The paradigm is dead, the paradigm is dead…long live the paradigm: the legacy of Burrell and Morgan

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Abstract

Most of the research in the field of Information Systems appears to be guided by one set of philosophical assumptions — those of positivism. Such paradigm unity could prove problematic as it might stymie alternative conceptions of problems in the IS field. This paper inquires into whether the field does indeed embrace a solitary paradigm and if so, what its implications are. In so doing, the paper provides an overview of positivism, its paradigmatic grounding, why it became popular, and the obstacles to change. The paper looks at the possibility of paradigm pluralism particularly as it relates to pragmatism. The relationship between pragmatism and the call for more relevance in IS research is also explored. In its examination of these topics, the paper notes the rather surprising importance Burrell and Morgan's notion of paradigms has played in the conception of the field's philosophical discussions. © 2000 Elsevier Science Ltd. All rights reserved.

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1. Introduction

While there is general agreement that the field of Information Systems (IS) is broad and embodies many themes and areas, there is far less agreement when it comes to deciding what the field actually includes and does not include, and what its core features are. Mason and Mitroff [1], for example, in their classic framework of IS, characterize the core components to be: psychological type (of the user), class of problems to be solved, organizational context, method of evidence generation and guarantor of evidence, and mode of presentation of the output. Ives et al. [2] define IS in terms of five environments (external, organization, user, IS development and IS operations), three processes (user, IS development and IS operations), and an information subsystem. Lyytinen [3] divides the field into nine components: the information system itself, IS operations environment, IS development environment, user environment, organizational environment, external environment, use process, development process, and operations process. Swanson and Ramiller [4] discuss the field in terms of the broad areas people write papers on: computer-supported cooperative work, information and interface, decision support and knowledge-based systems, systems projects, evaluation and control, users, economics and strategy, introduction and impact, and IS research. Others have used co-citation analyses to identify intellectual subfields upon

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which IS draws [cf. 5–8]. Still others [9,10] have used historical analyses to offer insight into the nature of the field.

On the whole, the field of IS can be characterized as diverse and pluralistic. There is diversity of problems addressed; diversity of theoretical foundations and referent disciplines; and diversity of research methodologies [11]. Consider, for example, the phenomenon of IS implementation. It has been examined from such diverse perspectives as technical implementation [12,13], planned change models of Lewin and Schein [14,15], political theories [16–19], action learning [20–22], marxist economic theory [23,24,147], and institutional economics [25–27]. To make matters worse, there are probably as many conflicting messages about what constitutes 'good IS implementation' as there are perspectives [145]. Regardless of whether diversity is considered a blessing [e.g., 28] or a curse [e.g., 11], it is widely accepted as a hallmark of the field [4,23,29–33].

Perhaps because of this diversity, some have gone so far as to question whether the field of IS actually exists. King [34], for example, referred to the study of information systems as arguably "not even a field, but rather an intellectual convocation" (p. 293). Denning et al. [35] consider it as part of computer science. Banville and Landry [31] offer a somewhat different view. By applying Whitley's [36,37] model of cognitive and social institutionalization of scientific fields (or academic disciplines), they conclude that the field of IS is a "fragmented adhocracy". This is so because in order to work in IS one does not need a strong consensus with one's colleagues on the significance and importance of the research problem as long as there exists some outside community for support. Nor are there widely accepted, legitimized results or procedures on which one must build "in order to construct knowledge claims which are regarded as competent and useful contributions" [36, pp. 88–123 as quoted by Banville and Landry [31, p. 54]]. In addition, research involves high task uncertainty, because problem formulations are unstable, priorities vary among different research communities and there is little control over the goals by a professional leadership establishment (such as bars or licensing boards for physicians and engineers). For example, some IS research groups may choose to define and cherish projects that do not follow the familiar patterns of engineering or empirical social science, although such groups are generally in the minority. There appears to be — to some extent at least — local autonomy to formulate research problems, and standards for conducting and evaluating research results. Others have cast doubt on whether such 'local autonomy' really exists or is simply a figment of the imagination [23,38]. All this has led to a rather lively debate on the nature and purpose of IS research [2,7,11,28,39–50].

In fact, the discussion about the nature and purpose of IS research provides the motivation for this paper. It is our contention that whilst there is no doubt diversity in the field of IS, this diversity has not been fully extended to the set of philosophical assumptions upon which the vast majority of information systems research is based. More specifically, a particular set of assumptions — those surrounding functionalism — has dominated IS research to date [23,29,38,51,52]. This, despite the many who champion the view that a reliance on a solitary research paradigm inhibits a full understanding of and appreciation for the multifaceted reality of information systems [e.g., 47–50,53]. Why does this disparity exist? Will it ever be resolved? This paper addresses these questions. Its purpose is twofold: (1) to examine why information systems research is so tilted in one direction; and (2) to suggest an alternative paradigmatic position — pragmatism — as a vehicle for moving towards a more balanced stream of research.

The paper is organized as follows. First there is a brief review of philosophical issues surrounding knowledge and its acquisition, and the rise of positivism. Next, we will summarize the literature that points out the preponderance of positivist research in the field of information systems field. This is framed in terms of Burrell and Morgan's [54] seminal work. Then reasons for the dominance of this perspective are explored, along with obstacles to change. We then explore some alternative approaches based on pragmatism. Finally, we offer some thoughts on the implications of pragmatism for current and future research directions.

2. The essential problem of science

Anyone who does research in any field must come to grips with two fundamental problems in his/her pursuit of knowledge. They are often referred to as the "essential problem in science". That is: "how do we know what we know", and following on from that, "how do we acquire knowledge"? This age-old problem has been at the core of science since its inception. And the solution to the problem is, arguably, as contentious now as it has been for centuries [55].

It is typical to trace the problem back to the Greeks who felt the primary role of science was to turn *doxa* (that which was believed to be true) into *episteme* (that which was known to be true). But the Sophists questioned how, and even if, this could be done. They asked whether it was possible to actually know that something was true. The argument since then has centered on whether knowledge can ever be "proven" [56]. To put it differently, does it makes any sense to search for "truth" as though it exists as some independent

reality. Conventional philosophical wisdom now holds that knowledge is not infallible but conditional; it is a societal convention and is relative to both time and place [57]. Knowledge is a matter of community acceptance. The criteria for acceptance are an agreed set of conventions that must be followed if the knowledge is to be accepted by the community. The set of conventions is not arbitrary but is well thought out and has historically produced knowledge claims that have withstood the test of time. In any society there are a myriad of knowledge claims; those which are accepted are those which can be supported by the forces of the better argument.[1] They are an agreed best understanding of what has been produced at a particular point in time. (Such knowledge claims may become unaccepted as further information is produced in the future.) We thus consider science, in its current sense, to be a convention — related to societal norms, expectations, and values — which is used to engage in a search for understanding. Science uses whatever tools, techniques and approaches which are considered appropriate for the particular subject matter under study. Snyder [58] discusses science in terms of:

> . . .something that people do. It is not a particular set of assertions or theories, but a set of activities that may or may not produce organized theories.

