

# Let's be Pragmatic: Research in Information Systems with Relevance and Rigor

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## Abstract.

Pragmatism can be defined as a doctrine that considers things from a practical point of view. Pragmatism preaches that action and practical relevance should be the key points of scientific research. The pragmatic paradigm has been presented as a paradigmatic alternative of positivism and interpretivism, enabling the solution of inherent problems of dominant paradigms, the positivism and interpretivism. The present article presents, from a bibliographical survey, the pragmatic paradigm, making a comparison with other paradigms, as well as the use of quantitative, qualitative and mixed methods, from a perspective of practical relevance with methodological rigor.

**Keywords.** Pragmatic paradigm; Research in Information Systems; Mixed methods; Rigor and relevance

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## 1. INTRODUCTION

Hevner and Chatterjee (2010) begin the discussion in the book "Design research in information systems: theory and practice", calling attention to the need for rigor and practical relevance of Information Systems (IS) research. Following this line of practical relevance, it is important that a research paradigm can be aligned with these two requirements of rigor and relevance, and here the pragmatic paradigm, as proposed by William James (1842-1910), John Dewey (1859), Charles Sanders Peirce (1839-1914) and Herbert Mead (1863-1931) (Parvaiz, Mufti, & Wahab, 2016), appears as option to the most widely used paradigms in conducting IS research.

The search for the practical relevance of SI research is not a new subject. In 1999, Benbasat and Zmud (1999) questioned the practical results of research in the area, opening their article with a comment by Scott Cowen, then dean of the Weatherhead School of Management of Case Western Reserve University, that 80% of management research is irrelevant (Benbasat & Zmud, 1999). In this tone of practical relevance of the research, the pragmatism, as a research philosophy, focuses on asking the right questions and the empirical response to these questions (Baskerville & Myers, 2004).

Research approach that will answer the questions raised in any study should follow a philosophical positioning that will affect the way the researcher sees the world and thus the choices it will make (Parvaiz *et al.*, 2016). Mackenzie and Knipe (2006) affirm that several paradigmatic positions can be adopted for the conduction of IS research, as positivist, constructivist, interpretivist, transformative, emancipatory, critical, deconstructivist and pragmatic. However, the paradigmatic discussion is concentrated in two poles, the positivist and the interpretivist (Darke, Shanks, & Broadbent, 1998; Goldkuhl, 2012; Morgan, 2007).

Lee (1999), in dealing with positivism in social sciences, states that this is a belief that research in the social sciences should emulate as research is done in the natural sciences. Research in the natural sciences seeks truth in formal propositions, using the hypothetical-deductive method. Lee (1999) himself goes on to suggest that research into IS should emulate research in applied sciences such as medicine or law. Research in applied sciences should seek effectiveness in acting.

At the other pole, the interpretivist, the search is for the participant's understanding of the situation being studied. Thus, the researcher tends to use qualitative methods of collecting data, and quantitative methods only support the qualitative data (Mackenzie & Knipe, 2006). Orlikowski and Baroudi (1991) point out that the interpretive philosophy of research can be criticized because this perspective does not examine the conditions that led to certain meanings in some reported experiences, or does not explain the unintended consequences of an action, since these are significant forces in the construction of social reality. A pragmatic approach, which proposes the proximity of the phenomenon and the triangulation of sources and methods, allows ways of escaping from this dependence on the concepts of the research participants (Goldkuhl, 2004).

The discussion between positivism and interpretivism has been fought for some time. Some studies attempt to integrate these two world views (Lee, 1991; Weber, 2004), but others insist that these differences are large and irreconcilable (Orlikowski & Baroudi, 1991). The irreconcilable differences between the two views of the world, positivist and interpretivist, are even more evident when consider mixed research methods. In these cases, objectivity and subjectivity must contribute to the answer of the research question, and antagonistic visions of

the world can bring problems for the researcher. Thus, the pragmatic perspective appears as a viable alternative, being this one the most indicated in the conduction of researches of mixed character (Mackenzie & Knipe, 2006; Morgan, 2007; Parvaiz *et al.*, 2016; Feilzer, 2010).

