - This is a theoretical research paper. It presents a proposal for the evaluation of the quality of a project management based on a new and 'General Cognitive Model of Wisdom' -GCMW-. For the development of this GCMW, is proposed the conception of an 'Information Ecosystem' -IE-, which is composed by the following 'cognitive units': Data -D-; Information -I-; Knowledge(tacit, explicit) - $K^{(tacit, explicit)} = (K^{t,e})$ - and Wisdom(tacit, explicit) - $W^{(tacit, explicit)} = (W^{t,e})$ -, compactly written as $DIK^{t,e}W^{t,e}$. By aligning this IE with the DIKW hierarchical conception, we have created a new, no hierarchical, integrated and generalized framework -the GCMW-. This GCMW framework aims -as an insight generator or strategic foresight- to provide a better assessment to different problems in any field of science, from information science, applied researchers or a more general audience as per example, to point out the theoretical and conceptual bases for the interaction between the project manager and this GCMW framework. It is introduced a new set of logical -general-, definitions for the DIKW to instrumentalize the GCMW framework.

Finally, based on the GCMW framework, we have proposed a 'Particular Cognitive Model of Wisdom' -PCMW- for paper quality evaluation. Aiming at to build a comprehensive and in-depth evaluation of the quality of any scientific production, is derived from the GCMW framework a new no-hierarchical model -the PCMW framework- and a new set of logical -particular-, definitions for the DIKW are introduced to instrumentalize the PCMW towards paper quality assessment. This particular framework should provide -for any paper being written-, a better assessment and insight generator. By last, as we are admitting that any paper published has quality so; the proposal is, the quality of this paper is complete if -and only if-, the paper has also W. Both, the PCMW and the particular DIKW instruments definitions, are necessary and sufficient conditions for guaranteeing -guiding- if the paper -which is in evaluation-, has W.

Keywords-General & Particular Wisdom Frameworks; Cognitive Models; Decision Making; Scientific Publication Evaluation; Ecosystem; Quality Indicator

I. INTRODUCTION

This is a theoretical research paper proposal regarding the - 'assessment of the quality of a project management and scientific publications based on original models, The Wisdom Frameworks. As described in the abstract, in this theoretical research paper we are presenting these two new models 1) and 2):

Model 1). - Proposal Framework for project management or project writing: A new **General Cognitive Model of Wisdom -GCMW-**, and, a new set of generalized logical definitions for the **Cognitive Units -CU- Data -D-, Information -I-, Knowledge -K- and Wisdom -W-** (DIKW), and,

Model 2). - Proposal Framework for Paper Quality Assessment: A new **Particular Cognitive Model of Wisdom -PCMW-**, and, a new set of particular logical definitions for the CU DIKW.

Before advancing and broadening the concept within Models 1 and 2, it is necessary to clarify -as showed in table I- that: a) - Wertheimer (1958)¹, was the first to describe "...cognitive units as 'elements' of cognition...". b) - Zeleny (1987)², was the first to describe the hierarchical elements "DIKWE", c) - Ackoff (1989)³ was the first to present a hierarchical model for

the elements "DIKUW" and, finally d) - Targowski (1990)⁴, the first to call these hierarchical elements "DICKW" as CU. In this paper, we are the first to propose -based on the conception of an Information Ecosystem-, the existence of a new no hierarchical and generalized framework composed by the cognitive units -CU-, DIKW. This new framework aims - as an insight generator or strategic foresight- to provide a better assessment to different problems in any field of science, from information science, applied researchers or a more general audience as per example, pointing out the theoretical and conceptual bases for the interaction between the project manager and this GCMW framework

As these Models 1 and 2, have not been proposed in the literature earlier so, as a starting point for this theoretical research paper it is worthwhile to present how this set of four elements -DIKW-, are supposed to come to existence. At first, in this introduction, we are looking at DIKW from the following point of view:

- briefly at **each element** D, I, K and W and,
- thoroughly at the **whole** DIKW set, the pyramidal or hierarchical relationship among the elements DIKW -models- found in the literature.

a) - **Each element-D, I, K, W-**. In according to Dictionay.com¹ as well with ‘Faucher, Everett & Lawson’⁵, D, I, K and W come to existence as: “wisdom is the oldest of these fourterms -year 888-, followed by knowledge -year 1300-, information -year 1386- and, data the latest -year 1646-”

b) - **The whole DIKW set.** As presented in table I, the current literature is replete with similarities among the elements DIKW which have, traditionally, been placed into a hierarchical or pyramidal order i.e., D (in the bottom) to W (in the top). By considering the scope of 20th - 21st centuries, it follows how this set DIKW were supposed to come to existence:

1929 - Einstein⁶. As far as this research point out, Einstein had been the first to present some kind of correlation involving K and imagination², i.e., “Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world” - Einstein⁶. After Einstein we could infer the relationship among DIKW could be proposed in any moment between the 20th-21th centuries, since -as explained before- the individual concepts for D, I, K and W do exist since the years 1646, 1386, 1300 and 888, respectively.

1934 - T.S. Eliot: *apud*Hey⁷, *apud* Rowley⁸, *apud* Burgin⁹ and *apud* Warm¹⁰. According to Hey⁷, T.S. Eliot “was the first to provide insight into the complex conceptual structures regarding information, knowledge and wisdom”. The poet Eliot wrote in ‘The Rock’ (1934), the first well-known correlation involving the elements IKW: “Where is the life we have lost in living? Where is the W we have lost in K? Where is the K we have lost in I?”

1956 - Bloom¹¹. He proposed the taxonomy of educational objective -known as Bloom’s Taxonomy-, by presenting in hierarchical order of cognitive complexity, starting with K -a lower order thinking skills-, and ending in evaluation -a higher order thinking skills-. Latter, ‘Bierly, Kessler and Christensen’¹² applied this taxonomy to develop the hierarchical elements DIKW.

1982 - Cleveland¹³ introduced the hierarchy ‘IKW’.

1982-2014. Table I presents several authors that have considered at least three of the hierarchical or pyramidal elements DIKW:

TABLE I. Chronological Order [1982-2014] for disclosing the set DIKW. In this table, the publications marked with ‘✓’ -majority -, presents the four elements -levels- DIKW. Cleveland (1982)¹³ and Case (2012)¹⁴ do not consider in their studies D and W, respectively. Zeleny (1987)³, the first to discuss the DIKW hierarchy, proposes an additional level, “enlightenment” -E-. Ackoff (1989)⁴, the first to present a

¹Retrieved from Dictionary.com <<http://dictionary.reference.com/>>

² Imagination is ‘one of the principles’ used in the PCMW - Methodology.

hierarchical model for DIKW, proposes an additional level, “understanding” -U-. Targowski (1990)², the first to call DIKW as a hierarchy of Cognitive Units -CU-, proposes an additional level, “concepts” -C-. The publications marked ‘X’ do not consider the extra levels C, U or E.