Science, for all intents and purposes, is a problem-solving vehicle. It is as Anderson [59, p. 25] puts it: "essentially a process of consensus formation". The consequence of this conception of science is that virtually any scholarly attempt at acquiring knowledge could be construed to be "science". The demarcation between science (normal science) and non-science (pseudo-science) blurs. And it is unlikely that this blurring will clear. Laudan [60] writes:

> The fact that 2400 years of searching for a demar-

cation criterion has left us empty-handed raises a presumption that the object of the quest is non-existent. (p. 275)

It is important to note how this notion of science places the emphasis of knowledge acquisition on the "community". Knowledge (truth) is a communal achievement. It is what the community agrees to bestow the label "knowledge" or "truth" upon. It is also not arbitrary as it is based on the accepted conventions of the time. Nor is it entirely relativistic. Knowledge, in this context, is not the relativistic notion that "everything is relative, where no knowledge claim is any better than any other", as might be argued by, for example, Feyerabend [61]. On the contrary, knowledge claims are scrutinized through the accepted community conventions; only those claims that are judged to be acceptable through an informed debate are adopted. But what constitutes "acceptable"?

Although writers such as Laudan [60] and Anderson [59] might believe the distinction between science ("acceptable knowledge claims") and non-science ("unacceptable knowledge claims") is not particularly clear cut, the weight of evidence is against them [62]. The distinction between science (normal science) and non-science or quasi-science (pseudo-science) — at least in the Western World — is relatively clear. For something to be considered scientific it must use the agreed set of conventions — the scientific method. It is the manifestation of the positivistic conception of science/inquiry — or what might be termed 'positive science' — and has a long history of providing an accepted understanding of nature [63].

3. Explication of positivist science

Positivism has been defined by numerous individuals over the years. Kolakowski [64], for example, states that positivism embraces a four point doctrine: (1) the rule of phenomenalism which asserts that there is only experience; all abstractions be they 'matter' or 'spirit' have to be rejected; (2) the rule of nominalism which asserts that words, generalizations, abstractions, etc. are linguistic phenomena and do not give new insight into the world; (3) the separation of facts from values; and (4) the unity of the scientific method. Burrell and Morgan [54] define it as an epistemology "which seeks to explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements". For the purpose of our discussion, positivism can be summarized as being based on five pillars: (1) Unity of the scientific method; (2) Search for Humean causal relationships;

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[1] Habermas [100] offers a good theoretical account on how this might be done through his so-called "ideal speech situation". The ideal speech situation allows participants to resolve differences and misunderstanding without giving up their consensual orientation, because in the absence of external force, the cogency of reason will make the better argument win. Insofar as this consensus is only based "on the force of the better argument", it may be termed "rational" (cf. [16], chapter I.3). For example, if an argument "wins" because of opportunism, considerations of power or lack of motivation by the other side to explain their point of view, then it wins not by the "force of pure reason" and hence the consensus would not be called rational. A rational consensus would be replicated at all times as long as the state of knowledge does not change which may lead to new arguments that are "stronger".

(3) Belief in empiricism; (4) Science (and its process) is value-free; and (5) The foundation of science is based on logic and mathematics.

One, unity of the scientific method means that the accepted approach for knowledge acquisition (the scientific method) is valid for all forms of inquiry. It does not matter whether the domain of study is animate or inanimate objects; human, animal or plant life; physical or non-physical phenomena; etc. Two, the search for Humean causal relationships reflects the desire to find regularity and causal relationships among the elements of study. The process used is based on reductionism, where the whole is further and further reduced into its constituent parts. Three, the belief in empiricism refers to the strongly held conviction that the only valid data is that which is experienced from the senses. Extrasensory experience, conscious and unconscious organizing apparatus, subjective perception, and the like, are not considered acceptable. Four, science and its process are value-free reflects the belief that there is no intrinsic value position in science. The undertaking of science has no relationship to political, ideological, or moral beliefs. It transcends all cultural and social beliefs held by the scientist. Five, logic, and more generally, mathematics provide the foundation of science. They provide a universal language and a formal basis for quantitative analysis, an important weapon in the search for causal relationships.

Positivism also embraces a particular ontological position. (Ontology refers to the nature of the world around us; in particular, that slice of reality which the scientist chooses to address.) The position adopted by the positivist is one of realism. It postulates that the universe is comprised of objectively given, immutable objects and structures. These exist as empirical entities, on their own, independent of the observer's appreciation of them.[2] This contrasts sharply with an alternative ontology, that of relativism or instrumentalism, which holds that reality is a subjective construction of the mind. Socially transmitted concepts and names direct how reality is perceived and structured; reality therefore varies with different languages and cultures. What is subjectively experienced as an objective reality

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[2] This realist ontological position is often referred to as 'naïve realism' and for many social scientists has been replaced by a more moderate form of 'scientific realism'. Scientific realism holds that while the world exists independently of its being perceived ('classical realism'), the world can only be known through models of the world. The models themselves are not immutable — they never can be known with certainty ('fallibilistic realism'); indeed, the job of science is to develop better models of the world [140].

Table 1
Assumptions about the nature of social science [54]

	Subjective	Objective
Ontological assumptions	Reality is interpreted by the individual. It is socially constructed (nominalism).	Reality is external to the individual. It is a "given" (realism).
Epistemological assumptions	Knowledge is relative. Researchers should focus on meaning and examine the totality of a situation (anti-positivism).	Researchers should focus on empirical evidence and hypothesis testing, looking for fundamental laws and causal relationships (positivism).
Assumptions about human nature	Humans possess free will and have autonomy (voluntarism).	Humans are products of their environments (determinism).
Methodological assumptions	Understanding the world is best done by analyzing subjective accounts of a situation or phenomena (ideographic).	Operationalizing and measuring constructs, along with quantitative analysis techniques and hypothesis testing, will uncover universal laws that explain and govern reality (nomothetic).

Table 2
Assumptions about the nature of society [54]

Regulation	Radical change
Society tends towards unity and cohesion.	Society contains deep-seated structural conflict.
Society forces uphold the status quo.	Society tends to oppress and constrain its members.

exists only in the observer's mind. (The latter ontological stance is the one supported by anti-positivism.)

Through the centuries, positivism has enjoyed great success. It has had an especially happy relationship with the physical sciences where a tremendous growth in knowledge has been experienced. It has allowed mankind to reach the moon, develop drugs and procedures for fighting sickness, build skyscrapers, invent computers, and a host of other advancements too numerous to mention. Its application in the social sciences has, however, been less than spectacular. Throughout history, individuals have sought to apply positivism to the human realm, bolstering or modifying its conception as necessary. (The emergence of 'post-positivism' as an evolutionary development of positivist thought is but one visible example; cf. [65–67]). Critics have surfaced to question its validity on numerous occasions [68–70]. From an historical perspective, one can distinctly see the uneasy tension that has existed in the application of positivism in the social sciences. This has given rise to what Tashakkori and Teddlie [71] have termed "the paradigm wars": 'battles' fought by the adherents of positivism against the anti-positivists. Yet, positivist science still reigns supreme. Its visibility throughout the social sciences is clear for all to see [62], and its popularity in IS is without question [23,38]. In this paper, we shall explore this popularity through the lens of Burrell and Morgan's [54] paradigms.

