Interactive Qualitative Analysis: a methodological contribution to researches in sustainability

Análise Interativa Qualitativa: uma contribuição metodológica para pesquisas em sustentabilidade

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ABSTRACT

This study discusses the use of the Interactive Qualitative Analysis Method (IQA) to operationalize a research that investigated the adoption of shared value strategies in large companies. Sustainability studies deal with complex problems that require interdisciplinary and systemic methodological approaches. The IQA method offers a structured and systemic approach to collecting and analyzing data in qualitative research. The aim is to reduce the researcher's biases as much as possible, since the constituencies of the study, and not the researcher as expert, do the data analysis and interpretation. Meanwhile, the researcher has the role of facilitating the analysis process. What differentiates the IQA from other forms of qualitative inquiry is that it provides a roadmap with transparent and traceable methodological procedures. The systematization of the protocols, the methodological rigor, and the multiple sources of data collection and analysis suggest that the IQA is an appropriate method for studies on the theme of sustainability, with the potential to contribute to a literature still under construction. The article adds value to academic practice because, through an innovative approach, it offers an in-depth discussion on the use of the IQA in research related to sustainability. The methodological traceability of the IQA allows other researchers to investigate the same phenomenon in different contexts or even in the same context involving other constituencies.

Keywords: IQA Method, Sustainability, Shared Value; Strategy

RESUMO

Este estudo discute a utilização do método Análise Interativa Qualitativa, em inglês, Interactive Qualitative Analysis (IQA), para operacionalização de uma pesquisa que investigou a adoção de estratégias de valor compartilhado em empresas de grande porte. Os estudos em sustentabilidade lidam com problemas complexos que requerem abordagens metodológicas interdisciplinares e sistêmicas. O método IQA oferece uma abordagem sistêmica e estruturada para a coleta e análise

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RESUMO

de dados em pesquisas qualitativas. Tanto quanto possível, busca-se diminuir os vieses do pesquisador, posto que os constituintes do estudo são os responsáveis por interpretar os dados, enquanto é reservado ao pesquisador um papel de facilitador do processo de análise. O que diferencia o IQA de outras formas de investigação qualitativa é que ele fornece um roteiro com procedimentos metodológicos transparentes e rastreáveis. A sistematização dos protocolos, o rigor metodológico e as múltiplas fontes de coleta e análise de dados sugerem que o IQA é um método adequado para estudos na temática da sustentabilidade, com potencial de contribuir para uma literatura ainda em construção. O artigo agrega valor à prática acadêmica pois, mediante uma abordagem inovadora, oferece uma discussão aprofundada sobre a utilização do IQA em pesquisas relacionadas à sustentabilidade. A rastreabilidade metodológica do IQA permite que outros pesquisadores possam investigar o mesmo fenômeno em contextos diferentes ou, ainda, em um mesmo contexto envolvendo outros constituintes.
Palavras chaves: Método IQA; Sustentabilidade; Valor Compartilhado; Estratégia

Introduction

The theme of sustainability is inserted in a context of complex interactions among various stakeholders. This fact highlights the need for knowledge and understanding integration from an interdisciplinary perspective, thus overcoming epistemological paradigms that analyze the world as something homogeneous. The field of sustainability research demands methodological approaches that consider the social, environmental, economic, political, ethical, and cultural challenges, aiming to understand the intrinsic relationships between humans, nature, and society (SANTOS; BASSI, 2017).

In this sense, the complexity of this theme demands new techniques of data construction and analysis. Innovative methodologies and 20th and 21st century thinkers have proposed other ways of scientific investigation with applications, especially in the field of social sciences that oppose positivism, which, despite having brought numerous scientific discoveries, has been questioned for not meeting the demands of current society (NIELSEN *et al.*, 2018).

One of the theorists who challenged positivism was Kuhn (2013) when he established the concept of scientific paradigm, defined as a set of beliefs, values,

and techniques shared by members of a given scientific community. For the theorist, the objectivity of positivism is not possible, because two scientists, no matter how much they share paradigmatic commitments, may reach different conclusions about the same theory. The reasons for this are subjective, since they are related to professional, personal, ideological, or religious issues. Kuhn proposes that theoretical analyses are not determined by rules but are conditioned or influenced by values. Such divergences, rather than imperfections to be removed, are an essential part of the nature of science.

Corroborating this idea, Morin (2011) argues that nature is composed of open systems that organize themselves from the interaction with other elements. Instead of knowledge specialization, simplification, and fragmentation, the scholar proposes the concept of complexity. That which cannot be summarized in a key word, and which cannot be reduced to a law, or a simple idea is complex. Transdisciplinarity proposes to break the paradigm of studying disciplines in isolation, emphasizing that uncertainty and contradictions are part of life and the human condition. At the same time, the author suggests solidarity and ethics as a way to reconnect beings and knowledge (MORIN, 2011), which opposes the positivist theory that states that the maximum of human knowledge would have the mission to discover and compile the laws of nature, which would be precise and invariable (NIELSEN *et al*., 2018).

In this way, the theoretical developments of Kuhn (2013) and the complexity theory of Morin (2011) prove to be epistemological mainstays for research in the social sciences. They are also pertinent to the area of sustainability, as it is a field of study permeated with complex issues that can systemically involve the economic, environmental, social, and governance dimensions. Looking at the issue from the standpoint of the methods most used in research in this field, there is a predominance of the qualitative approach. In a bibliometric survey conducted by Souza and Ribeiro (2013), it was observed that the Brazilian production on the subject in national journals (Qualis A1 to B2 between 1992 and 2011) is centered on qualitative studies, with a predominance of bibliographic research, followed by case studies.

