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Research Methodology in Management Sciences

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Abstract: In management sciences the choice of a research methodology is generally complex and requires a meticulous analyse to find the adequate epistemology posture because the management sciences it is considered as a key step in the enhancement of scientific research work, generally, and particularly, in the study of management practices.

The purpose of this article is to shed light on the diverse paradigms and on the distinctions between quantitative and qualitative methodologies, that govern the management sciences research landscape. Moreover, this article aims to analyse the theoretical foundations: the issues, meaning, contours and theoretical foundations of the epistemology posture in management science, but also to clarify the necessary elements that the researcher need to opt for the epistemological choice and its appropriate paradigms and the method of reasoning to defend his thesis.

To answer these questions, this work will be divided into two parts. Firstly, it involves analysing the theoretical foundations via a literature review of the construction of reasoning and the paradigms of the epistemological posture. Secondly, we will move on to the epistemological aspect appropriate specifically in management sciences.

Keywords : Méthodologie, épistémologie, paradigmes, Quantitative, Qualitative.

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1. Introduction

For researchers, selecting an epistemological framework for thematics in management sciences remains a challenging task, because Management science is a discipline that is characterized by the interactions between several elements, namely the context, human dimensions and organizational aspects.
The issues addressed are becoming increasingly complex, necessitating reflection on the epistemological stance in alignment with the adopted methodological process.
First it is crucial to differentiate between methodology and epistemology, since epistemology refers to the study of the theoretical foundations of research, while methodology is an aspect of epistemology that seeks to establish the process of research development and construction (Piaget, 1967).
Therefore, researchers in management sciences must adapt their epistemological stance by considering the established processes to address their research objectives, which implicitly represent the general research problem. For that, this paper gives a glance on the multiplicity of epistemological choices in management science, we focus the analysis on the main epistemological paradigms such as: positivism, interpretivism, and constructivism.
This paper digs into the understanding of knowledge within a framework that seeks to answer questions such as, "**What is knowledge? How is it developed? What is its value** ?"

2. Choosing Research Postures in Management Sciences

In the field of management sciences, research can be positioned within three distinct epistemological paradigms: positivism, interpretivism, and constructivism. These paradigms have evolved over time, providing researchers with methodological guidance and serve them as guiding principles when making methodological decisions.
The positivist paradigm assumes that reality exists independently, while interpretivism considers reality as the result of lived experiences. Constructivism posits a dependence between the subject and the research object. The epistemological positioning of research is a choice that must be based and justified.

2.1 Positivism

Auguste Comte is considered the founding father of positivism, and he believed that the word "real" referred to the "positive." This concept was further developed by his disciples, leading to the theoretical foundations of positivism. For a positivist, reality exists independently, and the researcher's role is to find the mechanisms and methodological processes to understand it by discovering the laws governing the observed phenomena. Positivism is based on scientific realism inspired by exact sciences. According to Avenier & Gavard-Perret (2012), positivism is founded on three hypotheses: an ontological realism hypothesis, a natural determination hypothesis, and an objective dualistic epistemology hypothesis.
Ontological Realism Hypothesis: This hypothesis states that reality is independent of a researcher's orientations and interests, and it is inherently knowable. A positivist's role is limited to understanding and studying phenomena objectively.
Natural Determination Hypothesis: The hypothesis of natural determination assumes that observing facts allows us to understand the studied phenomena through causal relationships to construct universally applicable rules.
Objective Dualistic Epistemology Hypothesis: In the third hypothesis, the observer (the researcher) and the object under study are two separate entities, allowing the researcher to remain distant from the research object. In other words, the researcher maintains a position of objectivity and neutrality.

In addition to the three hypotheses mentioned above, three criteria for scientific validity differentiate a positivist researcher from a researcher adopting a different epistemological stance: verifiability, confirmability, and refutability.
Verifiability: As proposed by Blaug (1982), verifiability implies that a synthetic proposition must be empirically verifiable.
Confirmability: The second criterion is confirmability, which incorporates probabilities into the process of generalizing statements, indicating the likelihood of statements being accepted and validated.
Refutability: The final criterion is refutability, which suggests that a theory remains true until another theory refutes it. In the realms of science, absolute truth does not exist, as there is no evidence that a theory is certain, while there is certainly evidence that a theory may be false.
While the positivist approach is well-suited to the construction of knowledge in natural sciences, it offers less flexibility concerning objectivity and neutrality. In social sciences, various epistemological paradigms have emerged to address the diverse issues and disciplines within research.