By using the pragmatic perspective, the researcher allows to use a series of methods such as action research (Baskerville & Myers, 2004), or other qualitative research methods (Goldkuhl, 2012; Rathbun, 2008), use only quantitative methods or a combination of the two (Mackenzie & Knipe, 2006). The focus is on solving the problem raised, which leads to a "problem-oriented" approach, close to what is proposed by Davis (2010).

Thus, considering the context of IS research area and the need to carry out research with rigor and practical relevance, **the present study seeks to present the pragmatic paradigm as a paradigmatic alternative to positivism and interpretivism in the performance of research in IS with methodological rigor and focus on the practical relevance of the study.**

This work contributes to the literature on research paradigms and research methods in IS based on the discussion about the use of the pragmatic paradigm to carry out researches in IS, the call for research that has practical relevance and in the use of methods the field of research in IS.

The present work is structured in five sessions. Initially the pragmatic paradigm will be presented. The second part presents the relation of pragmatism and the dichotomy between positivist and interpretivist perspectives. On the third part, will be treated the methods of quantitative, qualitative and mixed research, and how the pragmatic paradigm makes possible its conciliation. The fourth section will bring the discussion of rigor and relevance. And finally, in the fifth part, the final considerations of the study will be presented.

## 2. THE PRAGMATISM

Pragmatism, in the literature, is treated as a research paradigm (Goldkuhl, 2012), as a methodological approach (Parvaiz *et al.*, 2016), or as a philosophical positioning (Goldkuhl, 2004). Its origin was the so-called American pragmatism, present in the works of Peirce (1931), James (1907), Dewey (1931) and Mead (1938). Despite its American cradle, pragmatism finds resonance in European thinkers such as Arens (1994) and Thayer (1981), and in Asian philosophy as described by Shusterman (2004).

Per Dewey (1931), an empiricism that is content to repeat facts already known has no place for possibility even for liberation. Thus, pragmatism is interested not only in what "is," but in what "should be." This way of perceiving the world causes the pragmatist to seek the realization of changes in desired directions, and the action of change, which is a central concern of pragmatism, must be guided by purpose and knowledge. In this way, the world would be transformed through reason and action, which are inextricably linked with human knowledge and human action (Goldkuhl, 2004).

The word 'Pragma', of Greek origin 'πράγμα', means action, and the term 'pragmatic' has the connotation of searching for possible and executable solutions to complex human problems. Thus, Kinouchi (2007) defines pragmatism as a doctrine that considers things from a practical point of view. Mackenzie and Knipe (2006) argue that pragmatism is not committed to any philosophical system, and that pragmatic researchers focus on the "what" and "how" of the research problem.

From on the concepts of Peirce, James, Dewey and Mead, there are assumptions underlying the pragmatic philosophy (Baskerville & Myers, 2004). The first is based on Peirce's principle that all human concepts are defined from their consequences. An intellectual conception, or an idea, must consider its practical consequences, the sum of these consequences being the meaning of conception or idea (Peirce, 1905).

Following the fundamental premises of pragmatic philosophy, James' principle, second premise, deals with truth, stating that truth is embodied in the practical outcome of action. For James (1907) most of our thoughts are used to change the world, so it is necessary to know what we must change. Therefore, the mind engenders truth in reality, for we know what we have to change, and the theoretical truth, which for James (1907) is this knowledge of reality, must come before practical application.

The third premise, based on the logic of Dewey's controlled research (1931), in which rational thought is interspersed with action. For Dewey (1931) pragmatism is the theory of inquiry, in which ideas take logical forms in a process called controlled research, which is both scientifically rigorous and everyday common sense. Research is then the direct or controlled transformation from one indeterminate situation into another which is determined in its distinctions and relations, so that the elements of the original situation are converted into a new unified whole.

Baskerville and Myers (2004), in dealing with Dewey's logic, present five characteristic elements that are common to all forms of human inquiry: (1) an indeterminate situation; (2) the formulation of a problem; (3) the determination of a solution; (4) the reasoning or the deep thought of the applications of the solutions found; and (5) the operationalization of solutions in facts or actions.

Finally, in the fourth premise, Mead (1938) proposes that human action is socially contextualized and that human conceptualization is also a social reflection of these actions. Because of the pragmatic perspective, Mead (1938) realizes that human interaction shapes human action, and as action leads to practical consequences, then social configuration shapes concepts such as truth, rationality, and even the concept of

practical action itself.

