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Debate on Production, Evaluation, Storage and DisseminationScientific Information in the Digital Age

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ABSTRACT: World reality is evolving faster than scientific research capacity is able to systematize its understanding. At the heart of globalization is technological development. Today we are experiencing a profound technological revolution. In the last twenty years more technological and scientific knowledge has been accumulated than in the entire history of mankind. This has a positive side due to the significant advances in terms of increasing productivity that has been achieved, due to advances in health, information and so many others. Technological progress has not had a corresponding advance in institutional terms, especially at the civilizational level, which makes it explosive for society.The globalization of information promotes the integration of research, seeking to contribute at the same time to a significant improvement in the production, peer review, retrieval, dissemination, interpretation, and usefulness of scientific information. The dissemination of knowledge is done through events, conferences, and publications. To understand a scientific field, whatever it may be, this research considered the possibility of analyzing the elements involved, the established relationships, the processes of production, evaluation, storage and dissemination of knowledge. Based on the quantitative and qualitative results of Web Science, it is possible to recognize and applaud the researchers who contribute the most / contributed to the development of different sciences / disciplines / areas of the scientific field, by analyzing their citations.The research proposes a global hybrid conceptual model of production, peer review, storage and dissemination of scientific knowledge, based on scientific publications (books, articles, conferences), on specialized journals, their evaluation models and the main units of measures used, as well as indexing, for the dissemination of scientific knowledge. Hierarchical models are proposed to separate the initiates from those who contribute the most (the highly cited) to the development of knowledge, the respective scientific field and its characteristics of universality. It contemplates the theoretical and practical discussion of the global conceptual model, the units of measurement and their meaning, in their different approaches.

KEYWORDS: *Information. Knowledge, Production, Citation, Indexing, Peer Review and Knowledge Dissemination.*

I. INTRODUCTION

To understand how it works and what are the "forces" that contribute to scientific knowledge, it is essential to understand how the scientific field works, using the notion given by (Bourdieu, 1983, 2004). The scientific field is the universe in which researchers and institutions that produce, reproduce, or disseminate science are inserted. For (Bourdieu, 1983, 2004), the scientific field has a structure of objective relationships between different researchers.

Scientific capital is a kind of symbolic capital, which consists of recognition by peers within this field. The biggest holders of scientific capital are certainly the dominant researchers, that is, highly cited. These are the ones that indicate the set of issues that are important to researchers and on which they should focus. According to (Bourdieu, 1983), within the field, the "power to impose" a definition of science is always at stake. In the whole field there are unequal "forces", according to the structure of the distribution of knowledge, in the scientific field, the dominant ones, represented by experienced researchers, and the dominated ones, represented by novices.

Scientific capital is gained through publications that arouse interest in the scientific community, being used to feed and feedback the knowledge production process. This production does not occur in isolation, since it is necessary to capture material and intellectual resources. Scientific literature allows researchers to share information about the research carried out and the results obtained, providing interaction and giving them credibility, recognition and prestige in the scientific field.

Second, (Latour, 1994), scientific knowledge is the product of the articulation of different elements: the scientific instruments, which link research to methodology and bibliographical references: the scientific community and colleagues from the same area / discipline / specialty that attest the validity; regional, national, and international, public and/or private socio-institutional alliances; the political dimensions of research and their influence on the study; the theory, the idea, the concept or in a word the scientific content.

Second, (Levy, 2001), researchers build scientific knowledge from existing knowledge and the scientific community was the first to organize itself around a scientific intelligence. In the knowledge production process, researchers are in constant interaction, establish relationships and continuously transform what transforms them. The production of knowledge is the major concern of science, which is a dynamic and evolving activity, directed by the production and flow of information, until it becomes knowledge. Second, (Kuhn, 2003), science is the set of facts, theories and methods. Scientists are people dedicated to its construction, based on the accumulation of knowledge. Science's major concern is the production and dissemination of knowledge, that is, information that becomes knowledge.

2. Scientific Method

This is an exploratory study that seeks to organize the concepts of production, peer review, storage and dissemination of scientific knowledge, as well as the respective units of measurement and their meaning presented in the literature of science. This is not a proposal for new terms and concepts, but rather a hierarchy of research carried out by beginning and highly cited researchers that allows identifying a common denominator, among the different concepts already indicated in the literature, in a way that allows their grouping. by identity, application / use and pertinence / addition of value in the context in which the terms are inserted. Data collection is characterized by bibliographical research on terms and concepts referring to different scientific fields.

It is a descriptive and analytical approach seeking to know and analyze the existing cultural and / or scientific contributions on this subject, based on the literature review. The research was structured based on a systemic approach to understanding the problems of Globalization (digital society), seeking in practical, operational or application terms, the solution of "real life" problems of organizations and people.

Theme and Research Problem

The development of science has been guided, in the last four centuries, by the objectives of understanding nature and phenomena related to the real world. For this, scientific knowledge was subdivided into several Sciences / Disciplines / areas of knowledge that, with great success, made the sciences develop. This advance ended up generating classical science, which uses methods that are often ineffective to deal with some of the most complex contemporary problems. New sciences emerged in the post-war period and developed differently from classical science, presenting, as one of its characteristics, the interdisciplinary practice, necessary for the development of its research.

Second, (Japiassu, 1976, p.44), currently, the terms units of measurement and meaning are part of the scientific vocabulary and have their concepts more or less defined (although still far from being consolidated), due to the need of the current scientific field , immersed in increasingly complex and diversified projects, and an "[...] increasingly intense mobilization of converging knowledge, with a view to action"

Clarivate's Scientific Information Institute (ISI) has been a pioneer in organizing the world's information/knowledge research for over half a century. Today it remains committed to promoting integrity in scientific research while improving the retrieval, interpretation and usefulness of scientific information. This maintains the corpus of knowledge upon which the Web of Science index and related information and analytics, content and services are built. It disseminates this knowledge, through events, conferences and publications, on primary research to sustain, extend and improve the knowledge base.

Issues periodic reports encouraging researchers and managers / managers to carry out deeper evaluations of research with data collected from the Research Front of the Web of Science and describing the structure and dynamics of the scientific areas of the specialty. Uses quantitative measures based on publication and citation data, as a complement to traditional expert peer review, with standard indicators, citation count, impact on the Web of Science Journal Factor or the h-index.

Questions to discuss:

1. Is it possible to define a hierarchy, to qualify / quantify the relevance of the scientific contribution, for the evolution of knowledge, in a certain scientific field?
2. Is there a hierarchy in the production, evaluation, storage and dissemination of knowledge in a scientific field?
3. Is it possible to define a hierarchy in the peer review of the same scientific field?

Goals

(Smit et al., 2004), states that in addition to the lack of consensus with regard to its object and delimitation, the measurement units and the meaning, of production, peer review. storage and dissemination of scientific knowledge, is still under construction, due to Globalization (digital society). As such, due to the lack of a basic and conceptual structure, it still suffers external influences, because the institutional scientific capital weighs more on the few renowned researchers in the area.

This article seeks to contribute to the definition of a hierarchical global hybrid model of production, peer review, storage and dissemination of the importance of measurement units and meanings, within the scope of different sciences, based on a theoretical framework. The objective is a debate in the field of establishing a "possible consensus" on the method and meaning, on how to analyze and evaluate the units of measurement of scientific research, developed by the different Sciences / Disciplines / Areas, in their global matrix of nature social and human society and the necessary clarification of their relationships. The theoretical discussion of the different measurement units and the meaning of empirical research forms the basis for the outline of its structure, presented at the end, bringing together the measurement units and meanings according to their nature.

Methodological Approach

As for its nature, the research is quantitative-qualitative, since it does not claim to quantify the units of measurement and meaning, nor does it privilege statistical study. Its focus is on obtaining descriptive data, that is, the incidence of topics of interest in fields such as Information Science and other Sciences. With regard to the extremities, the research is of an exploratory and descriptive nature, as the technique used is categorized, consensually, as a direct documentation study, which provides for the consultation of sources related to the study in different media, print or electronic.

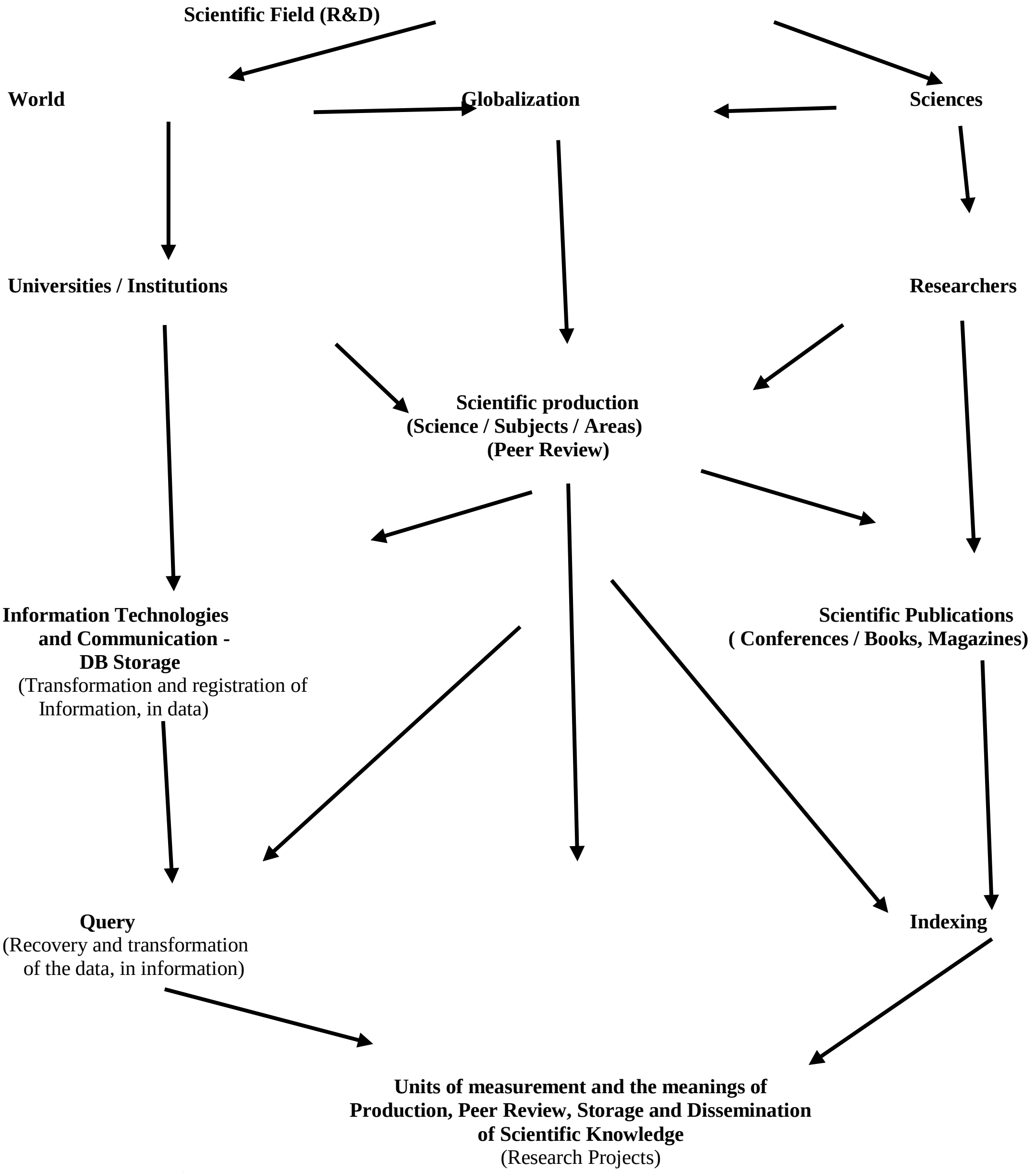
The complexity and turbulence of the digital society have led to the globalization of research, as essential processes for the development and innovation of science and technology. Information is the source of energy that propels the "engines" of the Digital Society, but in order to be able to use it, we need to convert it into a usable form: knowledge, (Murteira, 2001).

The digital society is a complex society of technological innovation and communication, in which new environments and changes in people's dynamics occur, in the way they understand reality, modifying the way they relate to the environment, with the other people and how they conceive of their own reality. Both senses can be understood, as a result of the informational revolution, promoted mainly from the attempts to understand human intelligence, via computational bases. As a consequence, the pre-modern notion of information, as the information that shapes or molds the human mind, is gradually being replaced by information, as a "data structure" (Boland, 1987) representing the intangible realities too large to be experienced directly by people's senses.

The research method is likely to make two or more units of measurement and meanings interact with each other. This interaction can range from the simple communication of ideas to the mutual integration of concepts, epistemology, terminology, methodology, procedures, data and research organization. This is an exploratory study that seeks to clarify and organize the concepts presented in the literature of different sciences.

It becomes necessary to understand, through a theoretical review of concepts, through historical reference documents; a psychosocial analysis of the concepts of measurement units and meanings, applied to the production, evaluation and distribution of scientific knowledge, the normative framework in which they fit; the Internet, as a platform for exercising human action and the problems associated with it, digital data. The research was structured based on the systemic approach, for the understanding of the problems of Production, Evaluation, Storage and Dissemination of Knowledge, in this Complex and Turbulent Society. We represent this conceptual network as follows:

Figure 1 - Model of Measurement Units and the Meanings of Scientific Research



Source: elaboration of the authors

It presents the approach model for intervention in Knowledge Production, Evaluation and Dissemination actions, in the academic space, with the purpose of producing and sharing information and knowledge, among the participants, in addition to promoting the development of search skills. , recovery, organization, appropriation, production and dissemination of relevant information for scientific researchers, managers and other interest groups in society.

3. Theoretical-Methodological Framework of the Research

Introduction

What is Knowledge?

About the nature of knowledge, theories of knowledge stand out, from which it is analyzed through the relationship between the cognitive and the world. For (Dretske, 1981, p. 56), the information processors of the sensory systems of organisms are channels for receiving information about the external world.

Second, (Moraes, 2014), the naturalist stance in Philosophy consists of disregarding the supernatural in the explanation of nature and mind, conceiving reality consisting only of elements and natural laws, which are explained through scientific methods. The term "natural" would encompass other terms, such as "physical", "biological" or "informational" that express a rejection of transcendent assumptions in the foundation of a priori knowledge, the acquisition of knowledge. (Adams, 2010), in turn, argues that knowledge acquires its properties from its information base. In such a relationship, knowledge is about the world, about the truth, constituting the bridge between the cognitive agent and the world.

In addition to problems about the ontological and epistemological nature of information, and the nature of knowledge, the following questions are part of the research agenda of the Philosophy of Information (FI): "what is meaning?", "what is the relationship between mental states and informational states?", "could reality be reduced to informational terms?", "can information support an ethical theory?", among others. Having presented the topics (problems) and theories (hypotheses and explanations) of FI, we highlight two methods specific to this area of investigation: the "synthetic method of analysis" and the "levels of abstraction".

Such methods come from the influence of the works of (Turing, 1950), in Philosophy (marked, in particular, by the informational turn). The "synthetic method of analysis" is the result of the hypothesis of (Turing, 1950), according to which the study of the mind is appropriate when carried out using mechanical functions that could be manipulated by digital computers (Gonzalez, 2005; Floridi , 2012). Through such functions it would be possible to build mechanical models of the structure and dynamics of intelligent thinking. The understanding that underlies such a conception is that the ability to manipulate information, in a mechanical way, constitutes thinking.

This understanding enabled the development of mechanical models of the mind, which initially generated two strands in Cognitive Science (Teixeira, 1998): strong Artificial Intelligence, which defends the thesis according to which mechanical models of the mind, when successful, do not they only simulate/emulate mental activities, but explain and instantiate such activities; and weak Artificial Intelligence, according to which the model is only a limited explanatory tool of intelligent mental activity. The common point of such notions is that both accept the thesis that to simulate is to explain, in order to attribute to the mechanical models, the value of theories. This sets up an example of an approach, the other question specific to FI: what is the relationship between information and intelligent thinking?

The "levels of abstraction", in turn, derive from the algorithmic approach of (Turing, 1950), which is summarized by (Floridi, 2013b, p. 210), as follows: we saw that questions and answers never occur in a vacuum, but are always embedded in a network of other questions and answers. Likewise, they cannot occur in any context, without any purpose, or regardless of any perspective. According to this perspective, a philosophical question is analyzed, considering its context and purpose, which delimit the field of possibilities for adequate answers.

(Adams &Moraes, 2014), considering the topics, theories and methods specific to FI, propose the "argument from analogy" to analyze the autonomous aspect of FI. These authors point out that, like the Philosophy of Mathematics and the Philosophy of Biology, FI has characteristics such as:

- Proximity to the scientific approach, epistemological and metaphysical problems, in addition to the presence of specific problems not previously addressed in other areas of Philosophy.
- Given that FI shares characteristics present in areas already recognized by the philosophical society as legitimate, it would be counterintuitive not to accept FI as an autonomous area of investigation in Philosophy.

As indicated, the development of information studies in the philosophical-scientific scope contributed to the constitution of FI in the academic scope. This is illustrated with the constitution of FI, as an autonomous and interdisciplinary area of Philosophy: interdisciplinary due to its relationship with Computing, Sociology, Engineering, among other areas, generating methods and theories to deal with its problems; and autonomous, due to its own (and new) problems. With the academic development of FI, the influence in the social sphere is also highlighted.

Understanding the historical evolution of scientific knowledge based on the analysis of research and researchers is an important topic for the history of science and for the philosophy of science. Because it is an interdisciplinary area, the history of Information Science (IS) has been and still is influenced by the history of other areas of scientific knowledge.

(Capurro, 2003), describes the historical roots as: "Information Science (IS) has two roots: one is classical library science or, in more general terms, the study of problems related to the transmission of messages, the other being digital computing". The author also highlights the possibility of tracing a line of evolution from studies of specialized libraries to documentation and, finally, to IC, both in the United States and in Europe (Williams, 1998; Rayward, 1998 in: Capurro; Hjørland, 2003, p. 378).

The change in nomenclature would have occurred under the influence of new technologies, especially computing and cybernetics, and also due to the mathematical theory of communication (Shannon, 1948; Shannon, Weaver, 1949), now known as information theory, and the cognitive paradigm of the brain as an information processor. (Capurro; Hjørland, 2003, p. 379; Capurro, 1991).

As the historical roots of IC did not limit its scope to studies developed internally in the area, the change in nomenclature has been accompanied by the gradual expansion of topics of interest, as confirmed by Capurro's analysis of the epistemological paradigms of IC, that is, physical, cognitive and social, (Capurro, 2003).

Information and/or Knowledge?

Although the terms information and knowledge are used very often, they are not the same thing. Information is not the same thing as data, although the two words are often confused, so it is understood that the subtle distinction between these concepts is essential. The data do not carry sense or meaning of the facts, images, or sounds, since they lack relational elements indispensable to the establishment of a complete meaning, lacking an internal relational structure for a cognitive purpose. This structure is one of the attributes of information. Data becomes information when its creator adds meaning to it (Davenport and Prusak, 1998).

(Wiliam G. Zikmund, 2000, p.19) defines knowledge as "the mixture of information, experience and understanding that provide a structure that can be applied in the evaluation of new information or new situations". Information "feeds" knowledge. Knowledge can thus be defined as a person's ability to relate complex information structures to a new context. New contexts imply change – action and dynamism. Knowledge can be shared if the possessor wants to share it. When a person internalizes information to the point of being able to use it, we call it knowledge (Zikmund, 2000). This is a fluid mix of structured experiences, values, contextual information and expert judgment that provide a framework for evaluating and incorporating new experiences and information.

In organizations it is found not only in documents and reports, but also in organizational routines, processes, practices and standards. Knowledge originates and is applied in the minds of the knowers (Davenport and Prusak, 1998, William Zikmund, 2000). Knowledge is information as valid and accepted, integrating data, acts, information and sometimes hypotheses. Knowledge requires someone to filter, combine and interpret information. Information can be considered as a "substance" that can be acquired, stored and possessed by a person or a group and transmitted from person to person or from group to group. Information has a certain stability and perhaps is better seen as existing at the level of society (Davenport and Prusak, 1998).

Although we can store it using various physical supports, the information itself is not physical, but rather abstract and not purely mental. Knowledge is stored in people's memory, but information is out there in the world. Whatever it is exists somewhere between the physical world around people and the mental world of human thoughts. Knowledge = Internalized information + ability to use it in new situations. Knowledge lies fundamentally and intrinsically within people. These are much more complex and unpredictable at the individual level than a whole society, so it is not surprising that knowledge is much more difficult to obtain than information.

Knowledge exists mainly within people, it is an integral part of human complexity and unpredictability, (Davenport and Prusak, 1998). Knowledge presents a fundamental duality: it is something storable (at least sometimes we intend to) and something that flows (something that is communicated from person to person). It is possibly the duality of knowledge (thing that flows and storage process) that makes its treatment and management difficult. Second, (Dahlberg, 2006), knowledge is organized into knowledge units (concepts), according to their characteristics (objects / subjects / subjects). The organization of knowledge is related to a process of conceptual analysis of a domain of knowledge and from there, this is structured / architected, generating a representation of knowledge about such domain that will be used for the organization of information about that domain of knowledge.

Knowledge Production

The production of scientific knowledge is a dynamic process, fed by scientific publications by researchers. In order to understand any scientific field, this research considered the analysis of the elements involved, the established relationships, the knowledge production process and the products resulting from this process.

Second, (Bourdieu, 1983, 2004), a scientific field is the universe in which researchers and institutions that produce, reproduce or disseminate science are inserted. It has a structure of objective relationships between the different investigators. It is this structure that will guide researchers on which way to go in terms of research. The author(s) of this scientific capital consists of recognition by peers, within that Science, Discipline or area of knowledge. According to the distribution structure of scientific capital, in the field, the dominant, represented by experienced researchers, and the dominated, represented by novices.

Scientific capital is gained through publications that have aroused the interest of members of the scientific field, being used to feed and feed back the knowledge production process. Scientific literature enables researchers to share information about the research carried out and the results obtained by peers, providing interaction and giving them credibility, recognition and prestige in the scientific field.

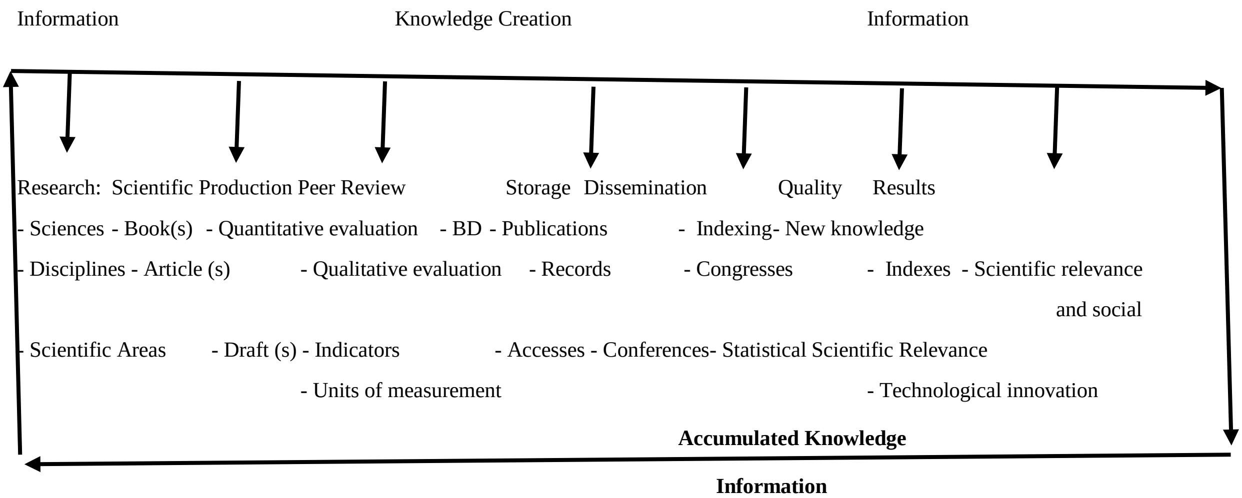
Second, (Latour, 1994), scientific knowledge is the product of the articulation of scientific instruments, which link research to the methodological and bibliographical references of the world of the respective science; the scientific community and colleagues from the same specialties, who attest to the validation; socio-institutional, regional, national and/or international, public and/or private alliances; the political dimensions of the question researched and its internal and external influences on the study; and, mainly, what sustains the other four horizons, but which can only be thought from them: the theory, the idea, the concept or, in a word, the scientific content. Depending, therefore, on the articulations made between these horizons, on the choices, on the paths and on the context of their development, the resulting configuration will be extremely different in terms of content, from this scientific fact.

According to (Lévy, 2001), researchers build scientific knowledge from existing knowledge and the scientific community was the first to organize itself around a collective intelligence. Second, (Foucault, 1995), scientific knowledge is structured by the limits of what is possible to say, that is, by what is communicated. Scientific knowledge rests on an institutional support, is reinforced and accompanied by other strata and social practices, such as the knowledge communication system.

According to (Foucault, 1995), all knowledge is based on other knowledge already disclosed. This is underscored by citations, which represent a citation system, to other documents. Such quotes show that knowledge is cumulative. In the knowledge production process, researchers are in constant interaction, establishing relationships and continuously transforming what transforms them. (Morin, 1999 and Elias, 1994), claim that human beings are created by other human beings who already existed before them, and there is no doubt that they grow and live as part of an association of people and of a social whole. . The same occurs in the production of scientific knowledge, since the researcher produces knowledge.

In terms of summary:

Figure 2 - Synoptic Table of Knowledge



Source: elaboration of the authors

Fundamental Concepts

What is science?

Britain's Science Council spent 2009 working on a new definition of the word 'science'. But how does he rise to the challenge of intelligent design and creationism? It may have been the 16th-century philosopher Francis Bacon who coined the term "science," but even if he wasn't, the word must have come into common usage in his day, at least in the Western world. Thus, the Scientific Council decided to spend a year to come up with a new definition of science. They claim, the first "official definition of science" ever published.

Second, (Edgerton, 2009), "Science is the search for knowledge and understanding of the natural and social world, following a systematic methodology based on evidence. It defines science as a search, an activity, related to the creation of new knowledge, rather than existing knowledge. Science is seen, as a kind of research. However, a definition of science needs to define the nature of knowledge, not the means, only its creation."

Second, (Grayling, 2009a), "science denotes a wide range of activities, a definition of which needs to be general; it certainly needs to encompass investigation of the social and natural worlds; it needs the words "systematic" and "evidence"; and it needs to be simple and short. The setting succeeds admirably in all these respects."

In terms of synthesis, it can be said that science is the search and application of knowledge and understanding of the natural and social world, following a systematic methodology, based on evidence. Scientific methodology includes the following:

- Objective observation: Measurement and data (possibly, though not necessarily, using mathematics as a tool).
- The Evidence.
- Experience and/or observation, as a reference to test hypotheses.
- Induction: reasoning to establish general rules or conclusions drawn from facts or examples.
- Repetition.
- Critical analysis.
- Verification and testing: critical exposure to scrutiny, peer review and evaluation.