Another research with the same methodology but more recently conducted in the Scielo database (2013-2017), reaffirms the predominance of qualitative studies with exploratory objectives, with interviews as the main data collection tool (SANTOS; DOS SANTOS; MOURA, 2017). This can often present numerous challenges

and compromise the results, depending on the preparation of the researcher and the pre-disposition of respondents to share knowledge and values through their perception (BISHWAKARMA, 2017).

On the other hand, qualitative research sometimes uses focus groups for data collection, which enables listening to different points of view on a theme. A focus group is a technique where a group of people are interviewed informally and questions about specific issues are discussed to explore their perceptions, opinions, beliefs, and attitudes. The combination of interview and focus group techniques for data collection can bring significant contributions to qualitative research especially focused on understanding the perception of a certain type of constituent, such as children and adolescents or participants with multidisciplinary backgrounds (BISHWAKARMA, 2017).

Corroborating the idea of using other data collection and analysis techniques, Zappellini and Feuerschütte (2015) emphasize the use of methodological triangulation to increase the reliability of research findings and conclusions. The authors draw on Denzin's (2005) definition, where triangulation refers to knowledge production rather than the outcome. The technique allows for a more complete research process.

Given the importance of systemic methodological approaches, as well as the need to diversify the research methods used in sustainability, it is important to seek authors in the field of scientific methodology who have affinity with the epistemological assumptions presented. The proposition of this study is that the Interactive Qualitative Analysis method (IQA), proposed by Northcutt and McCoy (2004), brings relevant contributions to qualitative research through systems-based protocols and multiple sources of data collection and analysis, and has an active participation of the subjects (constituencies) who not only contribute with their testimonies, but are also involved in rounds of analysis and validation of the empirical data.

The method uses qualitative research design and analysis techniques that combine phenomenology with systems theory (SANCHEZ, 2007). IQA was initially developed for undergraduate students and has become a reference in studies of complex social problems where researchers seek to thoroughly understand the phenomenon through data collection, coding, and analysis. The construction of answers is done together with the research participants so that the perception of those involved becomes a strong point in the analysis of the results.

Although the IQA methodological approach has been used in research in several areas, such as in health and technology, and strongly explored in studies in the area of education (PUGALIA, 2016; BARGATE, 2014), in the area of business administration, specifically in the field of sustainability, it is still little used. Thus, the method has a significant potential to contribute to the investigation of complex research problems based on the challenges of sustainable development whose perception of the different stakeholders is fundamental for the delineation of possible paths in the proposition of solutions.

This study aims to describe the protocols and operational procedures of the IQA method applied in an empirical research in the area of sustainability. The article presents the results of the methodology used in a research project that sought to understand the adoption of Creating Shared Value as a competitive advantage strategy to reconcile profitability and social welfare by large Brazilian companies. However, the focus of the article is on the method used and not on the empirical and substantive results of the research.

The article is structured in four parts, besides this introduction. The second part is an explanation of the main elements that make up the IQA method. The discussion of the results is presented in the third part. Finally, the contributions that the IQA method may bring to complex phenomena studies in the area of sustainability and recommendations for future studies are presented.

Interactive Qualitative Analysis (IQA)

Interactive Qualitative Analysis (IQA) is a research method developed by Northcutt and McCoy (2004) that combines two central goals: to investigate the elements that make up a system and their relationships, and to translate this theory into research practice. It is a qualitative research approach that seeks to provide a systemic, rigorous, and reliable framework that is suitable for studies in which researchers wish to examine how phenomena are socially constructed (NORTHCUTT; MCCOY, 2004).

The data collection and analysis techniques of the method originated from Total Quality Management (TQM) procedures that seek knowledge from the productive

force to solve problems and improve industrial processes. One of the IQA premises is that the people closest to the phenomenon are the most appropriate to interpret the elements of the system and their relationships. In the early stages of analysis, the voices of the constituencies (the term for the participants) are privileged over that of the researcher. The assumptions of the method directly address the knowledge dependency and power positions between the researcher and the participants. Constituencies are defined as a group of people who have a shared understanding of the phenomenon (NORTHCUTT; MCCOY, 2004). In this research, they were identified in the sustainability reports of the companies investigated, based on the functions performed and which were directly linked to the implementation of shared value strategies. The functions are as follows: CEO, director, manager, and sustainability analyst. Among the seven companies investigated, the constituencies were selected based on their availability to participate in the research interactively.

Once the constituencies have been defined, the IQA method assumes the formation of the focus group. One of the sampling techniques for choosing the focus group is convenience sampling, provided that the criteria cited for the selection of constituencies are met. According to Northcutt and McCoy (2004), a focus group should consist of 8 to 12 participants and consists of collective work with the fundamental purpose of listening and learning from the group members. The goal is to improve the overall understanding of a construct, issue, or phenomenon. The researcher listens to the participants and learns from them. Although each participant may have their own ideas, a completely new set of data can emerge when participants interact with each other.

The researcher acts as the focus group facilitator through three processes related to Glaser and Strauss' (1967) content analysis: a) open coding (survey in which participants are free to express perceptions and experiences; b) inductive coding (organization of perceptions and experiences into groups of categories; and c) axial coding (naming the groups or affinities). Coding is the procedure in which data are divided and conceptualized and in which their relationships are established. It is an analytical process aimed at building theory, providing the necessary methodological rigor to the scientific process, helping the researcher to detect biases, and developing the foundation, density, sensitivity, and integration necessary to generate a theory (STRAUSS ; CORBIN, 1990).

In traditional qualitative research, researchers generate the subjects, collect the data, and do the analysis. In the IQA method, observers and observed are dependent (or interdependent). Thus, constituencies are responsible for generating themes or affinities (BARGATE, 2014). In this way, the method challenges the traditional assumptions of qualitative research that suggest that the participants' role is to provide data and that only the researchers are qualified to analyze it. With IQA, constituencies generate, theorize, and interpret their own data while researchers facilitate the process. The intention is that researcher biases are minimized in the process.