2.2 Interpretivism

According to Perret and Girod-Séville (2002), the world is a result of interpretations stemming from interactions among individuals. This perspective departs from positivism in terms of ontological and foundational principles.
The first ontological hypothesis is replaced by a phenomenological hypothesis, which posits that reality is constructed through social interactions. The second criterion that distinguishes these two paradigms is epistemological in nature, as interpretivism asserts that knowledge is constructed through an understanding of social interaction, for positivists, this implies verification and validation of results that can subsequently be generalized (Walsham, 1995). A third-dimension distinguishing positivism from interpretivism is methodological. A positivist researcher follows hypothetico-deductive approaches using objective measurements, such as questionnaires. In contrast, an interpretivist contends that only social interactions can reveal the nature of the observed phenomena, making case studies and resulting interpretative findings more appropriate.
The core of the interpretative logic centers around lived experiences, as it suggests that knowledge production depends on the environment and actions of individuals based on their goals and intentions (Cherkaoui et Haouta, 2017). Another idea posits that research founded on the interpretative view is a diagnostic process based on empirical reality, involving a scientific approach using tests before generalizing results and framing statements as rules (Savall et Zardet, 2004).

2.3 Constructivism

Considered an extension of interpretivism, constructivism posits that knowledge and science are based on models that are valid only within their areas of experience (Von Glasersfeld, 1994). The two paradigms share a similar view but also differentiate on certain principles (Velmuradova, 2003). Divergences and convergences can be derived from five fundamental principles of constructivism:

- The Representability Principle: This suggests that reality is unknowable in its essence because it is impossible to reach directly, except through experiences.
- The Constructed Universe Principle: This principle, or teleology hypothesis, stipulates that reality is intentional; it is constructed in relation to a reference represented in our values, intentions, and goals.

- The Projectivity or Subject-Object Interaction Principle: This principle, or subjectivism hypothesis, refers to the interdependence of the subject and the object, with their interaction considered constitutive of knowledge.
- The General Argumentation Principle: This calls for multiple modes of reason to produce reasoned solutions outside of purely formal disjunctive logic.
- The Intelligent Action Principle: This principle asserts that a constructivist does not seek to discover an optimal mode of observable subject but rather a mode in line with their goals.

In summary, the three classical epistemological paradigms in management sciences exhibit characteristics that distinguish the attitudes of researchers from one another. Interpretivism and constructivism share some commonalities but also present two completely different visions from positivism. The following table summarize the questions and the nature of paradigms to use according to the thematic studied.

Table 1: Comparison of the main epistemological paradigms

Epistemological questions	Paradigms		
	Positivism	Interpretativism	Constructivism
Status of knowledge	**Ontological hypothesis:** The knowledge object has its own essence	**Phenomenological hypothesis:** The essence of the object is multiple (interpretativism), cannot be attained (moderate constructivism) or does not exist (radical constructivism)	
	Independence of subject and object	Dependence of subject and object	
Nature of 'reality'	**Determinist hypothesis:** The world is made up of necessities	**Intentionalist hypothesis** The world is made up of possibilities	
How is knowledge generated?	**Discovery**	**Interpretation**	**Construction**
	The research question is formulated in terms of 'for what reasons …'	The research question is formulated in terms of 'what motivates actors to …'	The research question is formulated in terms of 'to what ends does …'
	Privileged status of explanation	Privileged status of understanding	Privileged status of construction
What is the value of knowledge? (Validity criteria)	Degree of confirmation Refutability Logical consistency	Credibility Transferability Dependability Confirmability	Adequacy 'Teachability'

Source : Girod-Séville et Perret, 1999

That the main epistemological positions of a researcher have been presented, it is essential to note that these paradigms shape research in management sciences. Historically, positivism, the oldest paradigm,

has limitations that constrain positivist researchers according to their research posture. To illustrate the degree of objectivity and neutrality toward the research object, it becomes apparent that the further one departs from pure positivism, the more accepting of reduced objectivity one becomes.
To overcome the limitations of positivism, some paradigms have emerged, such as post-positivism and adapted positivism. These paradigms offer greater flexibility while maintaining a level of objectivity and neutrality.