Scientific research

Second, (Severino, 2017), scientific research is a rational, systematic procedure with the aim of finding answers to certain problems. Scientific research requires a method of reflective thinking that requires scientific work to answer the problem(s). Scientific work is based on logical reasoning and on systematic, coherent and methodological methods.

According to Webster's International Dictionary research is a thorough or critical and exhaustive inquiry in the search for facts and principles to find out something. Research is not just about finding the truth. It is to find answers to the proposed questions, using scientific methods.

For (Ander Egg, 1978, p.28, in, Marconi; Lakatos, 2018, p.01), research "is an activity for the investigation of theoretical or practical problems, using scientific methods. It is a reflective, systematic, controlled, and critical procedure that allows finding facts or recent data, relationships or laws, in any scientific field".

(Abramo, 1979, p. 25, in: Marconi; Lakatos, 2017, p. 02), states that there are two valid general principles in scientific research, which can be summarized: "objectivity and systematization of fragmented information". There are, however, principles that are valid for research in each field of knowledge and those that depend on the nature and specificity of the object of science in question.

According to (Oliveira, 2018), doing scientific research is not accumulating data and quantifying them, but analyzing the causes and their effects, contextualizing them in time and space, within a systemic conception.

Importance of Scientific Research

Scientific research seeks to contribute to the development of human knowledge in all sectors, from pure science to applied science, mathematics or agriculture, technology or literature, etc. and analysis of data and/or information,Thus, all scientific research aims to add knowledge to existing knowledge, which allows understanding and transforming reality, inserted in a historical-sociological context, respecting a set of values, ideology, conceptions of man and that constitute this context and from which the investigator is part.

Second, (Padua, 2016), the indispensable elements of scientific investigation are the scientific method, epistemology, and methodological approach. The research starts from the doubt or problem and based on the scientific method, seeks an answer or solution to the problem to be investigated.

Scientific article

A scientific article is a written work that describes the original results of the research that was carried out. The main feature of this type of research article is that it must always provoke advances in knowledge, so it is obvious that it can only fulfill its mission when it is published and made available to the scientific community, so that it can be read, understood, and incorporated by your pairs.

It can also be defined as an organized work that must provide enough information so that people can know how the work was carried out, its interest, evaluate the observations, repeat, if necessary, the experiences and thus validate the intellectual processes. Scientific articles maintain an orderly structure, although they may have some variants that depend on the regulations of each event / scientific journal.

objective

The aim is to clearly and precisely disseminate the results of an investigation carried out on a specific area of knowledge. It can also encourage the development of innovative experimental methods.

Resources

Scientific essays must be carefully written to clearly and concisely express what is intended to be communicated, and include the citations and bibliographical references necessary to contextualize, justify and verify the background and previous ideas or data contained in the work. The content must also expose all the necessary information so that it is possible to reproduce the original results published therein.

Some scientific articles are summaries of larger reports or theses, which guide the efforts of anyone who may be interested in consulting the original work.

Table 1 - Summarizes some main characteristics of a scientific article:

Characteristic	Description	QualityCriteria
Scientific work	The article is the result of an investigation in which the results are disclosed.	It must be the result of rigorous scientific research. That is, methods, standards and procedures that have been scientifically proven to be valid must be
Originality	The work must bring something new to the corresponding field of knowledge.	It must be an original work by the author or authors.
Arbitrated	Refers to the fact that the article was evaluated by a committee of specialists that approved its inclusion in the publication.	Peer-reviewed. The reviewers can propose to the authors corrections and improvements or expansion and justification of any obscure aspect before its final acceptance.
Structure	It is the way the article is organized.	It must follow the structure imposed by the body where the article is published, including the way of making references, the sections, and the length of each section for each of the explanations of the topics below.
Thematic.	Refers to the content addressed in the article.	Attractive to the reader, current and from the area of the magazine that publishes it.

Source: elaboration of the authors

Articles are generally short and not accessible to non-experts. The introduction generally does not explain certain technical matters in detail and instead refers to other references that contain such details. In general, a reader who does not know the essentials of bibliographical references may find it difficult to understand, since scientific articles are not popular works and are intended for an audience with specific knowledge, to be brief.

Scientific Relevance (Impact Factor)

(Irving H. Sher and Eugene Garfield, 1960), created the Thomson Reuters Institute (JCR) annual citation report to assess scientific relevance (impact factor). So, for example, a journal's scientific impact factor for 2009 is equal to A/B. When A is the number of times articles published in 2007 and 2008 were cited in indexed journals during 2009 and B is the number of articles published between 2007 and 2008.

The impact factor (scientific relevance) is a frequency measure that indicates the average number of articles in a journal that were cited during a given year or during a given period and is used to evaluate and rank journals in the scientific literature. Overall, the impact factor simply reflects the ability of journals and publishers to attract the best scientific work available.

Author(s) of Knowledge

The scientific author acts in the diffusion and dissemination of science and also in the scenario of major cultural issues, identifying trends and addressing themes specific to knowledge and the dynamics of its cultural, scientific and technological transformations. Not all researchers wear white lab coats and work in laboratories.

The authors seek to relate science to all aspects of our lives, leading people to new ways of thinking, new connections, and new sectors. Its aim is to be an essential source of information and ideas that make sense of a world in constant transformation for a wide audience that goes beyond the limits of academia. They seek to combine science, culture, technology, innovation, art and philosophy, in a single story told by scientists, journalists and thinkers, informing and enchanting their readers.

In this way, the published articles and essays use an attractive and captivating language. The points of view are exposed concisely, in specialized language or not, enabling the understanding of readers from different areas and, in this way, expanding the communication of science. All texts are rigorously peer-reviewed from the same scientific field. The quality of the text, information and relevance of the articles and essays are essential for their approval. From business research, to regulation, to teaching, they require knowledge and application of science. Let's present some examples:

Business Scientist

Business Scientists require excellent management and business skills, with scientific knowledge, supporting decision-making, based on evidence inside and outside companies. This type of researcher has the scientific and technical knowledge to be credible to peers and competitors in a business environment.

Communication Sciences Scientist

This researcher combines his scientific and technological knowledge with the ability to communicate. He enthuses, informs, and gets his message across through empathy and understanding of audience needs, expertise in how social media and other communication channels work, and of course a deep understanding of the science involved.

Development Scientist

It uses knowledge generated by others and transforms it into something that society can use. It may be developing new products or services, ideas that change behavior, improvements in healthcare and medicines, or applying existing technology in new environments.

Entrepreneur Scientist

The entrepreneurial researcher makes innovation happen. His scientific knowledge and connections run deep enough to see opportunities for innovation – not just in business, but also in the public sector and other sectors of society. Combine your scientific knowledge and credibility with people management skills, entrepreneurial flair and a strong understanding of business and finance to start your own businesses or help grow existing ones.

Explorer Scientist

The Scientist Explorer is someone who, like the Enterprise crew, is on a journey of discovery "to boldly go where no one has gone before". They rarely focus on a specific result or impact, but want to know the next piece of the puzzle of understanding and scientific knowledge.

Research scientist

Research scientist in a laboratory discussing results on a computer. The Research Scientist investigates the unknown by observing, manipulating, understanding and gathering in-depth knowledge and data, setting the stage for others to translate and build on. Usually works in a University or research center, or in Research and Development (R&D) in an organization, working in a team and probably in a multidisciplinary environment.

Policy Scientist

The Political Scientist uses their scientific and technical knowledge, as well as their understanding of government and policymaking, to ensure that legislation and policy have a solid evidence base. Some political scientists describe themselves as 75% scientists and 25% politicians.

Regulatory Scientist

The Regulatory Scientist is there to assure the public that systems and technology are reliable and secure, through management and regulation. You have a mix of skills and although you may not be involved in things like laboratory work, you have a thorough understanding of the science and processes involved in managing its use or application.

Professor Scientist

The Scientist Teacher is trained in the science(s), sharing their knowledge, and understanding to educate the next generation of scientists. His application of science is combined with pedagogical skill and a passion for teaching others. This type of scientist works in schools, colleges, universities, and other educational organizations, developing their tools and experiences for teaching and learning.

Technical Scientist

The Technical Scientist provides operational scientific services in a variety of ways. These are the scientists on whom healthcare, forensics, food science, health and safety, materials analysis and testing, education, and many other areas depend.

A scientific publication (project, book, article, conference) may result from the work of one or more scientific researchers, depending, however, on their degree of participation / involvement. There may be other participants in the publication with lesser involvement and they are called contributors. All authors of the same publication are called co-authors, which is nothing more than the plurality of holders of the same publication.

Informational Ethics

Concept

Second, (Du Mont 1991), ethics aims to establish principles of human behavior that help people to choose alternative forms of action. These considerations lead to definitions of ethics and morals, prompting us to refer to deontology, such as the study of codes or ethics of professions. (Targino, 2006, p. 135), states that the definitions of ethics originate from the "Greek term ethos, as the etymology suggests, is the part of philosophy that deals with reflection on customs, encompassing guidelines". While morality "a term from the Latin mores refers to acts and customs per se, that is, to the set of objective norms of conduct, changeable in time and space".

Second, (Sá, 2007), the word ethics is sometimes associated with the sense of morality, but not always properly. It has also been understood as the science of human conduct towards beings and their fellow beings, to study the actions of men and their considerations of value. In this research, we emphasize the importance of ethics in the context of today's society and, mainly, with regard to its social responsibility.

With a view to the theoretical foundation of the study, we approach the topic of professional ethics linked to the code of ethics, studied by deontology which, according to (Targino, 2006, p.135), "comes from the Greek deontos, duty; logos, discourse or treaty, etymologically equivalent to treaty or science of duty".

Territory

The domain of informational ethics has great relevance about the recognition of human rights in an era of intensive use of Information and Communication Technologies (ICTs), in particular, the Internet. Hence the need to protect human rights in the context of digital technologies.

The European Convention for the Protection of Human Rights and Fundamental Freedoms recognizes as inalienable values the protection of the right to life, the prohibition of torture and slavery and freedom, among others. The right to demand respect for private life and family life, representing a guarantee of the individual's freedom to choose how to interact with others in a shared world.

(Rafael Capurro, 2009), states that digital experiences suffer from what the philosopher calls "colonialism" and "cultural oppression" in favor of corporate profit, and conceives an intercultural information ethics, in the absence of unique and fixed parameters in the definition of different moralities.

Second, (González De Gómez, 2009), intercultural information ethics is concerned with different issues, depending on the culture in which it is dealt with. Such questions are of an ethical nature and arise in the genesis of the development of ICTs. These are problems arising from issues such as copyright and intellectual property in general; freedom of expression; censorship; in cases of authoritarian or (semi) democratic governments, technology is a means of political protest and/or social repression; the issue of digital exclusion for a large part of the population, due to the lack of economic conditions; the excessive use of technological means, especially by a generation that was born in a digital world, resulting in social or educational segregation; technology addiction; the protection of citizens' privacy, as a responsibility of the State, within the scope of public security.

(Capurro, 2009), the current context in cyberspace is the growing supply of personal data both to digital companies and to the network of users to which the individual is connected. The protection of privacy is one of the ethical issues that arise in this context.

(Freire, 2010) adds that data confidentiality; information security; the practice of spamming; the dehumanization of the user resulting from the impersonality or "depersonalization" of virtual life; the release of incriminating information to charge an individual suspected of committing an offence; these are other worrying issues that have arisen in the context of digital technologies and are studied by information ethics.

Privacy

Having privacy means, in Western culture, having autonomy. (Rainer Kuhlen, in: Capurro, 2005), understands privacy under the name "informational autonomy", which consists of the individual's power of choice regarding the use of information in an electronic environment. The individual must enjoy freedom in the process of searching, selecting, even using the information. From the moment that the autonomy of individuals is infringed, their freedom is violated, because "the autonomy of privacy protection is the basis of freedom, and not the opposite" (Rössler, Apud Capurro; Eldred; Nagel, 2012, p. 79).

Second, (Floridi, ibid.), the private data associated with an individual, in the so-called infosphere, are seen as "packages of information", in which individuals are reduced to numbers and mere collections of information, so that human beings are treated as "informational entities". He sees personal privacy as a defense of individuals' information (information that is a constituent part of their very being), in order to avoid a process of alienation that the author defends as being characteristic of the invasion of that privacy. The invasion of privacy and other ethical problems arising from the (bad) use of ICTs, especially the Internet, have a playful nature, which causes a diffusion of responsibility.

Information in the digital environment is of an immaterial nature and the environment itself enables remote interaction with "faceless individuals", the crimes committed in the infosphere are not perceived by their practitioners as something harmful, since cyberspace is seen as different from the real world. Internet users, acting in an "unreal environment", also see the information as unreal. Therefore, the reasons that cause cybercrime (invasion of privacy, including) are linked to what Floridi called "diffusion of responsibility".

Social media

Profit marks the backstage of social media interfaces. For-profit organizations, social networks such as Facebook, adopt business stratagems to attract users' attention to their products and services. According to (Eli Pariser, 2012), a political and cybernetic activist, in his book "The invisible filter", these organizations gain the loyalty of Internet users through the personalization and filtering of content. This is done by requesting and analyzing the personal data of its users (using technologies such as cookies and beacons).

According to (Pariser, 2012), with as much information as possible about their users, these organizations develop personalization algorithms to target advertisements, services, and digital experiences appropriate to their users / customers, based on an analysis of their profile, enhancing thus your sales. "Trying to know as much as possible about your users/customers has become the fundamental battle of the Digital Age, between Internet giants such as Google, Facebook, Apple and Microsoft.", (Pariser, 2012, p. 12). The author argues that the problem lies when these digital companies use user / customer data without their consent and, in more extreme cases, in order to harm them in some way.

Social responsibility

Ethics is an area of great interest, and the factors that demonstrate the evolution and that expand its attributions and that influence the behavior in the performance of such functions were identified. According to (Du Mont, 1991, p. 24), people's responsibility is focused on information needs. It categorizes assignments into four stages: set of information available on the Internet for consultation, citizens, information users and finally society, which are led to think about ethical problems.

In the first stage, people are responsible for the set of information available on the Internet for consultation; in the second stage, the concern is with the citizens who are in the institutions, with the human side, since the organizations want to have competent professionals who help them in the development of working conditions; in the third stage, the responsibility expands to the users (of the Internet and social networks), who need information with good services and, finally, the fourth stage reaches the maximum point, the question in which the politicians really understand the correct interpretation of social responsibility. At this stage, politicians are led to think about ethical dilemmas and reverse their responsibility in the development of society (Du Mont, 1991).

The production, collection, classification and dissemination of digitized knowledge and information (eg documents) raise ethical challenges, such as: How to guarantee a democratic right of access to knowledge and information? What kind of digitized knowledge and information should be created? How is the integrity and sustainability of this digitized knowledge and information guaranteed, in economic, technical and cultural terms? Who are the beneficiaries of these value-added services? The main added-value features of digitized knowledge and information are:

- Access to digitized knowledge and information (eg documents) regardless of time and space.
- Combination of documents of different types, in different files (digital and/or classic).
- Search for non-digital documents and information, based on search engines and online catalogues.
- Combination of information and communication processes.

The ethical issue is related to the availability of digital information, in accordance with the interests of political, economic, religious, and military powers. Cultural and moral traditions also play an important role with regard to, for example, what is considered offensive. The main ethical issue in this area has to do with the limits to intellectual freedom; the desire to exclude "bad" information is an ethical paradox, insofar as any exclusion that limits intellectual freedom must be avoided. There is such a tendency in liberal societies. But this leads to ethical, moral, and legal conflicts (Froehlich, 1997; Frické / Mathiesen / Fallis, 2000).

The protection of intellectual property is one of the most important and difficult ethical, moral and legal issues in the information field. Different moral and legal traditions have led to different protection laws in different regions of the world. The European tradition emphasizes the moral rights of authors. They relate to the author as a person and concern the integrity and authorship of his work, as well as his reputation. The Anglo-American tradition emphasizes ownership or economic rights (copyright).

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The forms of harmonization are the Berne Convention (1886) and the Universal Copyright Convention (1952) (UCC). Both treaties are administered by the World Intellectual Property Organization (WIPO). Scanning makes copying and reforming easier. Internationalization via the Internet changes the dimension and perspective of legislation and national control. This new situation raises questions such as: should information always be considered as property? should the notion of knowledge sharing become predominant, in relation to the notion of ownership? Can public access to electronic information be guaranteed?

Ethical issues related to the dissemination of information are related to problems of public access and referral / brokerage services. The issue of access can be studied from a personal or social point of view. Individuals and society are interested in free access to information. At the same time, it must be recognized that information is a work product and has an economic value that must be protected. The question is: what the information is and to whom should it be free? The access issue, as a social issue, concerns the problem of creating equal access opportunities, avoiding the gap between the rich and the poor, in information (digital divide).

Second, (Foster, et all, 2000), it is controversial, the discourse on the digital divide that can lead to a confusion (theoretical and practical) between what can be seen, as a social necessity, but not, as a right (human). The last statement ends up expanding the government's power, legitimizing its activities of control and government. About referral/brokering services, ethical conflicts may arise regarding, for example, the right to confidentiality. Organizations can ask information workers to break confidentiality. Information professionals should inform their users about the limits of their sources and methods. Finally, there is the issue of misinformation (or misinformation) that can cause great (economic) harm to users.

Online and Offline Environments

Among the topics that emerge from the investigation agenda of this new area, whose main factors responsible for the inclusion of the topics indicated in the philosophical-interdisciplinary investigation agenda of Information Ethics are four:

- Large amount of information available on the network (online) – due to the ability to capture, store and transmit information by ICTs.
- Digitization of everyday actions – ICTs have become necessary for the performance of common actions in industrial and informational societies; since the evaluation of a moral action is considered from its digital relationship with the environment, and only human beings can perform such a relationship of moral judgment. (Discussion remains open! private property! censorship! freedom of expression! digital identity (e-ID)! accessibility! surveillance society! digital divide! confidentiality! privacy! cybercrime! ubiquitous computing and IoT! digital citizenship! governance of Internet.
- Tacit acceptance – the novelty character present in technological development promotes a certain fascination (in fact or by economic interests), generating a period of use of ICTs.
- Familiarity – on the one hand, daily contact with digital technologies promotes in individuals a feeling of familiarity with these artifacts (even when there is no knowledge about their use); on the other hand, familiarity can come from knowledge of the facts, that is, from effective know-how in the use of such technologies.

In view of the amount of information available online, the absence of a single controlling center for this medium stands out. Since among such information we have those referring to music, videos, books, among others, which, in general, have copyright (of an authorial and patrimonial nature regulated by legislation and which limit the free use of intellectual production), it may be questioned. whether: should there be free access to such information, regardless of private property boundaries?

An affirmative answer to this question would characterize free accessibility, but if not, we will have, in principle, a type of censorship (content control). But we can also ask: does limiting access to intellectual property effectively constitute a type of censorship? Thus, one of the ethical and legal issues of great impact of ICTs in society stands out: on the one hand, the mere abolition of copyright will make it impossible for "artists" to support themselves through their intellectual work, especially writers and musicians; on the other hand, however, as with other human professional activities, there is a whole set of business interests that profit from the limitation

Literature revision

Globalization

We live in a time of profound change. The changes will perhaps be more radical than those operated when those of the "Second Industrial Revolution" were introduced in the mid-twentieth century or even those introduced by the Second World War. Some of these challenges are already visible in all developed countries and in most emerging or developing countries, with the Covid-19 pandemic and technological globalization. These challenges can already be identified, discussed, analyzed and applied. Some organizations are already preparing for the new challenges and will be leaders and dominate tomorrow. Those who wait will be left behind and may never recover.

World reality is evolving faster than scientific research capacity can systematize its understanding. At the center of globalization is technological development, with all due respect for (Weber, 1864-1920) and the strength of certain ideologies, it must be recognized that when (Adam Smith, 1968) (division of labor) or Marx (productive forces) placed the evolution of techniques / technologies, as the engine of social transformations, were strictly correct.

Today we are experiencing a profound technological revolution. In the last twenty years more technological and scientific knowledge has been accumulated than in the entire history of mankind. This has a positive side due to the significant advances in terms of increasing productivity that has been achieved, due to advances in health, information and so many others. Technological progress has not had a corresponding advance in institutional terms, which makes it explosive for society.

Technologies redefine the concepts of time and space. The planet has become a global village. Communications make it easier and faster today to carry out an operation on the New York or Tokyo stock exchange than to travel a short distance. International financial markets transfer more than a trillion dollars daily without any control by central banks. Chinese textiles close factories in Europe or any other country in the world. The economy has become global, while regulatory instruments remain national or regional in scope. International regulatory institutions such as the United Nations, the GATT, the IMF and the World Bank articulate nations and not the supranational space. The capitalism of nations today strikes a precarious balance between business efficiency and social justice. Global capitalism is accountable to no one.

This absence of instruments to regulate the global economy aggravates the global polarization between rich and poor. Companies have to assume their social and environmental responsibility. The reality is that, while the planet "shrinks", everything becomes closer, populations "piggyback" more and more in urban spaces, the economic and social divide between populations increases rapidly, there is a great proximity between wealth and poverty, luxury and deprivation, and this is proving to be an explosive and unsustainable mix in the medium term. The balance of terror is no longer at the level of countries, but at the door of our homes.

Another axis of institutional transformation is given to us by the process of globalization that is radically changing the way of life of populations worldwide, in a few generations. Globalization ended the time when government decisions could be taken by the central government. Today, with generalized globalization, big, medium or small cities have to respond to simple everyday problems of citizens (school, health, small production, etc.) and it becomes increasingly absurd to wait endless times in different state bodies. Another axis of change is the structural transformation of work. Unemployment no longer results from the absence of economic growth, but from economic growth itself. Anyone waiting for the situation to improve will probably miss the train. The division of activities into primary, secondary or tertiary sectors will be of little importance, since this technical division will make it difficult to understand the hierarchization of the economic and social system into differentiated subsystems.

Job for life is over. Large companies began to work with multiple spaces. They hire cheap Russian and Indian researchers, move software programming to India, subcontract production to Indonesia or Thailand, but keep general system organization services, coordination of marketing services, and the like in Europe or the United States. This reduces the space for formal employment and increases informal employment and the parallel economy. While, on the one hand, the democratization of global management is developing and the world is advancing in an apparent modernization process, on the other hand, society is being disintegrated at the base.

In terms of conclusion, we can present five fundamental trends in this globalization process: technological development, economic polarization, urbanization and the transformation of work. Society urgently needs to rein in its development and equip itself with institutional instruments capable of capitalizing on scientific and technological advances for human development.

Science

Philosophical Sciences

Introduction

What is Philosophy?

Philosophy is the activity of thought to think about itself conceptually and problematically. It can be said that the first and essential activity of Philosophy is thought. Philosophy is a form of organized, conceptual thinking that can move thought itself through the identification and formulation of problems, that is, Philosophy is, by nature, problematic, it avoids providing ready-made answers to the questions raised and it creates questions, new questions and new problems that make thought never cease its cycle of existence. The issue of knowledge and science, in addition to politics and ethics, philosophy in contemporary times has embraced new problems, characteristic of our time, to develop new problems and new concepts.

The Philosophical Knowledge

Philosophical knowledge is the type of knowledge based on reflection and construction of concepts and ideas, based on the use of logical reasoning in search of knowledge. Philosophical knowledge arose from the abandonment of mythology as a way of explaining reality. Curiosity and the desire to know generated the need to develop logical and rational explanations based on the human capacity to reflect and create concepts and ideas.

Philosophical knowledge makes use of reason, but dispenses with the need for scientific verification, since its objects of study are the concepts themselves. The main concern of philosophical knowledge is to question and find rational answers to certain questions, but not necessarily to prove something. In this sense, it can be said that this model of knowledge is critical and speculative. The Characteristics of philosophical knowledge are:

- Systematic: - believes that the basis for resolving issues is reflection guided by logic.
- Elucidative: - tries to understand the thoughts, concepts, problems and other situations in life that are impossible to scientifically unravel.
- Critical: - all information must be deeply analyzed and reflected before being taken into account.
- Speculative: - conclusions are based on hypotheses and possibilities, due to the use of pure theoretical knowledge.

Scientific knowledge is based on experiments, with the purpose of testing the veracity and validity of a hypothesis. Philosophical knowledge, on the other hand, has a rational and logical character, but does not require the need for scientific proof. Philosophical knowledge can be understood as being beyond theological and scientific thinking. Theological knowledge consists of the way of thinking and seeking knowledge based on the principles of faith, organized around a religious doctrine.

Philosophical knowledge differs from other forms of knowledge in terms of its method. The same theme can be explained by theories and foundations of different orders, here are some examples:

- **Philosophical knowledge** - logical and rational theories that could explain the phenomenon, such as determining a primordial element that would have given rise to everything that exists and can be observed. This approach is present in the first Greek philosophers, such as: Thales of Miletus, Anaximander, Anaximenes, Pythagoras, Heraclitus, Parmenides and Democritus.
- **Mythical knowledge** - mythical thinking was based on belief in narratives about myths, bringing explanations based on relationships with the gods.
- **Religious knowledge (theological)** - model of knowledge based on belief (faith) and supported by sacred scriptures, directly revealed, or influenced by God. Religions such as Christianity, Judaism and Islam share a knowledge of the origin, understood as the creation of the world, called Genesis.
- **Scientific knowledge** - knowledge based on collection methods, data analysis, experimentation, which result in theories validated and recognized by peers (scientific community), such as the big bang theory.

Human actions and life in society can be studied and developed from different approaches according to the knowledge base:

- **Philosophical knowledge** - ethics is the study of the principles that govern human actions in their relationship with the other. There is, then, a system of values that determine human actions, their possibilities, and the judgment of these actions. Some thinkers such as Aristotle, Spinoza, Kant, Hegel, Nietzsche, among others, developed fundamental theories for understanding the values that guide actions.
- **Religious knowledge** - one of the fundamental concepts to discuss human actions from a religious perspective is free will, the idea that even if determined by God, human beings have the capacity to act freely, according to their own will.
- **Sociology** - actions are studied from their social and cultural elements.
- **Neuroscience** - studies actions based on the analysis of the activity of the human nervous system and brain in its relationship with the environment.
- **Law** - actions are studied based on a legal system guided by the formulation of values, norms and laws that guide social life.

Evolution of Philosophy

Ancient Philosophy (from the 6th century BC to the 6th century AD), comprises the four great periods of Greco-Roman Philosophy, ranging from the pre-Socratics to the great systems of the Hellenistic period, mentioned above.

Patristic Philosophy (from the 1st to the 7th century) begins with the Epistles of Saint Paul and the Gospel of Saint John and ends in the 8th century when Medieval Philosophy begins. Patristics sought a reconciliation between the new religion – Christianity – and the philosophical thought of the Greeks and Romans. Patristic philosophy is therefore linked to the religious task of evangelization and the defense of the Christian religion against the theoretical and moral attacks it received from the ancients. His most important name was that of Saint Augustine.

Patristics was forced to introduce ideas unknown to Greco-Roman philosophers: the idea of the creation of the world, of original sin, of God as a trinity, etc. To impose Christian ideas, the Fathers of the Church transformed them into truths revealed by God which, being divine decrees, would be dogmas, that is, irrefutable and unquestionable. The great theme of all Patristic Philosophy is the possibility or impossibility of reconciling reason and faith.