From an epistemological perspective, IQA considers that people know their world through the social construction of meanings. Both deduction and induction are deemed necessary to investigate meanings and their influential relationships. The authors borrow Denzin and Lincoln's (2000) metaphor of the *bricoleur* (craftsman) in proposing that IQA offers the chance for participants to "create" system meanings or representations through "patchwork quilting."

Four points are essential in the structure of the IQA method. The first refers to the research design, which should illustrate the heuristic process for conceiving an interactive qualitative study. The second important aspect is the group reality and system elements that introduce the coding used to identify, clarify, and describe affinities. The third point is the use of a formal protocol, whereby participants systematically construct hypotheses based on the data to establish the existence and directionality of existing influences. The aim is to summarize the underlying structure in a mental map of the group's perceptions of the cause-and-effect relationships among all the affinities in a system. Finally, the individual reality is of major importance, captured through individual interviews that validate the collective perception developed in the focus group.

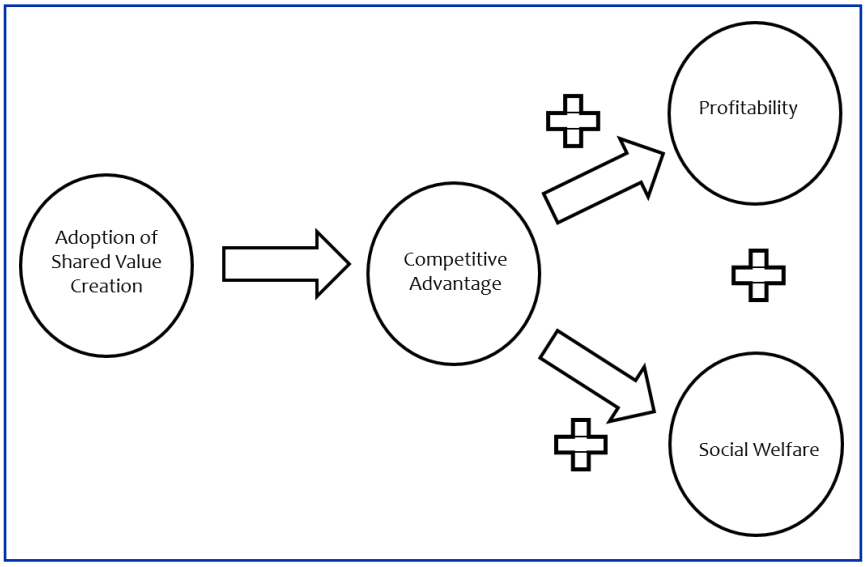
Research design is a key element in the deployment and success of the IQA method. Corroborating this idea, Lukosevicius (2018) points out the importance of research design. According to the author, the inadequacy and lack of maturity of research projects are some of the problems that most lead to outright rejection of articles in the business administration field.

Another fundamental assumption of a research is the definition of the construct, conceptualized by Gil (2009) as a mental construct created from simpler elements to represent the theoretical meaning of a concept or proposition. A construct

has validity when it reflects its true meaning. To be operationalized, the construct is broken down into variables that, in turn, are characteristics, properties, or observable aspects. Based on these elements, researchers develop hypotheses to be verified throughout their research. In the IQA language, an affinity comes close to the concept of a variable in qualitative research because it is reflections on a construct. However, they differ in the way they are measured. Affinities do not have to be operationalized. Unlike variables, they are constructed from the thoughts and words of those who have knowledge and influence over the phenomenon studied. They tend to be richer in meaning and assume a dialectical unity within a system. To elucidate, (intellectual) growth as a variable would be measured in an extension between confusion and clarity. As an affinity, it would be a dialectical representation that suggests that growth occurs when there is constant and dynamic interaction or tension between the two opposite poles: confusion and clarity, thus creating a unit of analysis (NORTHCUTT; MCCOY, 2004, p. 83).

Figure 1 presents the theoretical model of the research that is presented in this paper, describing the relationship between constructs.

Figure 1 Theoretical Model



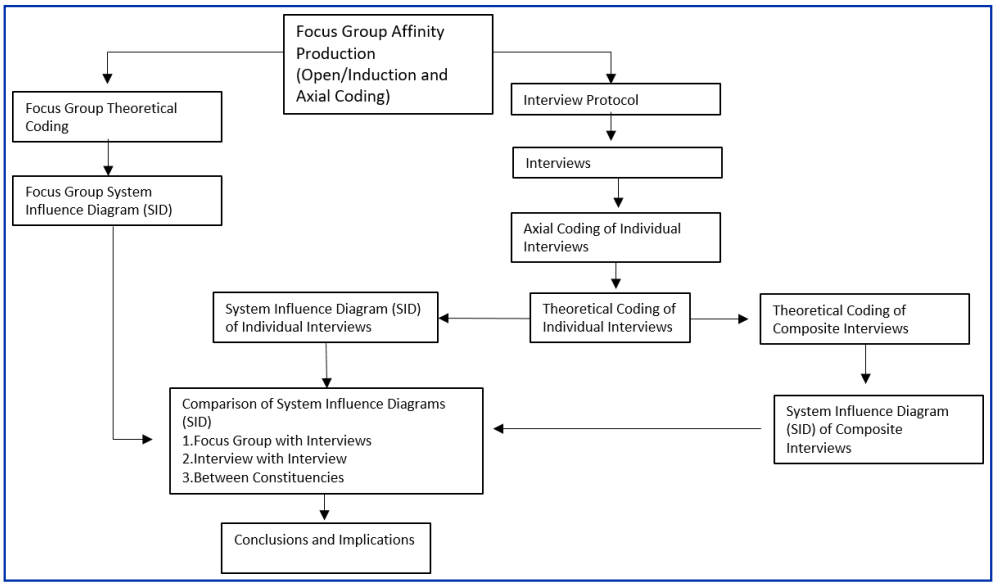
Source: Prepared by the authors (2021).