4. Paradigms

In 1979, Burrell and Morgan [54] expanded the collective consciousness of researchers by introducing their typology of paradigms for the analysis of social and organizational theory.[3] By identifying fundamentally different assumptions concerning the nature of

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[3] The term "paradigm" has been interpreted quite differently by different researchers. In the Kuhnian sense, paradigms are "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners" [57, p. viii]. Burrell and Morgan [54] use the term as a "commonality of perspective which binds the work of a group of theorists together" [54, p. 23]. In this paper, paradigm is used in the broader sense of Burrell and Morgan rather than Kuhn's more specialized notion.

social science (see Table 1) and the nature of society (see Table 2), they arrived at a matrix composed of four different research paradigms: functionalism, interpretivism, radical structuralism, and radical humanism (See Fig. 1).

The functionalist paradigm is concerned with providing explanations of the status quo, social order, social integration, consensus, need satisfaction, and rational choice. It seeks to explain how the individual elements of a social systems interact together to form an integrated whole. The interpretivist paradigm seeks explanation within the realm of individual consciousness and subjectivity, and within the frame of reference of the perspective: "social roles and institutions exist as an expression of the meanings which men attach to their world" [72, p. 134]. The radical structuralist paradigm has a view of society and organizations which emphasizes the need to overthrow or transcend the limitations placed on existing social and organizational arrangements. It focuses primarily on the structure and analysis of economic power relationships. The radical humanist paradigm seeks radical change, emancipation, and potentiality, and stresses the role that different social and organizational forces play in understanding change. It focuses on all forms of barriers to emancipation: in particular, ideology (distorted communication), power and psychological compulsions and social constraints; and seeks ways to overcome them.

This seemingly simple 2 × 2 matrix has had an impact far beyond what its originators, or anyone else, could have anticipated [73,74]. Perhaps the most significant contribution of the Burrell and Morgan frame-
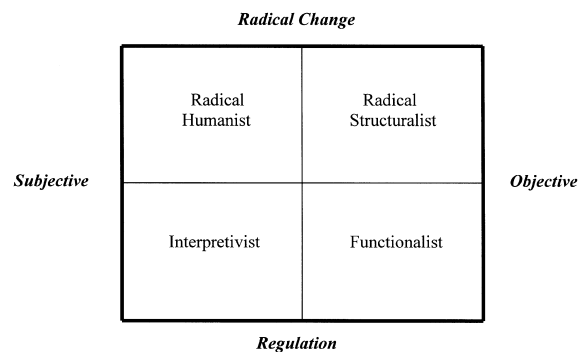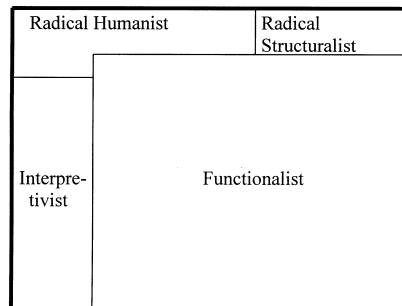

Fig. 1. Burrell and Morgan's four paradigms.

Fig. 2. Proportional representation of IS research modeled on the Burrell and Morgan framework (adapted from [77, p. 586]).

work has been to legitimatize (or at least provide impetus to the legitimizing of) alternative approaches to the study of organizations by bringing to light "a growing dissatisfaction with the dominant, functionalist orthodoxy" [75, p. 681]. In the field of information systems, Burrell and Morgan's work has been used to show the absence of a unifying paradigm [76]. While there is an on-going debate regarding the desirability of a single, overarching paradigm for the study of information systems (see, for example, [11,28]), previous examinations of the field leave little doubt that information systems research to date has been clustered around a solitary paradigm. Alavi et al. [29] reviewed 792 articles published over 20 years in major MIS journals. Their conclusion: "Almost all of the research methodologies employed in the articles included in the study can be characterized as traditional methodologies patterned after research in the natural sciences" (p. 369). Orlikowski and Baroudi [23], in an analysis of published research over a five year period (January 1983–May 1988) from four major sources (*Communications of the ACM, Proceedings of the International Conference on Information Systems, MIS Quarterly*, and *Management Science*), went a step farther and determined that "while no one topic area or theory dominates information systems research, there clearly is a prevailing set of assumptions about what constitutes acceptable information systems research" (p. 6). Walsham [38] extended Orlikowski and Baroudi's work to include the period from January 1992 to July 1993, using their classification scheme but expanding his review to include European journals. He also dropped *Management Science* and added *Information Systems Research* to attain a more accurate selection of mainstream IS journals. Walsham's findings second Orlikowski and Baroudi's, even though Walsham is somewhat more optimistic about a possible trend

towards the greater acceptance of alternative research perspectives in the IS field. Although the proportion of positivist to non-positivist articles varies somewhat from study to study, the indisputable consensus is that positivism dominates information systems research. This is graphically represented in terms of Burrell and Morgan's four paradigms in Fig. 2.

5. Barriers to change

It is apparent that the vast majority of information systems research is done from a positivist perspective. But why is this so? It may be instructive to cast the answer in terms of a similar debate in the field of organization theory. Parallels between the fields of information systems and organization theory are striking [28,31]. In their early stages (and to a certain extent still today) both attracted researchers with varying backgrounds. Research streams in both fields often appear unrelated. Both utilize a variety of methodologies. Both draw on closely related referent fields, especially psychology and sociology (among others). Research, by and large, in both fields has been dominated by a positivist perspective [31,77,78].[4] It seems as if the field of information systems is, to a certain extent, undergoing the same growth pains organization theory has already encountered. Consequently, information systems researchers can gain some insight from the experiences of their cousins in the field of organization theory.

Stern and Barley [78] have identified four sets of circumstances which constrain theorists from adopting alternative perspectives: the milieu in which the field is based; the field's search for respectability; difficulties in boundary setting within the field; and the social constructions which govern academic careers. To these we could add one more: the perceived lack of palatable alternatives.

5.1. Social milieu

Organizational studies grew out of a movement by those interested in the field to establish an identity that would differentiate them from sociologists and managerial theorists. In searching for a home for this emerging field, organizational theorists noted a precedent in many business schools, where organizational behavior programs had been spun off from the area of management science (i.e., operations management and research). Consequently, by the 1980s a number of organizational researchers, regardless of whether their background was in sociology, psychology, or management theory, had set up camp in business schools. With this migration, however, came associated press-

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[4] Although as will be shown in the section 'Breaking the Mold', this is starting to change.

ures. Existing disciplines in business schools (e.g., accounting, finance, management science) were based in a relatively positivist tradition. Students called for pragmatic relevance and applicability to their future careers. External constituents of business schools, which provided funding and research opportunities, were likewise grounded in the "real world". The net effect of the business school milieu was to nudge organizational studies towards the southeast corner of the Burrell and Morgan framework — the functionalist paradigm [78].

In a like vein, early IS researchers came from a number of different backgrounds. In the case of IS, however, this included the computer science and engineering fields, two so-called "hard" disciplines. This is reflected by the large number of early IS papers dealing with technical issues [34]. Information systems researchers also gravitated towards business schools. The business school tendency towards positivism, combined with the functionalist influence of computer scientists and engineers, helped anchor information systems research in the functionalist paradigm.

5.2. Search for respectability

As a young and emergent field, there was a strong inclination on the part of researchers in organizational studies to mirror the practices of more established fields, especially the "hard" sciences [79]. This was also true of information systems, with its reliance on referent fields in its early quest for legitimacy. "The quickest way to acceptance and stability seemed to be compliance with the culture and research norms of reference disciplines" [11, pp. 390–391]. However, the models of science selected for emulation by IS researchers were generally those based on an objective and rational view of reality [11,47]. As a result, the field's search for respectability became firmly grounded in the functionalist paradigm.

