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Title: *Rethinking need for multiple paradigms in Operations Management Research*

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### ***Introduction:***

The field of operations management is constantly evolving widening the scope of its activities and thereby facing some challenges that were previously not given much attention. Primarily dominated by manufacturing systems, the field now acknowledges with same enthusiasm the service operations domain. However the research methodology that was used primarily for manufacturing systems need certain amendments to explore service sciences that is primarily dominated by human behavior. Also with manufacturing systems moving towards integrated supply chains it is argued that socialization is an increasingly important mechanism in facilitating and enhancing the supply integration process (Cousins et al, 2006). Also research within the confines of one paradigm, while useful, limits the kinds of questions researchers can address (Meredith et al. 2001). This sets the need for interpretivist approaches that can help in understanding this complex interaction of human actors with the system. With the essence of viewing reality through social construction which is at the heart of interpretivist approach, it offers a scope for addressing as well as exploring relevant research questions.

Field research from interpretivist paradigm can be used to document the state of the art in operations management, as well as to provide a baseline for longitudinal studies. It can also be invaluable in the development of parameters and distributions for mathematical and simulation modeling studies. A very important use for empirical data is in theory building and verification, topics which are virtually ignored in most POM research (Flynn et al, 1990).

Further the positivist approach can be combined with the traditional positivist approach widely used in this field. Studies have concluded that alternate research methods are not mutually

exclusive and, if combined, can offer greater potential for enhancing new theories than either method alone (Meredith et al., 2001).

To address the need for multiple paradigms, this paper contains three sections. The first section gives a brief overview of the interpretivist approach and compares it with the positivist approach. The second section presents a discussion about bridging the gap between interpretivist and positivist paradigms. Lastly the paper discusses the limitations of the approach and implications for operations management research.

***Interpretivist v/s Positivist paradigm:***

Interpretivist line of thought states that knowledge of reality is a social construction by human actors. Further the data gathered for researches is value laden by the researcher as the researcher uses their preconceptions to guide the enquiry process (Walsham, 1995). The goal here is generate descriptions, insights, and explanations of events so that the system of interpretations and meaning, and the structuring and organizing processes are revealed. It tends to be more inductive in nature. The basic stance is to become part of evolving events, to see from the perspective of the organization members experiencing the structuring process. The analysis, theory generation and further data collection go hand in hand (Gioia et al, 1990). The aim of all interpretive research is to understand how members of a social group, through their participation in social processes, enact their particular realities and endow them with meaning, and to show how these meanings, beliefs and intentions of the members help to constitute their social action(Orlikowski, 1991).

On the contrary, positivist line of thought seeks to examine relationships that lead to generalization and universal principles by using deductive method for theory building. In this approach the phenomenon of interest is single, tangible and fragmentable, and there is a unique, best description of any chosen aspect of the phenomenon. The researcher and the object of inquiry are independent, and there is a sharp demarcation between observation reports and theory statements. Nomothetic statements, i.e., law-like generalizations independent of time or context, are possible, implying that scientific concepts are precise, having fixed and invariant meanings. There exist real, uni-directional cause-effect relationships that are capable of being identified and tested via hypothetic-deductive logic and analysis. Inquiry is value-free (Orlikowski, 1991).

Interpretive researchers use techniques like case studies, textual analysis, ethnography and participant/observation and methodologies like phenomenology, hermeneutics, and semiotics and grounded research (Goulding, 1998) to conduct their research. Positivist research on the contrary has discretion towards quantitative techniques and causality establishing techniques. A brief comparison of the two stances as often seen from various stances as given by (Fitzgerald et al, 1998) is given in table 1.

Table 1: Comparing Interpretivist and Positivist paradigms

INTERPRETIVIST	POSITIVIST
<b>ONTOLOGICAL LEVEL</b>	
<b>Relativist</b> Belief that multiple realities exist as subjective constructions of the mind. Socially-transmitted terms direct how reality is perceived and this will vary across different languages and cultures.	<b>Realist</b> Belief that external world consists of pre-existing hard, tangible structures which exist independently of an individual's cognition.
<b>EPISTEMOLOGICAL LEVEL</b>	
Interpretivist No universal truth. Understand & interpret from researcher's own frame of reference. Uncommitted neutrality impossible. Realism of context important.	Positivist Belief that world conforms to fixed laws of causation. Complexity can be tackled by reductionism. Emphasis on objectivity, measurement and repeatability.