2.4 Post-Positivism

Post-positivism recognizes the limitations of strict positivism and attempts to address them. Researchers in this paradigm still value empirical observation and scientific methodology but acknowledge that complete objectivity is unattainable. They use a critical realist perspective, meaning they believe there is an objective reality, but it can only be understood through imperfect human observations. Moreover, they employ methods such as triangulation and peer debriefing to enhance the validity of their findings.

2.5 Adapted Positivism

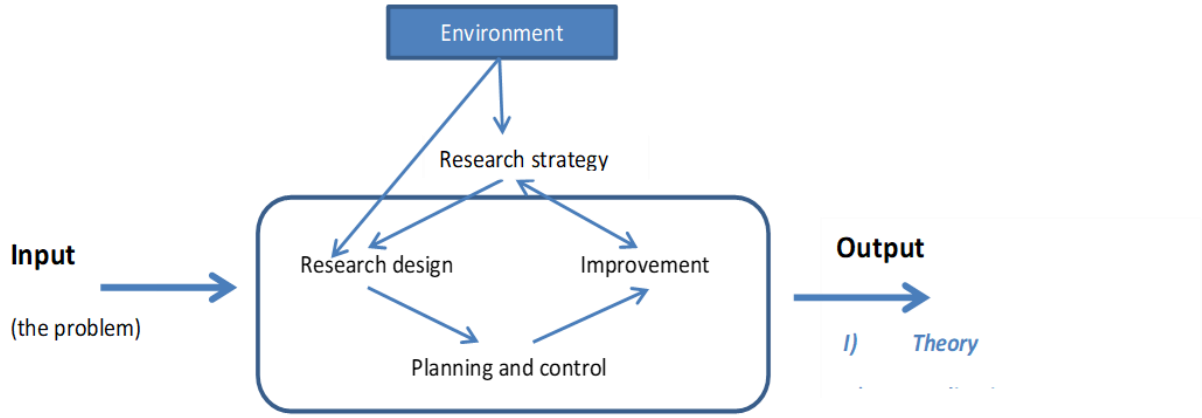
Adapted positivism represents a flexible approach that combines elements of positivism with other paradigms, such as interpretivism and constructivism. Researchers who adopt this stance recognize that there is value in using both quantitative and qualitative methods in their research. They understand that different research questions may require different approaches and that a one-size-fits-all methodology is not appropriate.

3. Methods and Techniques in Management Sciences Research

Research in the field of management sciences is rooted in the broader context of social sciences. It is defined as an organized, systematic, and critical inquiry initiated by scientific questioning, with the objective of finding solutions to problems, leading to the development of new theories or the construction of knowledge through the analysis of the research subject (Ben Aissa, 2001).
The choice of epistemological stance in management sciences has significant implications for the research process and outcomes. Researchers in this field must carefully consider which paradigm aligns best with their research objectives. The selection of a paradigm will influence various aspects of the research, including the research design, data collection methods, and data analysis techniques.

Research follows a logical sequence similar to the stages involved in product development, often adhering to the Inputs-Transformation-Outputs model (Coughlan & Brady, 1995). The research process starts with observing facts that lead to the formulation of research hypotheses. These hypotheses are then tested against empirical reality in a verification process, which can result in the creation of laws and/or theories (Del Bayle, 2000). In the field of management sciences, each stage corresponds to different levels of inquiry, beginning with the formulation of the central problem or research questions (Evrard et al., 2009).