Medieval Philosophy (from the 8th to the 14th century) encompasses European, Arab and Jewish thinkers. From the twelfth century onwards, because it was taught in schools, Medieval Philosophy is also known as Scholasticism.

Medieval Philosophy had Plato and Aristotle as its main influences, although the Plato that the medieval people knew was Neoplatonism and the Aristotle that they knew was the one preserved and translated by the Arabs. It was also greatly influenced by the ideas of Saint Augustine. During this period, Christian philosophy, which is theology, emerges. One of his most constant themes is the proofs of the existence of God and of the soul.

The difference and separation between infinite (God) and finite (man, world), the difference between reason and faith, the difference and separation between body and soul, the Universe as a hierarchy of beings, the subordination of the temporal power of kings and barons to the spiritual power of popes and bishops, these are the themes of medieval philosophy.

Inserted in the scholastic movement, the philosophy of Thomas Aquinas (Thomism) was born with clear objectives: not to contradict the faith. In fact, the purpose of his philosophy was to organize a set of arguments to demonstrate and defend the revelations of Christianity.

The Philosophy of the Renaissance (15th and 16th centuries), there are three main lines of thought that predominated in the Renaissance:

1. That coming from Plato, Neoplatonism, and the discovery of the books of Hermeticism; in it, the idea of Nature as a microcosm (as a mirror of the entire Universe) stood out and could act on it through natural magic, alchemy and astrology, since the world is constituted by bonds and secret connections between things; man can also know these bonds and create others, like a god.
2. That origin of Florentine thinkers, who valued active life, that is, politics, and defended the republican ideals of Italian cities against the Roman-Germanic Empire, that is, against the power of popes and emperors. In defense of the republican ideal, the writers rescued ancient political authors, historians, and jurists, and proposed the “imitation of the ancients” or the revival of political freedom, prior to the emergence of the ecclesiastical empire.
3. The one that proposed the ideal of man as the maker of his own destiny, both through knowledge (astrology, magic, alchemy) and through politics (the republican ideal), techniques (medicine, architecture, engineering, navigation) and of the arts (painting, sculpture, literature, theater).

The most important names of this period are: Marcílio Ficino, Giordano Bruno, Machiavelli, Kepler and Nicholas of Cusa. Giordano Bruno presented Nicolaus Copernicus' heliocentric theory, which proposed that the Earth revolved around the sun, and that this was the center of our planetary system. He held that the universe is an infinite whole, the center of which is nowhere. Giordano Bruno was sentenced to death at the stake for challenging Catholic thought, which had as one of its basic points the belief that the Earth was the immovable center of the universe.

Modern philosophy (from the 17th century to the middle of the 18th century) predominated in this period the idea of scientific and technical conquest of all reality, from the mechanical and mathematical explanation of the universe and the invention of machines thanks to physical and chemical experiments. The main thinkers of this period were: Francis Bacon, Descartes, Galileo, Pascal.

One of Galileo's most extraordinary contributions was to assume a posture of scientific investigation, whose methodology in the patient and meticulous observation of natural phenomena; in carrying out experiments to prove a thesis; in the appreciation of mathematics as an instrument capable of enunciating the regularities observed in phenomena.

Francis Bacon is considered one of the founders of the inductive method of scientific investigations. He is also credited with creating the motto “knowledge is power”. According to Bacon, science should value experimental research, with a view to providing objective results for man. But, for that, it was necessary for the scientist to free himself from what Bacon called “idols”, that is, false notions, prejudices, bad mental habits.

René Descartes stated that, to know the truth, it is necessary, at the beginning, to put all our knowledge in doubt, questioning everything in order to carefully analyze whether there is something in reality that we can be completely sure of. From it derives the famous conclusion: “I think, therefore I am”.

In Philosophy, during its long history (approximately 25 centuries) and from so many different periods, several philosophical themes, disciplines, and fields of investigation have emerged. Philosophy investigated countless themes, such as: reason, knowledge, subject, object, History, space, time, freedom, Nature, man, etc.

Philosophy had its field of activity increased when, in the 18th century, the philosophy of art or aesthetics appeared; in the nineteenth century, the philosophy of history; in the twentieth century, the philosophy of science or epistemology, and the philosophy of language. On the other hand, the field of Philosophy diminished when the sciences that were part of it were disconnected to constitute their own spheres of investigation. This is what happens, for example, in the 18th century, when biology, physics and chemistry are disconnected from philosophy; and in the twentieth century, the so-called human sciences (psychology, anthropology, history).

Philosophy manifests and expresses the problems and questions that, in each epoch of a society, men pose to themselves, in the face of what is new and has not yet been understood. Philosophy seeks to face this novelty, offering paths, answers and, above all, proposing new questions, in a permanent dialogue with the society and culture of its time, of which it is a part. Philosophical thought has evolved and continues to evolve every day, along with society.

Philosophy does not have the advantage, enjoyed by other sciences, of being able to presuppose its objects, as given by representation; and also, the method of knowing, to start with and go from there. First, philosophy does indeed have its objects in common with religion. Both have truth as their object, certainly in the highest sense: in the sense that God is truth, and he alone is truth. In addition, both deal with the scope of the finite, nature and the human spirit, the reciprocal relationship, and the relationship with God.

Philosophy can, and must, presuppose a familiarity with and interest in objects; since consciousness makes representations of objects in time, before making concepts about them, the thinking spirit, only by means of representing and turning to it, does it advance to knowing and conceiving thinking. But in thoughtful consideration, it soon becomes apparent that this includes within itself the requirement to show the necessity of its content, to prove both the being and the determinations of its object. The familiarity alluded to above, with the objects, appears as insufficient and as inadmissible to make or legitimize presuppositions and assertions.

But the difficulty of instituting a beginning presents itself at the same time, a beginning, as something immediate, makes its presupposition; or rather, himself, is a presupposition. Initially, philosophy can determine, in general, as a thinking consideration of objects. If it is correct that man is distinguished from the animals by thinking, everything human is human because and only because it takes place through thinking.

While philosophy is a peculiar way of thinking, a way in which thinking comes to know and know the concept, its thinking will also have a diversity in relation to active thinking, in everything that is human, and even if it effects the humanity of the human; as much as, it is identical with this thinking: in itself there is only one thinking. This difference is linked to the fact that the human content of consciousness, founded thanks to thinking, does not first appear in the form of thought, but as feeling, intuition, representation, forms to be differentiated from thinking, as a form.

It is an old prejudice, a proposition that has become commonplace, that man is distinguished from animals by thinking. It may sound trite; but it should also seem strange that it was necessary to appear banal; but it should also seem strange that such an ancient belief should be recalled. However, this may be considered necessary for the prejudice of the present age, which separates feeling and thinking from each other, to the point that they must be opposed, and even so hostile that feeling, especially religious feeling, would be tainted, perverted. , or perhaps even completely annihilated by thinking; and religion and religiosity would not have their root and place in thinking.

With such a separation, one forgets that only man is capable of religion, but the animal has no religion at all; nor does it belong to law and morality. When this separation between religion and thinking is affirmed, it is customary to evoke the thinking that can be designated, as reflection, the thinking that reflects, which has as its content and brings to consciousness thoughts, as such. It is the negligence in knowing and considering the difference determinedly established by philosophy with respect to thinking, which gives rise to the grossest representations and reproaches against philosophy.

Because only religion, law and ethics belong to man, and that, in fact, just because it is the thinking essence, thinking has not been inactive with regard to religion, law, ethics, be it feeling, belief or representation. ; and the activity and productions of thinking are present and contained therein. Only it is different to have such feelings and ideas determined and penetrated by thinking, and to have thoughts about them. Thoughts about these modes of consciousness, produced by meditation, are what they are comprehended under, reflection, reasoning and the like, and also philosophy.

Metaphysical proofs of God's existence were presented, so that only through their knowledge and conviction of Him could faith and conviction of God's existence be essentially produced. A similar statement would agree with this one: that we cannot eat anything before having acquired for ourselves the knowledge of the chemical, botanical or zoological determinations of food; and we should postpone digestion until we have completed the study of anatomy and physiology. If that were the case, these sciences would certainly gain a lot in usefulness in their field,how philosophy and even its usefulness would rise to absolute and universal indispensability. Indeed, instead of being indispensable, these sciences would not exist.

The content that fills our consciousness constitutes the identity of feelings, intuitions, images, purposes, duties, etc., and of thoughts and concepts. Feeling, intuition, image, etc., are to that extent the forms of such content, which remains one and the same. In any of these forms or in a mixture of several, the content is the object of consciousness. But, in this objectivity, the determinants of these forms join the content, so that, in each of these forms, a particular object seems to arise, and what in itself is the same can appear to be a different content.

While the determinants of feeling, intuition, desire, will, etc., insofar as they are known, are generally called representations, it can be said, generally speaking, that philosophy replaces representations with thoughts. , categories and, more precisely, concepts. Representations, in general, can be seen as metaphors for thoughts and concepts. But, since there are representations, their significance for thinking is not yet known, their thoughts and concepts are not yet known. Inversely, having thoughts and concepts and knowing which representations, intuitions and feelings correspond to them are also two different things.

One side of what is called the unintelligibility of philosophy concerns this. The difficulty resides in the incapacity which is only a lack of the habit of thinking abstractly; that is, of firmly holding pure thoughts and moving in them. In our ordinary consciousness are thoughts clothed and united with a common sensible and spiritual matter; and in meditating, reflecting and reasoning, we mix feelings, intuitions and representations with thoughts.

The other side of unintelligibility is the impatience in wanting to have before oneself, in the mode of representation, what is in consciousness, as thought and concept. One finds the expression that one does not know what to think about a concept that one has learned; Now, in a concept there is nothing more to think about than the concept itself. But the meaning of this expression is nostalgia for a well-known, current representation; for consciousness, it is as if, with the mode of representation, the soil in which it has, moreover, its fixed point and domicile were removed.

When it is displaced to the pure region of concepts, it does not know where it is in the world. Consequently, what is most intelligible is the writers, preachers, orators, etc., who dictate to their readers or listeners things that they already know by heart, that are familiar to them, and that are understood by themselves. . As for our common conscience, philosophy would first have to establish the need for its peculiar way of knowing, and even awaken it. But about the objects of religion, with regard to truth in general, philosophy would have to prove its ability to know them from within itself.

As for a diversity that comes to light through religious representations, philosophy would have to justify its discordant determinations. With a view to a preliminary understanding of the difference presented and the interrelationship that is united to it, that the true content of our consciousness is preserved in its transposition into the form of thought and concept, in fact it is only placed in its own light, Another old prejudice may be recalled, namely, that reflection is required in order to experience what is true in objects and events, as well as in feelings, intuitions, opinions, representations, etc. In any case, reflection does at least change feelings, representations, etc., into thoughts.

Insofar as thinking is only what philosophy claims for the peculiar form of its task, even though every man by nature can think, by virtue of this abstraction, which leaves aside the difference indicated, the opposite of what was before occurs. indicated, as a complaint about the unintelligibility of philosophy. This science often suffers from contempt, so that even those who have not taken the trouble to study it declare their presumption of naturally understanding the situation of philosophy; and, as they are able, in an ordinary culture, especially of the religious feeling, to come and go, they are also able to philosophize and to judge about philosophy. There is agreement that one needs to have studied the other sciences in order to know them; and that it is only thanks to such knowledge that one is authorized to make a judgment about them.

To make a shoe one must have learned and exercised, although each shoe has a measurement standard and needs hands, and in them the natural aptitude for the required task. Only to philosophize, one should not demand the study, the learning of similar things, nor the corresponding effort. This self-indulgent opinion has nowadays received its

To make a shoe one must have learned and exercised, although each shoe has a measurement standard and needs hands, and in them the natural aptitude for the required task. Only to philosophize, one should not demand the study, the learning of similar things, nor the corresponding effort. This self-indulgent opinion has been ratified in modern times by means of the doctrine of immediate knowledge, of knowledge through intuition. On the other hand, it is important for philosophy to be well aware that its content is none other than the content originally produced, and being produced, within the scope of the living spirit, and constituted in the world, exterior and interior of consciousness; and understand that the content of philosophy is the effectiveness of consciousness; and that the content of philosophy is effectiveness.

We call experience the closest consciousness of this content. A sensible consideration of the world already distinguishes what, in the vast realm of being, exterior and interior, is only a phenomenon, is transitory and insignificant, and what in itself truly deserves the name of actuality. While philosophy only differs according to the way in which another becomes aware of this single and identical content, its agreement with effectiveness and experience is necessary; and even this agreement can be considered as a touchstone, at least an external one, of the truth of a philosophy; thus, how it is to be considered, as the last and supreme end of science, when provoking, through the knowledge of this concordance, the reconciliation of self-conscious reason, with reason positioned with actuality.

"What is rational is effective and what is effective is rational." These simple propositions seem shocking to many; they have experienced hostility, including from people who do not want it to be doubted that they have the philosophy, and also, certainly, from religion. It is unnecessary to add religion to this purpose, because its teachings about the divine government of the world express these propositions in an excessively determined way. But, as far as the philosophical sense is concerned, one must presuppose a lot of culture to know not only that God it is effective, that it is the most effective, that only it is truly effective; but also, in the formal aspect, that in general being there, is on the one hand phenomenon and on the other hand is effectiveness. eventually "an effectuation" of any whim; error, evil, and what belongs to that side of things, as well as any existence, however petty and transitory it may be.

But also, for an ordinary sensibility, a contingent existence will not deserve the emphatic name of something effective. The contingent is an existence that has no greater value than that of something possible, which, just as it is, may also not be. But if effectiveness would be to think of oneself, in what sense is this expression used? The separation between effectiveness and the idea is particularly grateful to the understanding that takes the dreams of its abstractions for something true and is vain of the must-be that it likes to prescribe, also and above all in the political field, as if the world had waited for him to experience, as it should be, but it is not. If it were, as it should be, where would the precocity of its must-be be? Who would not be prudent enough to see, in what surrounds him, many things that in fact are not as they should be? But this prudence is wrong when it appears that, with such objects and their ought to be, it is within the interest of philosophical science. This only has to do with the idea, which is not so impotent as to merely ought to be, and not actually be; and that is why philosophy has to do with an effectiveness in which these objects, structures, conjunctures, etc. they are only the superficial outer side.

While reflection in general contains the principle of philosophy, and after it flourished again in its autonomy in modern times (after the time of the Lutheran Reformation), while from the beginning it did not simply behave in an abstract way, as at the beginning of the philosophizing of the Greeks, but at the same time threw himself into the matter, which seemed immeasurable, of the world of phenomena, the name of philosophy was given to all knowledge that dealt with the knowledge of fixed measure and the universal, in the sea of empirical singularities , and the necessary, of the laws, in the apparent disorder of the infinite multitude of the contingent; and with that, at the same time, it took its content from intuiting and perceiving itself from the outside and from the inside, from present nature, as well as from the spirit also present, and from the heart of man.

The principle of experience contains the infinitely important determination that, in order to admit and hold a content true, man must be there; more precisely, the determination to find such content in unity with, and associated with, the certainty of oneself. Man must be there himself, whether only with his outer senses, or else with his deepest spirit, his self-consciousness. This principle is the same as what we call faith, immediate knowledge, revelation on the outside and above all on the inside of man. These sciences, which have been called philosophy, we call them empirical sciences, because of the starting point they adopt.

But the essential that they aim at and produce are laws, universal propositions, a theory: thoughts about the given. Thus, Newton's physics was called natural philosophy, while for example Hugo Grotius, through the confrontation of the historical attitudes of peoples, in relation to each other, and with the support of an ordinary reasoning, established general principles, in a theory that it may be called the philosophy of external public law.

The name of philosophy still generally has this determination among the English: Newton continues to have the reputation of being the greatest philosopher the science, which is due to more recent times, of political economy is also called philosophy; what we usually call rational political economy or eventually political economy of intelligence.

Satisfactory as this knowledge may be at first in its field, that of experience, it reveals, first of all, another circle of objects that are not included in it: freedom, the spirit and God. They cannot be found on that ground, not because they do not belong to experience, in fact they are not sensibly experienced, but what is in consciousness is generally experienced; this, by the way, is a tautological proposition, but because these objects are immediately presented, according to their content, as infinite.

The relation of speculative science with the other sciences only exists, while speculative science does not set aside the empirical content of the others but recognizes and uses it; and likewise recognizes the universal of these sciences, laws, genres, etc., and uses it for its own content; but also, in these categories it introduces and enforces others. The difference refers, to that extent, only to this change of categories.

Speculative Logic contains the Logic and Metaphysics of the past; it conserves the same thought-forms, laws and objects, but at the same time perfecting and transforming with other categories. What is usually called a concept must be distinguished from the concept, in the speculative sense. And in the last, one-sided sense, which has been posed and repeated thousands and thousands of times, and has become a prejudice, that infinity cannot be understood through concepts.

The birth of philosophy has experience, immediate and reasoning consciousness, as its starting point. Excited by it, as if by a stimulus, thinking proceeds essentially in such a way as to rise above the natural, sensible and reasoning consciousness to the pure and unmixed element of itself, and thus bestows itself in this way at first on a negative relation of move away, stop with that beginning. Thus, he finds in himself, in the idea of the universal essence of these phenomena, first of all in their satisfaction; this idea (the absolute, God) can be more or less abstract. Conversely, the sciences of experience bring with them the stimulus to overcome the form, in which the richness of their content is offered, as something only immediate, as a finding, a multiplicity arranged side by side, in general, as something contingent, and to elevate this content to need. This stimulus takes thinking away from this universality, and from this satisfaction obtained, and impels it to develop, starting from itself.

The empirical sciences do not stop at perceiving the singularities of the phenomenon; but, by thinking, they elaborate the material for philosophy, while discovering universal determinations, genera and laws: they thus prepare that first particular content so that it can be accepted by philosophy. With that, they include, for thinking, the urge to progress, himself, to these concrete determinations. The welcoming of this content in which, thanks to thinking, and at the same time a development of thinking, from itself. While philosophy owes its development to the empirical sciences, it gives them the most essential figure of freedom (a priori) to think and the verification of necessity, instead of confirming the finding, and the fact-of-experience; in such a way that the fact becomes the presentation and reproduction of the original and perfectly autonomous activity that is thinking.

Each of the parts of philosophy is a philosophical Whole, a circle that closes in on itself; but the philosophical idea is there in a particular element. The singular circle, being in itself a totality, also breaks the barrier of its element and founds an ulterior sphere. Therefore, the whole presents itself as a circle of circles, each of which is a necessary moment, so that the system of its own elements constitutes the complete idea, which equally appears in each single element.

The whole of philosophy therefore truly constitutes a science; but it can also be seen of many particular sciences. The unit in which, in such an aggregation, the sciences come together, since they are received in an external way, is an equally external unit: an order. This order must necessarily, for the same reason and because the materials are of a contingent nature, remain an essay, and always present inadequate sides.

Its beginning, rational, becomes contingent because it has to bring the universal down to empirical singularity and actuality. In this field of mutability and contingency, the concept cannot be asserted, but only reasons. Legal science, p. e.g., or the system of direct and indirect taxes require very precise ultimate decisions, which are located outside the being-determined-in-itself-and-for-itself of the concept, and therefore allow a space for determination, which according to a reason can be apprehended in one way, and according to another reason in another way, without being susceptible of anything, which is last with guarantee. Likewise, the idea of nature in its singularity is lost in contingencies, and natural history, geography, medicine, etc. fall into the determinations of existence, into species and differences that are determined by an external fortuitous accident and the play of chance, and not through reason. History also fits in here, insofar as the idea is its essence, but its manifestation is in the contingency and in the field of the arbitrary.

Such sciences are also positive, as long as they do not recognize their determinations as finite, nor do they show the passage of these determinations and their entire sphere to another superior sphere but admit them as purely and simply valid. The superior, but they admit them, as purely and simply valid. To this finitude of form, as the first was the finitude of matter. The finitude of the foundation-of-knowledge, which is, on the one hand, reasoning; on the other, feeling, faith, the authority of others in general, the authority of intuition. Philosophy also comes into this case, which wants to base itself on anthropology, the facts of consciousness, inner intuition or outer experience.

It may still be that the form of scientific exposition is simply empirical, but that sense-full intuition orders what are merely phenomena, according to the inner sequence of the concept. It belongs to such an empirical that by the opposition and manifold variety of the phenomena grouped together, they elevate the external circumstances, contingent on the conditions, and then, thereby, the universal appears before the mind.

An experimental physics, a history, etc., endowed with meaning, will thus expose the rational science of nature, the events, and acts of man, in an external image that reflects the concept. As for the beginning that philosophy must make, it also seems that philosophy in general begins with a subjective presupposition, like the other sciences. Namely: it must make a particular object the object of thinking. As in other sciences, this object is space, number, etc. here in philosophy it is thinking itself. However, the free act of thinking is this: placing oneself in the point of view in which it is for oneself, and that is why it is engendered and given as an object itself.

Moreover, this point of view, which thus appears as immediate, must, within science, become a result; and indeed, the ultimate result of science, in which it reaches its beginning anew and returns upon itself. In this way, philosophy shows itself, as a circle that returns on itself, that it has no beginning, in the sense of the other sciences, so that the beginning is only a relationship with the subject, while he wants to decide to philosophize, but it does not stop with science as such. Or, what is the same, the concept of science and therefore the first concept and, because it is the first, contains the separation, namely, that thinking is the object for a philosophizing subject, in a certain way external, this concept must be apprehended by science itself. And even this is its only end, action, and goal: to reach the concept of its concept, and thus its return, upon itself, and its satisfaction.

As a prior, general representation of a philosophy cannot be given, since only the whole of science is the exposition of the idea, so its division can only be conceived from this exposition; the division is like the idea, which must be anticipated. The idea, however, proves itself, as thinking purely and simply identical to oneself, and this, as an activity of opposing oneself, to be for oneself; and be in that other, only with yourself. So, science is divided into three parts:

1. **Logic -** the science of the idea in and for itself.
2. **The Philosophy of Nature -** as the science of the idea in its being-other.
3. **The Philosophy of Spirit -** as an idea that in its being-other it returns to itself.

Logic is the science of the pure idea, that is, of the idea in the abstract element of thinking. The same holds true for this determination, as for the others contained in this preliminary concept, as it holds for the previously presented concepts about philosophy in general: namely, that they are determinations drawn from and in accordance with the general view of the whole. It could well be said that Logic is the science of thinking, of its determinations and laws. But thinking as such constitutes only the universal determination or the element in which the idea is found as logic. The idea is thinking, not as formal thinking, but as the unfolding totality of its own determinations and laws, which the idea gives itself: (and) not what it already has and finds.

Logic is the most difficult science, since it does not deal with intuitions, nor even as geometry does with abstract sensible representations, but with pure abstractions, and requires a strength and skill to withdraw from pure thought, to keep it firmly and to move within it. On the other hand, Logic could be seen as the easiest, since the content is nothing but thinking itself, and its current determinations; and these are the simplest, and at the same time are the elementary. They are also what is most known, being, nothing, etc.; determination, greatness, etc.; being-in-itself, being-for-itself, one, multiple, etc. However, this notoriety makes the study of Logic more difficult.

On the one hand, it is easily considered that such a well-known thing is not worth occupying oneself with; on the other hand, it is a matter of making it well-known in a completely different way, and even opposite, to what is already known. The usefulness of Logic about the relation to the subject, insofar as he acquires a certain formation for other purposes. The formation of this subject, through Logic, consists in that he exercises in thinking; because that science is the thinking of thinking; and in which the subject receives thoughts in his head, and receives them too, as thoughts. But while logic is the absolute form of truth and, even more than that, it is also pure truth itself, it is quite different than simply something useful. But since the most excellent, the freest and the most autonomous is also the most useful, the logical can also be understood in this way. Its usefulness must be seen differently than simply the formal exercise of thought.

The first question is this: what is the object of the Philosophical Sciences? The simplest and most understandable answer to this question is that the truth is this object. Truth is a lofty word, and the Thing even loftier. If the man's spirit and soul are still healthy, his heart must soon beat faster. But soon the however presents itself if we can know the truth. There seems to be an inadequacy between us limited men and the truth laid down in you; and the question arises about the bridge between the finite and the infinite. God is the truth; how should we know him?

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The virtues of humility and modesty seem to be in contradiction with such a project, but it is also questioned whether the truth can be known, to find a justification for continuing to live in the vulgarity of its finite ends. Such humility is no big deal at this point. Language like this: "How would I, poor worm of the earth, be able to know the truth?" it is outdated. In its place came presumption and fantasy and if they imagined themselves to be immediately in the truth, youth is persuaded that they, as they are, already possess the truth (in religion and ethics). It was also said in this regard that, as a whole, adults, meaning and ossified, are submerged in untruth.

The dawn would shine for the young, while the world of the old would be in the swamp and mire of day. The sciences, in this case, are characterized, as something that must be acquired, certainly, but as a simple means to external vital ends. Here it is not modesty that impedes the knowledge and study of the truth, but the conviction that one already possesses the truth in and for oneself. Undoubtedly, the elderly now places their hope in youth, as it must carry forward the world and science. But this hope is only placed in youth, insofar as it does not remain as it is, but undertakes the bitter work of the spirit.

There is yet another figure of modesty towards truth. And vanity before the truth, as we see in Pilate face to face with Christ. Pilate asked, "What is truth?" in the sense of one who had settled accounts with everything, for whom nothing had any more significance - in the sense in which Solomon said: "all is vanity". Here only subjective vanity remains. Furthermore, pusillanimity is opposed to the knowledge of the truth. It is easy for the lazy mind to say, "Don't assume that philosophizing is to be taken seriously." One can even pay attention to logic, although it must leave us as we are. It is believed that if thinking goes beyond the usual circle of representations, it will lead to bad directions. Indeed, whoever entrusts himself to a sea, where he is tossed from side to side by the waves of thought, in the end will find himself back on the sandbar of that temporality that was left for nothing; and twice nothing.

What follows from such an opinion is well seen in the world. One can acquire various skills and knowledge, become a routine employee, and otherwise cultivate oneself for one's own purposes. But it is another thing to also cultivate your spirit for what is most exalted and strive to reach it. It can be expected that in our time a desire for something better has arisen in youth, and that it does not want to be content simply with the straw of external knowledge.

That thinking is the object of logic is universally agreed on this point. But of thinking one can have a very low opinion and also a very high opinion. Thus, on the one hand, it is said: "this is only a thought", and with this it is supposed that the thought is only subjective, arbitrary, and contingent, but is not the Thing itself, the true and effective. On the other hand, one can have a high opinion of thought, and apprehend it so that it alone can reach the highest, the nature of God; and that with the senses nothing can be known of God. It is said that God is spirit and wants to be worshiped in spirit and in truth. We agree, moreover, that what is felt and sensible is not the spiritual; but that his innermost being is thought, and that only the spirit can know the spirit. The spirit can undoubtedly behave like a feeling soul (for example, in religion); one thing, however, is the feeling as such, the modality of the feeling, and another thing its content.