YEAR - AUTHORS	1982 - Ref. 13	1987 - Ref. 3	1989 - Ref. 4	1990 - Refs. 2 and 15-17	2000 - Ref. 12	2004 - Ref. 18	2004 - Ref. 19	2006 - Refs. 8, 20 and 21	2008 - Ref. 22	2009 - Ref. 23	2009 - Ref. 24	2010 - Ref. 25	2012 - Ref. 26	2012 - Ref. 14	2013 - Ref. 27	2014 - Ref. 28
	CU - COGNITIVE UNITS															
D *	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
I *	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C *	X	X	X	✓	X	X	X	X	X	X	X	X	X	X	X	X
K *	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
U *	X	X	✓	X	X	X	X	X	X	X	X	X	X	X	X	X
W *	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓
E *	X	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Where:

CU: Cognitive Units	Cognitive Units -CU-: Wertheimer (1958) ¹ was the first to describe “cognitive units as ‘elements’ of cognition, in terms of which any given way of cognizing something may be described”. Targowski (1990) ² was the first to call DICKW as CU. In this research paper we are keeping the denomination CU for any elements presented in this table. However, it is clear from the table I that no one proposed an interrelationship between the CU DIKW, as we presented in this research paper.
*	D: Data; I: Information; C: Concepts; K: Knowledge; U: Understanding; W: Wisdom; E: Enlightenment.

This research paper does not discuss the reasons for the existence of the extra levels E, U and C presented in Table I since we have not considered –or used- them in these models: The Frameworks GCMW and PCMW. Anyhow, ‘Bellinger, Castro, and Mills’¹⁹ stated his contend against the extra level ‘U’ presented by Ackoff⁴. Rowley²⁰ after has examined the presence of DIKW in a number of widely read textbooks and papers, stated there is a consensus among authors that “the hierarchy or pyramid models” does not take into consideration the existence of an extra level. She wrote:

[DIKW], referred to variously as the ‘Knowledge Hierarchy’, the ‘Information Hierarchy’ and the ‘Knowledge Pyramid’ is one of the fundamental, widely recognized and ‘taken-for-granted’ models in the information and knowledge literatures. [...]. (Rowley²⁰).

Both statements –‘Bellinger, Castro, and Mills’¹⁹ and Rowley²⁰- are in agreement with the majority of the results presented in table I. Many others references cited in this research paper -and not inserted in the table I- also present the four ‘DIKW’ hierarchical Cognitive Units -CU-. Therefore, in this research paper we are considering the **hierarchical model composed by DIKW**, which is majority of publications as shows table I. From the alignment -coupling- of the fundamental DIKW hierarchical model -table I-, with the conception of “information ecosystem -IE-”, composed by “D, I, K^(tacit, explicit) -(K^{t,e})-, W^(tacit, explicit) -(W^{t,e})-” = DIK^{t,e}W^{t,e}, we

created an **integrated and no-hierarchical model, The GCMW Framework**. This aligned ecosystem $DIK^{t,e}W^{t,e}$ i.e., the no-hierarchical GCMW framework -for project management or project writing-, is a graphical analogous model -of easy visualization-, and it is presented in the Theoretical Foundation Section. So, the differential of this paper regarding all publications about DIKW -table I-, is the interrelationship proposed among the cognitive units - $DIK^{t,e}W^{t,e}$ -, and the creation -with reasonable arguments-, of a generalized, no-hierarchical GCMW, which no one have done before.

From the GCMW to the PGCM.

By applying specific contour conditions in the no-hierarchical GCMW framework -and in its new general logical definitions for the instruments DIKW-, we migrate to a no-hierarchical PCMW. As detailed in the Methodology Section, this PCMW & the new particular logical definitions for the instruments DIKW we must apply -to use-in the evaluation process of the information quality of a scientific publication.

Finally, as no one have proposed this network of interactions among $DIK^{t,e}W^{t,e}$ so, we do have a paradigm shift i.e., we believe we do have a simplified framework -The GCMW- which must bring a plus vision for scientific researches, projects writings and public policies. **If so**, aiming to advance knowledge and understanding, both models -the GCMW framework (the aligned $DIK^{t,e}W^{t,e}$) as well the PCMW- must be made available for the scientific communities, managers and public policy makers, which are invited to add their contribution.

By last, one fundamental question: “what are the justificative for the creation of this model, The PCMW Framework, aiming at evaluation of quality of scientific publications?”

This PCMW Framework may be justified by the need to build more frequent, comprehensive and in-depth evaluations about any scientific production. ‘Fortier, Doiron, Burton and Raina’²⁹, to discuss how to obtain quality and applicability to harmonize the consolidation of the avalanche of D and ‘I’ in the area of epidemiology, propose the standardization of metrics and procedures and a more flexible harmonization approach:

This requires the scientific community -or partner studies fostering data synthesis- to agree on a common set of measures and use identical information collection tools and procedures to collect and generate data in each study. (Fortier et al²⁹).

The proposition of Fortier and colleagues demonstrates the concern which are showed in several areas of K regarding the need of a directive for the academic research and filtering of D. The process of measuring the reach of an academic production or a scientific action through indicators of performance is controversial when it is univocal. According to Brisolla³⁰, a researcher who participated in a pioneering FAPESP initiative regarding the production of detailed indicators aiming to subsidize the public policies in the sector for the San Paolo State, revealed the ‘philosophical problem’ faced at that time:

“will be possible to construct indicators that express, with some level of reliability, the reality which these indicators are assumed to represent?” i.e.: “how can be possible to establish

cause-and-effect relationship -CER- between a scientific and technological activity and the socioeconomic impact it causes? Are there indicators that can give account of this process?” - And quoted Cozzens³:

There are some threats that one must avoid when making assessment studies. The first is regarding to the temptation to manage the policy of a research financial support on the basis of a pre-established socio-economics objectives, when the management of the resources for a financial support of a research should be evaluated as such, by its own goals i.e., by the research objectives.

Brisolla also alleged that:

It is very difficult to directly measure the socio-economic outcomes from a research system and, so, to be able to assess this economic effectiveness from this research system it is necessary to check how much of the desired result directly aimed by research has been reached, such as: by human resources training, scientific publication and patents creation. (Brisolla³⁰).

Next, we present the sections included in this paper.

Section 2. Presents the ‘Theoretical Foundation’, which is the conceptual basis for the IE towards the GCMW framework -the interrelationship proposed among the cognitive units $DIK^{t,e}W^{t,e}$ -, and the creation of an original generalized, no-hierarchical GCMW-. The CER arguments presented reinforce the GCMW framework.

Section 3. Presents the ‘Methodology: The Cognitive Method’ which introduces the new PCMW & the new set of logical definitions for ‘DIKW’ to instrumentalize the model towards paper quality assessment. Discuss the challenges faced regarding the implementation of the PCMW & the quality of information.

Section 4. Presents the ‘Research Perspectives and Expected Contributions’.

Section 5. Presents the ‘References’.

By last, this is a theoretical research paper regarding the evaluation of project management/writing based on the GCMW and, its derived model, the PCMW, which aims paper quality assessment. These models do not seek to provide the definitive analysis regarding project management/writing or paper quality evaluation, but indeed looks for to share with the research community the news proposed models -GCMW and PCMW-. The goal of this proposed research paper is to open the debate, promote reflection, and to capture the interest of others to add their improvements in both models.