The first construct is the adoption of Creating Shared Value (CSV). This is a strategy proposed by Porter and Kramer (2011), where the company generates social value while obtaining economic return. The authors suggest three ways of implementing the strategy: the redesign of products and markets, the redefinition of the value chain productivity, and the development of clusters (local productive arrangements). The second construct refers to competitive advantage, defined by Barney (1991) as the creation of value by the company in such a way that its activities and capabilities differentiate it from its competitors. This construct is measured by revenue, income, costs, and market share. The third construct is profitability, defined by the financial return on the amount invested, and operationalized by the variables production cost, marketing, sales, and tax and business structure (SEBRAE, 2020). The fourth construct is social well-being, whose variables are metrics of education, health, food, housing, work, and income (IBGE, 2020).

Based on these constructs and their variables, the proposition established by the researchers for dialogue with the constituencies was as follows: the adoption of shared value reconciles the company's profitability and society's well-being. From this sentence the work of the focus group begins. In the focus group, the constituents emerge the affinities from the suggested proposition (Due to the COVID-19 pandemic, the research that illustrates this article could not develop the focus group, and the interaction between observed and observer was done by videoconference). In this sense, IQA is consistent with the principles of social constructivism because it "privileges the socially constructed meaning" (NORTHCUTT; MCCOY, 2004, p. 4). The research process identifies affinities, i.e., the elements of a phenomenon and their relationships making up a system. And finally, the signification descriptions of each relationship. The visual representation is a mind map constructed collectively by the constituents and the researcher. This mind map is configured into the System Influence Diagram (SID) which is the final result of the research, prepared according to rigorous and replicable rules with the goal of achieving comprehensiveness and interpretability as stated by Northcutt and McCoy (2004, p.41).

Figure 2, IQA Steps, presents a typical flow chart of the IQA method with the steps of the survey and its operationalization flow. The boxes on the left-hand side depict working with the focus group constituents until the SID is formed. The boxes on the right depict the flow of the interview stages, also culminating in the Individual SID or Composite SID, which consolidates the results of more than one interviewee.

Figure 2 IQA Steps



Source: Based on NORTHCUTT, MCCOY (2004, p. 45).

Northcut and McCoy (2004) describe the development of the focus group work and the participation of the researcher as a facilitator of this process. The session begins with brain storming (discussion), where constituencies explore different perceptions of the proposition posed by the researcher. From this discussion, the next step is open coding, where participants silently record their perceptions on notecards (sticky notes). After recording, the sticky notes are posted on a clean wall and read aloud by the constituencies. The facilitator (the researcher) reads each post-it aloud once more to ensure that the participants understand what is written and to clarify any points if necessary.

Next, inductive coding is performed, at which point constituencies organize sticky notes into clusters with common meanings. This continues until consensus is reached, with sticky notes placed in clusters of affinity, producing a collective view. Again, this process should be conducted individually and quietly to prevent dominant individuals or the facilitator from monopolizing the process. In the final step, participants explore the relationship between the clusters through axial coding.

In IQA, there are three possible cause and effect relationships between a pair of affinities that are named and subsequently related. A may influence B, or B may influence A, or there may be no relationship between A and B. The constituencies evaluate these possible relationships among all affinities based on the protocols provided by the IQA method. The affinities defined in the research that illustrates this article are the following: leadership with purpose, materiality matrix, ecosystem, sustainable economic development, impact, profitability, social welfare, business results, and social results. The IQA method suggests more than two and less than 12 affinities by the relevance of the number of relations. In this research by the analysis done through coding in Atlas.ti, nine affinities were determined by the frequency and relevance of citations.

The affinities were arranged in numerical sequence in alphabetical order without any inference of degree of importance. All affinities are equally important according to the method. The sequence of activities suggests the completion of Table 1, ART (affinity relationship table) by the participants. This table establishes a list of possible relationships between a pair of affinities. Each constituent develops a table to establish the relationships among the affinities based on their perceptions and knowledge. The Table is constructed by inserting arrows directed from A to B (A→ B), which indicates that A is the cause or affinity of influence and B is the effect or affinity influenced, or with the arrow directed from B to A following the same cause and effect relationship reasoning. The third option is to leave the space blank, indicating that there is no relationship between A and B. And the participants describe the significance of the suggested relationships as exemplified in Table 1, Relationships between affinities.

Table 1 Affinity Relationship Table (ART)

Relationship between affinity pair	Theoretical Citation
1 2	The materiality matrix has the participation of the High Leadership (interviewees)
1 3	Actions that promote social well-being are approved by all leaders, including senior leadership through the Sustainability Committee.
1 4	Leadership defines, via Committees, business strategies that promote profitability. Currently, the business strategy is aligned with sustainability through sustainable products and services
1 < > 5	Because we are a financial institution, the ecosystem indirectly influences leadership. In need of greater engagement with the PRB, leadership will be more influenced by the ecosystem
1 6	Social results generate value to stakeholders, making leadership decisions by investments in social actions, as well as social products and services
1 7	With pressure from investors and the allocation of capital in assets of companies that have ESG criteria linked to the business, business outcomes increasingly influence leadership to adopt a more sustainable agenda.

Source: Prepared based on NORTHCUTT, MCCOY (2004, p.153).