Feeling as such is generally the form of the sensible, which we have in common with animals. This form can then very well take over the concrete content, but this content does not belong to this form; the form of feeling is the lowest form of spiritual content. That content, God himself, is only the truth in thinking and how to think. In this sense, thought is not just thought, but rather is the highest way and, strictly considered, the only way in which the eternal can be apprehended and sustained in and for itself. As with thought, so with the science of thought one can have a high opinion and a low opinion. It is believed that thinking can be done by everyone

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If one also studied logic, then one thinks afterwards as before, perhaps more methodically, but with little change. If logic had no other function than that of familiarizing with the activity of purely formal thinking, then it would not even produce anything that had not already been done just as well in another way. Also, the logic prior to ours in fact only had this position. By the way, the knowledge of thinking, as a purely subjective activity, also honors man and interests him; by the fact of knowing what he is, and what he does, man differs from the animal.

But Logic as a science of thinking has a high point of view insofar as only thought can experience what is highest, what is true. If, the science of logic considers thinking to be its activity and its production (and thinking is not an activity without content, because it produces thought and produces thought), the content in general is the supersensible world, and dealing with the thought is to linger in that world.

Mathematics deals with the abstractions of number and space, but which are still something sensible, even though they are the abstract sensible and needing-to-be-there. Thought also bids farewell to this last sensible one, and is free with itself; it renounces external and internal sensibility, puts aside all particular interests and inclinations. Insofar as Logic has this basis, we must make a more dignified idea of it than is usually the case.

The need to understand Logic, in a deeper sense than that of the purely formal science of thinking, is occasioned by the interest of religion, law, the State, and the ethical life. In the past, nothing was seen to be wrong with thinking; thought and done. People thought about God, nature and the State, and there was the conviction that only through thought can one come to know what truth is, and not through the senses or through some contingent representation and opinion. But while people continued to think like this, it happened that in life superior relationships were compromised by it. Through thinking, the positive has been stripped of its power. Political constitutions fell in holocaust to thought; religion was attacked by thought, solid religious representations, which were worth purely and simply as revelations, were buried; and the old faith was destroyed in many souls.

Thus, for example, the Greek philosophers opposed the old religions and annihilated their representations. Therefore, philosophers were banished and killed for subverting religion and the state, which both were essentially connected. In this way, thinking asserted itself in effectiveness and exercised the most colossal effectiveness. He therefore aroused attention to the power of thinking, began to examine his complaints more closely, and it was pretended to have found that he had too much pretensions, and could not effect what he undertook. Instead of knowing the essence of God, nature and spirit, and generally speaking, instead of knowing the truth, thought has destroyed religion and the state.

For this reason, a justification of thinking about its results was required, and the examination of the nature of thinking and its legitimacy is what, in modern times, has largely constituted the interest of philosophy. Let's think about its representation, which is closer; then it appears:

1) first in its usual subjective meaning, as one of the spiritual activities or faculties, along with others, such as sensibility, intuition, fantasy, etc.; of wanting, wanting, etc. Its product, the determination or form of thought, is the universal, the abstract in general. Thinking, as activity, is therefore the active universal, and in fact the universal that acts; while the act, the produced, is precisely the universal. Thinking, represented, as a subject, is the thinking subject, and the simple expression of the existing subject as a thinking being is, I.

The determinations set out here and in the following paragraphs should not be taken as a statement or as my opinions about thinking. However, because in this preliminary way (of speaking) no deduction or proof can take place, they must count as facts, so that in any person's consciousness, if he has thoughts and considers them, it is found empirically that the character of universality and so also the subsequent determinations. For the observation of the facts of your consciousness and your representations, it is certainly required that a culture of attention and abstraction be present and available. Already in this preliminary exposition, there is talk of the difference between sensible, representation and thought; decisive difference for understanding the nature and modes of knowledge. It will also serve to clarify this difference already here.

For the sensitive, it is first of all its external origin - the senses or sense organs - which is taken as an explanation. But the denomination of the instrument does not determine what is captured by it. The difference between the sensible and the thought must be placed in that the determination of the sensible is the singularity, and, while the singular (in an entirely abstract way: the atom) is also in the connection, the sensible is an outside (being). of-an-other, whose most precise abstract forms are: the (being), of-an-other and the (being)-alongside and of-another.

Representing has such sensible matter as its content; but placed in the determination of mine, [namely] that such content is in me; and in the determination of universality, self-relationship, simplicity.

In addition to the sensible, however, the content of representation also has [an] original matter of self-conscious thinking, such as representations of the juridical, ethical, religious and also of thinking itself; and it is not at all easy to place where the difference lies between such representations and thoughts about such content. Here the content is thought, all the more so since the form of universality is also present, since it is convenient that it is there because it is a content in me, and generally speaking because it is a representation. But, in general, the peculiarity of the representation must be put, also under this aspect, in which such content remains equally isolated in its singularity. Depending on the time, they certainly manifest themselves as if they were “one-after-the-other”; but its content itself is not represented as affected by time, flowing in it and changeable. But such self-spiritual determinations are likewise isolated in the broad terrain of the interior, abstract universality of representation in general.

In this isolation they are simple: right, duty, God. Now, the representation, or stays at this: in saying that law is law, God is God; or else, more cultivated, it indicates determinations, for example, that God is the creator of the world, omniscient, omnipotent, etc. Listed here are many simple isolated determinations which, despite their connection, which has been assigned to them in their subject, remain outside one another. The representation here coincides with the understanding, which is only differentiated from it by relations of universal and particular, of cause and effect, etc., and therefore, the relations of necessity between isolated determinations, of representation; while this one leaves them in their indeterminate space, one next to the other, connected by the simple too. The difference between representation and thought is particularly important, because in general it can be said that philosophy does nothing but transform representations into thoughts; but after that, it is true, it transforms mere thoughts into concepts.

By the way, if the determinations of singularity and being-out-of-the-other were indicated for the sensible, it can still be added that these determinations themselves are, in turn, thoughts and universals. In Logic it is shown that thought and the universal is precisely this: it is itself and its other, it takes hold of this other and nothing escapes it. While language is the work of thought, nothing can be said of it that is not universal. What I only aim at is mine, it belongs to me, as to this particular individual; but if language only expresses the universal, I cannot say what I only aim at. And the unspeakable feeling, sensation, is not the most excellent, the truest; but the most insignificant, the most untrue. If I say: the “singular”, “this singular”, “here”, “now”, all these are universalities; each one is something singular, one this: and also, if it is sensitive, it is one here, one now. Likewise, if I say: “I”, I aim at myself, as this one who excludes all others; but what I say “I”, each one precisely is: an I that excludes all others from itself.

Kant used the inappropriate expression that I accompany all my representations, and sensations, desires, actions, etc. The I is the universal in and for itself, and the community is also a form of universality, but an external form. All other men have one thing in common with me, just as all my sensations, representations, etc. be mine. But. I, abstractly as such, is the pure relation to oneself, in which one abstracts from representing, from feeling, from every state, as well as from every particularity of nature, talent, experience, etc. He is, to that extent, the existence of the totally abstract universality, the abstractly free. Therefore, the I is thinking, as a subject, and, as I am at the same time in all my sensations, representations, states, etc. thought is everywhere present and traversing, &c. Thought is present everywhere and crosses, as a category, all these determinations.

When we speak of thinking, this initially appears as a subjective activity, as a faculty, among the different ones we have, such as memory, representation, the faculty of wanting, and similar ones. Were simply thinking a subjective activity and, as such, the object of logic, then logic would have, like other sciences, its determined object. It could then appear as arbitrary, to make thinking the object of a particular science; and not to do the same with the will, the imagination, etc. That thought should have this honor could well have its reason for granting it a certain authority, and which is considered, as the true nature of man, as that in which his difference from the animal consists of. Learning to know thinking, also simply, as a subjective activity, is not without interest. Its most precise determinations would then be the rules and laws whose knowledge is acquired through experience. Thinking, considered in this relation, according to its laws, is moreover what ordinarily constituted the content of Logic. Aristotle is the founder of this Science. He had the strength to assign when thinking about what belongs to him as such. Our thinking is very concrete, but in the multiform content one must distinguish what belongs to thinking or to the abstract form of activity. A discreet spiritual bond, the activity of thinking, brings all this content together; and Aristotle stressed and determined this tie, this form as such.

Until today, Aristotle's Logic is the logic that was only expanded more widely, mainly by the scholastics of the Middle Ages, although they did not increase, but only developed the content further. The action of modern times in relation to Logic only consists mainly, on the one hand, in rejecting many logical determinations elaborated by Aristotle and the scholastics, and, on the other hand, in grafting numerous psychological materials. In this science, the interest is to learn to know your way of finite thought, and science is correct when it corresponds to its presupposed object. The occupation with this formal logic undoubtedly has its usefulness; for her, as they say, “the head is fixed”; he learns to concentrate, he learns to abstract himself, whereas in ordinary consciousness one deals with sensitive representations that intersect and become entangled. However, in abstraction, the spirit concentrates on a single point, and from there one gains the habit of occupying oneself with interiority.

Familiarity with the forms of finite thinking can be used as a means of training for the empirical sciences, which proceed according to these forms; and in this sense Logic was characterized as instrumental logic. Now, one can undoubtedly act more “liberally and say that Logic should not be studied for its utility, but for itself, because the excellent should not be sought for the simple utility. In fact, this on the one hand is completely accurate; but on the other hand, the excellent is also the most useful, since it is the substantial that stands firm by itself, and for that reason it is the support for the ends, which it promotes and carries out. There is no need to consider ends, such as what is first, but the excellent promotes them. Thus, for example, religion has absolute value in itself; at the same time the other ends are supported and fulfilled by it. Christ says: "Seek first the Kingdom of God, and the rest will be given to you in addition". Ends can only be attained in so far as the essential in-and-for-itself is attained.

Information Philosophy

Considering the philosophical work, as the art of interpreting reality from the formulation of conceptual schemes about the human being, nature and society, can Philosophy face the problems that arise from the new organizational dynamics of society today? We understand that Philosophy alone, without interdisciplinary analysis tools, does not seem capable of facing, perhaps even formulating, the problems raised by ICTs.

(Floridi, 2011, p. 14), characterizes the Philosophy of Information (FI) as follows: a philosophical area that is related to:

a) Critical investigation of the conceptual nature and basic principles of information, including its dynamics, use and sciences; and refers to FI, as a new area of investigation in Philosophy, guided by the investigation of information content and not only in its form, quantity and probability of occurrence (thus differing from the proposal of (Shannon & Weaver, 1949/1998) It is important to emphasize that FI does not seek to develop a "unified theory of information", but to integrate the different forms of theories that analyze, evaluate and explain the different concepts of information defended.

b) The characterization, in turn, indicates, according to (Floridi, 2011, p. 15-16), that FI has its own methods for analyzing philosophical problems, both traditional and new. These methods have information as a central element, are interdisciplinary and maintain a relationship with computational methods, in addition to using concepts, tools and techniques already developed in other areas of Philosophy (e.g., Philosophy of Artificial Intelligence, Cybernetics, Philosophy of Computation, logic, etc.).

Thus, FI will provide a broad conceptual framework for dealing with issues that emerge from the "new" dynamics of contemporary society (Floridi, 2011, p. 25). An example of this dynamic is the interaction possibilities provided by ICTs which, depending on the degree of familiarity of people with such technologies, promote a feeling of dependence on being online. Furthermore, even if people do not want to be online most of the time, this feeling remains due to the dissemination of informational devices in everyday life, such as cameras, credit cards, among others. In this situation, the question arises: what are the implications of the insertion of ICTs in society for people's daily actions?

Considering (a) and (b), (Floridi, 2002, 2011), argues that FI constitutes a new paradigm and an autonomous area of investigation in Philosophy. It is characterized as a new paradigm, as it would break with previous paradigms of Philosophy, since it is neither anthropocentric nor biocentric, admitting information as the central focus in the analysis of concepts and social dynamics. The autonomy of FI would be sustained by the presence of topics (problems, phenomena), methods (techniques, approaches) and theories (hypotheses, explanations) of its own, in accordance with other areas already recognized as legitimately philosophical (Floridi, 2002, 2011; Adams &Moraes, 2014).

Among the FI topics, the question "what is information?" stands out, referring to the ontological and epistemological nature of information. It is the answer to this question that directs the paths to be developed by FI and delimits its scope of investigation (Floridi, 2011). The importance of this issue also arises from the fact that, as we have indicated, there is no consensus among scholars on their proposals.

Since the "informational turn in philosophy", several conceptions of information have been developed in an attempt to respond to concerns about the ontological and epistemological status of information. Although, (Adams, (2003), indicates the milestone of the informational turn in Philosophy with the publication of Turing's article in 1950, there are precursors of information theory in several areas, especially in Semiotics, such as the works of (Charles S. Peirce, 1865-1895).

Some examples can be given with the following proposals:

- **(Wiener, 1948, p. 17):** «The commands through which we exercise control over our environment are a type of information that we impose on it». Furthermore, for this author, information would be a third constituent element of the world, alongside matter and energy, not being reducible to them.
- **(Shannon & Weaver, 1949/1998):** the authors establish, the Mathematical Theory of Communication, a technical notion of information, conceived in probabilistic terms resulting from the reduction of possibilities of choosing messages, which can be understood objectively.
- **(Dretske, 1981),** information is understood, as a commodity that objectively exists in the world, independent of a first-person conscious mind that captures it. The information would constitute an indicator of regularities in the environment, from which representations, beliefs, meaning, mind, mental states, among others, would be made.
- **(Stonier, 1997, p. 21),** information would be on the physical plane, objectively, and Physics theorists, in turn, would have to expand their vocabulary and admit infoms (information particles) as a constituent element of the world. «[...] information exists. It does not need to be perceived to exist. It does not need to be understood to exist. It does not require intelligence to interpret it».

(Floridi, 2011, p. 106), «Information is well-formed data, with meaning and truth». Well-formed and meaningful data that refers to the intrinsic relationship that the data would need to have in relation to the choice of system, code, or language in question. These would have their aspect of "true" and "truth" related to the adequate provision of the contents to which they refer in the world.

- (Gonzalez, 2014), conceives information as an organizing process of dispositional (counter-factual) relationships that bring together properties attributable to material / immaterial objects, structures or forms) in specific contexts.

Although the indicated concepts of information are different, there is a common naturalist stance in relation to the objective aspect of information. Furthermore, proposals such as those by Dretske and Floridi denote an intrinsic relationship between information and truth. According to (Dretske, 1981, p. 45), characterizing "false information" as information would be the same as saying that "rubber ducks would be types of ducks". Since the information could not be false, the information would be genuinely true and would necessarily say about its source. This source can be interpreted as the world itself, allowing the treatment of another IF problem, that is: what is the nature of knowledge?

About the nature of knowledge, theories of knowledge stand out, from which it is analyzed through the relationship between agent, the cognitive and the world. For (Dretske, 1981, p. 56), the information processors of the sensory systems of organisms are channels for receiving information about the external world.

The naturalist posture in Philosophy consists of disregarding the supernatural in the explanation of nature and the mind, conceiving reality constituted only by natural elements and laws, which are explained through scientific methods. The term "natural" would encompass other terms such as "physical", "biological" or "informational" that express a rejection of transcendent assumptions in the foundation of a priori knowledge (Moraes, 2014), the acquisition of knowledge. (Adams, 2010), in turn, argues that knowledge acquires its properties from its information base; thus, if someone 'knows that p' it is because he is told 'that p'. In such a relationship, knowledge is about the world, about the truth, constituting the bridge between the cognitive agent and the world.

In addition to problems about the ontological and epistemological nature of information, and the nature of knowledge, the following questions are part of the FI research agenda: "what is meaning?", "what is the relationship between mental states and informational states?", "could reality be reduced to informational terms?", "can information support an ethical theory?", among others.

Having presented the topics (problems) and theories (hypotheses and explanations) of FI, we highlight two methods specific to this area of investigation: the "synthetic method of analysis" and the "levels of abstraction".

Such methods come from the influence of Turing's work on Philosophy (marked, in particular, by the informational turn). The "synthetic method of analysis" is the result of Turing's hypothesis (1950), according to which the study of the mind is appropriate when carried out using mechanical functions that could be manipulated by digital computers (Gonzalez, 2005; Floridi, 2012). Through such functions it would be possible to build mechanical models of the structure and dynamics of intelligent thinking. The understanding that underlies such a conception is that the ability to manipulate information in a mechanical way constitutes thinking.

This understanding enabled the development of mechanical models of the mind, which initially generated two strands in Cognitive Science (Teixeixa, 1998): strong Artificial Intelligence, which defends the thesis according to which mechanical models of the mind, when successful, do not they only simulate/emulate mental activities, but explain and instantiate such activities; and weak Artificial Intelligence, according to which the model is only a limited explanatory tool of intelligent mental activity. The common point of such notions is that both accept the thesis that to simulate is to explain, in order to attribute to mechanical models, the value of theories. This sets up an example of an approach to another issue specific to FI: what is the relationship between information and intelligent thinking?

The "levels of abstraction", in turn, derive from Turing's algorithmic approach, which is summarized by (Floridi, 2013b, p. 210) as follows: We have seen that questions and answers never occur in a vacuum, but are always incorporated in a network of other questions and answers. Likewise, they cannot occur in any context, without any purpose, or regardless of any perspective. According to this perspective, a philosophical question is analyzed considering its context and purpose, which delimit the field of possibilities for adequate answers.

Considering the topics, theories, and methods specific to FI, (Adams &Moraes, 2014) propose the "argument from analogy" to analyze the autonomous aspect of FI. These authors point out that, like the Philosophy of Mathematics and the Philosophy of Biology, FI has characteristics such as:

- Proximity to the scientific approach, epistemological and metaphysical problems, in addition to the presence of specific problems not previously addressed in other areas of Philosophy. Given that FI shares characteristics present in areas already recognized by the philosophical society as legitimate, it would be counterintuitive not to accept FI as an autonomous area of investigation in Philosophy.

As we indicated, the development of information studies in the philosophical-scientific scope contributed to the constitution of FI in the academic scope. This is illustrated with the constitution of FI, as an autonomous and interdisciplinary area of Philosophy: interdisciplinary due to its relationship with Computing, Sociology, Engineering, among other areas, generating methods and theories to deal with its problems; and autonomous, due to its own (and new) problems. In step with the development of the academic field of FI, the influence in the social field is also highlighted, illustrated by the growing presence of ICTs in the daily lives of people and organizations. Such a presence would be influencing the dynamics of contemporary society, constituting the "Information Society".

Philosophical Concept of Information

(Belkin, 1978) contributed many studies to an important problem of information science: the question of defining an adequate concept of information for information science. Although Belkin discusses information concepts used only in information science, many of these concepts originated in other fields and/or are used in a wide variety of these (Belkin, 1978, p. 82):

- Information as a Fundamental Category: Information is seen as something essential for the existence of the universe, as a basis, but a different category of matter.
- Information as a Property of Matter and Consciousness: Information is not considered, as a special category, but as a property of matter (ie, objective information) and or property of an individual's consciousness or reflection (ie, subjective information);
- Information as social-scientific information is based on the classification of (Mikhailov, Chernyi and Giliarevskii, 1975, in; Belkin, 1978). This classification divides the intuitive idea of social and non-social information, social and non-semantic semantic information, and scientific and non-scientific information. According to (Mikhailov, Chernyi and Giliarevskii, 1975), information is limited by the social sciences.
- Information as Event: Information is seen as the expression of the mental image that occurs when we receive a message.
- Information Frame: Information is not seen as an event, but as the resulting structure of that event. For example, information is the structure resulting in the mind from sensory data or some experience.
- Information as probability of occurrence of an event comes from the information theory of (Shannon and Weaver, 1949).
- Information as a Message: Vague concept in which information is confused with the content of a communication.

Data Science

The term resource can be considered as any element used to achieve a particular purpose. Thus, for example, it is possible to speak of economic resources, human resources, technological resources, intellectual resources, renewable resources. From this perspective, the whole resource is an element or set of elements that serves to achieve a goal. Given the breadth of the definition, it is obvious that this term issued in various areas of knowledge and circumstances. However, there are some areas where their use has well-defined limits, due to the importance that this resource means.

One type of resource with attendance and of great importance in the economy is the so-called natural resource. This expression refers to all the element extracted from nature that serves for the production of goods and services. Occasionally, these resources may have a limited obtaining in some cases, already in others, unlimited. In fact, on certain occasions there are resources that, because of natural processes, are constantly renewed: this is the case of natural resources. For the latter case, some energy sources such as energy, wind, solar, water, etc. may be mentioned.

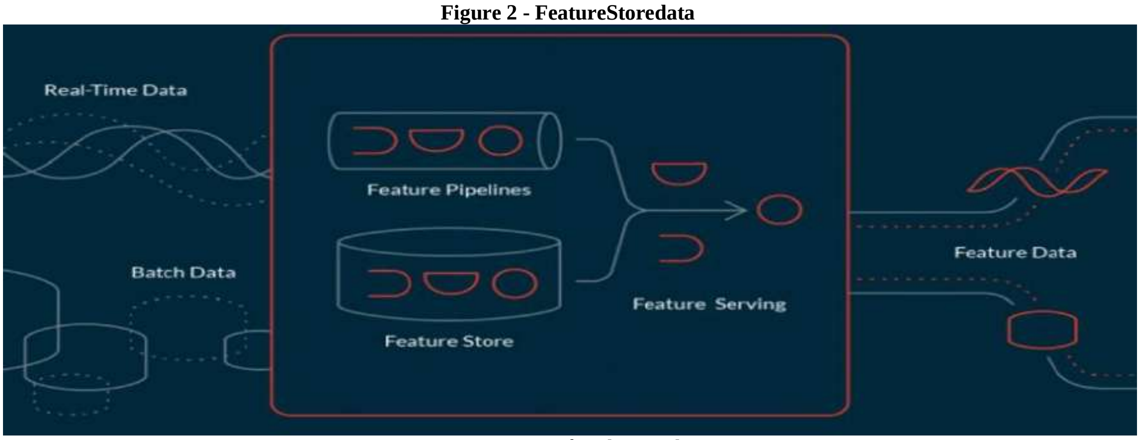
In the area of psychology, the term resource refers to a person's ability to deal with the difficulties of the environment. They can consist of work skills, attitudes, ability to relate to others, etc. In this sense, resources have the function of keeping the person healthy from the, psychic point of view. In fact, when people are overwhelmed by external circumstances, when problems are impossible to solve with the internal tools they have, it is quite possible to fall into depression or some stressful situation.

Finally, it is worth highlighting the economic resources. They are the ones who guarantee the development of a company / organization, family, or person. On some occasions, these resources may become scarce and it is appropriate to assess the possibility of having access to external funding. The relationship between the economic resources produced and those consumed, shows to a large extent the health panorama and the proper functioning of the agents in question, from the economic point of view.Economicresources are those material or immaterial means that offer the possibility of satisfying some needs of the production process or the economic activity of a company / organization. Therefore, economic resources are essential to carry out financial, commercial, or industrial operations.

To have access to an economic resource, it is necessary that there is an investment in advance. In the process of being profitable, it must be recovered through the use or exploitation of the activity itself. Let's examine this general idea through a concrete example: the field is an economic resource that allows the development of agriculture, but this resource may be unfeasible from an economic point of view. If the field is situated in a geographical area that requires a large amount of money in its exploitation. Economic resources allow individuals to meet their material needs and face life.

The process of creating features is called resource engineering (or attribute engineering), which is a complicated but critical component for any process apprenticing tomachines/equipment'sBetter features mean better models, resulting in better business results.Generating a new resource requires a huge amount of work and creating the pipeline to build the resourceis just one aspect. To reach this stage, it probably takesa long process of trial and error, with a wide variety of resources, until you reach a point where you aresatisfiedwiththe new unique feature. Then you need to calculateand store it as part of an operational pipeline, which differs, depending on whetherthe resource is online or offline.

Figure 2 - FeatureStoredata



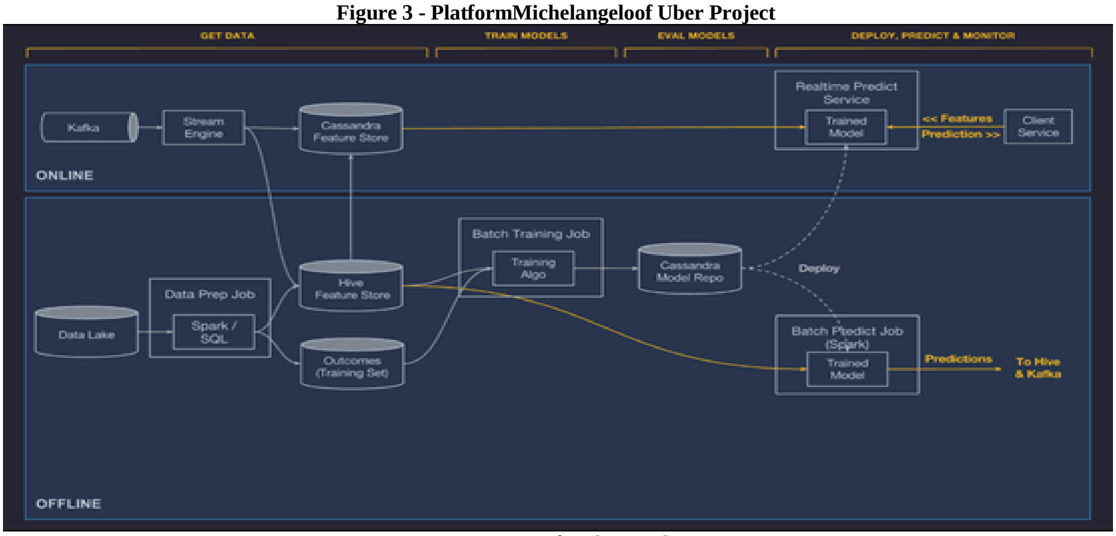
Source: Microsoft Industry Blogs

In addition, the entire data science project begins with the search for the right data. The problem is that most of the time, there is no single, centralized place to search; the data is hosted everywhere. Therefore, first, data storage provides a single pane of glass to share all available data. When a Data Scientist starts a new project, you can access this catalog and easily find the data you're looking for. But data onstorage is also a data transformation service that allows userstomanipulate the raw data and store it, ready to be used by any model of apprentice of the machine(computer). There are two types of data: online and offline

Offline data – some data is calculated as part of a batch job. For example, average monthly spend. They are mainly used by offline processes. Given its nature, creating this type of data can take time. Typically, offline data is calculated through structures such as Spark or simply running SQL queries in given database, and then using a batch inference process.

Online data– it is a bit more complicated data because it needs to be calculated very quickly and is usually displayed in milliseconds. For example, calculate a score for detection of a fraud in real time. In this case, the pipeline is constructed by calculating the mean and standard deviation, in real-time sliding window. These calculations are much more challenging, requiring fast computing as well as fastaccess to data. **<u>The data can be stored in memory or database</u>** of fast key values. The process itself can be performed on multiple cloud services or a platform.Here is an example of an online data and offline pipeline using Data Storage (Feature Store). It was designed by Uber, as part of its Michelangelo platform:

Figure 3 - PlatformMichelangeloof Uber Project



Source: Microsoft Industry Blogs

Ideally, data scientists should focus on what they have studied to do and what is best: building models. However, they often spend mostof their time in data engineeringconfigurations. Some features are expensive to compute and require aggregation, while others are quite straight forward. But that is not something that should worry data scientists or stop them from leveraging the best features for their model. Therefore, the concept of data storage isto abstract all engineering layers and provide easy access to read and write them..