II. THEORETICAL FOUNDATION.

Today is even more worthy to pursuit W! We are so deeply rooted in the D and ‘I’ paradigm that we forget “the integration of [CU DIKW] represents an ever ascending,

³ Cozzens, S. (1995). Assessing fundamental research: ten ways to get it wrong. *Simpósio Farmacêutico de Smithkline Beecham*. Cambridge, UK.

integrated whole, worthy of pursuit toward [W] [...]” (Lombardo³¹). This integration of DIKW encompasses the conception of network of interaction, presented in the next section as ‘The Information Ecosystem’ -IE-.

II.A. The information ecosystem -IE-

According to Schulze, Ernst-Detlef 2005, *apud* Wikipedia³² “Ecosystems are defined by the network of interactions among organisms, and between organisms and their environment”.

Information Ecosystem -IE-: comprises the network of interactions among the following CU: D, I, K(*tacit, explicit*) and W(*tacit, explicit*) or, respectively represented by D, I, K(*tacit, explicit*) ($K^{t,e}$) and W(*tacit, explicit*) ($W^{t,e}$)” or, compactly by:

$DIK^{t,e}W^{t,e}$

Where: **D**: Data;

I: Information;

K^t: tacit Knowledge;

K^e: explicit Knowledge;

W^t: tacit Wisdom, and

W^e: Explicit Wisdom.

Definition of IE. By quoting and adapting ‘Balloni, Azevedo and Silveira’³⁴, we can rewrite the following definition for IE:

[The integration of the above CU] represents an expanded vision of an ecosystem that aims to recognize these actors [$DIK^{t,e}W^{t,e}$] -and their interrelationships-, which are the formative elements of an information ecosystem. This expanded vision [- $DIK^{t,e}W^{t,e}$ alignment-] is necessary for building [and laying the foundations of a specific model -framework- for this IE, i.e.: the alignment of $DIK^{t,e}W^{t,e}$ creates the GCMW framework]. [...] (Balloni, Azevedo and Silveira)³⁵.

Note 1: this IE do not represent any hierarchical or pyramidal model. It is in constant interaction with Information Technology -IT- and with the ‘Human Being Cognition’ -HBC- i.e., quoting and adapting the cognition definition from The American Heritage® Science Dictionary, ‘Human Being’ -HB- “cognition is the mental process of knowing, including perception, reasoning, and judgment [that lead to the awareness or consciousness of the ‘world around us’] [...]”. (Cognition³³).

Next, we present a ‘**simple -but necessary-**’ discussion regarding each element $DIK^{t,e}W^{t,e}$. ‘Simple’ because as we advance towards the development of the GCMW framework, a generalized and logical definition for those CU will be presented. ‘Necessary’ because it is an introduction to the definition of DIKW -mainly the presentation of what we call as **Mnemonics Definitions -MD-**.

D. According to ‘Davenport and Prusak’³⁵, “D is a set of discrete, objective facts about events. In an organizational context, data is most usefully described as structured records of transactions”. D without context is meaningless.

MD example for D: If we say ‘123456789’ (Conger and Probst)²⁸, what that means? Means nothing! These numbers have not a context. The event that concerns these numbers have not contextualization.

I. According to Drucker³⁶, “‘I’ is data endowed with relevance and purpose -information has meaning-”.

MD example for ‘I’: is the contextualization of the numbers “123456789” presented -above- for D (Conger and Probst)²⁸ i.e., by informing those numbers represent an ‘Identity Card’ -IC- so, you do have ‘I’. Therefore, when applying our experience on those numbers i.e., on the ‘I’, we may create a K.

K. By quoting and adapting Smith³⁷, we have:

Tacit Knowledge -K^t-: practical, action-oriented K or ‘know-how’ based on practice, acquired by personal experience, seldom expressed openly, often resembles intuition [since it is part of human mind] and,

Explicit Knowledge -K^e-: academic K or ‘know-what’ that is described in formal language, print or electronic media, often based on established work processes, use people-to-documents approach [and, as such K^e is designed for sharing]. [...] (Smith³⁷).

A MD for K^{t,e} within the point of view of an Identity Card -IC- is: with an IC we may conclude -per example-, we are eligible to borrow money in a bank. Once we have formalized the borrowing process we do have a K^e. We may also imagine what other application carried out with that IC -and that imagination is K^t. So, K delivers all you do need for a final action and, whichever K we consider -K^e (formalized decision making -designed for sharing-) or K^t (still envisioned decision making -part of human mind-), the way or how we are going to apply any borrowed money must be a wise decision making -so, it involves W-.

W. MD: keeping in mind the information written -above-, for K^{t,e} & IC; we may state that once you know you may borrow money (be this borrowing process through a bank -K^e process-, or another imagined borrowing process or situation where you may use the IC -K^t process), you must make the wisest decision-making. So, aiming at the wisest decision you should ask the following question when borrowing money: Do I need to borrow money? Which should the wisest investment be? What to buy? A house? A new kitchen? A yacht? A new car? Vacations? Other envisioning?

Anyhow, a no wise decision making you may do, you will pay the price.

Wis a context dependent CU which involves ultimate action towards a decision-making. W may be explicit i.e., W^e is clearly manifested through the wisest action -you made the decision to invest the borrowed money by buying a yacht-! Or W may be tacit, i.e., W^t it is part of human mind since it could only be visualized as another -and wise- possible decision making rather than investing the borrowed money to buy a yacht.

As W involves ultimate action towards a decision-making and, in according to Targowski³⁸ “wisdom is not found in Knowledge”, so W implies in correct judgment. Then, this ultimate action towards decision-making such as -“Do I need to borrow money? Which should the wisest investment be? What to buy?” - must be ballasted by a philosophical definition of W. Next follows a couple of philosophical definition of W:

• W is the capacity to put in action an acquired knowledge. This action implies in correct judgment and requires the understanding of the coupling of knowledgewith the following

principles ‘Competence, Prudence and Imagination’ -CPI-⁴ before an ultimate action towards a decision-making. (Source: paper authors).

- “Wis the most essential virtue of man -is good judgment and choice in the context of the art of living-; and so, it is the most important intellectual resource, determining the earthly success of the human species”. (Targowski¹⁶).
- “W is the highest level of abstraction, with vision, foresight, and the ability to see beyond the horizon”. (Awad and Ghaziri)¹⁸.
- Others philosophical definitions of W are find in these references: Rowley²⁰, Lombardo³¹, ‘Birren and Fisher’⁴².

This section presented the IE definition and the MD for DIKW. Next section we present the interrelationships among the CU of this IE aiming to build the foundations for the GCMW.

II.B. Interdependent and intertwined character among the cognitive units of the IE -DIK^{t,e}W^{t,e}-.

The interrelationship among the CU of the IE -DIK^{t,e}W^{t,e}- is a dynamic process and this IE do not represent any hierarchical or pyramidal model. This IE is in constant interaction with both IT and the HBC. The alignment of this IE creates the GCMW framework. Based on the information available in the literature, we represent this dynamic process among the CU - The IE- as follows:

- A) - W^{t,e} may become K^{t,e};
- B) - W^{t,e} may become ‘I’ and,
- C) - The intertwined character of DIK^{t,e}W^{t,e}.