From this, the Interrelationship of Affinities Diagrams (IRD) were developed. This is the first step in the process of rationalizing the system. In Table 2, the IRD shows whether the relationship between a pair of affinities can be a perceived cause or an effect. There is also the possibility of no relationship between the affinity pair. The arrows are positioned up (↑) OUTS or to the left (←) INS, and each relationship is documented twice as in an input-output ledger. If a relationship was determined between 1 and 2 and transcribed as 1←2, it will read as 2 influences 1. And two arrows will be placed in the Table to represent this relationship. After all relationships are recorded, the Delta value (Δ) is determined. This value is used to mark the relative position of an affinity in the system.

Affinities with positive Deltas are relative drivers or trigger drivers. Affinities with negative Deltas are relative effects or outcomes. There is Delta value positioning as first and second drivers, first and second outcomes and articulators (circulator/*pivot*), when there are an equal number of INS and OUTS indicating an affinity position in the middle of the system. This is the element on which the entire functioning of the system depends. There are cases where the IRD Table shows all INS and OUTS with values other than zero. In such cases, this indicates that the affinity is a strong relative effect but is still influenced by or influences other affinities. Thus, it is advised to name these affinities as first driver or first outcome.

Table 2 consolidates five affinities as drivers (affinity 1, 4, 5, and 7), four affinities as outcomes (affinities 2, 3, 6, and 9), and one affinity as a pivot, affinity 8. Accounting for the relationships brings the quantitative metrics into the qualitative analysis.

Table 2 IRD Table

	1	2	3	4	5	6	7	8	9	OUT	IN	Δ
1		←	↑	↑	←	↑	↑	↑	↑	6	2	4
2	↑		↑	←	←	←	←	←	←	2	6	-4
3	←	←		←	←	←	←	↑	←	1	7	-6
4	←	↑	↑		←	↑	↑	↑	↑	6	2	4
5	↑	↑	↑	↑		↑	↑	←	←	6	2	4
6	←	←	←	←	←		←	↑	↑	2	6	-4
7	←	↑	↑	←	←	↑		↑	↑	5	3	2
8	←	↑	←	↑	↑	←	←		↑	4	4	0
9	←	↑	↑	←	↑	←	←	←		3	5	-2

Source: Prepared based on NORTHCUTT, MCCOY (2004, p.173).

Adding to this accounting, Northcutt and McCoy (2004) use the Pareto principle to determine the power influence ratio of each affinity in the system. The Pareto principle is a statistical method that is based on the fundamental principle that a minority of the relationships in any system will account for a majority of the variation within the system. Northcutt and McCoy (2004) assume that 20% of the affinities that will be ranked according to their power of influence, are responsible for 80% of the results caused by these influences. From the IQA protocol, the Excel spreadsheet – Table 3: Pareto Protocol – was filled in.

Table 3 Pareto Protocol

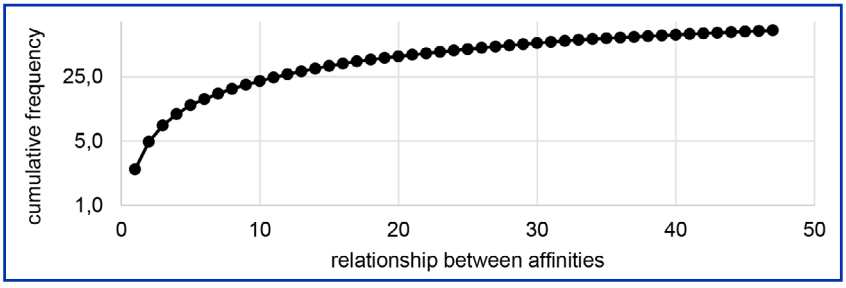
Affinity Pair Relationship	Frequency Sorted (Descending)	Cumulative Frequency	Cumulative Percent (Relation)	Cumulative Percent (Frequency)	Power
1 < 2	3	3	1,4	1,2	-0,2
1 < 3	1	4	2,8	1,6	-1,1
1 < 4	1	5	4,2	2,0	-2,1
1 < 5	4	9	5,6	3,7	-1,9
1 < 6	1	10	6,9	4,1	-2,8
1 < 7	2	12	8,3	4,9	-3,4
1 < 8	0	12	9,7	4,9	-4,8
1 < 9	1	13	11,1	5,3	-5,8
1 > 2	3	16	12,5	6,6	-5,9
1 > 3	6	22	13,9	9,0	-4,9
1 > 4	5	27	15,3	11,1	-4,2
1 > 5	4	31	16,7	12,7	-4,0
1 > 6	6	37	18,1	15,2	-2,9
1 > 7	5	42	19,4	17,2	-2,2
1 > 8	6	48	20,8	19,7	-1,2
1 > 9	6	54	22,2	22,1	-0,1
2 < 3	2	56	23,6	23,0	-0,7
2 < 4	3	59	25,0	24,2	-0,8
2 < 5	4	63	26,4	25,8	-0,6
2 < 6	3	66	27,8	27,0	-0,7
2 < 7	2	68	29,2	27,9	-1,3
2 < 8	3	71	30,6	29,1	-1,5
2 < 9	3	74	31,9	30,3	-1,6
2 > 3	5	79	33,3	32,4	-1,0
2 > 4	5	84	34,7	34,4	-0,3
2 > 5	3	87	36,1	35,7	-0,5
2 > 6	3	90	37,5	36,9	-0,6
2 > 7	5	95	38,9	38,9	0,0
2 > 8	3	98	40,3	40,2	-0,1
2 > 9	4	102	41,7	41,8	0,1
3 < 4	2	104	43,1	42,6	-0,4
3 < 5	5	109	44,4	44,7	0,2
3 < 6	5	114	45,8	46,7	0,9
3 < 7	3	117	47,2	48,0	0,7
3 < 8	3	120	48,6	49,2	0,6
3 < 9	4	124	50,0	50,8	0,8
3 > 4	4	128	51,4	52,5	1,1
3 > 5	2	130	52,8	53,3	0,5
3 > 6	4	134	54,2	54,9	0,8
3 > 7	5	139	55,6	57,0	1,4
3 > 8	4	143	56,9	58,6	1,7
3 > 9	4	147	58,3	60,2	1,9
4 < 5	4	151	59,7	61,9	2,2
4 < 6	3	154	61,1	63,1	2,0
4 < 7	3	157	62,5	64,3	1,8
4 < 8	2	159	63,9	65,2	1,3
4 < 9	4	163	65,3	66,8	1,5
4 > 5	1	164	66,7	67,2	0,5
4 > 6	3	167	68,1	68,4	0,4
4 > 7	6	173	69,4	70,9	1,5
4 > 8	4	177	70,8	72,5	1,7
4 > 9	4	181	72,2	74,2	2,0
5 < 6	2	183	73,6	75,0	1,4
5 < 7	1	184	75,0	75,4	0,4
5 < 8	2	186	76,4	76,2	-0,2
5 < 9	2	188	77,8	77,0	-0,7
5 > 6	4	192	79,2	78,7	-0,5
5 > 7	5	197	80,6	80,7	0,2
5 > 8	3	200	81,9	82,0	0,0
5 > 9	5	205	83,3	84,0	0,7
6 < 7	2	207	84,7	84,8	0,1
6 < 8	3	210	86,1	86,1	0,0
6 < 9	3	213	87,5	87,3	-0,2
6 > 7	5	218	88,9	89,3	0,5
6 > 8	5	223	90,3	91,4	1,1
6 > 9	3	226	91,7	92,6	1,0
7 < 8	1	227	93,1	93,0	0,0
7 < 9	3	230	94,4	94,3	-0,2
7 > 8	4	234	95,8	95,9	0,1
7 > 9	3	237	97,2	97,1	-0,1
8 < 9	3	240	98,6	98,4	-0,3
8 > 9	4	244	100,0	100,0	0,0
Total Frequency	**244**	Equal Total Frequency	Equals 100%	Equals 100%	Power = 1-ß