As mentioned earlier, online, andoffline data have different characteristics. Behind the scenes, offline data is built primarily on structures suchas Spark or SQL, where actual data is stored in database or files. While online datamay require access to data using APIs for streaming engines such as Kafka, Kinesis, or databases of key values in memory, such as Redis or Cassandra.

Working with a data storeabstracts this layer, so that when a Data Scientist is looking for a data instead of writing engineering code, he can use a simple API to retrieve the data he needs.

One of the main challenges in data implementing the machine (computer) in production arises from the fact that the data being used to be a model in the software development environment (programs) is not the same as the data in the production service alayer. Therefore, enabling a consistent set of features (computer, and software) across the service layer enables a smoother deployment process, ensuring that the model really reflectsthe way thingsworkin production.

In addition tothe actual data, the data store maintains additional **meta** data for each resource. For example, a metric that shows the impact of the resource on the model it is associated with. This information can help Data Scientists tremendously select resourcesfor a new model, allowing them to focus on those who have achieved a better impact onsimilar existing models.
The reality today is that almost all businesses are based on Machine Learning, so the number of projects and resources is growing exponentially. This reduces our ability to have a good comprehensive overview of the resources available, since there are so many. Instead of developing in silos, data storage allows you to share our resources with our**colleagues**. It isbecoming common problem in large organizations that different teams end up developing similar solutions simply because they are not aware of each other's tasks. Data storage fillsthat gap and allows everyone to share their work and avoid duplication.
To meet guidelines and regulations, especially in cases where the Artificial Intelligence (AI) models (IA) generated serve sectors such as health, financialservices, and security, it is important to track the lineage ofalgorithmsunder development. Achieving this requires visibility into the end-to-end data flow to better, understand how the modelisgeneratingits results. Because data is being generated, as partof the process, it is necessary to track the flow of the data generation process. Data storage and the lineage of data and a resource can be maintained. This provides the necessary tracking information, such as the datageneratedramand provides the vision and reports needed for regulatory compliance.
MLOps is an extension of DevOps where the idea is to apply the principles of DevOps in machine learning pipelines. The development of a machine (computer) apprentice shippipeline is different from software development (programs), mainly because of the appearance is different from development of the softwaredata. Model quality is not based solely on code quality. It is also based on the quality of the data and the features that are used to run the model. According to Airbnb, about 60%-80% of data scientists' time is spent on creating, training, andtesting.
Data storage scansdata scientists to reuse resources rather than rebuilding them repeatedly for different models, saving valuabletimeand effort. Data storage automates data. This process and resources can be triggered by code changes that are sent to Git or by the arrival of new data. This automated resource engineering is an important part of the MLOps concept.
Some of the largest information, and communication technology companies that deal extensively with AI have created theirown Feature Stores (Uber, Twitter, Google, Netflix, Facebook, Airbnb, etc.). This is a good indication for the rest of the industry of how important it is to use data storageas part of an efficient Machine Learning pipeline. Given the growing number of AI projects and the complexities associated with putting these projects into production, the industry needs a way to standardize and automate the core of resource engineering. Therefore, it is fair to assume that data storage is positioned to be a basic component of any machine(computer and software) apprentice) pipeline.

4. Elements for Debate – Production, Evaluation, Storage and Dissemination of Knowledge

Knowledge Production

Scientific investigation

According to (Trujillo, 1974, p. 30), "scientific investigation begins when it is discovered that existing knowledge, originating either from common sense beliefs, or from religions or mythology, or from philosophical or scientific theories , are insufficient to explain the problems and doubts that arise". "In this sense, to start a scientific investigation is to recognize the crisis of an existing knowledge and try to modify it, expand it or replace it, creating a new one that responds to the existing question".
Scientific knowledge, in its claim to build a safe answer to answer existing doubts, proposes to achieve two ideals: the ideal of rationality and the ideal of objectivity. The ideal of rationality is to achieve a coherent systematization of knowledge present in all its laws and theories. (...).

Quantification of Knowledge

Quantitative methods are used to study scientific or technical activities, from the point of view of their production or communication, they are usually called scientometrics, the science of science (Derek de Solla Price, 1961, 1964). The usual data sources for these analyzes are the Science Citation Index (SCI) and the Social Science Citation Index (SCCI), both from the Institute for Scientific Information (ISI), which are based on the bibliometric works of (Callon, Courtial, Penan, 1995, p. 9).
To discern the intellectual structure of science, several variables or indicators have been developed, such as the number of publications and citations, to help assess the scientific performance of researchers. Second, (Vanti, 2002), the first authors to use them were Dobrow and Carennol, in a publication by the All-Union Institut for Scientific and Technical Information. The term scientometrics is here translated as scientometrics in Portuguese, since the Latin scientia also originates other words such as sciento, scientific and scientist.
Second, (Tague-Sutickffe, 1992, in: Vanti, 2002, p. 154), cient research units of measurement study, through quantitative indicators, a certain discipline of science. Quantitative indicators are used within an area of knowledge, for example, through the analysis of publications. They try to measure the production increments and productivity of a discipline, of a group of researchers in an area, in order to delineate the growth of a certain field of knowledge.
According to (Spinak, 1998, p. 141), science is an information production system, more specifically information in the form of publications, considering publication as any information recorded in a permanent format and available for common and simultaneous use. Thus, science can be understood as a dynamic that requires inputs and results. The measurement of these two categories – inputs and results – forms the basis of the indicators.
Scientometrics comprises and is dedicated to the study of quantitative analysis of scientific and technical research activity. It studies not only resources and results, but also forms of organization in production, that is, recorded scientific knowledge and practices for measuring information, knowledge and techniques. As a study that applies bibliographic measurement techniques in science and uses mathematical and statistical methods to investigate the characteristics of scientific research. The term applies both to the physical and natural sciences and to the social sciences, being much more than the application of measurement techniques, since it also analyzes the development of political sciences.
For the world scientific community, knowledge has become the main factor in creating wealth and promoting the social well-being of populations, due to the accelerated pace of development and technological change. Now this led to the effort to identify and produce quantitative indicators of scientific production, although obviously these do not supply the lack of a more consistent evaluation system, in relation to the dynamic and complex context of scientific knowledge.
Second, (Trzesniak, 1998, p. 159), scientific quantification models, physics and engineering indicators lend themselves absolutely perfectly to quantification and mathematical modeling. It questions, however, the reasons why these advantages do not extend to all areas of knowledge and shows that efforts in this direction exist in many areas, such as econometrics, for the economy; sociometry, for the social sciences, and psychometry, in relation to personality and certain human abilities.
Second, (Rousseau, 1998, p. 150), the scientometric method makes the research data visible and analyzable and makes them available to information specialists, for analysis and futuristic conclusions.
Second, (Rousseau, 1998, p. 150), the scientometric method makes it possible to make research data visible and analyzable and makes them available to information specialists, for analyzes and reasoned conclusions in relation to the development of new knowledge and future investigations.

The scientific quantitative models serve to identify the characteristics and trends of bibliographic units of measurement in the social and human sciences and allow the analysis of scientific production relative to its geographical origin, chronological evolution and thematic orientation. Some specialists in social and human sciences, historians, for example, who carry out quantitative analyzes on documents, similar to those considered as bibliographic analyzes of measurement units, and, because they do not know their terminology and bibliographic measurement techniques, give these analyzes a different name , Infometry or informometricsThe term informometrics was introduced by the professor (Otto Nacke, 1979, being immediately adopted by Viniti, in the former USSR (Vanti, 2002).

The term was discussed at the first Conference on Bibliometrics and Theoretical Aspects of Information Retrieval (1987), in Diepenbeek, Belgium, organized by Egghe and Rousseau, who considered informometrics as a conceptual “umbrella” encompassing bibliometrics. and scientometrics. (Turner, 1994), prefers the term infometrics, composed by the abbreviation of the word information, referring to the measurement of the impact of information flows in social organizations of knowledge production practices. When reflecting on the definitions used for the terms that represent quantification in different supports, Turner does not consider the character "R" a representative element of a new measurement indicator, but rather a new denomination for the "umbrella" usually called infometry , which I personally prefer to keep.

(Vanti, 2002, p. 155), states that the universe of quantification cannot be limited to the information recorded about scientific research. The term infometrics, according to (Irene Wormell, 1998, p. 210) is an emerging subfield of Information Science, based on the combination of advanced information retrieval techniques, with quantitative studies of its flows and similar techniques to analyze other types of support. beyond the book.

Webometrics, defined as the use of bibliometric measurement techniques on the World Wide Web (WWW), is a system for studying the relationship between different sites on the web. This technique can also be used to represent other areas of the Web that have become more used, based on the number of times they have been linked to by other websites. As an application of computer science methods on the WWW, it can be said that webometrics is a way of recognizing the importance of the network as a means of information and communication for science and academia, sectors that quantitative studies have served. The authorship of the term, according to (Vanti, 2002), can be attributed to (Almind and Ingwersen, 1997), who characterize it as a new area of interest within infometrics.

Second, (Smith, 1999, in: Vanti, 2002), the term cybermetrics corresponds to the name of the journal officially presented at the VI International Conference on Scientometrics and Informetrics, in Jerusalem, in 1997. Among the measurements that can be performed in the field of webometrics, the frequency of distribution and classifications that comprise categories such as personal, institutional, or organizational homepages stand out.

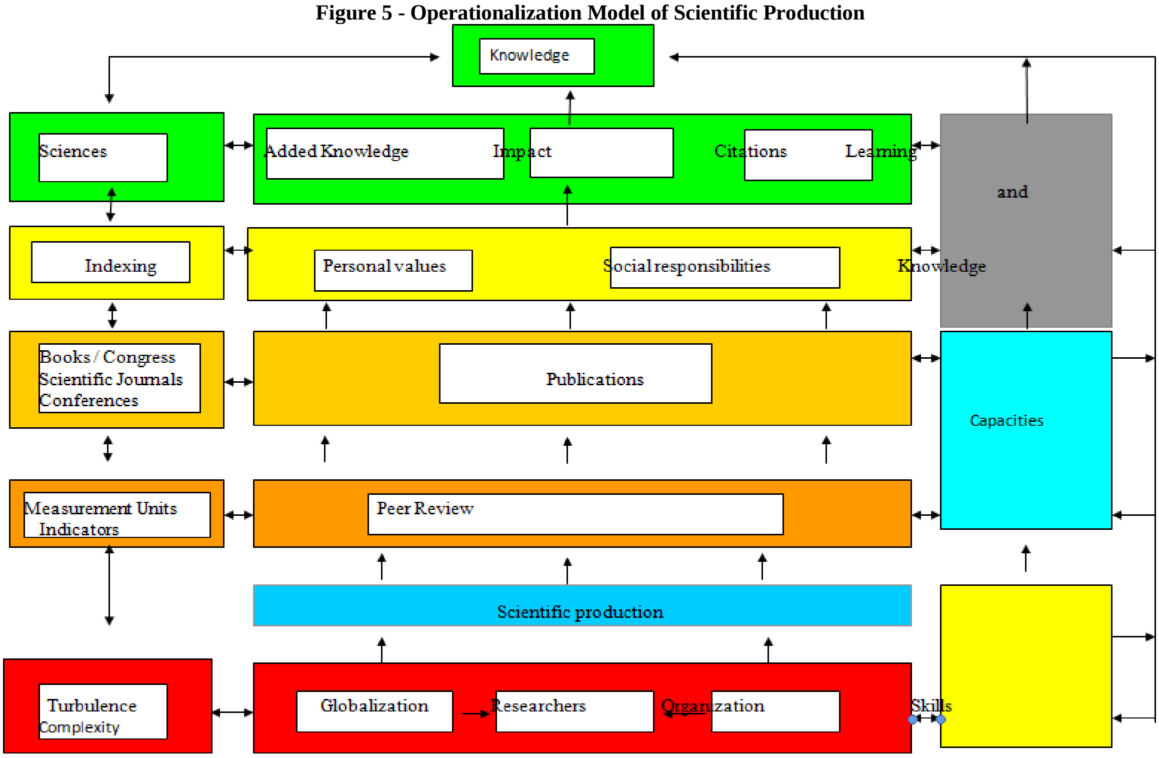
Second, (Vanti, 2002), different measurements can be made to compare the evolution of an institution or country, in the network, to calculate the average size of a page expressed in bytes, the average number of links per page and the average density by link. Other types of analysis refer to citations between pages, known as links, hyperlinks or weblinks, and are seen as indicators of the overall importance of a site or space.

Scientific Investigators

All scientific investigators designated as authors must be qualified to do so. Each individual author must have sufficient participation in the work to take public responsibility for its content as a whole, as scientific articles are considered indivisible publications. Authorship must be based only on intellectual and substantial contributions in the conception, planning, analysis, or interpretation of data, writing of the article or its critical intellectual review, responsibility for final approval for publication. Any part of the article that is critical to the conclusions must be the responsibility of at least one of the authors. Thus, authorship should only be attributed to researchers who have participated in a relevant way from conception to publication.

Scientific production is measured by the cumulative total number of items published in each period. It measures volume, productivity: how many publications were produced by an author, group of researchers, institution, country or group of countries, in a given period. It is also possible to obtain the total accumulated number of publications, according to each area of knowledge or discipline, in a given period.

Figure 5 - Operationalization Model of Scientific Production



Source: elaboration of the authors

Evaluation of Scientific Knowledge by Peers

Second, (Lilian Nassi-Calò, 2019), peer review is the review of a scientific work by specialists in the field of knowledge, of the work submitted for evaluation, therefore called by peers. The peers are responsible for evaluating the scientific article and making a critique of it for the journal editor. For example, indicate if the article should be accepted without modifications, if it should be rejected or if it needs revision, suggesting ways of improvement.

It is practically unanimous, among authors, peers and editors, the idea that peer review helps in the quality of articles. Despite its good reputation and the important space it has in scientific communication, peer review is also the target of negative criticism. The delay in the process, the difficulty in finding good peers in the area, the flexibility or non-existence of review criteria and even the lack of impartiality of peers are some examples. Thus, alternatives to peer review are emerging, such as preprints; fully open reviews, with identified authors and peers; open reviews, displayed at the end of the article; among others.

The peer review process constitutes the key stage of the editorial process that confers quality and credibility to scientific articles. In many countries, this system faces three difficulties: the difficulty of finding good peers in the scientific area, the evaluation time and the quality of the opinions. The theme has been the subject of discussion and some authors propose alternatives to the classic double-blind review model (in which the identity of the authors and peers is known only by the journal editor), with the aim of improving the quality of the reviews and, at the same time, time to publicly give credit to reviewers. One of these models is premised on joint publication of the article followed by reviewers' comments. This model aims to prevent false or forged articles from escaping the control of review processes and being published.

With the increase in the number of articles and journals worldwide, due to the migration from print to digital publication, the academic peer review system has been showing signs of collapse. Peers that provide consistent, quality reviews within the requested timeframe are being overwhelmed with more articles to review than they can handle. Second. (MartijnArns, 2014), director and researcher at the Research Institute Brainclinics, in Nijmegen, Netherlands, the most dangerous consequence of this saturation process is that articles are sent to peers who are not experts in the field, resulting in inadequate or superficial reviews.

The author expresses concern about the sustainability and quality of the peer review system, upon receiving inadequate opinions, showing a lack of understanding of the article's content by peers. The growth in the number of online journals has contributed to peer overload. In addition, the editorial policy of some open access journals consists of publishing articles whose quality has been evaluated by peers.

With the significant increase in open access articles and the supply of scientific publications, one of the consequences is the attribution of articles to peers who are not specialists in the areas, who do not have the skills and abilities to evaluate the methods and results, and do not they are able to assess the relevance of the article / topic and its contribution to the development of the respective scientific area, namely to verify whether the citations to the literature are adequate and in fact corroborate the author's reasoning. Citing obsolete or inappropriate articles is detrimental to the advancement of science, as erroneous ideas are perpetuated.

(Arns, 2014), proposed a model which he called hybrid to ensure the quality of the peer review process. According to this model, one third of the articles comprising those with negative results, methodological studies, could be published without going through peer review and submitted to post-publication review. This would leave peers with more time to evaluate the most relevant articles, where pre-publication review prevents unwary readers from exposure to “miracle cures” or absurd claims. Thus, one could prevent the expansion of online publications from resulting in the saturation of peers, with consequent compromise in the quality of reviews.

As already mentioned, there are models that propose the public recognition of reviewers, as a way of giving credit to this important stage of the scientific publication process and to improve the quality of reviews.

Quantification

There are three types of scientific concepts: measurement units, classifiers, and comparisons. Concepts are abstract units of knowledge that serve to explain the world. They are a representation or mental image about a situation (subjectivity), object, fact or quality. The word concept comes from the Latin conceptus, which means “act of conceiving” or “thinking”. Two conceptual systems are distinguished: the qualitative and the quantitative. The qualitative conceptual system encompasses classification and comparative concepts. In turn, the quantitative conceptual system includes concepts of measurement units. Qualitative and quantitative concepts are two categories of knowledge through which human beings know reality.

A metric is a quantifiable measure used to evaluate a scientific publication. It is a number that represents the measure that quantifies the contribution of a scientific publication to the development / accumulation of knowledge about the science / discipline / scientific area. The units of measurement represent the different methods employed to track changes over time in various respects and following various criteria. The term metric is often used to describe the method used to measure something, the resulting values obtained from the measurement.

Measurement is the process of determining a numerical value that is assigned to a scientific production, in the context of a frame of reference that allows comparisons to be made with other scientific productions. The act of measuring essentially involves the existence of units of measurement, which are compared in measurement. It also involves the existence of measuring instruments, which graduated according to the unit of measurement in question, provide, with varying degrees of precision, the desired measurement. Any measurement of scientific production can be evaluated by the following meta-criteria: scale (including magnitude), dimensions (measurement units) and uncertainty.

What will be measured in the peer review: title, abstract, methodological approach, literature review, text clarity, theoretical relevance, contribution to existing knowledge and practical relevance. Second, (Goldsby and Martichenko, 2005), measuring the quality of scientific research is fundamental for the success of knowledge development, as the quality of research can only improve if it is measured. To evaluate the measurement units, it is necessary to select the most relevant indicators, assigning weighting factors to each indicator to allow a global development value that can be measured through Key Performance Indicators (KPis), in order to compare the results of the author(s), publication, scientific field, country, continent, University and Research Institution

According to (Carvalho and Carvalho et al., 2001 and Martins and Carvalho, 2012), the use of a panel of indicators quantitatively shows the evolution of each indicator and globally, the measurement units and the author(s) of the respective scientific field and publications.

The scientific field(s) that use(s) an adequate set of Development Indicators at all levels (author(s), theme(s), publication(s), University(s), Institutions of Research, country and continent, time, and quality) can (m) obtain an optimization of information flows, related to the dissemination of knowledge.

Information Storage and Retrieval

Information and Communication Technologies (ICTs),

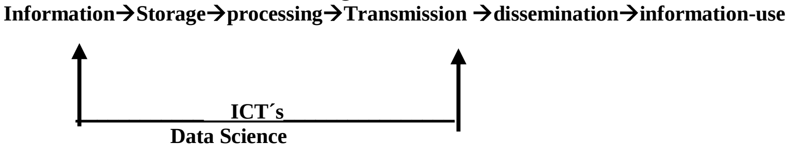
ICTs are an area of knowledge that uses computing to produce, transmit, store, access and use various data. As Information and Communication Technologies can cover and be used in several contexts, its definition can be quite complex and broad. However, it is used to process the data, helping the user to achieve a certain objective. Information and Communication Technologies can be divided according to the following areas:

- Schedule.
- Database.
- Technical support.

- Data security.
- Tests.

A professional can work in the various areas of Information and Communication Technologies. These include programming, database, technical support, data security and quality testing.
Security Analysts work mainly to maintain and improve the data security of a company / institution, whether public or private, creating “barriers” that protect the security of equipment and data. In addition to working with company / organization operating systems and servers, it prevents intrusion attempts. If there is a data invasion, these professionals are also responsible for combating threats and devising more efficient ways to prevent it from happening again.
Technical support is guaranteed by professionals who work in the maintenance of hardware (physical equipment), working on repairing computers, problems with access to operating systems and / or applications (software), among other issues that appear in the daily life of a company / organization. To work in this area, it is necessary to understand the technical part of computer architecture.
Professionals in programming can work in different fields, because this is one of the most comprehensive areas of information and communication technologies and, which is further subdivided into other areas. This is because there are several programming languages, and professionals can focus on just one. There is, for example, programming for databases, web, mobile, games, etc. Usually, an ICT professional who chooses an area of programming, seeks to specialize even more in that programming language.
Quality professionals work in the verification and analysis of software and applications even before they reach the market or the end customer of a company / organization. The professional who works with quality tests checks the usability of an application or software to find out if it is working as promised or what the company / organization expects it to do.
Network Administrators are professionals who are responsible for managing all the communication networks that exist within a company / organization, whether their computers or other equipment, such as printers and the like. It is one of the areas of ICT that requires technical knowledge of hardware and software (base), since these professionals deal daily with the infrastructure of the company / organization, the installation and maintenance of the technological systems of the local network. For this reason, professionals in this area usually have a lot of experience in the ICT area in general, understanding a little programming, technical support and databases to perform their function effectively.
The ICT industry includes “goods” from the industrial and information sectors, related to the storage, processing, transmission, dissemination and use of information, which can be tangible or intangible goods.

Figure 6 - ICT's



Source; Elaboration of the authors

E-commerce refers to the use of the Internet and other global communication infrastructures to initiate/provide commercial transactions such as surveys, orders, payments, etc. The synonym for the information economy is the term “knowledge economy”. these terms.
E-commerce refers to the use of the Internet and other global communication infrastructures to initiate/provide commercial transactions such as surveys, orders, payments, etc. The synonym for the information economy is the term “knowledge economy”. These terms were originally used by Machlup and are still used today, as a common term, to refer to the broader term information economy.
Information becomes knowledge after being processed internally by a person. People who acquire the same set of information can internally generate different types of knowledge, for the same data. Furthermore, the information sciences have a very specific and commonly agreed definition regarding information in the sense of resolving uncertainty, as well as the means and units for measuring it, but there is no such commonly agreed definition or unit. of knowledge.

Record of Scientific Knowledge

Second, (Marx, 1998, p. 157), the activity of scientific research in any field of knowledge necessarily implies a careful selection, given the large circulation of messages and registered information that, in continuous growth, attest to the intellectual capacity of the man. The activities of informing and communicating have become activities marked by ease and speed, fueling humanity's old dream of exercising control over knowledge.
Transformations in methodological research formats in the various fields of knowledge also stand out due to favorable conditions for the storage process, data processing, organization, retrieval and transfer of information and the development of technological possibilities offered to researchers in their daily lives. The specific field of this research is characterized by the diversity of sources and means of access and production of the information with which it works. In it, the process of accelerating scientific development, accentuated by information technologies, computing and telecommunications, favors the practices of measuring information and its flow.
The diversity and expansion of research modalities and the supports in which information is recorded resulted in the proliferation of terms used to define measurement activities in informational research. For example, terms such as scientometrics and webometrics, among others, present in the paradigmatic relationship that encompasses them, represent measurement practices of science information, or their representations in conventional mode or on the Web, defining with more specificity the quantifiable universe to which they refer.
By offering an overview of the development of concepts related to measurement activities, present in scientific research in the literature of Science / Discipline / Scientific area, Global Models are proposed for the production of statistics, analysis and mapping of this evolution. The activities of identification, analysis and mapping of representative terms of the measurement practice recorded in the literature aim to clarify semantic implications, support researchers in the development of new scientific activities and also provide a range of possibilities for the application of instruments in the measurement of information.
Therefore, two epistemological directions stand out in this investigation process. One of them addresses the literature of Science / Discipline / Area, more specifically the theoretical framework, the locus par excellence for clarifying the meanings of terms related to quantitative methods. The other addresses the most recent literature, extracted from a database called PERIO, to identify methodological trends related to quantitative research, observed in works that use bibliometric or infometric methods, as well as their relationship with innovative procedures.
The objective of the investigation in its first aspect is to conceptually present and discuss the diversity and meanings of the terms used to characterize the quantitative methods of scientific research in the literature, in its evolution. Regarding the second aspect, the aim is to identify, analyze and map the terms representative of measurement practice, recorded in the literature produced in the respective fields of knowledge and indexed in databases specially built for this purpose. The expansion of studies based on content analysis of the literature is especially noticeable when analyzing the main bibliographic instruments, such as abstracts and research keywords that show the most recent research on this topic and highlight the characteristics and the peculiarities of these texts.

Second, (Sanz Casado and Martín Moreno, 1997, p. 47), the field of theoretical contribution, composed of the interpretations of authors on the results of their respective research, uses a variety of terms related to quantitative studies in research practice, nor always coincident in their meanings. With this perspective, the analysis of studies on quantitative techniques allows the identification of the characteristics of the literature, its trends and evolution, and its importance does not reside only in the specific results, but in the changes that can be observed in them over time.

Reflection on the practice of research and on the terminology related to quantitative studies lends itself to knowledge of the respective Science / Discipline / scientific area in its characteristics, as well as the theoretical foundation of new research in the specific field of knowledge to which it relates. intended.

Database for Registering Scientific Publications

Databases are a set of structured data, resulting from the transformation of information into data, whose structure is related to each other, on a given topic or domain. They make it possible to manage a huge volume of data, in order to facilitate the organization, maintenance and data search (transformation of data into information).

Databases consist of one or more tables intended to store, for example, the scientific publications of a given volume of a scientific journal, several volumes of the same journal, citations of scientific publications, the scientific impact, the ranking of publications universities and other scientific research institutions, etc. With the support of Information and Communication Technologies, the stored data can be accessed through local and/or global Communication Networks, in any location and with any technology.

For a publication (article and/or scientific journal) to be scientifically evaluated, it must be stored in the ICI World of Journal Database and respond to the respective questionnaire and store it so that Index Copernicus specialists have access to the editions of the year evaluated and previous ones, as a way of indexing, provided that the defined criteria are met.

Dissemination of Scientific Knowledge

Scientific publications

Scientific dissemination (the term most used in the literature) can be defined as the use of processes and technical resources for communicating scientific and technological information to the general public. Dissemination presupposes the translation of a specialized language, aiming to reach the largest number of researchers and the public interested in these themes. Scientific dissemination is a narrower concept than scientific dissemination and a broader concept than scientific communication. Scientific dissemination refers to any and all processes used to communicate scientific and technological information.

Scientific diffusion can be aimed both at specialists (in this case, it is synonymous with scientific dissemination) and at the lay public in general (here it has the same meaning of dissemination). Communication of science and technology means communication of scientific and technological information, transcribed in specialized codes, for a selective public of specialists.

The role of science communication has evolved over time, following the development of science and technology. It can be oriented towards different objectives, such as the educational one, that is, the broadening of the knowledge and understanding of the lay public regarding the scientific process and its logic. In this case, it is about transmitting scientific information, both with a practical character, with the objective of clarifying people about one or more topics and the solution of problems related to phenomena already scientifically studied, and with a cultural character, aiming to stimulate them. scientific curiosity as a human attribute. In this case, science communication can be confused with science education.