A) - W^{t,e} becoming K^{t,e}: we must consider -besides the MD for DIKW presented in the section 2.1-, the following three approaches -A1, A2 and A3-:

A1) - According to Polanyi, 1976 *apud*: Sternberg⁴³⁻⁴⁵ and ‘Shavinina and Ferrari’⁴⁶, “the notion of W starts with the construct of K^t about oneself, others, and situational contexts”. According to our reasoning, the above ‘situational context’ is the external or internal ‘Situational Human Being Contexts’ - SHBCo-.

A2) - According to Targowski¹⁶, “W is dependent on time”. This means what today is W may, through the time, become ‘I’, which is in also according to Targowski¹⁶ affirmation, “semantically W is the highest form of information”-, or -still through the time- W may become K, which is in according to Esaki, as follows:

A3) - According to Esaki^{47, 48 and 49(a,b)}, “when we are able to explain others what wisdom is, then wisdom changes to

⁴Competence: “Competence is the ability to do something well or effectively.” (Competence³⁹).

Prudence: “Prudence is care and good sense that someone shows when making a decision or taking action.” (Prudence⁴⁰).

Imagination: “the faculty of producing ideal creations consistent with reality. The ability to face and resolve difficulties” (Imagination⁴¹).

knowledge”. This means we may recognize W –to make it clear, please, see discussion about MD of W in the section 2.1 regarding W^e and the yacht buying process...-.

Based on these three approaches (A1, A2, A3), we are asserting W can be tacit -W^t- or explicit -W^e-. Yet, the following two situational contexts -supported by the A1, A2 and A3 approaches- regarding W^{t,e} becoming K^{t,e}-, gives support to the above assertive. See:

In order to W^{t,e} to become K^{t,e}, it depends from the external or internal ‘Situational Human Being Contexts -SHBCo-’ and from the following ‘IF Condition’ -IFC-: let’s suppose what could happen when you read a text -per example a scientific paper or a project- as explained next, in the IFC1 and IFC2:

IFC1. If W is explicit in this text being read, W^e is clearly manifested in the text -a yacht was bought- i.e., external SHBCo, approach A1-, so we could have -through the time, the approach A2- this manifested W^e being transformed in K^e. Yet, when this same W^e can be explained to someone –see approach A3-, so W^e also becomes a K^e. Otherwise;

IFC2. If the W is tacit in this text being read, W^t is part of human mind since only may be perceived from the underlines of the text being read i.e., another visualized perception- so, W^t is not clearly stated in spite of being in the text being read i.e., could be perceived only by a specific internal SHBCo - approach A1-. In such situation, W^t may, through the time – see approach A2-, be transformed into a K^t. Yet, when this same underlined -perceived- W^t can be explained to someone, it also becomes a K^e –see approach A3-.

Further, when there is the existence of underlined W in the text -the W^t-, it is in such situation that may occur the triggering for new scientific accomplishments or discoveries. This may be understood by considering that our internal SHBCo is non-obvious i.e., W^t may be transformed either in K^e as K^t. This ‘internal SHBCo’ is the context in which the HBC is exposed! “*Scientia potentia est*”⁵.

From IFC1 and IFC2 we assert: W may be W^t or W^e and W^{t,e} may become K^{t,e}.

B) -W^{t,e} may become ‘I’-. How do we conclude this? Based on: the MD definition of ‘I’ -and how K is created based on this ‘I’-; on the definitions of and K^{t,e}; in the discussion presented in ‘item A) -W^{t,e} becoming K^{t,e}-, and also by considering the following supporting B1, B2, B3, B4 and B5 approaches:

B1) - According to Sternberg⁴⁴, “W is defined as the application of K^b”. We could rewrite this as W^{t,e} is the application of K^{t,e}. Why? Because from A) we have W^{t,e} may become K^{t,e} and, from the MD about W we have W^e is manifested through the wisest action -we bought a yacht- and, finally, W^t is another -still visualized- wise possible and different decision making rather than to buy a yacht. From the MD about K, we may write K^{t,e} delivers all you need for a final action towards W^{t,e}.

B2) - According to ‘Tang et al’⁵⁰, “K^e that is codified is therefore available as information”. In according to Bocij et al 2003, *apud* Rowley²⁰, “K^e can be recorded in Information

⁵ Knowledge is power. From Wikipedia, the free encyclopedia. Retrieved from <<http://goo.gl/zeqRGv>>.

Systems -IS-” and, in according to Balloni⁵¹ “once K^e is recorded in a IS it becomes in information”.

B3) - According to: Zeleny⁵², and Heskett, 2002 *apud* ‘Faucher, Everett, and Lawson’⁵, “D and ‘I’ are explicit”.

B4) - According to Fricke²⁴, “K^e and ‘I’ are synonymous. K^e and ‘I’ collapse into each other”.

B5) - According to Targowski¹⁶, “W is the highest form of ‘I’”. We may rewrite this as W^{te} is the highest form of ‘I’. This assertive comes from the discussion in the item A) -W^{te} may become K^e- and from the approaches B2 and B4, K^e codified is ‘I’ –self-collapse-.

We may assert W^{te} may become I.

Note 2: Considering:

1. The IE definition and the MD of DIKW –section 2.1-;
2. The remarks presented in the items A) and B) –section 2.1.1;

3. And by quoting and adapting ‘Saab and Riss’⁵³, “...different levels of the [DIKW hierarchy]are intertwined in the process of making meaning [...]”, we can assert there is a possibility of a never ending cycle of stimulus in the HBC due to the intertwined character of DIK^{te}W^{te}, i.e.:

C) - the intertwined character of DIK^{te}W^{te}-. Based on the above A) and B) discussions, it follows the conclusions for this section 2.1.1:

. W^{te} may become K^{te};

. W^{te} may become ‘I’;

. K^{te} may become W^{te};

. K^{te} may become ‘I’;

. ‘I’ may also become K^{te}: we may apply our human experience on this ‘I’, creating K^l -part of human mind- or creating K^e -designed for sharing-. See definitions of ‘I’, K^l and K^e;

. ‘I’ may become W^{te}: which is in according to Awad –see section 2.1-, “...wisdom is the ability to see beyond the horizon” (Awad and Ghaziri)¹⁸, and,

.D may become W^{te}: which is in according to Awad –see section 2.1-, “...vision & foresight...” (Awad and Ghaziri)¹⁸. However, W^{te} never becomes D. Why? Because -as definition of D & W-, Wis context dependent and D has no context.

These conclusions are also in according to ‘Faucher, Everett and Lawson’⁵ “There is no hierarchy among DIKW. One does not need to obtain them in a specific order. Depending on the situation, one may not even need to have all of them”. Similarly, Hey⁷ when writing about the hierarchy DIKW, stated “this hierarchy also suggest that one can affect the other and even can be changed into another”!

Finally, last remarks -after all explanations in this section-: as the network of interactions -the IE DIK^{te}W^{te}-, is a dynamic process in constant interaction with IT and HBC, then, it is presented -next section-, The GCMW Framework aiming a concluding generalization.

Note 3: the never ending cycle of stimulus in the HBC occurs due to the interdependent and intertwined character of DIK^{te}W^{te} regarding the achievement of W -network of interactions, the IE-.