Continuing in this line of action and practical application, Dewey (1931) clarifies that pragmatism does not concern itself with antecedent phenomena, but with consequent phenomena and about the possibilities of action. By using the pragmatic point of view, it is possible to realize that general ideas have a different role to play than to just report and record past experiences, they are the basis for organizing future observations, experiences, and applications.

Feilzer (2010) adds that pragmatism leaves aside questions as truth and reality, accepting, philosophically, that there are singular and multiple realities that are open to empirical questioning and that must be oriented towards the resolution of problems existing in the "real world". Thus, the pragmatic researcher would be free of mental barriers and practices imposed by the dichotomy positivism x constructivism, and would not be a prisoner of a particular research methodology or technique (Creswell & Clark, 2007; Robson & McCartan, 2016). So, for Goldkuhl (2004), it is not enough to just observe and then generalize. Knowledge can not only be a summary of past experiences, but that reason has a creative function that helps in the creation of the world, so that it is in transformation. This transformation is constant and present in IS practice, and since the pragmatic's interest is in change and action, it is a moral duty to give priority to changes that have a positive character to society. That is, the value of IS research to society is associated with the possibilities for improvements in IS practices (Goldkuhl, 2004).

Additionally, Goldkuhl (2008) states that three different types of pragmatism can be recognized. They are functional pragmatism, referential pragmatism, and methodological pragmatism. These three types of pragmatism are related to three fundamental questions:

- Why know?
- What to know?
- How to know?

Functional pragmatism, whose principle is the discovery to action, that is, action is purpose. Functional means that knowledge should be useful and applicable, that is, knowledge that has a prescriptive characteristic, such as models and methods, is important in functional pragmatism. In addition to the systematic and traditional approach to the creation of hypotheses (Cronen, 2001), in functional pragmatism it is possible to use Design Science and Design Theories (Hevner *et al.*, 2004);

Referential pragmatism, which uses knowledge about action, in which action is the object. In this type of pragmatism, the concern is to describe the world in an action-oriented way. There are several theoretical approaches that influence SI research such as Giddens's structuration theory, Habermas's theory of communicative action, action theory (Engeström, 1987) and practice theory (Schatzki *et al.*, 2001). Methodologically, Goldkuhl (2008) cites Action Workflow and the Dynamic Essential Modeling of Organizations (DEMO) methodology (Dietz, 1999).

Finally, methodological pragmatism, in which knowledge is obtained through action, that is, action is the source and means for discovery. The development of knowledge is based on continuous interactions between knowing and acting. Experimentation and exploration are central to the discovery process. The action research is the preference method of methodological pragmatism (Goldkuhl, 2008).

### 3. PRAGMATISM AND THE POSITIVIST X INTERPRETATIVE DICHOTOMY

According to Feilzer (2010), a paradigm can be considered an accepted pattern or model, an organized structure, or even a deep philosophical positioning regarding the nature of social phenomena and social structures. A paradigm is reaffirmed by excluding others, and articulating theories from their view (Kuhn, 1962). Thus, between objectivity and capture of the reality of positivism, and the plural subjectivity of interpretivism, paradigms can be interpreted as prescriptive, requiring specific research methods, and excluding others. Thus, the paradigm may restrict the curiosity and creativity, and even blind the researchers to key aspects of social phenomena (Feilzer, 2010).

This possible "blindness" of the social researcher can be perceived when Mertens (2014), in defining the use of positivism in the social sciences, affirms that positivism can be applied to the social world from the assumption that the social world can be studied from same way as the natural world. In this line, O'Leary (2017) adds that positivism aims at testing theories or describing experiences, from observation and measurement, so that it is possible to predict and control the forces that surround us. This harsh vision of pure, catchable and predictable reality contrasts, to some extent, with the vision that is postulated by the post-positivists. For them the world is ambiguous, variable and possessing multiple realities. Thus, what is true for one person or group may not be for others (O'Leary, 2017). However, positivist and post-positivist researchers are commonly aligned with quantitative collection and analysis methods (Mackenzie & Knipe, 2006).