Source: Prepared based on NORTHCUTT, MCCOY (2004, p. 159).

Column A describes the possible relationships among the affinities, and column B describes the frequency in descending order of appearance of each relationship indicated by individual constituencies. Column C, in turn, provides the cumulative frequency. Columns D and E show the percentage that each relation represents on the total of perceived relationships. And Column F indicates the influence degree and power of each relationship. Following the Pareto Principle, when the values are filled, it is possible to ascertain that 20% of the relationships are representative of 80% of the results, which, according to the authors, gives the researcher the security to discard the remaining relationships and analyze more deeply only 20% of them.

From this spreadsheet and the 80% cut, the degree of consensus of the interviewees on the System Influence Diagram was verified, in order to understand what were the 20% of causal relations that affected the 80% of the results. A total of 244 frequencies were obtained from the 72 possible relationships made by the constituencies. The optimal number of relationships is at the point where the power of influence in the system reaches its maximum. The result of the process is the frequency of each relationship in the order of affinity. An evaluation of the Pareto Table in this research indicated that, comparatively, just over 48 possible relationships accounted for most of the variance, which is consistent with the Pareto principle. Graph 1 is an illustration of the variance accounted for of the cumulative frequency related to the quantity of affinity pair relationships in the research illustrating this paper.

Graph 1 Variance Maximization

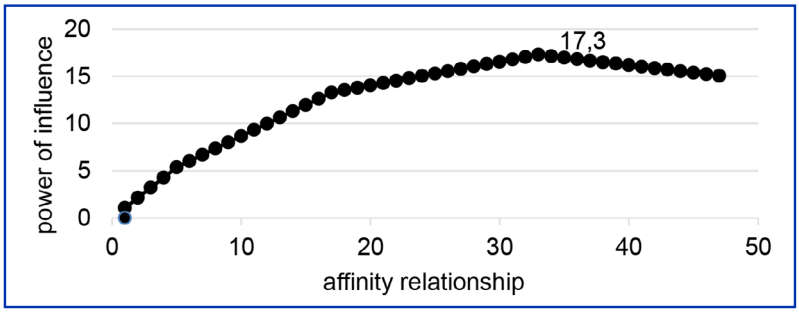


Source: Prepared by the authors (2021).

Graph 2 shows that the apex of influence power is achieved at the rate of 34 affinity relationships that represents 61.1% of the variation in this system. This is the

relationship of affinity 1 with affinity 5, where the Ecosystem (affinity 5) is the cause that drives Leadership with Purpose (affinity 1).

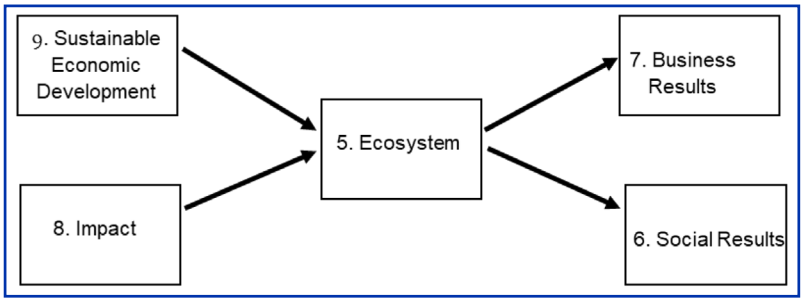
Graph 2 Power of Influence



Source: Prepared by the authors (2021).