II.C. Framework: The General Cognitive Model of Wisdom -GCMW-

In this section we present the GCMW which “surely, just as in any model of social or even technical (physics, chemistry, and biology) sciences is a simplification of reality, but thanks to the modeling of reality we are able to inquire into its essence better”. (Targowski¹⁶). The point: all models may evolve! Take as example the timeline for the atomic models:

- 2400 years ago: Democritus⁶, named the smallest piece of matter as “atoms”, meaning, “not to be cut”;
- 1803: Dalton presents his model, which led to acceptance of idea of atoms;
- 1897: Thomson’s Plum Pudding Model⁷, provided the first hint that an atom is made of even smaller particles;
- 1908: Rutherford Model⁸ of a nucleus and electrons;
- 1913: Bohr Planetary Model⁹, electrons move in definite orbits around the nucleus, much like planets circle the sun;
- 1924: Louis de Broglie Quantum Model¹⁰, developed the theory that particles have wave properties;
- 1932: James Chadwick¹¹, discovered the neutron
- 1966: Lise Meitner¹², discovered nuclear fission.
- “The Cloud Model, which is now in force, has been developed by a number of authors since the 1950s”. (Targowski¹⁶).

By the same line of reasoning, we hope our GCMW Framework -represented in this section by the figure 1- and, as well the PCMW -represented the section methodology by the figure 2-, both with its new logical definitions for the instruments DIKW could pass through similar unfolding.

II.D. The General Cognitive Model of Wisdom –GCMW-

Based on the following I), and II) conceptions:

I) Section 1: The DIKW hierarchical or pyramidal model as described in Table I.

II) Section 2.1 –and 2.1.1-: The IE & the intertwined character of DIK^{te}W^{te}

Mixing both above conceptions, we have created a new and generalized model for the Wisdom Theory -figure 1-.

⁶ Everything You Need to Know The History of Atomic Theory. Retrieved from <<http://goo.gl/5MMB6H>>. <http://pt.slideshare.net/jane1015/atomic-models-everything-you-need-to-know>

⁷ Thomson’s Model. Retrieved from <<http://goo.gl/gEogB>>

⁸ Rutherford Model. Retrieved from <<http://goo.gl/jeBVe>>.

⁹ Bohr Model. Retrieved from <<http://goo.gl/Xgof>>

¹⁰ Louis de Broglie, Samantha and Harm. Retrieved from <<http://goo.gl/TxnGfc>>.

¹¹ JAMES CHADWICK. RETRIEVED FROM <<HTTP://GOO.GL/MNT20P>>

¹² LISA MEITNER. RETRIEVED FROM <<HTTP://GOO.GL/MNT20P>>

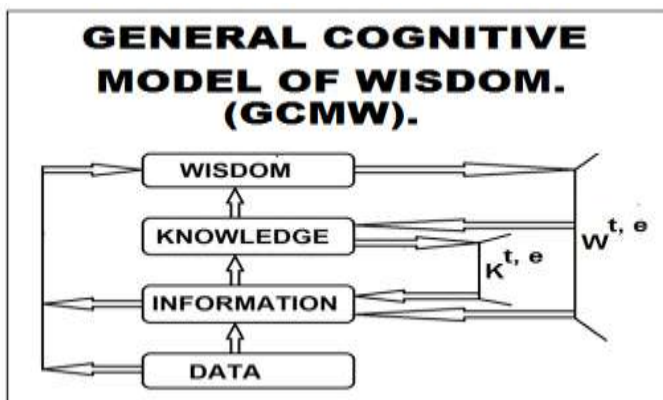


Figure 1. The interdisciplinary and integrated approach for the no-hierarchical GCMW Framework. The networks of interactions in the IE are intertwined and interdependent regarding the achievement of W.

The figure 1 is a graphical analogous model to assist a decision-making process in a project management through the simulations of ‘what if’ scenarios (Model⁵⁴). This GCMW framework is proposed to act as ‘insight generator or strategic foresight’* towards scientific discoveries, projects writings or improvement of the objectives and public policies, and, consequently, improving the ROI to the society.

* Strategic foresight is the ability to create and maintain a continuous high quality, coherent and functional forward view, and to use the insights arising in useful organizational ways. For example to detect adverse conditions, guide policy, shape strategy, and to explore new markets, products and services. It represents a fusion of futures methods with those of strategic management. (Slaughter⁵⁵).

Finally, let’s analyze ‘step by step’ the figure 1 and present -add- news arguments regarding the interdependent and intertwined character of DIK^{t,e}W^{t,e}. As discussed in the section 2, as we advance towards the development of the GCMW framework, it is needed a final and generalized and logical definitions for those Cognitive Units -CU-. The Mnemonics Definitions -MD- for DIKW are valuable for a better contextualization process of the GCMW -figure 1- in regarding to the following -news and generals- DIKW definitions:

D: “Is [a cognitive unit -CU- of] raw facts” [which is not a function of context] [...]”. (Case¹⁴). In the figure 1, D may trigger W, as presented in the section 2.1, item C.

On the other side, W may not triggers or becomes D: W “is a pragmatic¹³ cognitive [and context dependent] unit [...]” (Targowski³⁸), which involves ultimate action towards a decision making; D is not a function of context and it is not a pragmatic unit since it involves only measurements of raw facts. Therefore, D may trigger W and never vice versa!

I: “It is a comparative [and pragmatic] CU [...]”. (Targowski³⁸). It is “context dependent” (Case¹⁴). Therefore, by the same reasons presented for D, ‘I’ may also trigger W -section 2.1, item C-.

However, ‘I’ never become a D. Why? Because D is not a function of context and ‘I’ is context dependent. Furthermore, in according to Fricke²⁴, “information is irreducible to data”.

¹³ Pragmatic: practical, such as a solution that is attainable and focused on factual information. (Pragmatic⁵⁶)

K: “is a reasoning¹⁴ [and pragmatic] CU [...]” (Targowski³⁸), dependent from external or internal HB context -see section 2.1, item A-. K also never become a D. Why? Because D is not a function of context and K is context dependent.

K^{t,e}: besides of the definitions presented in the section 2.1, we should also emphasize when K^e is delivered (told or written) it becomes an ‘I’: when you tell someone something, you give them ‘I’ which may -or not- create new K^{t,e}.

W: is a “pragmatic cognitive [and context dependent] unit [which involves ultimate action towards a decision making] [...]”. (Targowski³⁸). See section 2: a no wise decision making and you pay the price.

W^{t,e}: finally, by considering the definitions for DIKW presented in this section 2.2, we may affirm W may become K and, also may become ‘I’ -we must emphasize what today is W may, through the time, become an ‘I’ or K-. See items A), B) and C), section 2.1.

We have an interdependent and intertwined character of the IE (‘D’IK^{t,e}W^{t,e}) -Q.E.D¹⁵-. Next section presents a last argument which strengths the proposal of the GCMW Framework -figure 1-.

II.E. Cause-effect relationship -CER- & wisdom engine -WE-.

What is CER? In according to the ‘Educational Portal’⁵⁸, “CER is a relationship in which one event (the cause) makes another event happen (the effect)”. One cause can have several effects. Next, we present a correlation between K-W & CER. Consider the following approaches -some already presented in section 2.1-:

1. - According to Esaki^{47, 48 and 49(a,b)}: “when we are able to explain others what W is, then W changes to K”.
2. - According to Targowski¹⁶, “W is dependent on time”.
3. - According to Esaki⁴⁷: “by considering knowledge is the cause then wisdom is the effect”.