Morgan (2007) recalls that this preference over the quantitative approach, and the clear limitations that this view has, could have generated a discussion about the possibilities that the qualitative approach would bring to the scientific milieu. However, the discussions focused more on philosophical issues, based on concepts of the philosophy of knowledge. The questioning of anomalies found in the dominant paradigm, one of Kuhn's (1962)

assumptions for paradigmatic change, led to an attempt to create an alternative paradigm, called by Morgan (2007) of metaphysical paradigm and by Guba and Lincoln (1988) of constructivist paradigm.

Regarding qualitative methods, an important discussion is whether qualitative research is equal, or always related, to interpretivism (Goldkuhl, 2012). For Trauth (2001) interpretivism is the lens that most influences the use of qualitative methods. However, for Myers and Avison (2002), the term "qualitative research" is not synonymous with interpretivism, and that qualitative research can be positivist, critical or interpretative, but that this choice is linked to the philosophical presuppositions of the researcher. Despite the different possibilities of paradigms related to qualitative research, Morgan (2007) recalls that much of the existing paradigmatic debate is related to the rivalry between interpretivism and positivism, and a third way, as proposed by Wicks and Freeman (1998) and Fishman (1999), would be the pragmatic paradigm. A similar proposition was made by Goles and Hirschheim (2000) for SI research, in which the pragmatic paradigm should be included in the debate of paradigmatic possibilities.

The pragmatic alternative shows us how it is possible to solve problems related to the positivist paradigm, such as a hard vision of reality and the exact possibility of measurement and prescription, as well as problems related to the interpretative paradigm, such as difficulty in determining boundaries, problems related to incommensurability and the relationships between paradigmatic thinking and research practices (Morgan, 2007).

Although the foundations of pragmatic thinking are not fully known and recognized, their influence on IS research is extensive and present in day to day research. Baskerville and Myers (2004) argue about the use of pragmatism as a paradigmatic foundation in conducting action research, as Lee and Nickerson (2010) argue that pragmatism is the most appropriate research paradigm in conducting Research Design rather than positivism. As pragmatism is concerned with action and change and with the interaction between knowledge and action, this would be the most appropriate paradigm in cases where intervention is an organizational change or the construction of artefacts (Goldkuhl, 2012).

Morgan (2007) summarizes how qualitative, quantitative and pragmatic methodologies deal with the relationship between theory and data, the research process, and inference from the data. The propositions of Morgan (2007) are in Table 1.

**Table 1 - Key questions in the Methodology of Research in Social Sciences.**

	<b>Qualitative Approach</b>	<b>Quantitative Approach</b>	<b>Pragmatic Approach</b>
Connection between theory and data	Induction	Deduction	Abduction
Relationship with the research process	Subjectivity	Objectivity	Intersubjectivity
Inference from the data	Contextual	Generalization	Transfer

Source: Morgan (2007)

#### **4 QUANTITATIVE, QUALITATIVE AND MIXED METHODS RESEARCH**

The Laughlin's (1995) connection matrix of theory is one of the tools that can be used to choose an appropriate methodological approach to research. According to this matrix, every research process is composed of three great dimensions that are theory, methodology and change. Thus, the choice of the researcher for a research paradigm will go through the application to a greater or lesser degree of each of these dimensions.

Thus, in the positivist paradigm the objective is the use of deduction for the confirmation of well-established theories, using data analysis from a quantitative approach. Already in the interpretivism, the inductive approach aims at the discovery of a theory or a deepening of the understanding about a phenomenon (Parvaiz *et al.*, 2016). Therefore, while positivism emphasizes the laws governing a gross and independent reality of observation and interpretivism emphasizes the role of creativity, subjectivity and individual reality, pragmatism rejects both, for no theory can be totally objective, falsifiable, etc., as positivism proposes, nor fully malleable and interpretatively satisfy any situation, as possibly occurs with the subjective results proposed by interpretivism (Powell, 2001).

The question of the dichotomy positivism versus interpretative in research in the human sciences, and in IS research, is discussed in the academy (Goldkuhl, 2012; Lee, 1991; Weber, 2004), however a point that Orlikowski and Baroudi (1991) raise is the impossibility of reconciling these two paradigms. This irreconcilable separation between the two paradigms, positivist and interpretivist, is reflected in methodological questions, in which quantitativists and qualitativists see themselves at opposite ends unable to see "beyond their methodological hill."