When deciding which relationships to include or exclude from the Composite Diagram (IRD), the last two columns of the Pareto Table are key to determining the cutoff point as the relationships are displayed in order of decreasing frequency. Relationships 49 through 72 were excluded. Two composite IRDs were made. The first only considers cause or effect relationships and the highest frequency and power of influence. Only four possible relationships, and with the positions in the system, were obtained, as described in Figure 3. The Ecosystem is the only consensus affinity that has only one direction in its relationship with other affinities. The Ecosystem is the cause that influences Business Results and Social Results and is influenced by the Sustainable Economic Development and Impact affinities.

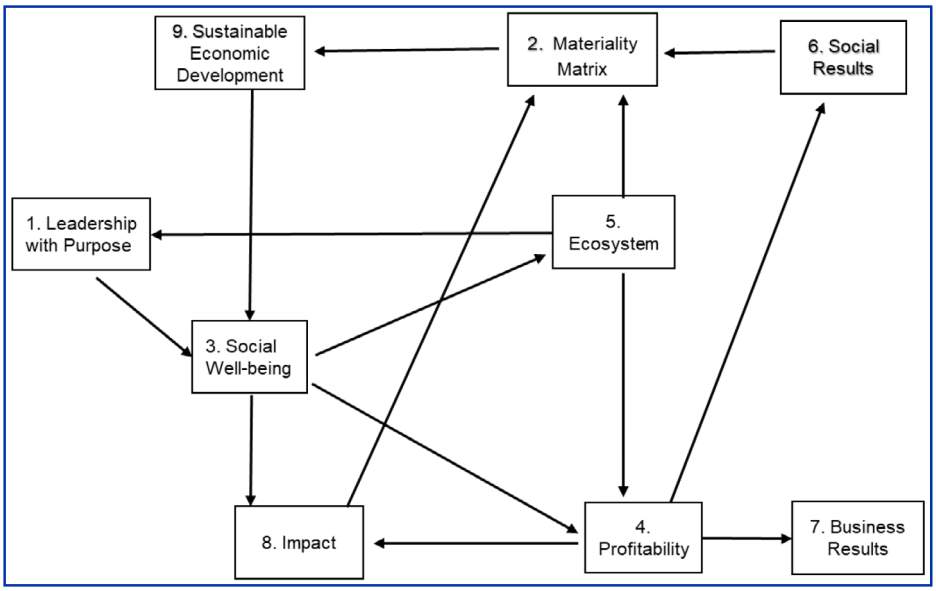
Figure 3 Consensus affinity topology



Source: Prepared by the authors (2021).

For this selection of relationships, we have reached the Composite System Influence Diagram (Composite SID), in which Sustainable Economic Development and Impact are the driving causes of the system, and Social and Business Results are the outcomes. Ecosystem is the articulating affinity of the system (Figure 3). The selection of relationships, considering the conflicting ones, that is, those that indicate cause and effect at the same time and with greater frequency, configured another diagram. In the composite SID, Leadership with Purpose is the driving cause of the whole system, influenced only by the Ecosystem. And the Business Result is the only first outcome, one that does not influence any other affinity, as shown in Figure 4.

Figure 4 Composite SID



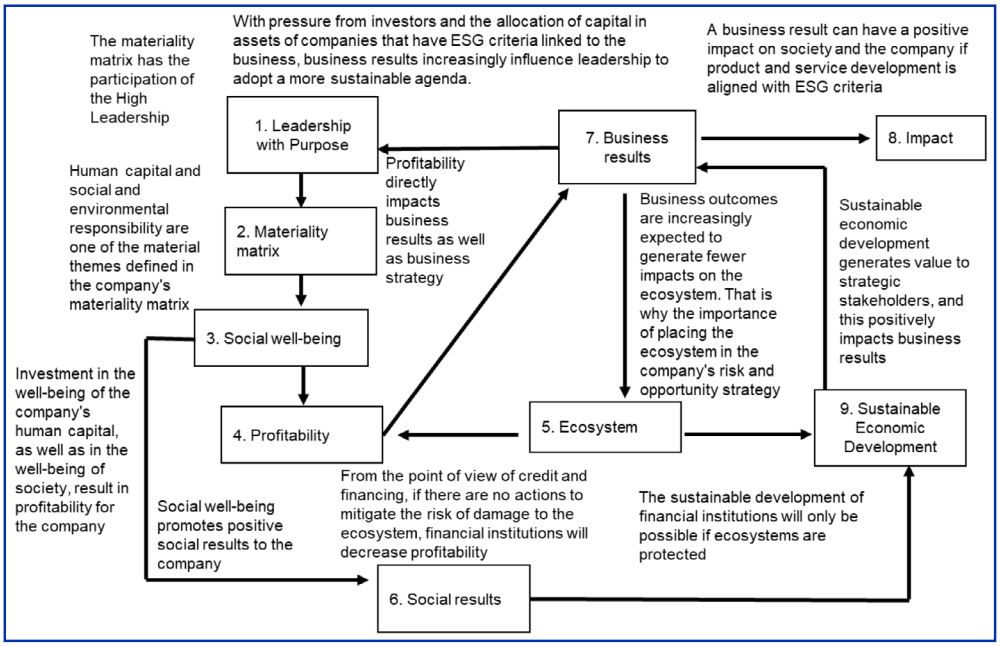
Source: Prepared by the authors (2021).