Then, based on the above approaches 1) -W being explained to others- and 2) -W time dependence-, we conclude via approach 3) the K-W CER are interchangeable, which is in agreement with our CGMW framework, figure 1. Yet, this interchangeable K-W CER is also in according to the ‘cause-effect criteria’ -CEC- i.e.

CEC: In order to establish a CER, three criteria must be complied. 1.) - The cause has to occur before the effect. This is also known as temporal precedence. 2.) - Whenever the cause happens, the effect must also occur. Consequently, if the cause does not happen, then the effect must not take place. 3.) - There are no others factors that can explain the relationship between the cause and effect. (Education Portal)⁵⁸.

Therefore, what today is ‘effect’ -W- may, through the time, become a ‘cause’ -K-, triggering new advanced possibilities of W. Yet, the second CEC presented in the above CEC

¹⁴ Reasoning: the process of thinking about something in a logical way in order to form a conclusion or judgment. (Reasoning⁵⁷).

¹⁵ Q.E.D.: Quod erat demonstrandum. Retrieved from Wikipedia, the free encyclopedia-<<http://goo.gl/FpU9>>

definition also supports our GCMW framework -figure 1- regarding our asserting that D -cause-, may generate W -effect- and not vice versa i.e., one can jump from D -that has no context- to W -has context- and never vice-versa. As discussed, D triggering W is a matter of "... foresight..." (Awad and Ghaziri)¹⁸ -see section 2.1-.

Finally, the new K -generated by the W, the interchangeable CER- may again create new W i.e., 'due the CER W may generate new K and this new K may create new W': Esaki⁴⁷ called this as the "Wisdom Engine" -WE-. This conception of WE is also in agreement with our GCMW -figure 1-, i.e., it is possible to generate W from DIK and vice versa -exception W never becomes a D-, as explained thoroughly. Therefore, the GCMW framework is also a generalization of the conception WE proposed by Esaki⁴⁷: CER are interchangeable -see figure 1-. In short, the interdependent and intertwined character of $DIK^{t,e}W^{t,e}$ -figure 1- has again been showed.

III. METHODOLOGY: THE COGNITIVE METHOD -CM-

Actually, project writings, paper evaluation etc., have also traditionally been guided by the cognitive unit -CU- 'D-I' and, specifically in this research paper, we are proposing the insertion of two more CU 'K-W' to instrumentalize the wisdom theory towards paper quality evaluation. We call this approach as Cognitive Method -CM-, i.e., according to the American Heritage® Stedman's Medical Dictionary, "cognitive is characterized by, involving, or relating to cognition" (Cognitive⁵⁹). Recovering our modified definition of cognition presented in the beginning of the section 2.1, we may write that the term 'world around us' introduced in that definition is the content of any scientific publication being evaluated based on the assumptions of the wisdom theory. Therefore, CM means the understanding of the content of this paper based on the assumptions of the PCMW -presented in the next section-.

III.A. The Particular Cognitive Model of Wisdom -PCMW-

The PCMW is derived from the GCMW framework -fig.1- based on the following contour condition:

- For the PCMW we are not considering the intertwined and interdependent character of the IE -see sections 2.1 and 2.2-. Therefore, the conceptions of $K^{t,e}$ and $W^{t,e}$ are irrelevant regarding the methodology towards paper quality evaluation -this affirmative 'irrelevant' is clarified below-. The figure 2 presents the final no-hierarchical PCMW:

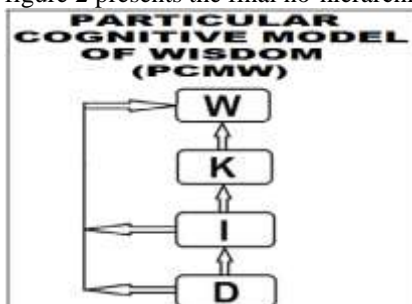


Figure 2. The no-hierarchical PCMW is a tool proposed to analyze if scientific papers deliver what we expected from them or if these publications only allow the scientist to discharge himself from the tasks imposed by a pragmatic orientation, without greater commitments with the W, in order to meet the

interests from the institutions. The character -tacit & explicit- presented in the figure 1, are now irrelevant in the figure 2.

In the fig. 2 the character tacit & explicit -presented in the GCMW, figure 1 is now irrelevant, and not showed. In spite of we are considering DIKW in the figure 2, we could -indeed- have considered DIK^eW^e . Our reasoning: considering we are admitting that all paper published has quality (the section 3.3 presents a further discussion about quality of information) so, it is our proposal the quality of a paper is complete if -and only if- it has explicit W i.e., W^e is clearly manifested in the text being read. However, -according section 2.1- item A)-, when reading a paper we may identify it has tacit W i.e., W^t may only be perceived from the underlines of the text being read -is part of human mind-. On the other hand, when reading a paper with the intention of quality evaluation -objective analyses-, the goal is not to find W^t i.e., in the context of a paper with "complete quality", the W, which should exist in the paper -if any- must be W^e . In short: when reading a paper we want to discover if this paper has W^e . This is why we have considered DIKW -and not DIK^eW^e - in the PCMW. Anyhow, the reader of this research paper might consider the DIK^eW^e in the PCMW without of any prejudice to the reasoning -is irrelevant- adopted regarding the proposed PCMW.

Note 4: if the paper evaluated has also W^t ; that is very significant! However, it is important to remember, as explained in section 2.1, item A), the internal SHBCo is non-obvious i.e., it is possible one to find W^t where others are not able to.

To instrumentalize the PCMW towards paper quality evaluation an integrated set of logical definitions for the instruments DIKW -figure 2- is proposed i.e., to figure out if a paper has W -or not- a clear and logical definition for W is needed. As such, this definition for W must consider an integrated view of all instruments -DIKW- from figure 2. In short, both, the 'PCMW and the new -particular-, integrated set of logical definitions for the instruments DIKW' are necessary and sufficient conditions for guaranteeing if the paper being evaluated has W.

D: "is a measuring CU", (Targowski³⁸) "that describes information of raw facts", (Case¹⁴). It is not a function of context and it is not a pragmatic unit since it involves only measurements. According to 'Bellinger, Castro, and Mills'¹⁹, "when moving from data to information involves understanding context". D may trigger the W -"...vision & foresight..."-, as already discussed in the sections 2.1 and 2.2-.

I: "is a comparative [and pragmatic] CU [...]" (Targowski³⁸), "which is meaningful and useful to human being" (Laudon²⁶) "in a specific context" (Case¹⁴). According to 'Bellinger, Castro, and Mills'¹⁹, "when moving from information to knowledge involves understanding patterns". 'I' also may trigger the W in a specific context -as already discussed in the sections 2.1 and 2.2-.