5.3. Problematic boundary setting

The role of organizations has changed substantially since the 1950s. Mergers, acquisitions, and globalization have resulted in organizations that transcend regional and even national boundaries. Interorganizational relationships and networks further blur the lines between "traditional" organizations and today's entities. Organizations have become increasingly complex and pervasive, yet at the some time more amorphous. The boundaries of the field and the phenomena of interest are shifting and expanding, causing theoretical and empirical difficulties [78]. As organizations and their environment evolve and became more complex, many researchers chose to

focus on a smaller set of variables, and to fix or isolate those variables, "as opposed to (studying) systems of interrelationships among clusters of variables" [79, p. 240]. Researchers found they could enhance or protect their reputations by narrowing the scope of the problems they investigated [78]. Kuhn [57] best describes the reasoning behind this choice:

> Under normal science conditions the research scientist is not an innovator but a solver of puzzles, and the puzzles upon which he concentrates are just those which he believes can be stated and solved within the existing scientific tradition

The applicability of this to IS is obvious. Similar to the growth and transformation of organizations, information systems have become widespread and pervasive in all aspects of organizations and society. Boundaries in the IS field, never very well defined, are becoming even more indeterminate. IS researchers with positivist leanings are in a quandary. The phenomena of interest they are trying to study is enlarging and evolving. It will not hold still long enough for them to measure it. Metaphorically speaking, it is like trying to nail Jell-O to a wall. To combat this sense of turmoil, they seek solace in a frame of reference where they feel comfortable and in control — functionalism. Another way to look at this is to apply Kaplan's Law of the Instrument: "Give a small boy a hammer, and he will find that everything he encounters needs pounding. It comes as no particular surprise to discover that a scientist formulates problems in a way which requires for their solution just those techniques in which he himself is especially skilled" [80, p. 28].

5.4. Social construction of academic careers

Closely tied to the issue of respectability as a field is the individual quest of the field's members for academic respectability. In order to first, gain tenure, and second, build a reputation, one must publish in the more established and well-regarded journals. Commentators in both the organizational studies and information systems fields have noted that one consequence of the "publish or perish" imperative is that newcomers, in order to improve their chances of acceptance by a "high quality" journal, tend to follow the path of those who have previously had success [38,47,75,78]. Since, as previously discussed, pioneers in the information systems field based their work on objective foundations, the effect was to reconfirm positivism as the underlying philosophy of practically all the papers published in mainstream information systems journals, at least in the US [23,38].

There are two other factors that reinforce this "publish positivism or perish" mindset. One is the nature of

objective research. According to Walsham [38], in contrast to the interpretive approach, positivist methods are usually less time consuming. A researcher can complete more studies in less time using empirical techniques, and thus improve his or her chances of publication. The second factor is the socialization of newcomers to the field. Although one could argue that, after tenure, scholars are free to adopt alternative research philosophies, it is unlikely that they will abandon the approach that has enabled them to achieve tenure, for two reasons. One, their future success remains dependent on, or at least strongly influenced by, adhering to the values of the established orthodoxy, which controls access to refereed journals, research opportunities, funding, and further promotions and academic appointments [23,75]. This tends to admit those who have a shared paradigmatic perspective with the gatekeepers, while excluding others [47,78]. Two, by this point in his or her career a particular set of assumptions has become ingrained in the individual. For a researcher to migrate from one frame of reference to another is tantamount to a religious conversion: it happens, but is so unusual an event as to be "heralded... in the literature, in that the theorist is usually welcomed by those whom he has joined and often disowned by his former paradigm colleagues" [54, p. 25].

5.5. Unpalatable alternatives

Through the process of accepting papers for publication, referees and journal editors have achieved a position of influence and leadership. As has previously been shown, the vast majority of these individuals have strong functionalist leanings. If one accepts Burrell and Morgan's premise of paradigm incommensurability, then the only alternative to positivism is some form of anti-positivism. Making this shift would amount to a tacit admission by an individual that his or her prior efforts were misguided. His status would change from a leader of the "mainstream navigators" to a camp follower of the "knights of change" [47].

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[5] This is not intended as a blanket indictment of referees and editors, but rather as an acknowledgement of human nature. Most of us find it difficult to grant credence to radically opposing viewpoints, much less switch our allegiance to them. However, there has been a trend towards methodological pluralism in IS journals [38], and those individuals who have demonstrated receptivity towards research outside the functionalist domain are to be commended. Nevertheless, the overall state of affairs remains such that research in the positivist mode is generally accepted without questioning its philosophical underpinnings, while non-positivist researchers must still justify their assumptions and approaches [38].

While there may be some referees and journal editors open-minded and non-egotistical enough to contemplate such an alternative, very few have actually done so.[5] Similarly, for functionalists, moving northward on the regulation — radical change dimension would be akin to opening the city gates to a horde of barbarians: anarchy would reign. A mind conditioned to stability and consensus has difficulty accepting change and conflict. Given these unpalatable alternatives, it is not surprising that paradigmatic conversions remain rare.

6. Breaking the mold

Notwithstanding the barriers to breaking out of the functionalist mold, a growing number of scholars argue that the dominance of a single perspective results in a narrow view that does not fully reflect the multifaceted nature of social, organizational, and phenomenological reality [e.g., 75,81,82]. There have been an increasing number of scholars advocating the application of multiple methods, theories, and philosophical approaches to information systems research [23,38,47–50,53]. Proponents of this viewpoint argue that a single research perspective limits, distorts, or even obscures our view of relationships between information systems, people, organizations, and society.

> An exclusive view is, in our opinion, always only a partial view, and the dominance of positivism, by not acknowledging the legitimacy of other research traditions, has limited what aspects of information systems phenomena we have studied, and how we have studied them. This has implications not only for the development of theory and our understanding of information systems phenomena, but also for the practice of information systems work. The findings of information systems research filter into the practitioner community and are used as prescriptions for practice. Restricted research, thus, has far-reaching consequences. [23, p. 7]

6.1. Alternative approaches

One way to view the debate about alternative paradigms may be to view it in terms of research approaches. For example, Galliers [83] has developed a taxonomy of research approaches in the context of objective and interpretive philosophies. Galliers' definition of approaches ("a way of going about one's research", p. 329) allows us to further cast the debate in terms of methodological monism versus methodological pluralism ("a diversity of methods, theories,

even philosophies'' [47, p. 78]). By adopting this point of view, information systems researchers may be roughly divided into three different groups, each with its own outlook on paradigm appropriateness. Landry and Banville [47] have characterized these groups as mainstream navigators, unity advocates, and knights of change. The first group, *mainstream navigators*, is composed of supporters of the dominant orthodoxy. Their epistemological roots are in logical positivism, which cements them in the functionalist paradigm. The second group, *unity advocates*, is more concerned with the acceptance of information systems as a scientific discipline than with a specific paradigm. In the unity advocates' view of the world, an immature or pre-science discipline is characterized by the existence of several competing paradigms. A more desirable state, that of a full-fledged scientific discipline, is characterized by the reign of a single dominant paradigm. Since the current state of information systems research is dominated by positivism, unity advocates tend to cluster towards this end of the paradigm dimension. The third group, *knights of change*, is of the opinion that reality is multifaceted, and forged from the interpretations and interactions of individual actors. They also give credence to the belief that no single research approach can fully capture the richness and complexity of what we experience as reality. Thus they champion a manifold (some might say motley) assortment of research approaches springing forth from diverse paradigms.