In civic terms it is the development of an informed public opinion about the impacts of scientific and technological development on society, particularly in critical areas of the decision-making process. It is about transmitting scientific information aimed at increasing the citizen's awareness of social, economic and environmental issues associated with scientific and technological development.

If the objective of scientific dissemination is to mobilize society, that is, to expand society's possibility and participation in the formulation of public policies and/or in the choice of technological options (for example, in the debate on energy alternatives, etc.), it is about transmitting scientific information that instrumentalizes the “actors” to intervene in the decision-making process. This set of concepts and definitions emphasizes

If the objective of scientific dissemination is to mobilize society, that is, to expand society's possibility and participation in the formulation of public policies and/or in the choice of technological options (for example, in the debate on energy alternatives, etc.), it is about transmitting scientific information that instrumentalizes the “actors” to intervene in the decision-making process. This set of concepts and definitions emphasize the scientific, educational, cultural, political and ideological aspects, and provide an idea of the possible, among others, science dissemination activities. Depending on the emphasis on each of these aspects and objectives, the target audiences for these activities also vary, whether students, scientists, public policy makers, etc.

Scientific dissemination has gained prominence with Open Access, since scientists are concerned about the quality of scientific content disseminated. First, it is necessary to differentiate the terms diffusion, dissemination and scientific dissemination. These terms seem synonymous but have different meanings. Scientific dissemination has the broadest concept of all, it refers to the entire process of disseminating scientific information, whether through technical publications or not, and aimed at a specialized public or not. Covers all other terms.

Scientific dissemination, on the other hand, is the transmission of knowledge to a specialized public, through technical language and improved understanding of selected individuals. An example of this communication are the scientific articles themselves, which need to follow ABNT standards and often address technical typologies that only people in the field can fully understand.

The term scientific dissemination, for a long time, has been the most used term in the literature to talk about the transmission of science to the public. Dissemination is the transposition of scientific discourse to the public, that is, passing on scientific knowledge through an accessible, easy-to-understand language, including the use of resources and techniques that facilitate this dialogue, adapting the discourse. In short, it means transposing the technical and formal language used in academia to a non-formal language that can be understood by non-specialists in each subject.

Citation of Scientific Author(s)

Quote

The tendency to evaluate scientific and biomedical literature journals has existed for about 80 years, during which time the methods have been changing, until they reach what is now known as the impact factor, a measure of the average number of times the Published works are cited up to two years after their publication.

Second, (Trujillo, 1974:14), scientific knowledge is real (factual), because it deals with published scientific works, that is, with every form of existence that manifests itself in some way. It constitutes contingent knowledge, since its prepositions or hypotheses have their truth or falsity, known through experimentation and not just by reason, as occurs in philosophical knowledge.

Scientific knowledge is systematic, forming a system of ideas (theory) and is not dispersed and disconnected knowledge, since hypotheses or statements that cannot be verified / proven do not belong to the scope of science. However, scientific knowledge is not definitive, absolute or final, since new investigations and the development of new techniques can reformulate the existing theory. It constitutes fallible knowledge, by virtue of not being definitive, absolute, or final and, for this reason, it is approximately exact: new propositions and the development of techniques can reformulate the existing body of theory.

The act of citing the author of a previous scientific publication (book, article) is always significant. Second, (Oliveira, Dórea and Domene, 1992, p. 239, Garfield, 1995), discussed (m) the need to establish the systematization of scientific production through citation indexes, since the quantity of these can be considered an indication of the quality of the author's publication and the impact of scientific production.

E. Garfield's proposal gave rise to the creation of the Science Citation Index (SCI), published by the Institute for Scientific Information (ISI), in Philadelphia, in the United States, and has been developed in analyzes based on citations, also used by sociologists, science historians and researchers (Callon, Courtial; Penan, 1995, p. 11).

To assess and determine the influence of an author in the production of knowledge, his methods can be used, and a common way to conduct this investigation is the use of the Social Science Citation Index, the Science Citation Index or the Arts and Humanities Citation Index.

The citation of an author means the influence that author had in the publication of several articles frequently cited by their peers in a certain period, for example ten years. The highly cited researcher shows exceptional influence and performance in one or more science / discipline / area of scientific knowledge and should be called highly cited in specific scientific areas or with scientifically transversal impact.

Highly cited researchers make a significant impact on research in their scientific field, with many quality publications and perform outstanding scientific work that is influential in the development of their science. The Institute for Scientific Information (ISI), at Clarivate, annually publishes a report listing highly cited Researchers from around the world whose research demonstrates a significant influence on the development of knowledge in their scientific field. For example, the 2021 List identified approximately 3,800 highly cited researchers in 21 fields of science and social sciences and approximately 2,800 highly cited researchers in various scientific fields.

Internet portals

It is not our intention to draw up a list of all Internet portals for the dissemination of scientific knowledge, but rather some examples of those that have contributed most to the dissemination of scientific knowledge in the respective field.

The startup Publons was created to register the contribution of peer reviewers on an Internet portal and encourage researchers to post their experiences online as scientific reviewers. In a note in Nature in October 2014, Richard Van Noorden reports the experience of the company created in New Zealand in 2013 by Andrew R.H. Preston and Daniel Johnston.

Nature also interviewed two users of the service, researchers Yogendra Kumar Mishra, who studies nanomaterials at the University of Kiel, Germany, and Malcolm Jobling, a marine biologist at the University of Tromsø, Norway. Mishra and Jobling stand out for their high ranking of reviews published in Publons recently.

Statistics

All citations of the work of a scientific researcher, over time, can be quantified and accumulated and statistics produced, as well as on the institution of the same, and be published periodically. Citation sources should be disclosed / public, where they were disclosed and by whom and in what context, as well as the respective peer reviews.

Dissemination statistics should include, among others, the following aspects: Research interest (numerical scale from 0 to 5), number of readers, number of recommendations, number of mentions. The source must be the publication where the research work was published. However, worldwide Databases may be set up, by continent, by country, and by University and/or Scientific Research Institution, to which the researcher belongs.

The units of measure are alternatives to traditional, such as bibliographic, citation-based units of measure, such as the impact factor. Altimetry is interested in the analysis and scientific dissemination of research results in the context of the social web and its resources, evaluating, for example, mentions in news portals, blogs, social networks, and reference managers. Citations in scientific articles normally occur between scientists (bibliometric indicator), which differs from mentions in a social network. They are new measures, new ways of measuring impact, based on non-traditional outputs. It is not about replacing traditional measurement units, but it can be complementary to traditional citation analysis.

Publication identifiers: DOIs, ISBNs and ISSNs

Impressive numbers of new books, articles, reports, and other texts, as well as audio and visual creations in a wide variety of media, are produced, shared, and published every year, and these numbers are constantly increasing. The vast amount of information available to readers requires accurate and efficient ways to identify and locate individual features, and sometimes even specific parts or elements of those features. This is certainly the case for scientific research papers that are published as a contribution to the development of accumulated knowledge in a science/discipline/area and used to inform and support the work of other researchers.

There are several publication identification systems with the numbers and codes assigned to publications, proving to be very useful for authors, editors, reviewers, researchers, and readers. The following non-exhaustive list provides definitions and explanations of the most common publication identifiers used in scientific research:

- **ISBN -** is the acronym for International Standard Book Number. A unique ISBN is normally assigned by the International ISBN Agency and its network of national agencies to each published version or edition of a book, so hardcover, paperback and electronic versions of a given book will be given a different ISBN.
- **ISSN -** Abbreviation for International Standard Serial Number. ISSNs are unique numbers assigned to serial publications such as journals and scholarly journals, newspapers and magazines, annual conference proceedings and reports, directories and directories, databases, and collections, and even websites and blogs, as well as other ongoing publications.
- **DOI -** is a Digital Object Identifier, which does exactly what its name implies – it identifies a digital object. DOIs are particularly common for scientific and scholarly journal articles but are also used to identify many other types of documents and materials, such as research reports and presentations, archives and datasets, official or government publications, book chapters, items audio and video, images and performances, software and much more.

Scientific Indexing

Indexing is a process in which articles published in a scientific journal or book present the results of original empirical, theoretical, technical, or analytical research, with the title of the publication, name of the author(s) and surname(s), together with their affiliation and articles presenting the current state of knowledge, research methodology, rigor of the research process, research results and conclusions, together with cited sources (bibliography).

According to the ICI journal, the minimum requirements for indexing a scientific publication are:

- Be of a scientific nature – articles published in the last two years, present results of original empirical, theoretical, technical, or analytical research and whose articles present the title of publication, authors' names and surnames, together with their affiliation and which present the status current knowledge, research methodology, content of the research process, research results and conclusions together with the sources cited in the Bibliography.
- Minimum number of published research articles – depends on the frequency of publication of the journal.
- The current ISSN number - a diary can be in paper form with an ISSN number, in electronic form with an eISSN number, or both.
- The scientific journal was published throughout the evaluated year - this condition means that the Editorial Manager must publish as many editions as result from the journal's frequency. If a journal that was created in the evaluated year is a quarterly journal and the online editions have been published so far, the evaluation will be possible in the next year of indexing.

- Active and up-to-date website - if a journal does not have a separate website, the Publisher, University website with a special section dedicated to the journal can be provided.

Failure to comply with one of the conditions mentioned above will result in the refusal of indexing. Journals that do not meet the requirements and that have not listed the current index will continue to be the rightful owners of the record in the ICI, World of Journals database. Editorial offices can regularly update data about the journal, introduce published articles or submit to evaluation, in the following year.

Purpose of citation indexing

The value of scientific information is determined by who uses it and the best way to assess the quality of this scientific production is to measure its impact / relevance in the scientific community and society in general. The academic population, those in training and those who are constantly updating, use or cite different scientific works, and as such, determine the influence or impact of that scientific publication and its author on knowledge. It is a relatively new system, which originated in 1950, thanks mainly to 3 factors:

- After the Second World War, the US government began to invest in research and development – the scientific community began to grow and needed to publish its work through scientific journals, and the need arose to create a cost-effective method to index the quantity of the scientific literature. The need arose to create / improve a Scientific Information Management System, (Leite, F.C. L. 2011).
- Dissatisfaction on the part of active researchers with the existing system for indexing information was evident, as it did not correspond to their expectations and made access to information difficult. The work was manual, and it took a long time to include the most recent works in the author index, so that researchers for long periods did not upload new "material" to have access to published articles on a topic relevant to their own research. On the other hand, there were drawbacks with the retrieval of documents and terminology. Thus, the appropriate terminology for a given discipline may not have meaning for researchers in another scientific area, even if the two disciplines were related. In this way, the researchers had to carry out extensive reviews of different areas, in order to have the peace of mind of having their work with an adequate review of all the existing literature.

Quality Assessment of Scientific Publications

The evaluation of the quality of scientific publications tends to increase. The evaluation methods have been changing over time, going through the number of citations of published works, that is, the scientific impact factor of the respective scientific field. The Scientific Citation Index (SCI) was pioneered by Science Magazine (1960). Journal Citation Reports™ (JCR) is a journal citation report that provides transparent, neutral data and statistics for editors of thousands of journals with scientific publications.

Journal Citation Reports is an expert-produced report independent of the publishers that provides unbiased statistics on trusted scientific publications for more than 9,000 institutions worldwide. The source of data and citations for assessing the quality of scientific publications in the Journal Citation Reports come from the Web of Science Core Collection, the world's original citation index for scientific and scholarly inquiry. Any scientific publication that has a less dignified behavior, that is, that has an abnormal activity of citations or excessive self-citations, will be deleted from the report.

The scientific citation index (SCI) is an indicator created to provide researchers and students with a quick and easy way to access bibliographic information. Its content has progressively increased from 600 journals in 1964, to 2,400 in 1972, and to 7,500 in 2008. At SCI you can find high-impact articles from recognized scientific journals, useful updates in the field of research and relevant results in different areas. In addition, you can identify potential contributors with a significant citation record. The SCI meets the standards of an objective review process that aims to provide investigators with accurate, meaningful, and timely information.

Citations allow you to track past and current research, identify progress made in a particular scientific area, see which articles have been cited, determine what has been the influence of other colleagues' scientific work, and follow the path of today's most interesting ideas. Among others, the scientific disciplines that can be found in the SIC are: biology, agronomy, environmental sciences, engineering, technology, applied science, biomedical sciences, physics and chemistry, etc.

A continuous and regular evaluation of publications and their dissemination, help the scientific community and do not harm it, since it allows scientific researchers to monitor their contribution to the development of the respective scientific field, provided that this evolution is with criteria, such as like:

- **Intuitive** – the metric that is understood so it can be used responsibly.
- **Transparent** - Make calculations and metric entries transparent to everyone.
- **Robust** - make it difficult to artificially manipulate or influence our metrics and not make disruptive calculation changes over time.
- **Relevant** - not showing metrics out of context, driving responsible use and always giving metrics the right context.
- **Research Interest** - a metric that captures interest in a researcher's work within the scientific community. Provides an indication of a member's impact, but in a more intuitive, transparent, and stable way.

The adoption of metrics such as Investigator Interest in Research, h-index, citations, readings, and recommendations form the core set of metrics that ignites interest in a researcher's work within the scientific community and provides an indication of the impact of a researcher, in a more intuitive, transparent, and stable way, in the respective scientific field.

Scientific Indicators

An indicator is a variable whose value begins when a scientific investigation takes place. An indicator is a measure, which measures the value of the contribution to the development of Science / Discipline / Scientific Area, in meaningful units that can be compared with past and future units. This is usually expressed as a percentage or a number. Good Indicators should have the following characteristics:

- **Relevant** - measures the relevance of the research and its contribution to the development of the scientific field.
- **Objective** - if two researchers (peers from the same scientific field) measure the relevance and contribution to the development of the scientific field, they should obtain the same result. The indicator should be based on facts rather than feelings or impressions/perceptions (another way of saying, ie saying it should be measurable);
- **Available** - the indicator should be based on data that are available (scientific production, and dissemination), or on data that can be collected with little effort.
- **Realistic** - it should not be too difficult or too expensive to collect information about the production and dissemination of scientific knowledge.
- **Specific** – the measurement indicator must be for that production and dissemination of scientific knowledge, of the respective field.

Indicator features:

- Specific - measurements must be expressed in precise numerical terms.
- Measurable - the indicator must relate to something that can be unambiguously measured.
- Achievable - the indicator must be reasonable and achievable.
- Replicable - measurements must be the same when taken by different people using the same method.
- Timeframe - there should be a timeframe within which changes are expected and measured

In summary, indicators should be limited in number, include a mix of quantitative and qualitative assessment, be practical and most importantly say something about the publication. The selection of indicators is fundamental and there are clearly a series of criteria for their selection. However, these are just guides, in the end researchers and editors must make decisions and select indicators that provide accurate information to achieve their goals.

Examples of Indicators:

- Number of readers.
- Number of citations.
- Number of recommendations.
- Number of mentions.
- Contribution to the development of knowledge in the scientific field.
- Contribution to social development.

All indicators that measure and assess relevance in the scientific community are essential as a way of showing a holistic “portrait” of a researcher or a specific publication. With citations, the scientific relevance of the respective field is measured (eg Google Scholar, Research Gate, Publons, Scopus…), but this must be combined with other indicators, such as the h-index and the like.

It is important to keep parallel systems in relation to citations, and to exclude self-citations for ethical reasons, but to follow the total number of citations (important for researchers who have developed their own methodologies and models). This helps to guarantee a true reflection of the work of the text researchers; however, it needs to make the sources credible.

Scientific Relevance

The evaluation of scientific journals since the 1980s has been an important trend in research. During this time, evaluation methods changed, arriving at what is now known as the impact factor.

(Gross and Gross, 1927), talk in his study on citation patterns during the 1920s. Later, during the 1940s, (Brodman, 1944), he exhibits his works focused on citation of physiology journals. (Eugene Garield, 1955), was the first to mention the idea of the impact factor in the journal Science. This work is considered the main reference for the concept of the Scientific Citation Index (SCI), which was published five years later. (Irving H. Sher and Eugene Garfield, 1960), created the impact factor as a method to help select journals for the new scientific citation index (SCI). The Journal of Citation Reports (JCR) appears, which is responsible for showing the results in terms of evaluating the scientific literature.

The SCI Journal citation reports (JRC), published by the Thomson Reuters Institute for Scientific Information, offers a number of tools to rank, evaluate, categorize, and compare journals in the scientific literature, one of which is the impact factor. An index is an indicator obtained when a publication (article and/or magazine) receives a certain number of citations (measurement unit), in a certain time interval (author, article, magazine or institution), with the particularity of valuing those publications with high volume of citations. For example, an author, publication (article or journal) will have a y-index, when 50 of its publications receive 50 or more citations each.

In Google Scholar Citations it is possible to consult the number of citations per article, which appears next to each reference in the list of results and which allows the consultation of citations that a given document has received. Google Scholar Citations allows authors to create a public profile, with the collection of articles of which they are the author and corresponding citation data. The author himself can, for example, exclude references that do not correspond to the list, thus correctly identifying his publications.

It is important to note that Google Scholar's citation counting methodology includes documents published on the Web from a variety of sources, which may include databases or platforms with non-scientific publications.

Measurement Units, Indicators and Success

Introduction

It is important to measure the relevance and social impact of research, when done correctly. It is necessary to understand and or discover the importance of analyzing and measuring data, what is the unit of measurement, as well as its relationship with the indicators and the main units of measurement to accompany scientific research, in this field of knowledge, for future investigations.

There are currently some publications and without intending to be exhaustive, we present some examples of what exists:

ScientificJournalEvaluationDatabases - Elsevier

- SCOPUS - Alternative platforms that use the information collected by Scopus:
    a. Scimago - Journal Ranking http://www.scimagojr.com/
    b. JournalMetrics
    c. Citationcount
        i. http://www.journalmetrics.com
- Web of Science (Thomson Reuters) - InCites
    a. http://jcr.incites.thompsonreuters.com
    b. JournalofCitationReports;
    c. ImpactFactor;
    d. Imediciadade Index;
    e. Eigenfactor.
- Google Scholar (Metrics)
    a. http://scholar.google.com
    b. Metrics (citationcount)
- IN-RECS - Bibliometric index of Spanish journals
    a. http://ec3.ugr.es/in-recs/informacion/como1.htm
- QUALIS -
    a. http://qualis.capes.gov.br/webquais/principal.seam
    b. https://sucupira.capes.gov.br/sucupira/public/consultas/coleta/veiculoPublicacaoQualis/listaConsultaGeralPeriodicos.jsf
- MIAR - Matrix Information for analysis of scientific journals
    a. http://miar.ub.edu/
- ALTAMETRICS
    a. http://lib.guides.umd.edu/altmetrics

Scientific Units of Measurement

Scientific measurement units are important for researchers and for Universities and Research Institutions, whose aim is to track the progress and impact of their research. The use of scientific indicators and measurement units are important in assessing the quality and performance of research activities at Universities and Research Institutions. Some analyzes have become popular about scientific production, such as, for example, InCites and SciVal .

- InCites (Clarivate Analytics) - is an online citation-based, personalized research assessment platform, sourced from the Web of Science Database. Allows you to carry out productivity and scientific impact analyses, compare results with other institutions, measure the performance of researchers.
- SciVal (Elsevier) - has a portfolio of analysis tools for scientific production indicators, whose data source is Scopus and Science Direct. It allows carrying out bibliometric analyzes of the scientific production of a given institution, country, region, author or groups of authors, or even journals, provided that the material is indexed in the Scopus Database.

Scientific Indicators and Metrics

Without intending to be exhaustive, in the survey of current indicators and measurement units, the following list is presented (source: JCR and Scopus):

Scientific production

- Scientific production (scholarly outputs) - Total accumulated number of items published in a given period. It measures volume, productivity: how many publications were produced by an author, group of researchers, institution, country or set of countries in a given period. It is also possible to obtain the total accumulated number of publications according to each area of knowledge or discipline in a given period.
- Citation count - Indicates the total number of citations that publications by an author, institution or country have accumulated over a given period. Differences in citation count between data sources are due to different coverage (title and dates) of the Database (Scopus or Web of Science). The number of citations received does not refer to the year in which the citation was received, but to the year in which the result was published. Citation count metrics are useful for comparing visibility where investigators are from similar fields or disciplines and with similar career lengths.
- Citations per publication - Indicates the number of citations received per published article/work. Indicates the average citation impact of each of an institution's or author's publications: how many citations an institution's or author's publications received, on average.
- H-index (h-index): Indicates a balance between productivity (scientific production) and citation impact (citation count) of publications by an institution or researcher. It has also been used for magazines. For example, an h-index of 12 indicates that, in the data set, 12 articles were cited at least 12 times each.
- Citation impact - is calculated by dividing the total number of citations received by the total number of publications. Citation impact shows the average number of citations a paper has received over a given period. Citation impact has been widely used as a bibliometric indicator in evaluating research performance and can be applied at all organizational levels (author, institution, country/region, research field or journal). However, there are limits to the indicator, as it ignores the total volume of scientific production. For example, Investigator A has only one publication that received 50 citations, while Investigator B published 10 papers that received 200 citations. The Investigator. A has a higher Citation Impact (50) than Researcher B (20), although Researcher B published more papers and received more citations overall. At the level of the field of knowledge, the impact of citation in certain disciplines is many times greater than in other scientific fields, due to the characteristics of each area, such as the frequency and volume of publications and citations. For this reason, care must be taken when using this indicator. (Source: InCites Help).
- Field-weighted citation impact (of knowledge) - Indicates how the number of citations received by publications from one institution compares with the average number of citations received by all other similar publications in the universe of data independent of the area of knowledge. Metric used by Scopus. A weighted citation impact in the field of more than 1.00 indicates that publications were cited more than would be expected based on the world average of similar publications, for example, a score of 1.44 means that outputs were cited 44% more times thanexpected. A field-weighted citation impact (FWCI) of less than 1.00 indicates that publications were cited less than would be expected based on the world average for similar publications, e.g. a score of 0.85 means 15% less cited than the world average. The Web of Science refers to this metric as Normalized Citation Impact.

Impact Factor (source: JCR)

- Journal impact factor - Measures how many times an article has been cited in relation to the total number of articles published in a journal/magazine over a two-year period, in the current year. (Web of Science Metric).
- Journal impact factor without self cites - is the same as journal impact factor, with one important exception: any citations to a publication that come from the publication itself (i.e.,self-citations) are excluded from the calculation.
- Journal impact factor in 5 years (5-year journal impact factor) - It is the average number of times that the articles of a journal published in the last five years have been cited in the year in the Journal Citation Reports (JCR). It is calculated by dividing the number of citations in the JCR year by the total number of articles published in the previous five years. (Web of Science Metric).

Statistics (WEB and Scopus)

Production in the top percentiles (outputs in the top percentiles) - Indicates the degree to which publications from an institution, group or country are present in the most cited percentiles of a universe of data: how many productions are in the top 1%, 5%, 10% or 25% of the most cited publications? Note that the period does not refer to the year citations were received, but to the year results were produced. This metric can also be used to distinguish investigators whose performance appears similar, when viewed by other metrics such as Scientific Production, Citations per publication, or Collaboration.

- Topic prominence in science: Combines three metrics to indicate the momentum of a Topic: (a) Citation Count in the year 2017 for articles published in 2017 and 2016, (b) Citation Count in the year 2017 of Views (Scopus Views Count) in the year 2017 for articles published in 2017 and 2016 and (c) Average (Average) Citescore in the year 2017. It can be applied to the World, Regions, Country, Institutions, Research Groups, and Investigators.
- Publications in the top journal percentiles (publications in top journal percentiles): Indicate the extent to which publications are present in the most cited journals in the data source. This calculates how many publications are in the top 1%, 5%, 10% or 25% of the most cited indexed journals. The most cited journals are defined by the metrics related to the journals in the databases (Web of Science, Scopus). Note that the period does not refer to the year citations were received, but to the year results were produced. This metric is useful to evaluate researchers, regardless of differences in size and disciplinary profiles (areas of knowledge), and to show the presence of publications in journals perceived as the most prestigious in the world.
- Collaboration - Indicates the number of publications by an institution, group or researcher produced in international, national, or institutional co-authorship, and sole authorship. It includes academic-academic, academic-corporate, academic-government, and academic-medical collaboration.
- Percent Internationalization (% internationalization) - is based on counting the number of countries of authors and co-authors of published items.

- Collaboration impact - Indicates the citation impact of an institution from publications produced in collaboration with authors from different geographic origins: how many citations of co-authored publications did the institution receive internationally, nationally or institutionally? Unique authors are also counted.
- Impact of academic-corporate collaborations (academic-corporate collaboration impact) - Indicates the impact of citing publications from an institution with or without both academic and corporate collaboration.
- Economic impact - Indicates the number of patents that cited publications from an institution, that is, references of publications cited in patents from the five largest patent offices in the world.
- Journal count - Indicates the diversity of an institution's publication portfolio: in how many different journals indexed in the Scopus or Web of Science Database an institution's publications appeared.
- Journal count by category - Indicates the disciplinary diversity of an institution's portfolio, that is, in how many distinct categories of journals the institution's publications appeared.
- Number of citing countries - Indicates the geographic visibility of an institution's publications: from how many different countries did an institution's publications receive citations?
- Most frequently cited journals in a field – refers to the classification / ranking of journals most frequently cited in each area of knowledge or subject.
- Journals with the greatest impact in a field of knowledge (highest impact journals in a field) – refers to the classification/ranking of the most cited journals in a given area of knowledge or subject.
- Journal self-citations – A self-citation is a reference to an article in the same journal. Self-citations can make up a significant portion of the citations a journal makes and receives each year.
- Immediacy index - Measures how immediately a journal article is cited after being published.
- Eigenfactor score - Based on the number of citations to articles published in journals in the last 5 years (JCR year), it also considers the importance of the journal where the citation was made, in such a way that the most influential journals (most cited) have a greater weight than less influential journals.
- Article influence score - Measures the relative importance of a journal from the number of cited articles appearing in the JCR. A score greater than 1.00 indicates that each article published in the journal has above average influence. A score of less than 1.00 indicates that each article published in the journal has below-average influence.
- Half-life or half-life - Measures how many years later an article published in a journal is still cited. It varies according to the characteristics of the knowledge area, its research and publication patterns. Generally, the half-life is inversely proportional to the impact factor.
- CiteScore – Measures the impact of citing serial titles, such as journals. Series titles are defined as titles that publish regularly (that is, one or more volumes per year). CiteScore calculates the average number of citations received in a year for all items published in that journal over the previous three years. The assigned year is determined by the dates of coverage, not the dates when the issues were made available online – since 2011. (Scopus Metrics).
- SNIP – Source Normalized Impact per Paper - Measures the impact of contextualized citations by journals by weighting citations based on the total number of citations in a subject field. It helps to make direct comparisons between journals in different subject areas, total number of citations referring to a research area. (Scopus Metric)
- SJR – SCImago Journal Rank - Prestige metric based on journal reputation, which results in higher citation value. (Scopus Metric)
- IPP – Impact per Publication - Measures citations per article published in a journal over a 3-year period. (Scopus Metric)
- Aggregate performance indicator - The aggregate performance indicator measures the impact of an institution or country against an expected citation rate for the institution or country. The indicator is normalized for differences in citation rates for a given field of knowledge, as well as differences in size between institutions and periods.
- Expected citations by category (category expected citations) - Average number of citations received by articles of the same type, published in journals of the same category (area of knowledge) and date. If a journal is assigned to more than one category, the average of the categories is used.
- View count - based on the number of user views of abstracts of documents indexed in the SciVal Database.
- Views per publication - based on the number of user views of abstracts per indexed document in the SciVal Database.
- Field weighted views impact - is based on expected worldwide average views for subject/field, publication type, and publication year.
- Production relative to country/territory (output relative to country/territory) - Production in specific areas in relation to the impact for the whole country/territory in all areas
- Impact of citations relative to country / territory (impact relative to country / territory) - Impact on specific areas relative to the impact for the entire country / territory in all areas (a value greater than 1 indicates that the impact of the country / region in the selected motive area is better than the Country/territory average impact in all areas)
- Impact relative to world - The percentage of documents that were cited out of the total number of documents cited in the world (a value greater than 1 indicates that the impact is better than average for the world – baseline).