Figure 1: Coughlan and Brady research model



Source : Girod-Séville et Perret, 1999

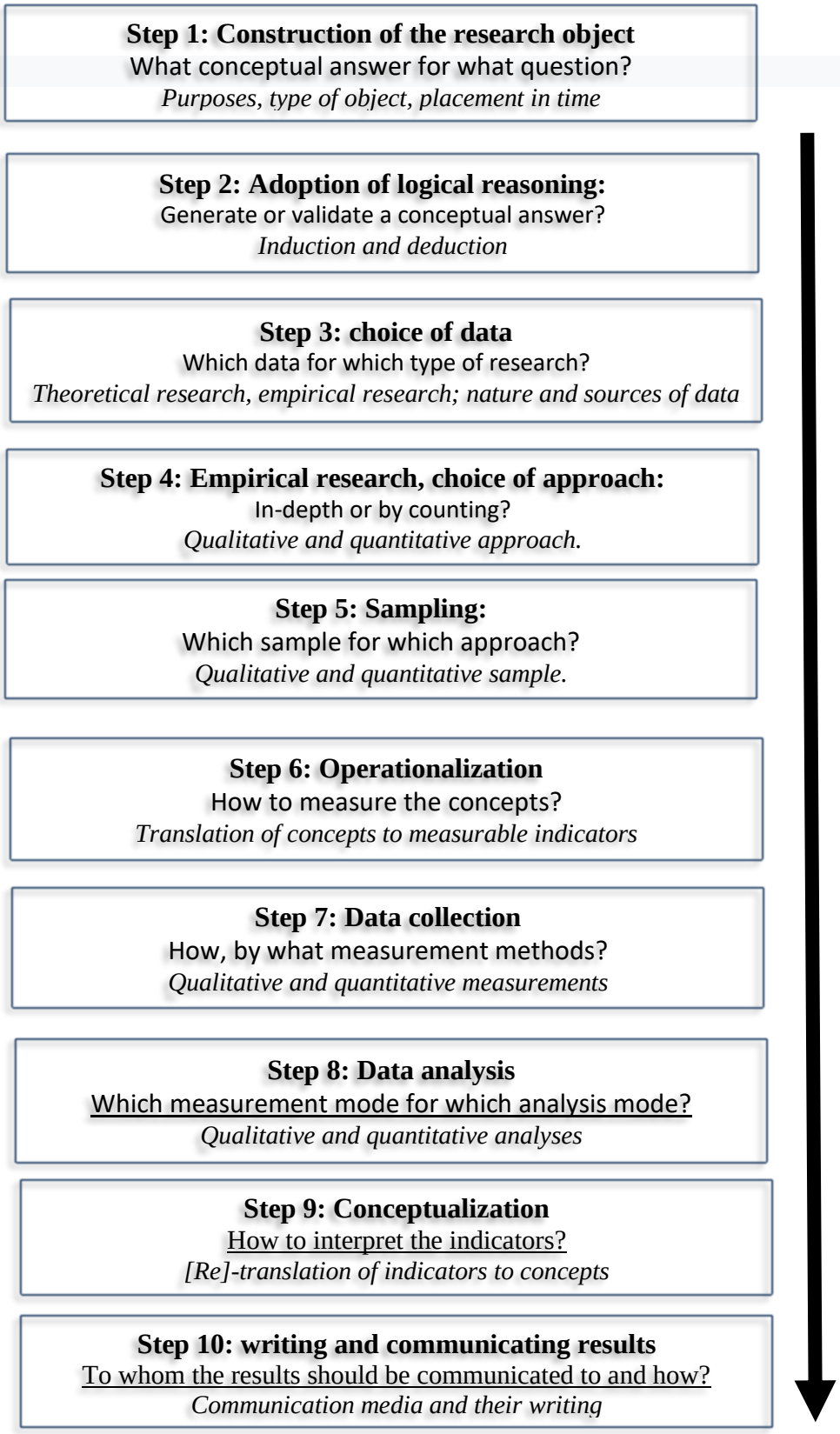
3.1 Inductive, Deductive, and Adductive Approaches

In management sciences research, it's essential to decide whether to adopt an inductive, deductive, or adductive approach. The inductive approach aims to construct new knowledge through empirical analysis of a given situation, starting with observation and then engaging with existing theories (Avenier & Gavard-Perret, 2012). In contrast, the deductive approach aligns with a positivist philosophy, seeking to apply theory to organizational reality objectively in order to confirm or refute initial hypotheses (Karami et al., 2006). The adductive approach involves moving back and forth between empirical work and theoretical concepts, progressively constructing knowledge while questioning the contexts to be tested, while remaining connected to existing knowledge (Avenier & Gavard-Perret, 2012).

3.2 General Research Framework

In the realm of management sciences, a typical research process involves ten key steps, as outlined by Thiétart et al. (2003), starting with identifying the research topic and concluding with results' discussion. It's important to note that research design is a fundamental step in the research process. Research design encompasses all the stages of research, and it doesn't constitute a standalone step. The choice of terminology for describing this phase often depends on the researcher's epistemological stance. For instance, the term "plan" is more suitable for post-positivist researchers and hypothesis-driven, quantitative research. In this type of research, the design phase is usually faster than in adductive research, where there are more iteractions before the research problem is stabilized (Giordano & Jolibert, 2012).