Perhaps the best way to illustrate the past and current attitude towards alternative research paradigms in the information systems field is with a quote from a recent editor of *MIS Quarterly*:

> On the empirical side, we welcome research based on positivist, interpretive, or integrated approaches. Traditionally, *MIS Quarterly* has emphasized positivist research methods. Though we remain strong in our commitment to hypothesis testing and quantitative data analysis, we would like to stress our interest in research that applies interpretive techniques, such as case studies, textual analysis, ethnography, and participant/observation. [84, p. vii]

Although there are a number of ways to interpret this statement (and a number of issues that can be raised if it were to be thoroughly analyzed), one point stands out. The journal has a ''commitment'' to positivist research, but only an ''interest'' in other approaches. While some may feel that this is semantic nit-picking, we would argue that it is an accurate reflection of the general attitude towards research approaches in the IS field. There may be growing interest in interpretive research, but its reception runs the gamut from enthusiastic embracing to grudging acceptance to outright disdain.

Journals often serve as indicators of the prevailing winds of change in academia. In the IS field, it is possible to trace the emergence of interpretivism as a valid research approach through monitoring their editorial policy and contents [38]. We have already seen a quote that demonstrates how *MIS Quarterly* is opening its doors to interpretive methods. The editorial policy of *Information Systems Research* as set forth in 1990 was to publish the ''full variety'' of IS research [85]. Although interpretive research is not specifically mentioned in this or subsequent editorial remarks, ensuing editorial statements emphasize the ''significance of information technology in a broader social context'' [34] and the importance of ''diversity in our research perspectives'' [86]. These declarations bespeak of a receptivity to interpretive methods and positions. Perhaps the most broad-minded IS journal is *Accounting, Management, and Information Technologies*, with its call for ''openly interpretive and critical analysis,...histories,...(and) field research which avoids a naïve sense that one can just see, record, or report accurately'' [87]. Taken as a whole, these remarks indicate a growing tolerance, or even enthusiasm, for interpretivism.

Editorial policy statements are well and good, but what is more to the point is journal content. As was noted earlier, in 1989 Alavi et al. [29] found little evidence of interpretive methodologies in a 20-year span of MIS literature. Two years later, Orlikowski and Baroudi [23] determined that, in a five year period from 1983 to 1988, only 3.2% of articles published in mainstream US MIS journals were interpretive. In a follow-up study, Walsham [38] concluded that there is compelling evidence for the emergence of interpretivism in journal content, especially in European IS journals. In place of summarizing Walsham's work, it may be more telling to illustrate his conclusion with an example. A recent issue of *Information Systems Journal* (April 1997) consisted entirely of interpretive research. This particular issue is notable not only for the fact that all of the articles in it were interpretive, but also for the strong, even extreme, nature of the articles. The issue began with a relatively traditional example of interpretive research; case histories from Lacity and Willcocks [88] examining outsourcing in government agencies. This was followed by a participant observation study by Nandhakumar and Jones [52], which forcefully argued for much closer interaction, or engagement, between the researcher and the phenomena of interest, in this case EIS development at a large manufacturing company. Then Brooks [89] used a technique of paradigm bridging, structuration model analysis, to examine the introduction of new technology to an organization. Finally, Harvey [90] provided

a series of ethnographic field studies in powerfully arguing that IT is a masculine culture that represses feminine expression. Harvey's work is especially notable because it is an extremely rare example of research in the radical change dimension. Research of this type, whether considered critical theory or radical humanist research, it is still virtually unheard of in mainstream IS journals (but note the two counter-examples of Hirschheim and Klein [91] and Ngwe-nyama and Lee [92]). The point here is that not only is more interpretive research seeing the light of day, but that it is breaking out of the case-study stereotyping that was prevalent not so very long ago.[6]

6.2. Multiparadigm perspectives

Yet even the knights of change, with their clarion call for methodological pluralism, argue for change *within* Burrell and Morgan's four paradigms. Others argue that Burrell and Morgan's framework, by virtue of its widespread acceptance and impact, has normalized and rationalized emerging streams of research, constraining alternative perspectives.

> In time, influential frameworks can become as restraining and restrictive as those they originally challenged. ...we are sometimes presented through responses to a conceptual framework...with a new, rich set of alternative perspectives through which we can continue our study and talk about our subject matter. [82, p. 190]

Although there are a number of proposed alternatives to Burrell and Morgan [e.g., 74], we shall focus on two in particular: multiparadigm perspectives, and paradigm interplay. These concepts both question one of the pillars upon which Burrell and Morgan have based much of their argument — paradigm incommensurability.

Paradigm incommensurability is an outgrowth of Burrell and Morgan's contention that paradigms are mutually exclusive. Proponents of incommensurability argue for the separate and distinct development and application of each paradigm. They contend that the different epistemological, ontological, methodological, and sociological assumptions upon which each paradigm is based are so contradictory as to erect insur-

mountable barriers between the paradigms [93]. Opponents of incommensurability counter with arguments that, while that the central assumptions of each paradigm are indeed incompatible, the paradigm boundaries are permeable [77,94]. For example, Burrell and Morgan have categorized both symbolic interactionism and abstracted empiricism in the functionalist paradigm, while hermeneutics is placed in the interpretive paradigm. It can be argued that interactionists, with their emphasis on understanding social phenomena through an analysis of the interaction between humans and their social context, have more in common with proponents of hermeneutics ("Hermeneutics is concerned with interpreting and understanding the products of the human mind which characterize the social and cultural world" [54, p. 235]) than with abstract empiricists ("research in which the social world is treated methodologically as if it were a world of hard, concrete, tangible reality" — ibid., p. 106). This facilitates a greater flow of ideas and information between interactionists and hermeneutics advocates than between interactionists and empiricists, undermining the notion of an impenetrable barrier between paradigms. From a conceptual standpoint, multiparadigm adherents also argue that perspectives involving multiple paradigms open more windows through which to view a particular phenomenon, permitting a more comprehensive outlook.

> This stance implies that the provincialism that comes with paradigm confinement might instead be turned toward the production of more complete views of organizational phenomena via multiparadigm consideration [77, p. 587].

Multiple paradigm advocates, in general, look for limited paradigmatic détente where feasible via contradictions, tensions, and linkages inherent in the different paradigms [75]. This may be best illustrated by using the analogy of studying religion. While there may be basic differences between Islamic, Buddist, and Christian beliefs, there are nonetheless similarities as well. By comparing and contrasting the similarities and differences, the religious scholar comes to a greater understanding of each in its own light, as well as a fuller appreciation of the connections between them.