The Alternative Units of Measure

Altmetric | Plum Analytics | ImpactStory, analyze the impact of a document through the number of shares on social networks, Twitter, Blogs, among others.

The Snowball Units of Measurement

They represent global standards of measurement units created by Research Institutions and scientific publishers that allow institutional benchmarking and cover the entire spectrum of research activities. The agreed and tested methodologies are freely available for use by any organization at: https://www.snowballmetrics.com/

Evaluation of Universities and Scientific Research Institutions

Scientific Relevance

The evaluation of research results is necessary to determine what is relevant, to support decisions about funding scientific research projects and to translate this scientific production into programs and public policies for society.

(Eugene Garfield, 1972), created the first bibliometric Impact Factor (IF) indicator to evaluate journals, with the publication of the Science Citation Index by the Institute for Scientific Information. It became an index for evaluating postgraduate programs, ranking Universities and Scientific Research Institutions to measure the scientific production that could benefit from a qualitative assessment and was often reduced to a list of publications associated with a factor of impact (FI).

The limitations of the IF and its wide use by the scientific community have been registered through actions such as the San Francisco Declaration on Research Assessment (DORA). This document, resulting from the action of the Editors and Publishers gathered in 2012 at the Annual Meeting of the American Society of Cell Biology in San Francisco, CA, USA, lists the recommendations so that citation-based impact indices, such as the FI, no longer be used to evaluate researchers in situations of hiring, promotion, or decision to grant funding for Research Projects.

In Europe, the scientific evaluation measurement units originated at the 19th International Conference on Indicators in Science and Technology, held in 2014 in Leiden, the Netherlands. The Manifesto has already been translated into 25 languages, adopted by institutions, and recognized by publishers around the world. Second, (Cameron Neylon, 2022), researchers at the beginning of their careers have little academic production, and as such are disadvantaged in terms of hiring opportunities and obtaining research funding. These decisions are based on questionable evidence, which if they were research data would not go through the peer review process.

International Rankings

(Neylon, 2022, Karl Huang, 2022), researched the data that inform international university rankings. Each ranking uses a certain database to count the citations of the scientific production of the Universities and Scientific Research Institutions, evaluated, such as Web of Science, Scopus or Microsoft Academic. The authors created a citation-based ranking of 155 Universities and compared citations from the three databases. The obtained results show that three Universities changed 110 positions, and 45 Scientific Research Institutions, changed more than 20 positions, when the data source was changed.

According to the same authors, each ranking provides different results, depending on the database. Based on these data, Universities continue to ignore these discrepancies and make decisions about contracting and funding Scientific Research Projects, knowing that these measurement units are false.

This scenario, however, is changing, as an Agreement on Reforming Research Assessment was drawn up in January 2022 and was published on the initiative of the European Research Area (ERA), European University Association (USA), Science Europe, and the Commission European. The agreement has the support of 350 public and private organizations including development agencies, Universities, research centers, institutes and infrastructures, associations and scientific societies, and associations of scientific researchers, among more than 40 countries.

The signatories have committed themselves to a shared vision, that the evaluation of scientific research, researchers and scientific research organizations recognize the diverse outcomes, practices and activities that maximize the quality and impact of research. This requires basing scientific assessment on qualitative peer review, supported by the responsible use of quantitative indicators. The San Francisco Declaration on Research Assessment completed 10 years of publication in 2022, but it took a decade and a new agreement to consolidate what DORA and its supporters already defended in 2012, and the Leiden Manifesto that it corroborated in 2015.

5. Discussion, Conclusions and Leads for Future Investigations

General considerations

Scientific research has become globalized and is highly competitive, which makes it necessary to universally integrate all researchers, Scientific Publications, Universities and Research Institutions, in global parameters / criteria / rules in assessing the quality of scientific production and in the worldwide recognition, as well as granting scholarships (prestigious awards) for scientific research (researchers, Universities and Research Institutes), both nationally and globally.

Change is inevitable to initiate the culture of innovation, science and technology. It is important that young researchers and professors become aware of the relevance assessment units and quality indicators at the beginning of their scientific careers.

There is no universally accepted/agreed upon concept of what constitutes outstanding research performance. To identify, for example, researchers with cross-sectional relevance, physical counts of articles and citations are important indicators on the same topic.

Ethics and Scientific Research

In research, the question of ethics is an important principle that we follow as a way of maintaining scientific integrity and protecting the rights and duties of participants in the research work of this and any other scientific study and in the personal lives of the researchers involved. We guarantee the willingness of participants in the research study, as well as keeping them informed throughout its development and discussing with them some of the models presented in this study. We had a more restricted group of participants with whom we previously discussed all the work done.

Table 2 - Summary of ethical considerations in the investigation:

Ethicalissues	Description
Reportingofresults	Our work is unique and free of research misconduct, as well as presents the results with the utmost accuracy
Confidentiality	We separate personal data from professional data that is public in the research study.
Participation in thestudy	The participants in the study are volunteers, some are invited and agreed to participate and others offered to participate in the Research Project.
Dignityofparticipants	The authors have always respected the dignity of the participants in the research.

Source; Elaboration of the authors

Hierarchy in Knowledge Production

The bottom-up approach is used to build the hierarchical structure of who contributes most / has contributed to the development of knowledge in a Science / Discipline / Area of knowledge, ie, among newcomers, cited and highly cited. This approach is easy for discovering new knowledge about a certain area of knowledge. The main importance is given by a tree approach to build the hierarchy.

The algorithm works in two phases:

- Gather and order researchers in the scientific field – draw up a list of newcomers, cited and highly cited (those who most contributed to the development of scientific knowledge in the respective field of knowledge.
- Building the hierarchy – ordering the hierarchy from the least qualified (novices) to the most qualified (those who most contributed to the development of scientific knowledge, in the scientific field). The result is a virtual hierarchy, with three levels, that is, the newcomers, the most cited and the highly cited.

The scientific path is unidirectional, so its development and validation is simple and straightforward. In this work, an efficient method is proposed to simplify the hierarchy of scientific knowledge, establishing a virtual hierarchy. The resulting hierarchy can be a single tree. This takes the complexity out of path checking because hierarchical path checking is simple.

Scientific production

We propose a standard and universal Global Model, with the necessary adaptations in each Science / Discipline / Scientific Area and which consists of the following parts:

Identification of the author(s)

Name, Institution to which they belong, Country, DOI and email. Exemple:

José Rascão, (jrascao_ips@yahoo.com)

Polytechnic Institute of Setubal
School of Business Sciences
Setubal (Portugal)
Orcid: https://orcid.org/0000-0003-2448-2713

Title
The Theme of the scientific article is decisive in terms of attracting attention. It is also about having as few words as possible that can adequately describe the content of the article in question.

Author(s)
To be the author of a scientific article it is necessary to have made a substantial contribution to the production of that scientific work and to assume responsibility for what you are researching and for what you are publishing. It is located immediately below the title of the article and in the right margin the name of the author or authors must appear, in alphabetical order, with a superscript that refers to the footer.

Abstract : It should be as short as possible (it should not exceed 150 words), and it should clearly, quickly and intelligibly identify the content of the article. The abstract must be written in English and/or in the author's language, according to the requirements of the journal where the article will be published.

Introduction
It is very important because it focuses on the character of the research. It should be carefully written to stimulate the reader's interest. Its objective is to clearly indicate the investigated problem and to give the reader the events of the case. The introduction should answer the question What was studied?

Scientific Method
It is the part that relates what was done to study and solve the research problem, that is, verify positively or negatively the hypotheses and achieve the research objectives. It describes the approach methodology in sufficient detail so that any researcher can repeat it and obtain the same or equivalent results.

Theoretical-Methodological Framework of the Research
The theoretical framework mentions previous research on the topic to be addressed and describes existing problems or areas that have not yet been studied. The framework identifies the purpose of the new research by discussing the existing body of knowledge on the topic. It presents the literature review, emphasizing the important themes related to the current research.
When the theoretical framework is completed, the reader should be able to understand the content and context of the problem, how it affects the related area, who will be involved in the research project and who will benefit from it.

Results
It is the most important part of the scientific article. It must not contain comments, value judgments or justifications. They are presented in the order in which the objectives were defined, from most important to least significant.

Discussion and conclusions
Its aim is to place the results of the study that is disseminated in the context of existing knowledge. Important points are expressed in terms of conclusions. The conclusions must be clearly presented, in response to the question that originated from the study and the established objectives, therefore there must be as many conclusions as the objectives.

Acknowledgments and thanks
This section is intended to acknowledge the help received by researchers or institutions.

References
Where quotes are referred to. It must include scientific articles published and cited in the text, respecting the publication rules specified in each scientific journal. In general, references should include, in accordance with APA standards: author, year of publication, title, place of publication, publisher. In the case of book; author, title, name of Publisher, volume, and pages.

Additional bibliographical references
It should include published scientific articles, not cited in the text, but which also helped in the investigation, incorporating for example doctoral theses and conference processes or similar.

Peer Review
Peer review is the review of a scientific work by specialists in knowledge of the work submitted for evaluation, which is why it is called peer review. These are responsible for evaluating the publication (article, book, etc.) and presenting a critique of it to the scientific journal editor. If the publication should be accepted without modifications, if it should be refused or if it needs revision, suggesting ways of improvement. It is practically unanimous among authors, peers, and editors that peer review helps in the quality of scientific publications. An admission criterion is also the analysis of the peer reviewers of a scientific journal (together with editors and authors), and it is important that the group of peer reviewers is efficient, professional, with common sense and ethically correct.A proposal for a peer review model at three levels is presented:

1st Level - Peer review of an article / document (publication)

Table 3 - Peer Review Model - Article / document for publication

Section	Things to consider	Reviewercommentsand notes
Summary, Title, Keywords	• Is the purpose of the study clear? • Is it clear the outcome of the investigation and the approach methodology? • Is the Title Appropriate and Relevant? • Are keywords relevant?	
Introduction	• What is already known about the topic is clear and sufficient?	
ScientificMethod	• Are the theme and the problem of research clear? • Is the research question clearly outlined? • Are the study objectives well defined? • The question(s) of the research is justified (m)- considering what is already known about the subject? • Is the approach methodology adequate? • The process of selecting the theme is clear? • Are variables defined and measured appropriately? • Are the study methods valid and reliable? • There are enough details to replicate the study	

Theoretical-Methodological Framework for Research	• Is the literature review adequate? • Are the concepts well defined, according to several reference authors of the study? • Is the evolution of Science(s) / Discipline (s) / Scientific area is developed (s)? • Models, if existing, are developed?	
Findings	• Is the data displayed appropriately? • Are thetables and the figures relevant and clearly presented? • Are the measurement unities appropriate, (rounding and number of decimals)? • Are Titles, columns, and rows labeled correctly and clearly? • The categories so grouped properly? • Does the text of the results add something to the data or is it repetitive?	
ResultsDiscussion	• Are the results discussed on various aspects? • Are the results interpreted, in the context of the investigation, without being overinterpreted?	
Conclusions	• Are the conclusions in line with the objectives of the study? • Do the findings answer the questions of the investigation? • Are the conclusions supported by the results?	
Studylimitations	• Are the limitations of the study relevant and or are they opportunities for future research?	

References	• Thebibliographicreferences are:
	    ○ Relevant?
	    ○ Recent?
	    ○ Referencedcorrectly?
	• Are the most significant studies included?	

Overallassessment	• Was the structure of the study adequate to meet the objectives? • Clarityofthetext? • Did the study add anything to what was already known on the subject? • What were the main flaws of this article? • Is thearticleconsistent? • Theoreticalrelevance? • PracticalRelevance? • Are all photographs, diagrams, and tables essential? • Is the content interesting for the dimension of the article? • Is the article suitable for the Journal/Scientific Journal?	
Comments additional		

Source; adapted from Clarivate, Publons web of science

Table 4 - Global Peer Review Model on Disclosure

Classification	Don'taccept	Acceptwithconditions	Acceptance	Good	Verygood
Title and summary are appropriate					
Methodologicalapproach					
Literaturereview					
Clarityoftext					
Theoreticalrelevance					
Contribution to existingknowledge					
Practicalrelevance					
Is article content interesting for the article dimension?					
Are all photographs, diagrams, and tables essential?					
If there are, are the arguments and statistics consistent and clear?					
Is the article suitable for the newspaper?					

Source; adapted from Clarivate, Publons web of science

2nd Level - Peer Review - Scientific Relevance (article / document published)

Table 5 - Peer Review Model - Scientific Relevance (article / document)

Section	Things to consider	Reviewercommentsand notes
Summary, Title, Keywordsand	• Is the study summary clear? • Is the Title Appropriate and Relevant? • Are keywords relevant? • Does the abstract have more than 350 words?	
Introduction	• What is already known about the topic is clear and sufficient?	

ScientificMethod	• Are the theme and the problem of research clear? • Is the research question clearly outlined? • Are the study objectives well defined? • Are the research questions relevant, considering what is already known about the subject? • Is the approach methodology adequate? • Are the defined variables and measures appropriating? • Are the study methods adequate, valid, and reliable?	
Theoretical-Methodological Framework for Research	• Does the literature review include at least the last 20 years on the subject? • Do the concepts refer to the main authors of the study? • Is the historical evolution of science(s) / discipline(s) / Scientific area(s) well developed? • Are the main models, if any, represented in the study?	
Findings	• Is the data displayed appropriately? • Are the Tables and figures relevant and clearly presented? • Are units of measure appropriate (rounding and number of decimals)? • Are table titles, columns, and rows labeled correctly and clearly? • Are the categories so grouped properly? • Does the text of the results add something new and relevant to the known data?	
ResultsDiscussion	• Are the results discussed on various aspects? • Are the results interpreted and analyzed in the context of the investigation, without being overinterpreted?	
Conclusions	• Are the conclusions in line with the objectives of the study? • Do the findings answer the questions of the investigation? • Are the conclusions supported by the results?	
Studylimitations	• Are the limitations of the study relevant for future research?	
References	• Are the bibliographic references all referenced in the text of the article/document? • The Additional references - indicate the most significant studies on the subject?	
Overallassessment	• Was the structure of the study adequate to meet the objectives? • Is the text clear, accurate and synthetic? • Did the study add something relevant on the subject? • Is the content appropriate to the size of the theme?	
Comments additional		

Source; adapted from Clarivate, Publons web of science

3rd Level - Peer Review - Relevance and Social Impact (article / document)

Table 6 - Peer Review Model - Relevance and Social Impact (publication)

Section	Things to consider	Reviewercommentsand notes
Title, Keywordsand	• Is the Title relevant and with social impact? • Are keywordssociallyrelevant?	
Introduction	• What is already known about the topic is clear and sufficient?	
ScientificMethod	• Are the theme and problem of research relevant and have a social impact? • Are the objectives of the study relevant and socially impacted? • Are the research questions relevant and with social impact on the topic? • Is the approach methodology adequate? • Are the defined variables and measures relevant and have a social impact? • Are the study methods adequate,valid and socially reliable?	
Theoretical-Methodological Framework for Research	• Does the literature review include at least the last 20 years on the subject? • Are the historical evolution of science(s) / discipline(s) / Scientific area well developed? • Are the main models, if any, represented in the study?	
Findings	• Are the data relevant and have a high social impact? • Are units of measure appropriate, relevant and have a high social impact? • Does the text of the results add something new and relevant with social impact?	

ResultsDiscussion	• The results are interpreted and analyzed in the context of research, and are presented with relevance and social impact	
Conclusions	• Are the conclusions in line with the objectives of the study? • Do the findings answer the questions of the investigation? • Are the conclusions supported by the results?	
Studylimitations	• Are the limitations of the study relevant for future research?	
Comments additional		

Source; adapted from Clarivate, Publons web of science

Peer Reviewer Profile

Globalization is nothing more than the practice of social, cultural, political, economic and technological incorporation between different countries, so decisions must be consistent and governed by ethical and moral rules. The ethics of peer reviewers is related to the incorporation of moral standards in the conduct of all peer reviewers involved with the dissemination of information (laws, norms, rules, procedures, processes, etc.), aiming to guide the actions of those who review them. exercise.

The researcher's professional ethics is the application of general ethics in the scientific field, so he incorporates his own principles and values, to experience them in his activities as a peer reviewer. It is through this activity that the scientific peer reviewer can fully realize himself, exercising his capacity, skill, wisdom and intelligence, proving his personality, raising his morale, being able to be useful to the scientific community and to rise and stand out in it. if for overcoming obstacles, allowing it to exercise its function of solidarity with its peers in the respective scientific field, receiving in exchange, not only dignities, but also eventual compensations.Practical examples:

Some ethical principles are presented by way of example:

- Respect for life and for all human beings, integrity, truth, honesty, justice, equity, institutional loyalty, responsibility, zeal, merit, transparency, legality, impersonality, coherence between speech and practice are the ethical principles that guide actions.

Some important aspects for ethical and socially responsible work by peer reviewers in the scientific field:

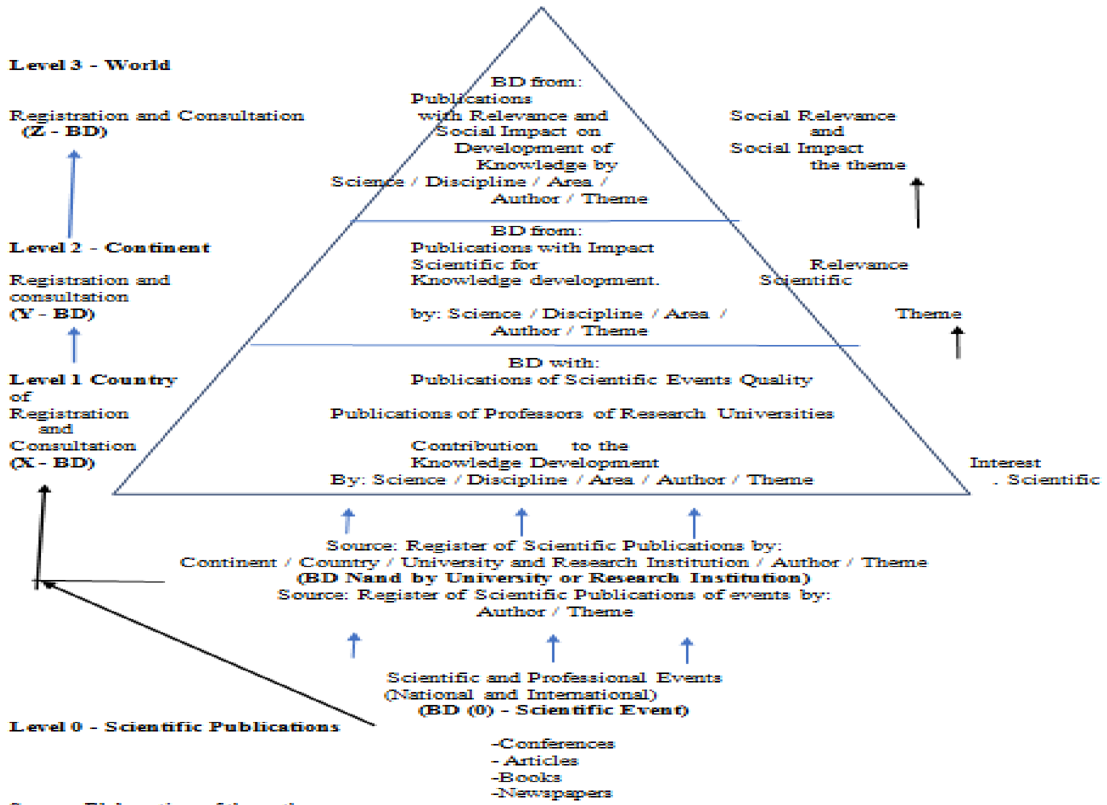
- Define formal mechanisms to monitor ethics; code of conduct; broad communication on ethics and social responsibility; leadership by example; encourage confrontation over ethical deviations; training programs in ethics and social responsibility.

Storage

Digital technology is an indispensable component for the success of scientific research, regardless of the technology, type and methods that are used for storing, cataloging, and accessing data from scientific publications, which allows keeping these data for future use. The main purpose of digital storage is to ensure future access to accurate and reliable information, taking into account security and protection against possible cyber-attacks. The use of information on scientific publications is associated with ease of access to relevant data on a particular topic in the respective scientific field. With the evolution of the technology industry, new types of data storage should emerge from the latest technologies will be put into practice.

In accordance with our moral and ethical principles of scientific rigor, seriousness and impartiality, we propose that scientific publications from events, University or Research Institution of the author(s), publications with scientific relevance and publications be stored. with relevance and social impact on society, as can be seen in the following global model:

Figure 7 - Database of Scientific Publications - Contribution to the Development of Knowledge (Theoretical and/or Practical) (Science / Discipline / Area / Theme)



Source; Elaboration of the authors

In practical terms, we propose a hierarchy of the Databases in each scientific field. Thus, in general terms, we propose the creation of four worldwide databases:

- Database (0) – from the scientific event with the scientific works, as long as they are evaluated by peers.
- Database (X) – University and Research Institution with the publications of their researchers and complemented with scientific publications of interest to their researchers.
- Database (Y) – publications with scientific relevance by researchers in this scientific field.
- Database (Z) – with publications by highly cited authors and whose publications have relevance and social impact in world society.

Disclosure / Publication

Considerations

Clarivate's Scientific Information Institute (ISI) pioneered the organization of the world's research information more than half a century ago. Today, he remains committed to promoting integrity in research, while improving the retrieval, interpretation, and usefulness of scientific information. Holds the knowledge upon which the Web of Science index and related information and analytical content and services are built. It disseminates this knowledge externally through events, conferences, and publications, while conducting primary research to sustain, extend and improve the knowledge base.

www.clarivate. com/webofsciencegroup/solutions/isi-institute-for-scientific-information/.

Scientific Publications

- **Scientific production (scholarly outputs) –**
  - Total cumulative number of volumes published in a given period. It measures volume, productivity: how many publications were produced by a newspaper in a country or group of countries in each period. It is also possible to obtain the total accumulated number of publications according to each area of knowledge or discipline in each period.

• Citation count –

- Indicates the total number of citations that this journal's publication received referring to one or more author(s), over a given period. Citation count metrics are useful for comparing the visibility of the journal and researchers from a scientific field or similar journals with similar periodicity.

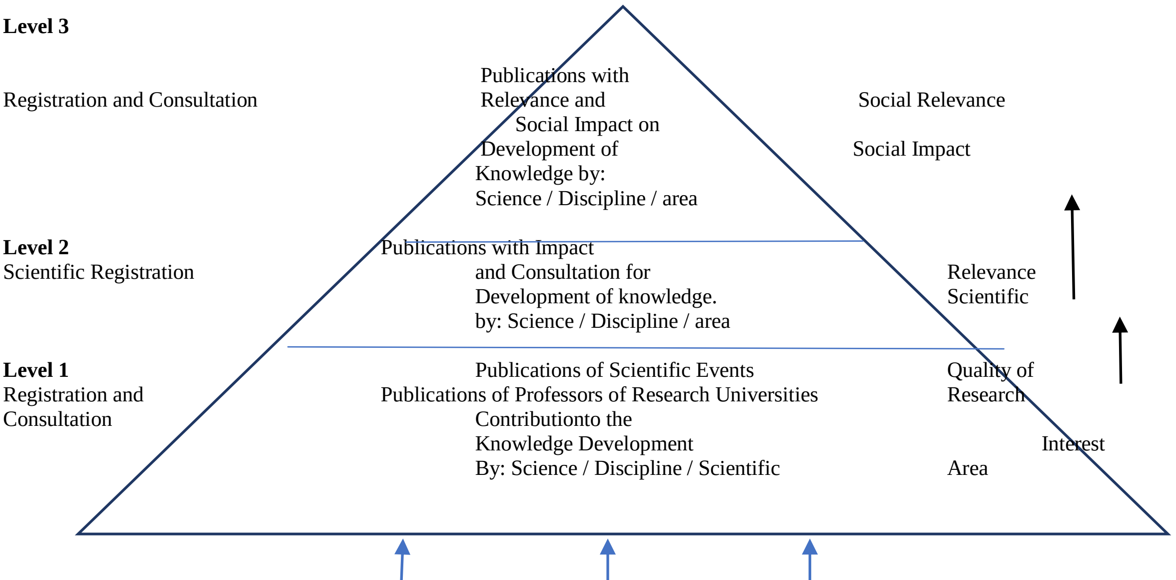
• Citation per publication –

- Indicates the number of citations received per article/work published in the journal. It indicates the average citation impact of each of the journal publications of an institution or author, that is, how many citations the journal publications of an institution or author received, on average.

- **H-index (h-index):**
  - Indicates a balance between productivity (number of journal publications) and citation relevance (citation count) of journal publications by an institution or researcher.
- Citation relevance –
  - It is calculated by dividing the total number of citations received by the journal's publications, by the total number of volumes published by that journal, in each scientific field. Citation relevance shows the average number of citations a given volume has received over a given period.
- Scientific relevance of the journal (journal scientific relevance) - Measures how many times an article was cited in relation to the total number of articles published in a journal/magazine over a two-year period, in the current year. (Web of Science Metric).
- Journal scientific relevance without self-citations – Citations to a publication that come from the publication itself (i.e., self-citations) are excluded from the calculation.
- Journal scientific relevance in 5 years (5-year journal scientific relevance) - It is the average number of times that the articles of a journal published in the last five years have been cited in the year in the Journal Citation Reports (JCR). It is calculated by dividing the number of citations in the JCR year by the total number of articles published in the previous five years. (Web of Science Metric).

Our proposal is to constitute a record of the world hierarchy of scientific publications, according to the model:

Figure 8 -World Registration of Scientific Publications - Contribution to the Development of Knowledge (Theoretical and Or Practical)
(Science / Discipline / Area)



Source: Register of Scientific Publications by:

University and Research Institution
Source: Register of Scientific Publications of events

Scientific and Professional Events
(National and International)

Level 0Scientific Publications

-Conferences
- Articles
-Books
-Newspapers

Source; Elaboration of the authors

This hierarchy consists of three levels:

- **1st Level** – publications of scientific events (Conferences, books, congresses, debates, etc.), in the respective scientific field.
- **2nd Level** – publications with great scientific impact, in the respective scientific field.
- **3rd Level** – publications with great relevance and social impact, in society, of the respective scientific field.