K: "is a reasoning [and pragmatic] CU [...]" (Targowski³⁸) created by applying human experience on available 'I' -the internal HB context applied on the available 'I'-. "As an internal human being process" (Case¹⁴), it is a guide for action, i.e., according to 'Bellinger, Castro, and Mills'¹⁹, "when moving from knowledge to wisdom involves understanding [Concept -C- and] principles [...]". Concept -C- is a keyword,

which represents the reasoning encompassing the K -not by taking into account what we know and rather, by the manner this K is used. This reasoning requires to take into consideration the coupling of K with a mindset -“the ideas and attitudes with which a person [envisions to deal with] a situation. [...]”-. (Mindset⁶⁰)-. This mindset has embedded the following principles: Competence, Prudence and Imagination -CPI, see section 2.1-. So, this coupling of K with the mindset -CPI- must be considered before presenting a set -when possible a set-of possible solutions regarding a decision making towards W.

W: “Pragmatic cognitive [and context dependent] unit [which is] not found in knowledge [...]”. (Targowski³⁸). In spite of K delivers all you need for a final action, it is in the W where the ultimate action effectively occurs: the capacity to put in action an acquired K (see C definition above). As already mentioned, this action implies in correct judgment and requires the understanding of the coupling of K with the principles CPI -the mindset- before an ultimate action towards a decision-making. Next section we present a correlation among C, CPI, & Mindset.

III.B. C and CPI. The Mindset: a Correlation with W.

By quoting and adapting Esaki^{47, 49(a,b) and 61} we have: “the method for creating [or finding] wisdom from knowledge is a mechanism that has been carried out in our unconsciousness throughout our life [and], in order to create [or find] wisdom, it is only necessary to have [an established mindset]. Therefore, although knowledge develops into wisdom, only with [an established mindset], we may rearranged knowledge into wisdom and, a wisdom action taken. [In short:] wisdom may be [found] or created if you have a mindset [...]”. (Esaki^{47, 49(a,b) and 61}).

The accomplishment of The Mindset is get by defining a keyword, which, according with Esaki^{47 and 61}, the definition of this keyword is a condition for the W attainment becomes feasible. Therefore, the keyword we have proposed for W finding or creation is the keyword concept -C¹⁶- defined within the instrument K -section 3.1-. From the point of view of Esaki^{47 and 61}, for completing this C definition we must add the ‘three principles’ -CPI- which constitute our mindset to find or create W.

Besides the introductory definition of imagination -see CPI-, Einstein⁶ also presented a definition for imagination -written in the beginning of section I-. As explained in the next paragraph, imagination is an important guide towards wise – W- decision-making.

Davies⁶², presents imagination “as synonymous with creativity” and “the ability to create and experience virtual situations in the mind that are independent of sensory input”. He describes about “imagination towards possible futures and wrote that imagining possible futures might have been key to the success of our species”. He grouped imagination into two elements: ‘has sensory and has not sensory elements’ and,

¹⁶ Concept -C- has also been used by Targowski^{2 and 15-17}. In spite of we are using the same word -C-, the approaches are not the same: Targowski utilizes C as a cognitive level between the ‘I’ & K levels - see table I-, while for this research paper, C is part of our new definition for the cognitive level, the instrument K -section 3.1-.

labeled both as ‘Mental modeling’ i.e., “the study of the working internal representations people have and create to understand systems such as [the wisdom theories GCMW and PCMW with] important implications for educational, interface design [and project writings and paper quality evaluations]. [...]”. (Davies⁶²).

Therefore, imagination is indeed an important instrument in a final decision making towards W -see the definitions for the instruments KW and the discussion about the keyword C.

By last, by quoting and adapting Faucher²⁵ we may construct an explanation which strengthen the concept ‘understanding’ used in the definitions of the instruments DIK -see section 3.1-, i.e.: “understanding is the power that generates new links -transformational relationship- among DIK to create a high level outcome -W-. Information can resonate with K and lead to the creation of W. K can interact with ‘I’ and create a new ‘I’, K or W. For any of these transformations, W requires a higher level of understanding than DIK [i.e., requires the application of the mindset CPI]. [...]”. The figure 2 represents the transformational relationship proposed by Faucher²⁵. Next, we present the challenges faced regarding the application of the proposed methodology PCMW towards paper quality evaluation.

III.C. Challenges to be overcome for implementation of the PCMW

The biggest challenge we face is to measure W for the purpose we are looking at i.e., “Proposal for the evaluation of the quality of a paper based on the PCMW & the new logical particular definitions for the instruments DIKW”. When reading a paper, the reader must have a background on the subject being evaluated in order to guarantee a minimum of reasoning similarity for each field of science -and its specific branch- into consideration for evaluation. For example, if the paper evaluated is about genetics, the reader must have a background in genetics to guarantee an unbiased¹⁷ conclusion in the process of evaluation.

The reader must also read the content of the paper strictly within the paper context -i.e., the paper reading must be limited between its abstract and its conclusions, final considerations or perspectives-, while taking into consideration the PCMW & instruments DIKW and, in this context, the reader must look for the existence of W -quality evaluation. Contextual background is essential to the correct assessment of the paper and, consequently, the validation process of the PCMW -i.e., the process of determining the degree to which the model PCMW is an accurate representation of the real world in the perspective proposed in this research paper.

III.D. The quality of information & wisdom.

The Moore’s Law predicts -indirectly- an exponential decreasing in the IT costs, and -consequently- the access to new technologies has been increasingly available for all. This permanent technological evolution has reduced the ‘I’ storage

¹⁷ Unbiased: without bias i.e., without “an inclination or preference that influences judgment from being balanced or even-handed”. Unbiased⁶⁶.

costs and has made possible for the computer to deal effectively with the issue of volume and control of 'I'. (Balloni and Targowski)⁶⁴.

According to Barreto⁶⁵, once resolved the above managerial concern regarding the stock of 'I', the focus should be directed to the quality of the 'I' being delivered and, in according to 'Bornmann and Loet'⁶⁶, "there is no standard for the validation of counts of papers and citations as they relate to quality".

Concerned with these issues, the following two questions arise:

1. - What is 'I' quality?

2. - Is there a W criterion regarding the quality evaluation of the content of a paper?

1. - About the first questioning, in according to Case¹⁴, 'I' quality is "the perceived attributes of information that make it of value to a potential user in a specific context. Some components of quality include relevance, timeliness, accuracy, specificity, comprehensiveness, and authoritativeness".

On the other hand, the Council of Canadian Academies 2012, apud 'Bornmann and Leydesdorff'⁶⁶, presents the idea that "...quality is a multidimensional phenomenon... Research quality is a complex, multidimensional attribute that takes into account various factors such as originality, rigor, and scientific impact..." For this research paper proposal, we are admitting all paper published has the quality as defined above. For us -as already mentioned-, the quality of any paper is complete only if this paper has also W.

2. - About the second questioning, in according to Seglen⁶⁷ "Science deserves to be judged by its contents" and, in according to 'Bornmann and Leydesdorff'⁶⁶ "there is not a standard for the validation of citation counts in terms of their correlation with quality [i.e., the paper content, as above, by Seglen⁶⁷]. There is no standard for the validation of counts of papers and citations as they relate to quality. [...]".

We may infer from above that the process for paper quality assessment is still required and this requisite is aligned with the PCMW Framework -figure 2, section 3.1, proposed for the evaluation of the quality of a published paper-. Particularly, the W instrument defined in the section 3 could also be a parameter for quality assessment of news scientific publications, i.e., the 'W criterion' or an 'ultimate W quality indicator' rated by peer judgments.