Gioia and Pitre [77] offer one thesis on how perspectives arising from different paradigms might be linked to yield a more sweeping vista of organizational phenomena. They recognize the existence of boundaries between paradigms, but unlike Burrell and Morgan, they consider the boundaries to be ill-defined. In a sense, this is an extension of Burrell and Morgan's position that each paradigm defines "a range of intellectual territory...with room for much variation within them" [54, p. 24]. If theorists can "adopt more

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[6] As mentioned earlier in this paper, the field of information systems seems to be following in the footsteps of organizational studies. In that light, the interested reader may want to peruse one of the more unusual and interesting approaches to organization theory: Jermier's " 'When the Sleeper Wakes': A Short Story Extending Themes in Radical Organization Theory" [141], and related commentary by Smircich [142].
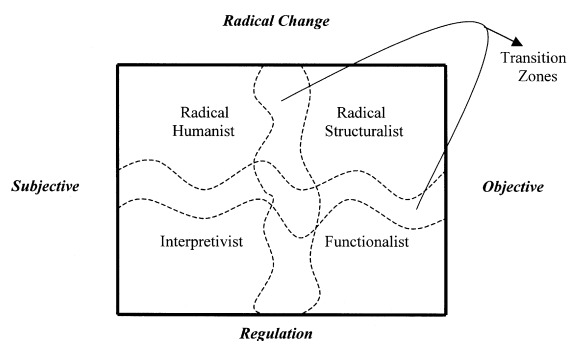
Fig. 3. Burrell and Morgan's four paradigms with transition zones.

extreme positions in terms of one or both of the two dimensions" (ibid.), it follows that the dimensions are continuums, and it becomes difficult to envision an absolute or impassable barrier dividing them. Gioia and Pitre [77] argue that this is the case; that it is "difficult, if not impossible, to establish exactly where one paradigm leaves off and another begins" (p. 592). In place of hard and fast barriers between paradigms, they posit the existence of transition zones, or intermediate regions with blurred and shifting lines of demarcation (see Fig. 3). Gioia and Pitre argue that these zones may be bridged. For example, in his work on *structuration theory* Giddens [95] rejects the dualistic nature of the objective/subjective dichotomy, arguing that subjects (people) and objects (structure) do not constitute separate realities, but rather a duality within the same reality. For Giddens, structure is simply 'memory traces in the human mind'. Structuration theory takes up a central location on the objective-subjective continuum, effectively bridging the transition zone between the two extremes. Orlikowski and Robey [96] and Orlikowski [97] draw on structuration theory to provide examples of this approach in the information systems field. In a like vein, the *critical theory* of Jurgen Habermas [98–100] may be seen in the context of bridging in that it encompasses empirical knowledge (which may be considered functionalist), hermeneutic knowledge (which may be considered interpretivist) and critical knowledge (knowledge devoted to exposing oppression and domination, or, in Burrell and Morgan's terms, radical humanism) [101]. Gioia and Pitre [77] argue that other philosophical perspectives, such as action research, some forms of Marxism and Weberian theories, and solipsism, may be seen as having a foot in more than one paradigm.

6.3. Paradigm interplay

In another approach to multiparadigm research, Schultz and Hatch [93] introduce the concept of inter-

play between paradigms. Their position is that there are three possible paradigmatic positions from which to launch multiparadigm research: paradigm incommensurability, paradigm integration, and paradigm crossing. *Paradigm incommensurability*, as mentioned, excludes any possibility of effective "joint ventures" between paradigms, making this approach moot as far as paradigm interplay is concerned. *Paradigm integration* synthesizes contributions from different paradigms in an attempt to achieve a more general model or theory. There is one major drawback to this approach. Although the paradigms may blur at the edges, they remain based on competing and irreconcilable assumptions. Advocates of paradigm integration often underestimate or overlook entirely the implications of blending concepts and arguments grounded in different paradigms while ignoring the incompatible assumptions upon which they are based. *Paradigm crossing* postulates interdependent relationships between paradigms by emphasizing interparadigmatic contrasts and connections. A researcher engaged in paradigm crossing "recognizes and confronts multiple paradigms, rather than ignoring them as in the integrationist position, or refusing to confront them as in the incommensurability position" [93, p. 533].

Schultz and Hatch [93] identified four basic approaches to paradigm crossing: *sequential, parallel, bridging*, and *interplay*. In sequential paradigm crossing the relationship between paradigms is linear and unidirectional. The results of research in one paradigm are used to inform or advance research in another. Lee [102,146] illustrated this approach in organizational studies, in which insights developed using interpretive methods were used to lay the groundwork for functional research into the same phenomena.

Parallel paradigm crossing applies different paradigms at the same time, on equal terms, to a particular problem. Examples of this are Hassard's [103] study of the British Fire Service, Martin's [104] work on organizational culture, and Lacity and Hirschheim's [105] analysis of IS outsourcing. Hassard presented four different accounts of work behavior in the British Fire Service, with each account based on a different Burrell and Morgan paradigm. Martin [104] took a multiparadigm approach to the study of dynamic organizational cultures, arguing that as organizational culture changes, viewing it from different social science perspectives yields a more comprehensive understanding of the process. Lacity and Hirschheim [105] analyzed 13 case studies using alternative multiparadigmatic lenses. Parallel paradigm crossing allows for the comparison of paradigms, but emphasizes contrasts and differences between paradigms while neglecting similarities.

Bridging as a technique of paradigm crossing is based on the work of Gioia and Pitre [77], as pre-

viously discussed. It involves the use of what Schultz and Hatch [93] term "second-order concepts" (p. 534) such as structuration, negotiated order, and organizing. By using these means of alternative social and organizational inquiry, researchers can work in transition zones between paradigms. This approach is the converse of parallel paradigm crossing. Bridging emphasizes similarities between paradigms at the expense of differences. For example, Barley [106] applied structuration theory [95] to investigate the relationship between technology and organization structure. He analyzed how the implementation of new technology, a CT scanner used as a diagnostic tool in hospitals, provided an opportunity for organizational structural change by way of altering the interaction between physicians and radiology technicians. By recognizing that the human activities of social construction which help create organizational structure are in turn influenced by the objective characteristics of the very structure thus created, Barley [106] bridged the gap between subjective and objective perspectives of the same phenomena.

Paradigm interplay simultaneously acknowledges both differences and similarities between paradigms. It permits the researcher to take advantage of cross-fertilization between paradigms by transposing contributions from studies in one paradigm into the theoretical frameworks of another. "This transposition allows the findings of one paradigm to be recontextualized and reinterpreted in such a way that they inform the research conducted within a different paradigm" [93, p. 535]. Paradigm interplay utilizes a mind-set of *both–and* instead of *either–or* to produce a new state of awareness. This is done in two steps. First, the researcher focuses on three sets of contrasts and connections between paradigms: generality/contextuality; clarity/ambiguity; and stability/instability. After identifying and probing these contrasts and connections in relation to the research question(s), the next step is to move between paradigms by exploring the implications of the contrasts and connections in terms of one another on opposing dimensions. According to Schultz and Hatch, this "transforms the paradigm debate from war...into a much more fluid or nomadic situation, where a shifting number of positions and researchers interact" (p. 552). Although Orlikowski and Robey [96] do not explicitly refer to their work as paradigm interplay, their research into the relationship between information technology and organizations may serve as an example. They constructed a theoretical framework that focuses on the interaction between the objective and subjective dimensions of social reality, arguing that information technology is "...physically and socially constructed by subjective human action, while (it is) also objectified and reified through institutionalization" (p. 164). By bringing to light the interchanges between ongoing human actions, social processes, contexts, and organizational properties, Orlikowski and Robey provide an alternative to researchers uncomfortable with the either/or choice between objectivism and subjectivism.