Scientific Author(s)

The production of scientific research has been increasing significantly in almost all countries, exceeding the total volume of the Web of Science. This pronounced growth since 2015 may be related to the introduction of the United Nations Sustainable Development Goals (SDGs) in 2015. Research is globally related and includes significant collaboration between researchers from various countries at the literal forefront of science. External partnerships are likely to be needed to build or operate the necessary infrastructure for science research.

This information is essential for the effective growth of the scientific community. Over the past few decades, science has captured the attention of bibliometrics and/or scientometians—social scientists who typically use quantitative analysis of journal literature to characterize the size, scope, and trends of a field of inquiry.

These analysts can also identify key players: nations, institutions, individuals, funders, and journals. Briefly, the works serve as a proxy for the activity in terms of research production, and citations to documents represent evidence of academic influence, visibility, and impact. These indicators are generally adjusted, or normalized, to allow comparisons across fields and years.

The analysis of bibliometric data on a research domain benefits greatly from interpretation by scientific experts. The depth of topics illustrates one of the benefits of scientometric analysis: a top-down view derived from analyzing the global research literature that offers insights that are beyond the knowledge and experience of the researchers themselves. As would be expected in such a vast and multidimensional field as science, a bibliometric approach yields a wide range of topics identified in documents related to sustainability; global change and the future, as well as reviews from journals specific to the field or nations and institutions active in this area of inquiry.

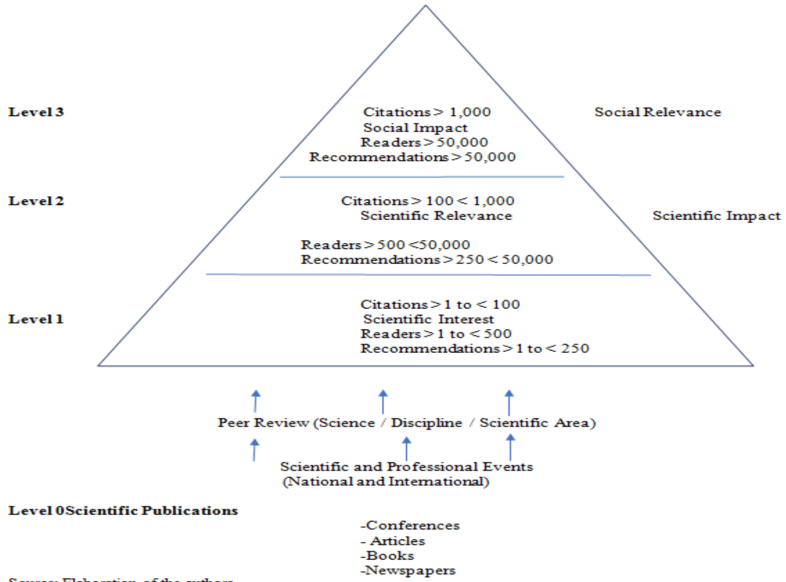
Scientific production

The cumulative total number of published items measures volume, productivity: how many publications were produced by an author, group of researchers, institution, country or set of countries. It is also possible to obtain the total accumulated number of publications, according to each area of knowledge / discipline / science.

- **Scientific production (scholarly outputs) –**
  - the number of books published
  - Number of book chapters
  - the number of articles published
  - the number of citations
  - the number of readers
  - the number of recommendations
  - Number of mentions.
- **Citation count –**
  - Indicates the total number of citations that publications by an author, institution or country have accumulated. Citation count metrics are useful for comparing visibility where investigators are from similar fields or disciplines and with similar career lengths.
- **Citation per publication –**
  - Indicates the number of citations received per published article/work. Indicates the average citation impact of each of an institution's or author's publications: how many citations an institution's or author's publications received, on average.
- **Z-index (Z-index):**
  - Indicates the balance between scientific productivity (published books, chapters and articles) and scientific relevance of publications (count of citations, number of readers and recommendations) of publications of a University, Scientific Institutions or researcher(s).
- **Citation impact –**
  - It is calculated by dividing the total number of citations received by the total number of publications by the author, University or Research Institute, country / continent, in a given scientific field. Citation relevance shows the number
- **Field-weighted citation impact (of knowledge) –**
  - Indicates how the number of citations received by publications from one institution compares with the average number of citations received by all other similar publications in the universe of data independent of the area of knowledge. Metric used by Scopus. A weighted citation impact in the field of more than 1.00 indicates that publications were cited more than would be expected based on the world average of similar publications, for example, a score of 1.44 means that outputs were cited 44% more times than expected. A field-weighted citation impact (FWCI) of less than 1.00 indicates that publications were cited less than would be expected based on the world average for similar publications, e.g. a score of 0.85 means 15% less cited than the world average. The Web of Science refers to this metric as Normalized Citation Impact.

Thus, we propose the following Ranking Model by scientific authors and their contribution to knowledge:

Figure 9 - Ranking by Author - Contribution to Knowledge(Theoretical and/or Practical)
(Science / Discipline / Area)



Source; Elaboration of the authors

The hierarchy consists of four levels:

- **Level 0** – Publications in national and international scientific events (Conferences, articles, books, magazines).
- **Level 1** – Publications with scientific interest (less than 100 citations, less than 500 readers and less than 250 recommendations).
- **Level 2** – Publications with scientific relevance (number of citations between 500 and 1,000, number of readers less than 50,000, number of recommendations less than 20,000).
- **Level 3** – Publications with social relevance (1,000+ citations, 50,000+ readers and 30,000+ recommendations).

Indexing of Scientific Publications

The Web of Science, formerly Web of Knowledge, is a website that provides access to various databases with citations for many Sciences / Disciplines / Areas of Scientific Knowledge, which was produced by the Institute for Scientific Information (ISI) and is currently maintained by Clarivate Analytics.

A citation index is based on the fact that scientific citations serve as a link between research documents (articles, books, journals, conference proceedings and abstracts) of similar research and allow a review of scientific literature in the same field. scientific. In addition to the literature review of the scientific field, it shows the relevance and impact in a specific field or more than one Science / Discipline / Area of Knowledge and that can be easily accessed through the citation index.

There is a significant and positive correlation between the impact factor and the CiteScore. However, Elsevier's analysis identified some journals in the top 10% of most cited journals in their specialty category, based on CiteScore. However, Impact Factor does not provide comprehensive and unbiased coverage of high-quality journals. Similar results can be observed comparing the impact factor with the SCImago Journal Rank.

Titles of publications in foreign languages are translated into English and therefore cannot be found in searches in the original language. Citation databases can be searched by topic, author, source title, and location.

As with other scientific approaches, scientometrics and bibliometrics have their own limitations. In 2010, a critique was made, pointing to certain shortcomings of the journal impact factor (JIF) calculation process, based on the Thomson Reuters Web of Science, such as: journal citation distributions are generally highly skewed towards established journals; journal impact factor properties are field specific and can be easily manipulated by editors or even changing editorial policies; this makes the whole process essentially non-transparent.

Regarding more objective journal metrics, there is a growing view that for greater accuracy it should be supplemented with article-level and peer-reviewed metrics. Thomson Reuters responded to the criticism in general terms, stating that "no single metric can fully capture the complex contributions that scholars make to their disciplines, and many forms of academic achievement must be considered".

In practical terms, we propose Databases in each scientific field. Thus, in general terms, we propose the creation of the following Citation Databases, from the same scientific field:

- **Database (1) – National database of citations.**
- **Database (X) – Continental Database (e.g., EU, USA, etc.), of citations.**
- **Database (Y) – Database with 10% of researchers' world citations (subject, keywords, author(s)).**
- **Database (Z) – Database with 10% of World citations of Scientific Research Journals, whose scientific publications by author(s) (subject, keywords, author(s)) have reached 100 citations in more than one country.**

Quality of Scientific Publication

Scientific production

The cycle of scientific knowledge involves two essential stages, as well as a third, no less important one. The first is the production of knowledge, which involves elaborating the problem to be investigated, selecting an appropriate approach methodology for such an investigation, conducting the investigation itself and analyzing and interpreting the results obtained. The second is the dissemination of knowledge, at conferences, publication of books, scientific articles in specialized journals in the respective scientific field, but always and after peer review in the scientific area, with criteria of excellence.

But the publication does not guarantee the quality of knowledge, being crucial that it awakens debate with other researchers, promotes new works and, thus, contributes to the development of the Scientific Area / Discipline / Science. In the stages, production, and dissemination, it is expected that the behavior of the "actors" involved (authors, editors, etc.) implies an unrestricted commitment to ethical norms.

In recent years, the number of articles submitted for publication has grown dramatically worldwide. Part of this growth was due to changes in the evaluation system, which began to incorporate other production quality indicators, making the so-called "scientific relevance factor" crucial to the system. This indicator shows how much a journal contributes to the growth of a Scientific Area / Discipline / Science, which is measured from the number of citations of the articles published in it. Thus, the greater the number of citations, the greater the influence of published knowledge and, consequently, the greater its relevance.

We suggest that authors take some precautions to consider when writing articles:

- Scientific rigor, both in writing the text and in respecting the norms of the language used, as well as in the logical structure of the text.
- Include and reference relevant publications, even those contrary to your conclusions.
- Present the relevance of the topic as well as the keywords.
- Avoid redundancies and/or ambiguities in data analysis.
- Compare, with maximum impartiality and scientific rigor, the results, with those already mentioned in the literature, showing consistencies and inconsistencies, which must be justified.
- Strictly respect the publication rules of the chosen journal (failure to follow these rules can lead to rejection of the manuscript even before the peer review process begins); due to the strict criteria adopted in the peer review process.
- Choose a periodical appropriate to the topic and with scientific prestige.
- It is important that the authors and co-authors have contributed intellectually to the content of the article, becoming responsible for it.
- Request a preliminary review of the draft from a colleague.
- Do not submit the article to more than one journal.

The Scientific Publications Editor

Although the opinions of reviewers are important, it is the Editor who is responsible for publishing or not and his commitment to innovation and originality of the knowledge to be published. His responsibility can be summarized as follows (Feitosa, 2004):

- Adopt rigorous publication norms, which allow the selection of articles of unquestionable quality.
- Carefully select peer reviewers to avoid injustices arising from theoretical, methodological, etc. differences.
- Use standardized processing procedures, which prevent the occurrence of privileges and preferences.
- Ensure the scientific rigor and intellectual independence of the author(s) and peer reviewers.
- Do not publish articles of your own authorship in your journal.
- Ensure that the topic to be published is up to date.

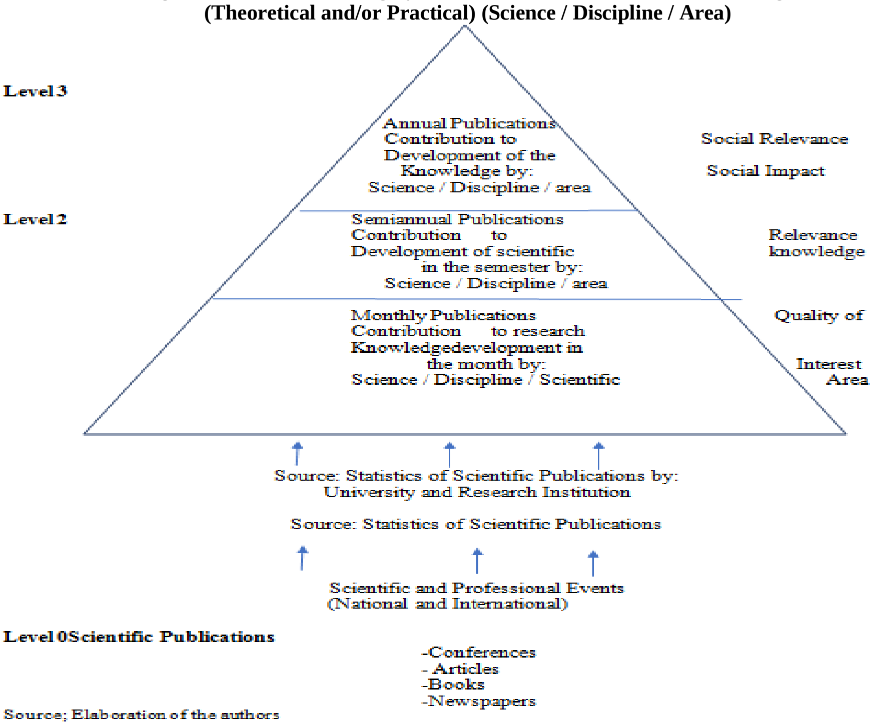
The process of disseminating knowledge is, undoubtedly, laborious and requires scientific rigor and commitment to ethics and the objectives of the Science / Discipline / Area of Knowledge, invaluable availability of time, perseverance and lucidity in the day-to-day research, excellence in writing texts, intellectual sophistication, etc. However, if all members of this process fulfill their tasks with responsibility and promptness, the process will certainly be less arduous and better results will be achieved. This must be everyone's commitment.

Statistics of Scientific Publications

Descriptive statistics describes the characteristics of your numerical dataset, while inferential statistics is used to make inferences from subsets of data so that you can better understand data from the production, peer review, storage, and dissemination of scientific research. . Without intending to be exhaustive, given that we do not have sufficient knowledge on this topic, we present / suggest the use of three types of statistics:

- Statistics on the Scientific Production of each Science / Discipline / Area of Knowledge, at the level of the author(s), country, continent, and world in an integrated way so that you can have a global vision of the highlighted themes and the evolution of knowledge. Ex: Number of citations > 1 to < 100, Scientific Interest, Number of readers > 1 to < 500, Number of recommendations > 1 to < 250
- Statistics on the Relevance of Knowledge on a given topic, Scientific Area, by author(s), Country, Continent and Worldwide, so that an integrated and global view of the themes can be obtained in each scientific field. Ex: Number of citations > 100 < 1,000, Relevance and Scientific Impact, Number of readers > 500 < 50,000, Number of recommendations > 250 < 50,000.
- Statistics on the Relevance and Social Impact on a given topic Scientific Area, by author(s), Country, Continent and Worldwide, so that an integrated and global view of the themes can be obtained in each scientific field. Ex: Number of citations > 1,000, Relevance and Social Impact, Number of readers > 50,000, Number of recommendations > 50,000.

Figure 10 - World Ranking by Publication - Contribution to Knowledge (Theoretical and/or Practical) (Science / Discipline / Area)



Source; Elaboration of the authors

Evaluation of Universities and Scientific Research Institutions

Scientific Relevance

The evaluation of the results of the Quality of Scientific Research and of the Training Offer is necessary and relevant, to support the rulers / decision makers on the volume of funding for research projects and for the training offer in programs and public policies each University or Institution of Investigation.

(Eugene Garfield, 1972), created the first bibliometric Impact Factor (IF) indicator to evaluate journals, with the publication of the Science Citation Index of the Institute for Scientific Information, which became an index to evaluate graduate programs. Undergraduate studies, making the Ranking of Universities and Scientific Research Institutions to measure the scientific production that could benefit from a qualitative assessment, was often reduced to a list of publications associated with an impact factor (IF).

The limitations of the IF and its wide use by the scientific community have been registered through actions such as the San Francisco Declaration on Research Assessment (DORA). This document, resulting from the action of the Editors and Publishers gathered in 2012 at the Annual Meeting of the American Society of Cell Biology in San Francisco, CA, USA, lists the recommendations so that citation-based impact indices, such as the FI, no longer the only index to be used to evaluate Universities and Research Institutions, as well as for decision-making in granting funding for Research Projects and the Training Offer.

In Europe, the measurement units for assessing the quality of scientific research originated at the 19th International Conference on Indicators in Science and Technology, held in 2014 in Leiden, the Netherlands. The Manifesto has already been translated into 25 languages, adopted by institutions and recognized by publishers around the world.

International Rankings

(Neylon, 2022, Karl Huang, 2022), researched the data that inform international university rankings. Each ranking uses a certain database to count the citations of the scientific production of the Universities and Scientific Research Institutions, evaluated, such as Web of Science, Scopus or Microsoft Academic. The authors created a citation-based ranking of 155 Universities and compared citations from the three databases. The obtained results show that three Universities changed 110 positions, and 45 Scientific Research Institutions, changed more than 20 positions, when the data source was changed.

According to the same authors, each ranking provides different results, depending on the database. Based on these data, Universities continue to ignore these discrepancies and make decisions about contracting and funding Scientific Research Projects, knowing that these measurement units are false.

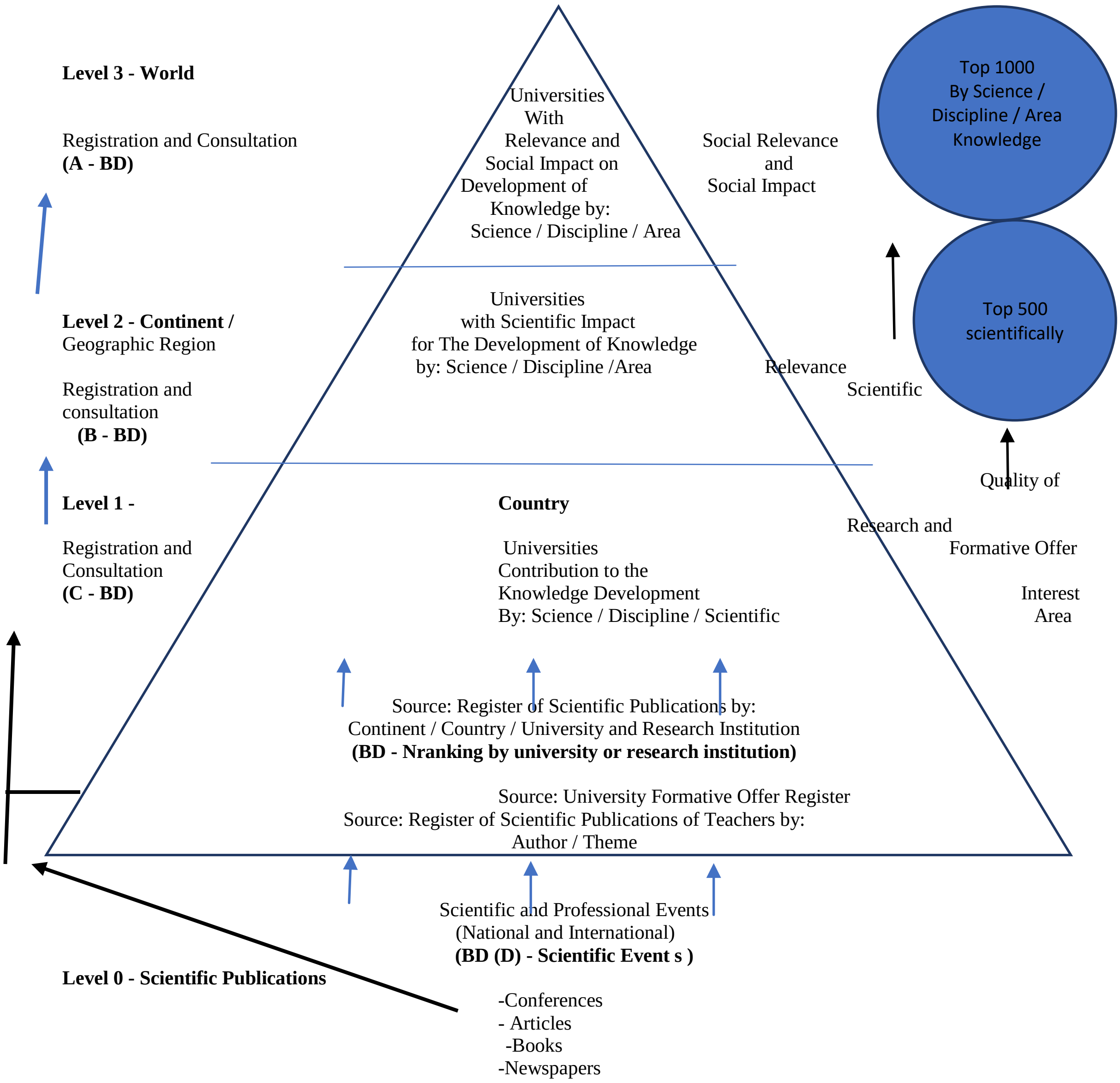
This scenario, however, is changing, as an Agreement on Reforming Research Assessment was drawn up in January 2022 and was published on the initiative of the European Research Area (ERA), European University Association (USA), Science Europe, and the Commission European. The agreement has the support of 350 public and private organizations including development agencies, Universities, research centres, institutes and infrastructures, associations and scientific societies, and associations of scientific researchers, among more than 40 countries.

The signatories committed themselves to a shared vision, that the quality assessment of scientific research, scientific researchers and scientific research organizations recognize the diverse results, practices and activities that maximize the quality and impact / relevance of research. This requires basing scientific assessment on qualitative peer review, supported by the responsible use of quantitative indicators. The San Francisco Declaration on Research Assessment completed 10 years of publication in 2022, but it took a decade and a new agreement to consolidate what DORA and its supporters already defended in 2012, and the Leiden Manifesto that it corroborated in 2015.

Therefore, we propose a Global Model for assessing the Quality of the Training Offer and Scientific Research of each Country / University / Science / Discipline / Scientific Area, based on the following criteria:

- **Teachers:**
  - Academic Qualifications.
  - Technical Skills
  - Scientific and Social Relevance.
  - Number of Scientific Publications (books, book chapters, articles, Conferences).
- **Training Offer:**
  - the Degree Courses
  - Masters and Doctorate Courses.
  - Graduate Courses.
- **Infrastructure**
  - Facilities
  - Scientific Laboratories.
  - the library(s)
  - Support for teachers and students
- **Financing:**
  - Governmental.
  - Companies.
  - Public and private non-governmental institutions.
  - Services provided
  - Others.

Figure 11 - Database of the World Ranking of Universities and Institutions of Scientific Research - Contribution to the Development of Knowledge (Theoretical and/or Practical) (Science / Discipline / Area /Theme)



Source; Elaboration of the authors

In practical terms, we propose a hierarchy of the Databases in each scientific field, Country / Continent or Geographical Region and World. Thus, in general terms, we propose the creation of four worldwide databases:

- **Database (D)** – Quality of scientific events and scientific work, as long as they are evaluated by peers.
- **Database (C)** – Quality of the Training Offer and Scientific Research of the Country's Universities.
- **Database (B)** – Quality of the Training Offer and Scientific Research of Universities at the level of the Continent / Geographical Region with Scientific Relevance.
- **Database (A)** – Quality of the Training Offer and Scientific Research of Universities, worldwide with Relevance and Social Impact of highly cited authors and whose publications have relevance and social impact, in world society.

Results

The evaluation of research results is necessary to determine what is scientifically and socially relevant, to support decisions on new scientific research projects and to eventually translate this scientific production into programs and public policies for society as a whole.
(Eugene Garfield, 1972), created the Impact Factor (IF) to evaluate journals, with the publication of the Science Citation Index of the Institute for Scientific Information and, as such, it also became an indicator for evaluating Graduate Programs, preparing the ranking of Universities and Scientific Research Institutions and evaluating authors.
The limitations of the IF and its wide use by the scientific community have been registered through actions such as the San Francisco Declaration on Research Assessment (DORA). This document, resulting from the action of editors and publishers gathered in 2012 at the Annual Meeting of the American Society of Cell Biology in San Francisco, CA, USA, lists the recommendations so that citation-based impact indices, such as the IF, no longer be used to evaluate researchers in situations of hiring, promotion or decision to grant funding for research projects.

In 2015, the Leiden Manifesto, originating at the 19th International Conference on Indicators in Science and Technology in 2014 in Leiden, the Netherlands, advises the use of scientific evaluation measurement units in Europe. To date, the Manifesto has been translated into 25 languages, adopted by institutions and recognized by publishers around the world.

Our proposal is that it is necessary to distinguish the evaluation of (s) and their contribution to the development of knowledge of the respective scientific field, regardless of the University or Research Institution and scientific publications. In relation to the author(s) it is important to assess the scientific relevance of the research, as well as their contribution to the development of knowledge in their scientific area and the relevance and social impact on society in general.

The evaluation of Universities and Scientific Research Institutions is made up of three components: the quality / scientific competence of their researchers / professors, the quality of their Teaching Programs (Graduate and Postgraduate), as well as the Project Financing Programs of Research, in addition to the World Ranking.

Scientific publications (public and/or private) are distinguished by the quality of the documents they publish. This quality is measured by the number of citations of authors / scientific publications, recommendations, number of readings of publications, ranking of the respective scientific field.

Conclusions

This study was carried out in the context of globalization and the digital age. This allowed a global approach to the scientific research of this project to be carried out, since with the support of the Research Gate platform it was possible to share the research, use the platform to publicize the project and have the worldwide participation of researchers who wanted to participate in it. Thus, according to Research Gate statistics, it was read by 2,610 researchers, 548 recommendations and 80 followers.

Throughout the development of the project, some drafts of the models conceived were presented on the Research Gate platform, in the different stages of knowledge production, evaluation, storage and dissemination. The production and information phase to other researchers interested in their follow-up and participation had 36 updates, each of which received the comments deemed opportune.

This method of approach allowed the pre-assessment of, among others, the following:

1. Basic structure and content for the elaboration of a research project.
2. Synoptic table of knowledge accumulation.
3. Hierarchical scientific structure to separate new researchers, top researchers and highly cited researchers.
4. Peer review model of a scientific article
5. Acceptance or rejection model for the journal to which it was submitted.
6. Global Model of the World Ranking for the evaluation of the Training Offer and the Quality of Research of Universities and/or Research Institutions.

……….

Research Study Limitations

We are aware of the limitations of the study, as our own knowledge is limited and as such, we are ignorant in many Sciences / Disciplines / Areas of Knowledge. However, we try to propose global models that serve as a basis for eventual adaptations of each Science / Discipline / Area of Knowledge.

Previous studies on this subject have numerous limitations that must be addressed in future investigations. Firstly, they are limited to partial studies, that is, on a theme and not on a global vision of Production, Peer Review, Storage and Dissemination of knowledge.

Some of the proposed models were theoretically validated by some of the researchers who were interested in the research project, but others take a few years to be validated in practice, to be able to make comparisons between them. Similarly, previous studies are often limited to just one country, which reduces the potential for generalizability of conclusions.

Leads for New Investigations

The Debate on the Production, Peer Review, Storage and Dissemination of Knowledge in the Digital Age can contribute to the development of a civilized world society that respects the ethical, moral, social, political and economic values of the world society. Where every citizen and public and private organizations are responsible and respect the freedom and universal rights of citizens and contribute to a future society in solidarity and peace.

Thanks

We would like to thank you for your kindness and the way in which Research Gate's platform made it possible to publicize this Research Project, as well as the participation of researchers from around the world. Such acknowledgment deserves to be highlighted, even more so, due to the fact that there was no prior contact between the authors and Research Gate.

We would like to thank all researchers worldwide who, in one way or another, accompanied, disseminated and participated in the prior validation of some of the proposed models and whose statistics are available on the Research Gate Platform.

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Notes

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European research area (ERA): https://research-and-innovation

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