<p><b>Subjectivist</b> Distinction between the researcher and research situation is collapsed. Research findings emerge from the interaction between researcher and research situation, and the values and beliefs of the researcher are central mediators.</p>	<p><b>Objectivist</b> Both possible and essential that the researcher remain detached from the research situation. Neutral observation of reality must take place in the absence of any contaminating values or biases on the part of the researcher.</p>
<p><b>Emic/Insider/Subjective</b> Origins in anthropology. Research orientation centred on native/insider's view, with the latter viewed as an appropriate judge of adequacy of research.</p>	<p><b>Etic/Outsider/Objective</b> Origins in anthropology. Research orientation of outside researcher who is seen as objective and the appropriate analyst of research.</p>
<b>METHODOLOGICAL LEVEL</b>	
<p><b>Qualitative</b> Determining what things exist rather than how many there are. Thick description. Less structured &amp; more responsive to needs &amp; nature of research situation</p>	<p><b>Quantitative</b> Use of mathematical &amp; statistical techniques to identify facts and causal relationships. Samples can be larger &amp; more representative. Results can be generalised to larger populations within known limits of error</p>
<p><b>Exploratory</b> Concerned with discovering patterns in research data, &amp; to explain/understand them. Lays basic descriptive foundation. May lead to generation of hypotheses</p>	<p><b>Confirmatory</b> Concerned with hypothesis testing &amp; theory verification. Tends to follow positivist, quantitative modes of research</p>
<p><b>Induction</b> Begins with specific instances which are used to arrive at overall generalisations which can be expected on the balance of probability. New evidence may cause conclusions to be revised. Criticised by many philosophers of science, but plays an important role in theory/hypothesis conception.</p>	<p><b>Deduction</b> Uses general results to ascribe properties to specific instances. An argument is valid if it is impossible for the conclusions to be false if the premises are true. Associated with theory verification/falsification &amp; hypothesis testing</p>
<p><b>Field</b> Emphasis on realism of context in natural situation, but precision in control of variables &amp; behaviour measurement cannot be achieved</p>	<p><b>Laboratory</b> Precise measurement &amp; control of variables, but at expense of naturalness of situation, since real-world intensity &amp; variation may not be achievable</p>
<p><b>Idiographic</b> Individual-centred perspective which uses naturalistic contexts &amp; qualitative methods to recognise unique experience of the subject</p>	<p><b>Nomothetic</b> Group-centred perspective using controlled environments &amp; quantitative methods to establish general laws</p>
<b>AXIOLOGICAL LEVEL</b>	
<p>Relevance External validity of actual research question &amp; its relevance to practice is emphasised, rather than constraining the focus to that researchable by 'rigorous' methods</p>	<p>Rigour Research characterised by hypothetico-deductive testing according to the positivist paradigm, with emphasis on internal validity through tight experimental control and quantitative techniques</p>

Source: Fitzgerald et al (1998)

### ***Bridging the GAP:***

Previous studies have tried addressing this debate of adopting a paradigm by suggesting four approaches of *isolationist* adoption of a single approach to the exclusion of all others; *supremacy* of one approach; *integration* of dichotomous approaches; or *pluralist* accommodation (Fitzgerald

et al, 1998). Rather than advocating a single paradigm, be it interpretive or positivist, or even a plurality of paradigms within the discipline as a whole, it is suggested that research results will be richer and more reliable if different research methods, preferably from different (existing) paradigms, are routinely combined together (Mingers, 2001).

In order to accommodate interpretivist research, it is required to take the research enquiries to a macro level in order to place both the paradigms in perspective and utilize their findings to develop a broader socio-technical understanding of the systems. Since interpretivist paradigm tries to generate the reality from field interaction by social actors, it can be used to generate propositions that can further be tested by the positivist framework to grant it reliability and validity. Further the interpretivist research can lead to certain fertile ideas for research which might be difficult to explore with the positivist framework due to methodological issues.

Even a same research question when addressed by both paradigms within same contexts can yield interesting findings to complete the understanding of the phenomena. Mixing methods driven by both paradigms can give a fine balance of including as close a view of reality possible in a scientific way within the confines of feasibility in conducting a research. Either in a stage wise or a concurrent way, both paradigms can be used to build a base and test the theory developed from the field.

Using both the paradigms gives a lot of power in the hands of a researcher to use both these paradigms to explore new directions in operations management field.

It also addresses to the need of practitioners and keeps the field progressing at par with the industry practices.

***Limitations of using Interpretivist with positivist paradigm:***

The nature of interpretivist enquiry requires involvement on the part of researcher in the phenomena while studying it. This makes the study vulnerable to personal influences of the researcher due to the choices made while conceptualizing, designing and implementing the study. Further since positivist paradigm is primarily involved in theory testing the results based on biased propositions developed from interpretivist approach might mislead the research into the topic studied and might further complicate the research problem by the incorrectly tested causal relationships.

Further interpretive studies require intensive involvement on the part of researcher which might be limited by time and cost constraints. Also studies done by a group of researcher might be difficult to co-ordinate due to different subjective biases of the researchers. This gets substantiated more when the skill set is divided and there is uneven understanding of different paradigms and its methodologies amongst the research team. Training into techniques of this new paradigm might be willingness as well as a resource issue for researchers working in the positivist paradigm while evaluating the adoption potential of interpretivist paradigm amongst operations management researchers.

Lastly there are no set criteria for evaluating the quality of such research and testing the genuinity of the research done. This makes it difficult to differentiate the work done within this framework as well as establish the validity of research results. Boundaries need to be set for different methodologies and techniques for interpretivist research and certain basic guidelines need to be developed to guide the work within this framework. Positivist methods can be used too as a way to lend the required reliability and validity to the outcome of interpretivist research.

***Conclusion:***

Using multiple paradigms can help to uncover different research aspects and include a variety of research problems into the current scope of operations management leading to enrichment in knowledge. It also helps in keeping research issues in line with the reality by offering different tools from interpretivist paradigm and thus capturing more detail by close interaction with reality and the actors.

The differences in interpretivist and positivist studies are differences in the questions asked and the types of conclusions drawn. However it is the differences in the enquiry while exploring various aspects of phenomena that provide a better understanding. Using multiple paradigms provides for this need by offering various perspectives and additional methodological tools to provide a better insight. It is in the interest of operations management researchers to adopt the multiple paradigm approach to address the interdisciplinary issues being faced currently with a complex interaction of human behavior with systems.

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