This proposal -W as ultimate quality indicator- originated from 'Bornmann and Leydesdorff'⁶⁶ ideas regarding the study about which the following indicators have had more influence in a paper citation: quality indicators (peer review), journal impact factor, numbers of authors and number of pages of the paper? We believe the 'W criterion as ultimate quality indicator' could increase a paper citation regarding peer review. Yet, in according to 'Bornmann and Loet'⁶⁶, "there is not yet been a standard for the validation of citation counts in terms of their correlation with quality: There is no standard for the validation of counts of papers and citations as they relate to quality". Therefore, the 'W criterion' could provide a new standard for a paper quality assessment, creating a new validation process for paper citation i.e., a paper submitted for publication -besides all consideration of quality- also has W -the ultimate impact for quality-.

IV. PERSPECTIVES AND EXPECTED CONTRIBUTIONS

The current practice of information science regarding paper quality evaluation and project writings has made use of only two traditional cognition units -DI- and, this theoretical research paper has proposed to work with more two cognition units -KW- a paradigm shift in the information science towards DIKW. These four units of cognition are essentials in all types of decisions-making processes. The models presented in this research paper -the GCMW and the PCMW Frameworks- may bring enlightenment in the discussion regarding policies for scientific research and decision-making in business and for the government.

What does we expect in regarding to the -whole- benefits from both models -GCMW and PCMW- proposed in this theoretical research paper? We have proposed two points of view: **General and Particular**, as follows:

In **General**, the no-hierarchical GCMW framework & the aligned IE -DIK^leW^lc, section 2.2-, represented by the **Wisdom Framework -WF-**, figure 1, which is a graphical analogous model of easy visualization that must bring a "plus" vision for scientific researches, projects writings and public policies. We have proposed to use the WF as insight generator or strategic foresight towards the solution of different problems in any field of science, from information science to applied researchers. The WF also intends to point out the theoretical and conceptual bases for the interaction between the scientist producer of articles and this framework. So, -as an open proposal for future work- the WF may contribute to the drawing up a governmental policy, which should fulfill entirely the objectives criteria of rational research based on the perspective of cognitive information. This government policy should avoid the duplication of studies researches with consequent waste of resources and a lack of exchange of information -I- and of complementarity. In short, the WF should improve the ROI to the society.

In **Particular**, the proposal is to use the no-hierarchical PCMW framework -figure 2-, to evaluate if a paper already published has delivered what we expected from it or if this publication only has allowed the scientist to discharge himself from the tasks imposed by a pragmatic orientation in order to meet the interests from the institutions. So, -as an open proposal for future work- could be to perform statistical comparison of various published papers i.e., a corpus of N papers should be studied and analyzed -evaluated- aiming to measure how many of these published articles meet -adequacy- the guidelines proposed by the figure 2. Contextual background is essential for the correct validation process of the PCMW -section 3.2-.

Finally, we are admitting all paper published has the quality as defined in the section 3.3. As proposed, the quality of any paper published is complete only if this paper has also W. Yet, for a paper submitted for publication, the instrument W could also be a new W criterion -ultimate quality indicator- aiming also the increase of paper citation.

- Researches suggestions: open proposals for future works.

1. To use the instrument W -the W criterion- aiming time reduction for online research with the focus to find -based on W criterion search- the exact content of quality we are interested. Actually, this proposal -W criterion search- is not

been considered by the present searches system. W criterion will help to access better and worthy content in an environment where the digital information has increased exponentially.

2. The GCMW could be an auxiliary framework for project evaluation for the National Science Foundation -NSF⁶⁸-. To add value to this proposal, we have modified some definitions presented in the NSF⁶⁸ as follows:

The National Science Foundation (NSF⁶⁸) -project evaluation proposal- presents in the section “Merit Review Criteria” these two criteria: 1.2 -“Intellectual Merit”- and 2.2 -“Broader Impacts”-. We have renamed those terminologies -merit review criteria and the two criteria- by, respectively: ‘criteria of sociotechnical merit ‘review’, 1.2 -‘Impact of Technical Merit’ -ITM -, and 2.2 -‘Impact of Social Merit’- ISM -.

The only content we are proposing to change is in the ITM criterion: “ITM encompasses the potential to advance knowledge [towards wisdom, by considering the GCMW in a process evaluation or project writings] [...]”. (NSF⁶⁸);

3. As is known, the management information system -MIS-, type SAP, Oracle, MS Dynamics etc. are also more organized around the paradigm DI and, the units of cognition such as KW are not and have not been the object of considerations in the architecture of projects of a MIS. Only in some specialist IS these two higher levels of cognition -KW- are considered. However, specialist IS have limited applications when you look at the context of a MIS such as SAP, Oracle and others: the majority of the MIS solutions are incomplete. This incompleteness is, from the point of view of ‘I’ and from software engineering, an important gap that must be fulfilled. So, as a future work we propose the DIKW could assist in program of public policies of how to design and develop a MIS in order to improve the level of quality of computer applications to support managerial processes.

4. Another and last proposal for future work is regarding the Human Being Cognition -HBC-. Since there is a lack of rules that govern the cognitive processes -the most important achievement of the HB, the HBC-, we propose to present The Frameworks to the new researchers aiming to instigate improvements as well the incorporation of news practices, concepts and methods in their research program based on assumptions of these W theories. We believe these models could contribute to the development of the theory of information and for the improvement of the Cognition Process -CP- (CP explained next). The possibility of a never-ending cycle of stimulus in the HBC due to the intertwined character of DIK^{te}W^{te}, which is constant interaction with Information Technology -IT- (IT is explained next) & the internal Situational Human Being Context -SHBCo-, as briefly presented in the section 2.1-. It is in this network of interactions in which may occur the triggering for new scientific accomplishments or discoveries.

IT: because as stated by Schaller⁶⁹: “Moore’s Law is a metaphor for technological progress on a broader scale, with broad applications and pervasive technological, economic, and social changes that continue to come”.

CP: the improvement of the cognition process because, according to ‘Roco and Bainbridge’⁷⁰ “as cognition cannot be understood without attention also to the interaction of the individual with the environment, including the ambient culture

[this is also the mean for the term ‘world around us’ inserted in the cognition definition, at section 3-]. [...]” so, for the HBC do not degenerate -due to the continuous development of technical skill- it is need, also, to continuously increase the HBC towards love, arts, aesthetic¹⁸, passion and enthusiasm - socio skill of HB- aiming an equilibrium of the HBC development.

• Next to the last considerations: the reasoning about this research paper turns around its original model proposition -The WF, figure 1-. This WF works towards the science of signs -not discussed in this paper-, with the potential to generate news feelings and interpretations in the reader - organizational or individual semiotics-. In short, the WF is a kind of universal design -original-, from which news approach to knowledge creation are possible to come to existence - trends towards semantic technologies- cause and effect relationship -CER-. I.e., the idea is that the reader of this research paper should get -based on the WF-, news insights or feelings. These insights and feelings aim to provide a better assessment to different problems in any field of science, from information science, applied researchers or a more general audience as per example, to point out the theoretical and conceptual bases for the interaction between the project manager and the WF.

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