Figure 2: Steps and choices in research



Source : Velmuradova, 2004, p. 30

3.3 Choosing Research Approaches in Management Sciences

The choice of research posture in management sciences is a critical decision. Researchers must consider the research process, methodology, and paradigms to align with their research goals and epistemological stance. Understanding the distinctions between quantitative and qualitative research and the context in which the research is conducted is essential for making an informed choice.

3.3.1 Quantitative vs. Qualitative Approaches

When choosing research approaches in management sciences, one often faces the decision between quantitative and qualitative methods. Quantitative research typically involves the collection and analysis of numerical data, with an emphasis on objectivity and generalizability. In contrast, qualitative research focuses on exploring non-numeric data, often with a focus on depth and context. It's important to note that the quantitative-qualitative distinction isn't solely about data types or methods but also about the depth of study and the objectivity or subjectivity of results (Velmuradova, 2004).

Table 2: Logical reasoning and qualitative/quantitative approach

Logic / Approach	Inductive	deductive
Qualitative	***Qualitative induction*** *(Generate the concept by in-depth study)*	***Quantitative induction*** *(Validate the concept through an in-depth study)*
Quantitative	***Quantitative induction*** *(Generating the concept, study by counting)*	***Quantitative deduction*** *(Validate the concept and the study by counting)*

Source : Velmuradova, 2004, p. 54

3.3.2 Contextual Distinction

One way to distinguish qualitative from quantitative research is by considering the number of cases studied and the depth of analysis. A qualitative study may involve a small number of cases studied in-depth, while a quantitative study often deals with a larger number of cases but may not delve as deeply into each case. This contextual distinction helps categorize research as qualitative or quantitative (Thiétart et al., 2003).

3.3.3 Paradigms in Qualitative Research

Qualitative research in management sciences is characterized by multiple paradigms that range from the objective to the subjective. These paradigms include axiomatic, logical positivist/empirical, interpretative, and critical theory perspectives (Merdith et al., 1993). The choice of paradigm is often influenced by the researcher's epistemological stance and the research objectives. While the use of the term "quantitative" may be more straightforward, "qualitative" research encompasses a wider range of perspectives and methods.

4 Conclusion

This paper provides a comprehensive exploration of research methodology in the field of management sciences, focusing on the complex decision-making process researchers face when choosing their research methodologies. It emphasizes the unique characteristics of social science research and the specific nature of research in management sciences by delving into the distinctions between quantitative and qualitative methodologies, shedding light on the diverse paradigms that govern research in management sciences.

Selecting an epistemological framework is a critical decision for researchers in management sciences. It shapes the entire research process and determines the approach to data collection, analysis, and interpretation. Positivism, interpretivism, and constructivism represent the classical paradigms, each with its own set of assumptions and limitations. Researchers may also consider post-positivism and adapted positivism as flexible alternatives.

Also, by recognizing the nuances between quantitative and qualitative research, as well as the various paradigms within management sciences, researchers can effectively design and conduct studies that contribute to the field's body of knowledge.

Ultimately, the choice of paradigm should align with the research objectives and the nature of the research questions. Management scientists should be aware of the strengths and weaknesses of each paradigm and select the one that best suits their specific study. Moreover, as the field of management sciences evolves and becomes more interdisciplinary, there is room for creativity in combining elements from different paradigms to address complex research questions effectively.

Hence, the implications of these epistemological choices for management science research are a central theme, emphasizing the need for researchers to align their methodology with their research objectives, the text delves into the various methods and techniques available, including inductive, deductive, and adductive approaches, with a focus on their suitability for different research scenarios. Additionally, it distinguishes between qualitative and quantitative research approaches, considering factors like subjectivity, objectivity, the number of cases studied, and the depth of analysis. The influence of various paradigms on research approaches in management sciences, such as axiomatic, positivist/empirical logic, interpretive, and critical theory paradigms, is also acknowledged.

Overall, this production provides a valuable resource for researchers and scholars in the field, offering insights into the intricacies of research methodology and its impact on knowledge construction in management sciences.

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