7. The end of the paradigm wars — the rise of pragmatism

Paradigm warriors have been characterized as mainstream navigators, unity advocates, and knights of change [31]. However, a new group is emerging which is calling for an end to the paradigm wars — the pacifists. These theorists and researchers argue that there are strengths and weaknesses in both the positivist and anti-positivist positions, and point out that the conflicting paradigms have, in spite of the best efforts of their most ardent supporters, achieved a state of coexistence [71]. Datta [107] has presented five compelling arguments in support of this assertion.

1. Both paradigms have been in use for a number of years.
2. There are a considerable (and growing) number of scholars arguing for the use of multiple paradigms and methods.
3. Funding agencies support research in both paradigms.
4. Both paradigms have had an influence on various policies.
5. Much has been learned via each paradigm.

This paradigmatic coexistence, or détente, has abetted the emergence of a fresh perspective on research. This viewpoint, grounded in the philosophical school known as *pragmatism*, is based on the proposition that researchers should use "whatever philosophical and/or methodological approach (that) works best for the particular research program under study" [71, p. 5]. While a full examination of pragmatism is beyond the scope of this article, a brief overview will help clarify its appeal as an alternative approach to information systems research.

Pragmatism has its roots in the work of late 19th and early 20th century scholars and philosophers William James, C. S. Pierce, John Dewey, and Oliver Wendell Holmes, and contemporary philosophers such as Richard Rorty and Donald Davidson [108]. It represents a distinctively American approach to philosophy, and as such has met with a lukewarm reception by European scholars, possibly due to its emphasis on "what works" while abstaining from the use of metaphysical concepts such as "Truth" and "Reality" which have led to much discussion and debate that, however enjoyable, has arguably

produced little in the way of research results [71]. In a nutshell, the overriding issue for pragmatists is whether or not something, be it philosophical assumptions, methodology, or information, is useful — useful in the sense that the something in question is instrumental in producing desired or anticipated results. However, it is important to understand that the pragmatists' use of the term "useful" is *not* the same as utilitarian. Pragmatists infuse "useful" with value, but the value is dependent on the researcher's beliefs and interpretation of the relevance and importance "of a set of ideas as defined by their purposes and those shared by their community" [148, p. 129]. In a research setting, pragmatists place the research question above such considerations as methodology or the underlying worldview [71]. A fuller understanding of this concept may be facilitated by a comparison of some fundamental assumptions of pragmatism to those of positivism and anti-positivism.

Assumptions concerning what forms the basis for "legitimate" research help create the conceptual framework within which a scholar operates. To help differentiate pragmatism from positivism and anti-positivism, we shall focus on three of these assumptions: ontology (the nature of reality); epistemology (the acquisition of knowledge); and axiology (the role of values in research).

As noted earlier in the paper, positivists argue that there is an external, objective reality that exists independent of the individual. Anti-positivists counter that reality is equivocal, that each individual uniquely interprets it. Pragmatists take the position that there is an objective reality, existing externally to the individual. However, this reality is grounded in the environment and experience of each individual, and can only be imperfectly understood. The choice of one version of reality over another by a researcher is governed by how well that choice results in anticipated or desired outcomes [71]. For example, upon observing an object consisting of a flat surface supported by four legs, a positivist would define it as a table, no matter how it was being used. An anti-positivist would define the object based on his or her individual perspective: if he were eating off it, it would be a table; if he were sitting on it, it would be a bench; if he were standing on it, it would be a platform, and so forth. A pragmatist would define the object based on what use it was to him. If he intended to eat, it would be a table. If he intended to sit on it, it would be a bench. If he intended to stand on it, it would be a platform. The crucial difference is that the object is not defined in terms of what it is or how it was or is being used, but rather by how it helps the pragmatist achieve his purpose.

In a like vein, positivists believe that knowledge is objective, and is acquired by examining empirical evidence and testing hypotheses to uncover general or fundamental laws. By contrast, anti-positivists believe knowledge is relative and reality is too complex to be "known" by a single perspective. Pragmatists fall somewhere in between positivists and anti-positivists. They view the process of acquiring knowledge as a continuum, rather than as two opposing and mutually exclusive poles of objectivity and subjectivity. This allows the pragmatist to select the approach and methodology most suited to a particular research question, providing a conceptual foundation for the use of both quantitative and qualitative tools.[7]

Positivists believe research is (or should be) value-free: "Researchers stand as neutral observers, using scientific techniques that allow them to get beyond human biases so that they can make contact with 'reality' and document facts" [148, p. 125]. Positivists typically go to great lengths to minimize their personal values and theoretical leanings and to ensure the internal and external validity of their work, as exemplified by the wide acceptance and use of the principles

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[7] To some extent, it is tempting to draw a parallel between pragmatism and the scientific realism of Bhaskar [143]. For Bhaskar, scientific realism is more than an ontological stance in that it adopts a particular epistemology as well. His version of scientific realism agrees with Kuhn that knowledge is a social and historical product. The task of science is to invent theories that aim to represent the world. In this way, science generates its own rational criteria that determine which theories are to be accepted or rejected. Crucially, it is possible for these criteria to be rational precisely because there is a world that exists independently of our cognizant experience [144]. The theories which result from these rational criteria may be wrong, since they are based on the known world rather than the world itself. But nonetheless, they are what the community agrees on and is based on a community standard of what constitutes "valid" or "believable" knowledge claims. According to Bhaskar [143], it is our knowledge of the world that is circular; the world itself exists, and we experience perceptions of that world. The goal of science is to build sophisticated models using rational criteria to represent the world. As already mentioned, the models represent only what we know of the world and this knowledge is inherently flawed; but as we build successive models we may improve our representation. By making use of cognitive materials and operating under the control of something like a logic of analogy or metaphor, we can postulate a model. We do not believe that the model exactly duplicates the world; but, if this model were to exist and act in the way specified, then it allows us to account for observed phenomena. Lastly, Bhaskar notes that models are composed of abstractions and are untruthful, by definition, since they oversimplify. The greater the level of abstraction, the more this is so since they move further from empirical phenomena and oversimplify by grouping lower level abstractions.

and methods set forth by Cook and Campbell [110]. Anti-positivists, on the other hand, view research as bound by the values of the researcher. They readily acknowledge their biases and subjectivity, arguing that the alternate perspectives generated by this approach offer a more accurate reflection of a complex and multi-faceted reality. Pragmatists once again take a middle position. They cheerfully concede that an individual's values play a significant role in research, but believe that the positivist zeal for objectivity is misspent time and effort in attempting to attain the unattainable [71]. Similarly, pragmatists see the anti-positivists relativistic approach as problematic due to its notion that all insights, perspectives, and values are equally valid [109]. To a pragmatist, values are relevant and important only insofar as they influence what to study and how to do so.

> Thus, pragmatists decide what they want to research, guided by their personal value systems; that is, they study what they think is important to study. They then study the topic in a way that is congruent with their value system, including variables and units of analysis that they feel are most appropriate for finding an answer to their research question. [71, p. 26]

It should not be taken from the preceding, however, that pragmatism espouses an anything-goes approach to research. On the contrary, pragmatism offers a welcome opportunity to improve the rigor and relevance of IS research. Pragmatism recognizes the importance of theory as a means of explaining and predicting phenomena, while subjecting it to the test of practice and time in order to determine its usefulness or value [109]. Similarly, regardless of what particular methodology is selected, the standards of scholarly rigor and thoroughness are still applicable.