For the pragmatists, the real world exists, but at the same time, everyone has his unique interpretation of this world (Morgan, 2007). Thus, the pragmatist does not accept or trust only subjectivity, but adopts the notion of intersubjectivity, which allows researchers to capture the subjective and objective duality of a phenomenon before representing it as a social reality (Parvaiz *et al.*, 2016).

Thinking in a straight line representing the two paradigms of research, positivist and interpretivist, in which on

one side we have positivism / post-positivism and on the other we have the interpretivism, pragmatism would emerge as the paradigm that could combine the two extremes. The quantitative methods, typical of the positivist studies, and the qualitative methods, also present in the interpretative studies, are used without restriction in pragmatic studies (Mackenzie & Knipe, 2006; Parvaiz *et al.*, 2016) quantitative and qualitative, in the realization of studies with mixed methods (Tashakkori and Teddlie, 2003).

Tashakkori and Teddlie (2003) are authors that point out the importance of the use of mixed methods. These mixed methods involve a research design in which the operationalization goes through the use of more than one research method and thus more of a worldview, quantitative and qualitative. For Creswell (2013), the technique of mixed methods is one in which the researcher bases his claims on pragmatic elements. Thus, Tashakkori and Teddlie (2003) propose that pragmatism, or the "philosophy of free choice" (Symonds & Gorard, 2008, p. 3), is the most appropriate epistemology for the use of mixed methods. The proponents of the use of research using mixed methods appreciate the value that can be obtained from the quantitative and qualitative worldview, allowing a better understanding of the phenomenon studied (Venkatesh, Brown, & Bala, 2013).

In IS studies, qualitative methods have typically been used for exploratory studies in order to develop a deeper understanding of a phenomenon, or to generate new theoretical insights (Walsham, 2006), while quantitative methods are used to confirmatory studies in order to test theories (Venkatesh *et al.*, 2013). However, for Teddlie and Tashakkori (2003), mixed research methods have the ability to respond to research questions at the exploratory and confirmatory level simultaneously. Another feature of mixed methods pointed out by Teddlie and Tashakkori (2003) is the ability to provide inferences more consistent than those obtained from singular world view methods.

The area of study that IS researcher act is constantly changing, which makes the medium extremely complex and presents us with new challenges in the search for understanding the capabilities, use and impact of new technologies. Thus, it is common to have situations in which the existing theoretical propositions do not explain the phenomenon. Therefore, the use of mixed methods provides tools that help the IS researcher in the constant search for better contributions to the area, both theoretical and practical.

## 5 RIGOR AND RELEVANCE

The rigor and relevance question has been addressed in academia for several years, with several researchers pointing to the loss of the practical relevance of organizational research and questioning the future of the field (Schultz, 2010). Back in 1999, Benbasat and Zmud alerted to the lack of practical relevance of the SI research, questioning whether the knowledge produced could be applied by professionals in their day to day (Benbasat & Zmud, 1999).

Research in the social sciences, and particularly in the IS area, which intends to be relevant to the practitioner, should always answer questions such as "what is this for?", "Who is it for?" And "how to search?". These three questions show us a concern of practical application, together with the need to carry out the research within minimum aspects of methodological rigor. These questions also bring epistemological aspects to the construction of the research, because there is no concern in the exact reproduction of reality, but in a solution to a problem that someone has, from a scientific research (Feilizer, 2009).

Lee (1999) argues that IS research should be carried out in the same way as in professional areas such as medicine or law and not using concepts inherited from the natural sciences. More recently, Baskerville and Myers (2004) carried out a call for papers with more practical relevance, with research using action research as a method.

According to Schultz (2010), research in social sciences pursues a type of scientific rigor that has not been developed internally, but using imported or imitated methodologies of the natural sciences. It is true that one strand in social sciences was built in which the specificity of the human being became the central theme, resulting in the interpretative paradigm (Santos, 1999). However, when we talk about research in several areas of social sciences such as marketing (De Andrade *et al.*, 2017), finances (Pinto *et al.*, 2016) and even information systems (Kwan, 2017), the field still shows itself as positivist

Thus, requests for high standardization of argumentation, theorization and presentation of empirical data requested by various journals "force" organizations to be institutions of hard logic in organizational studies. When this forced logic works, new theorizations and concepts are created, but failure leads to situations in which organizations have to adapt to the "phenomenon that is scientifically acceptable" (Schultz, 2010).