The System Diagram shows the path in the process of adoption of Creating Shared Value. A possible result analysis is that the driving affinity of the whole system is the Leadership with Purpose that, from the strategic objective of generating Social Well-Being and Impact, influences the definition of the Materiality Matrix that, in turn, influences the entire Sustainable Economic Development of the organization. Another possible analysis is that Sustainable Economic Development once again

influences the generation of social welfare that impacts the Ecosystem, returning feedbacks (loops) and feeding back the Leadership with Purpose and the constant analysis of the Materiality Matrix. This constant feeding comes from the social welfare and Impact feedbacks that come from the Ecosystem. The Ecosystem is positioned in the middle, making the whole system work. This affinity directly influences the Leadership with Purpose, the Materiality Matrix, and Profitability, and indirectly influences all the other affinities. It is therefore in this way that the researcher develops the analysis of the relationships among the elements and validates his reading with the participants (constituencies).

The constituencies elaborate a cluttered SID, which is revised and validated in the joint construction with the researcher, eliminating duplicate relationships and obtaining a clear SID. Finally, the theoretical meanings or citations provided by the constituencies in the Affinity Relationships Table (ART) are added to the clear SID. Figure 5 shows the finalized SID of one of the companies in the research sample that exemplified this article.

Figurr 5 Finished SID



Source: Prepared by the authors (2021).

The results obtained in this process provide input for the individual interview protocol. In this step, the collective experience will be investigated from the individual perspective.

According to the IQA method, semi-structured interviews begin with a conversation between the researcher and the interviewee, based on the SID (System Influence Diagram). In this way, the researcher does not induce the answers and aims to capture the individual perception of the results obtained in the collectivity.

Northcut and McCoy define that "the role of the researcher shifts from designer to facilitator, teaching group members the process and guiding them to generate and analyze their own data with minimal outside influence." (NORTHCUTT; MCCOY, 2004, p. 44). Consequently, the researcher's biases are minimized in the process.

The IQA method emphasizes that a social system and its elements involve the human interpretation of meanings, i.e., that which makes things happen and why. Thus, seven theoretical codifications were developed by making a "patchwork quilt" out of the interview transcripts.

Discussion of the IQA Method

The IQA method presents a consistent data analysis technique by combining two qualitative data collection techniques - interview and focus group - in order to bring out the best of each of these tools. By combining this technique and joint data analysis between researcher and participants, IQA seeks to minimize the interference of researcher biases in the research results. However, the method does not propose a protocol for minimizing participants' biases.

One of the strengths of the method is centered on the set of protocols that the researcher uses to generate the different spreadsheets that transform the qualitative perception of the participants into numerical codes. Thus, it reduces possible interferences in the analysis of the data by the researcher and focuses on the perception of those who in fact know and act on the phenomenon studied.

In this research, it was possible to identify elements often considered contradictory in the perceptions of the participants through the correlation between the variables Profitability and Social Welfare. As it is a qualitative analysis and with a

binary logic in the relationship between a pair of affinities, the positive correlation between these two variables was identified in the interviewees' statements.

The IQA method proposes three possible relationships between a pair of affinities: cause, effect, or none. It should be noted that in this study about 50% of the constituencies identified a fourth cause and effect relationship between an affinity pair. The relationship where an affinity pair is both cause and effect, indicated in the ART protocol by a two-way arrow (< >). This new relationship allows for the coexistence of two truth values.

There is empirical evidence of a change in the perception of business managers who seek to reconcile previously exclusive and contradictory objectives, such as, for example, the view that it is impossible to reconcile profitability and social welfare. In this sense, the change from the classical logic of binary linear thinking of "either this or that" to the logic of Morin's complex thinking is evidenced by admitting the connective "and". As stated by Morin (2011), complex thinking is a theory that accepts and seeks to understand the many faces and the constant changes in reality, and does not intend to deny multiplicity, randomness, and uncertainty, in which contradiction can coexist. In this sense, this paradigm shift in thinking contributes to the understanding of complex corporate issues in the area of sustainability.

The method reinforces the idea that we do not know reality as it is, but rather a representative image of the moment. The IQA protocols materialize perception in diagrams or mental maps elaborated collectively by those involved in the phenomenon under study. In other terms, each constituent formalizes his or her mental map according to how they prepared themselves to take on the elaboration of the system through its elements and their relationships.

The social phenomenon can thus show contradictory aspects that would be incomprehensible from the classical logic perspective. The linear mental model may be necessary to deal with the problems of exact sciences; however, it is not sufficient to solve human problems in which emotions and feelings participate (the social dimension). This shift in paradigm from "*classical logic*" to "*complex thinking*" is expressed in the significance of each affinity developed and validated by the constituencies. The methodology does not consider the possibility of the symmetrical cause and effect relationship between a pair of affinities. Thus, the use of the different connectives that exist between compound logical propositions could be consid-

ered. The constituents of the research reported here understood, for example, that it is possible to relate A and B beyond the connective "or", which considers that only one proposition is true. The connective "and" considers it possible to have two propositions true at the same time.

Final Considerations

This paper proposed to present a methodological option for complex sustainability research. In this sense, the IQA method by Northcut and McCoy (2004) brings important contributions to the qualitative approach as it incorporates aspects of the quantitative approach.

Protocols based on tables and spreadsheets that use numbers bring rigor to the research and minimize researcher bias. The meanings of these numbers appear in the final phase of comparing the diagrams. Validation of the collective diagrams by individual interviews helps to minimize participant and researcher biases. Furthermore, the protocols allow other researchers to apply them to investigate the same phenomenon in other contexts. Or even involving other constituencies in the same context. The comparative analysis according to the protocols and procedures of the method can contribute to the understanding of a phenomenon whose literature is still under construction.

The IQA method presupposes that the participants are actively engaged in data collection and analysis. In this sense, it can be considered an innovative method for discussing sustainability issues. However, the possibility of changing the diagrams through participant validation may bias the results. The method fails to offer a protocol for this point.

Therefore, it is recommended that further research using a qualitative approach and seeking answers to complex questions from different areas adopt the IQA method.

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