The challenge of trying to understand the organizational world from the perspective of the natural sciences can be seen in Lee (1999, p. 30) when he states that "the world does not stop as the natural sciences develop knowledge that helps solve problems of the real world". Real-world knowledge is produced independently of any natural science (Lee, 1999). Schultz (2010) warns that the imbalance between rigor and practice leads to excruciatingly detailed studies of minor problems that have little generalization and are applicable in highly specialized academic communities.

One of the important points of the pragmatic paradigm is the balance between rigor and relevance (Schultz, 2010). According to Ulrich (2007), this balance between relevance and rigor tends to benefit relevance,

because on relevance lies the foundation of pragmatic thinking. However, Ulrich (2007) goes on arguing that certain care must be taken on this balance, and that methodological rigor is also part of the scientific study. For Ulrich (2007) the careful ethical basis is a central point, because without this ethical foundation pragmatic thinking runs the risk of being merely a mere opportunism or a utilitarianism.

Specifically in IS research, Benbasat and Zmud (1999) provide some suggestions for approaches that should be avoided when scientific articles are produced so that they are more widely accepted in the practice of IS managers. The first suggestion is to avoid excessive rigor to the detriment of relevance. Practical relevance, the objective of solving day to day problems of the practitioner of management should always be the focus of scientific production. Scientific rigor cannot be forgotten, but there must be a balance between rigor and relevance. Benbasat and Zmud (1999) suggest that there is a lack of continuity in the field. IS surveys tend to present a result and then be abandoned. It is important that there be continuity and that new findings complement the theory, forming a theoretical tradition.

Finally, the object of study itself, information systems and / or information technology, is extremely dynamic. Changes and technological advances make studying the use of technology and its impacts on society a race against time, as it is possible that a result of high practical relevance will have no impact one year after its publication (Benbasat, Zmud, 1999).

## 6 CONCLUSION

The achievement of a scientific research is premised on the choice of an epistemological vision that will guide the researcher in his choices. Among the dominant paradigms in social science research we have the positivist and the interpretivist. For Orlikowski and Baroudi (1991), these are extreme opposites with respect to philosophical thinking and methodological choices. These visions, so different from the world, can undermine the perception of the phenomena studied or even "blind" the researcher to important aspects of the research. Thus, the pragmatic perspective, or pragmatic paradigm, is presented as a viable alternative to the constant discussion between positivism and interpretivism.

Pragmatism preaches the pursuit of knowledge from action as stated by Goldkuhl (2004, p. 24). "Pragmatism means the recognition of the complete dialectic between knowledge and action: proper action is an action with knowledge; the right knowledge is active knowledge". Thus, using a statement by Lee (1999), the SI research should be a practice-oriented research, aimed at solving problems experienced in the day-to-day management of IS.

Another important point presented in this article is that the choice by the pragmatic paradigm does not limit its methodological choices. It is true that qualitative research is possible under a positivist view and, conversely, quantitative research from the interpretative point of view. However, the philosophical position of each extreme, subjective vs. objective, contextual vs. generalist, makes the crossing of methods complicated, to say the least. The pragmatic researcher, however, has the flexibility to go through both quantitative and qualitative environments, and even to join them when the research problem requires several levels of research.

Finally, a point that must be placed is that of methodological rigor. Pragmatic research has as its main focus the practical relevance of the research. However, the rigor of scientific research cannot be neglected, otherwise we may end up with a work without foundation, which may even solve a problem, but, in Ulrich's words (2007, p. 1110), "it would be difficult to avoid the suspicion of being mere opportunism and utilitarianism".

Hardly a researcher changes his paradigmatic choice, especially when this choice is related to questions of personal and professional formation. When we speak of paradigmatic positivist or interpretivist choices, the detachment becomes palpable, not to say conflicting. However, the adoption of a pragmatic paradigm allows a better adjustment less traumatizing to the two paradigmatic extremes, allowing researchers, without entering into great philosophical conflicts, to have access to other methodological tools that allow to explain better the studied phenomenon. Additionally, it is possible to reconcile positivist and pragmatic thinking, as well as between interpretative and pragmatic thinking, so that the researcher can travel better, or with a degree of effort that does not deny his philosophical baggage, between paradigms.

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