8. Implications of pragmatism for information systems research

To summarize in metaphorical terms, positivism may be viewed as an orchestra. There is one common score, with clear-cut and well-defined roles and expectations for each musician. Anti-positivism might be likened to a solo performer, free to select and interpret a piece of music according to his or her own preferences. Pragmatism, then, is a jazz ensemble, with each performer having a certain amount of freedom within a general but loosely-defined framework. It offers a very practical basis for research that has great appeal to an applied field such as IS: "Study what interests and is of value to you, study it in the different ways that you deem appropriate, and use the results in ways

that can bring about positive consequences within your value system" [71, p. 30].

One example of this approach in the IS field may be seen in Gable's [111] use of both qualitative and quantitative methods to study IS consultant engagement success factors. By integrating case study and survey data, as opposed to using case data to feed the survey process, Gable was able to develop a contextual richness characteristic of ideographic research, while at the same time triangulating the results to improve the study's validity. Although Gable refers to this as multi-method, his emphasis on the research objectives and call for tolerance of methodological pluralism clearly falls within the spirit of pragmatism. More recently, King and Applegate [45], while not explicitly mentioning pragmatism, echo its underlying doctrine:

> We use the methods that work for us, nothing more and nothing less. We are not wedded to these methods, but to the insights they can uncover and the understandings they can afford us. We use them until they no longer provide benefit, and then we either switch methods or move on to other topics...

The rising acceptance within the IS field of alternate research methods and paradigms is earnestly welcome. It signifies a growing maturity of the field and its constituents. However, the use of multiple research methods does not necessarily indicate the researcher is approaching the question from multiple paradigms. To truly reflect a multi-faceted reality, methodological pluralism must have a philosophical foundation that embraces a pluralistic perspective. Otherwise the use of multiple methods within a single paradigm will still only result in a unidimensional view of the rich and varied tapestry called reality.

As we have argued, pragmatism undercuts the traditional dichotomistic warfare between conflicting paradigms by providing a philosophical basis grounded in pluralism [112]. Through its position that there are multiple concepts, interpretations, and classificatory formats of a phenomenon, pragmatism facilitates the construction of meaningful bridges and interplay between conflicting paradigms [109]. This is illustrated by the recent attention pragmatism is receiving as a philosophical foundation for futures studies [113], the study of business ethics [109,112], and organization studies [109].

What does this growing acceptance of pragmatism as a philosophical basis for academic research mean to the IS field? If, as some claim, the paradigm wars are over, what are the next steps in the evolution of IS research? One insight might be found in Markus' address to the 1997 International Federation for Information Processing (IFIP) conference. She argued that

one of the directions the field should now take is "the appreciation of practicality in IS research" [33, p. 18]. The intent of what she terms practical research is not to replace or overshadow research that builds or tests academic theory, but rather to complement theoretical research with "rigorous research that describes and evaluates what is going on in practice" [33, p. 18]. This is underscored by the 1997 International Conference on Information Systems (ICIS), with its emphasis on "the issue of relevance and relationship of IS research to practice" [114, p. xvii]. More recently, *MIS Quarterly* announced a renewed thrust aimed "at better imbuing rigorous research with the element of relevance to managers, consultants, and other practitioners" [102, p. viii]. The discussions presented by Benbasat and Zmud [115], Applegate and King [116], Lyytinen [117], and Lee [118] support this thrust. Pragmatism provides an attractive approach to meet these calls for increased interplay between research and practice. For example, pragmatism is suggested as a philosophical basis for the synergistic combination of consulting and academic research in IS [119]. Davenport and Markus [120], in like fashion, note the value of consulting and academic research learning from each other. Similarly, although not overtly referred to, Avison et al.'s [39] advocacy for greater use of action research to make IS academic research more relevant to practitioners endorses the tenets of pragmatism.

9. Conclusions

As has been suggested in the paper, there is considerable evidence to support the case that paradigmatic dominance has occurred in the short span of the evolution of IS. In a classical article Dickson [9] noted that the "genesis" of the IS concept can be linked to decision making and "viewing the management process as a cybernetic control system within the organization, relying heavily upon the computer as the control mechanism" (p. 6). Several more recent articles note that this control notion is still predominant in IS research [121–124]. This is hardly surprising when one considers that the one dominant paradigm guiding IS research, namely functionalism, embracing the so-called 'scientific method', favors control over interpretation and emancipation. Parenthetically, it can be noted that the idea that IS can contribute to better organizational control has become a cornerstone of Western management ideology [24,125,126]. It also underlies the research on IT for competitive advantage [127–129]. But whilst the preeminence of functionalism has been the case historically, need it continue in the future?

It is our belief that paradigmatic unity (or more specifically, paradigmatic dominance) is fundamentally undesirable. It is done at the expense of constraining the domain of inquiry by taking one viewpoint and construing all others through its lens. This we argue leads to a reduction in the variety of research approaches and limits their potential cross-fertilization. Instead, paradigmatic pluralism is needed. Indeed, paradigmatic pluralism should not simply be tolerated, but a goal the IS community should strive for.

Paradigmatic pluralism's strength is its recognition of the intrinsic diversity of problem formulations faced by the community of IS researchers. There are communities and sub-communities addressing rich and varied problems. We believe the next step is to intensify the interactions between these sub-communities because no one community has a privileged position over the others nor is always superior in its problem solving capabilities. (Indeed, to be consistent with the pragmatist position, one might sensibly argue that the final verdict ought to rest with the practitioner community which relies on the outcomes of IS research.) Instead, the credibility of the IS research community as a whole rests on its competence in handling diverse problems, in its ability to solve problems in the sense of generating successful IS solutions. This necessitates that different research communities recognize one another and interrelate their research outputs. IS researchers should exhibit more tolerance towards adherents of different research orientations. This includes the claim for equitable distribution of research resources among adherents of different traditions. Several institutional arrangements can serve this end. For example, tenure and promotion committee compositions should reflect competencies in a variety of research traditions, thus leading to more favorable decisions for those engaging in non-traditional research. Publication policies should not only reflect the pluralistic nature of the field but encourage research that interrelates different IS problem solving capabilities. In some specialties such as Computer Supported Cooperative Work this has already occurred [cf. 130–132]. It can also be seen in the publication decisions of some major research journals, for example, *ACM Transactions on (Office) Information Systems*' special issue on the Language Action View (April 1988) and *MISQ*'s special issue on Intensive Research (March 1999); conferences such as IFIP WG8.2's conferences on "Information Systems Research: A Dubious Science?" [49] and "The Information Systems Research Arena for the 90's" [50], "Information Systems and Qualitative Research" [48], the Software Engineering Conference on 'Reality Construction' [133]; specific papers such as Hirschheim and Klein's [76] paradigmatic analysis of information systems development, Cooper's [134] review of the IS research literature, Iivari's [135] analysis of seven contemporary IS schools, Orlikowski and Baroudi's [23] article on IS research traditions, and Iivari et al.'s.

[136] paradigmatic review of five 'contrasting' ISD approaches; and even on the web [45].

Publication policy changes are starting to become visible. Whilst the major IS research journals such as *Communications of the ACM, Management Science, MIS Quarterly, Information Systems Research, Journal of Management Information Systems*, and *Decision Science* have traditionally published mostly functionalist IS research, there has been an increasing number of non-functionalist pieces beginning to appear [e.g., 38,91,92,137–139]. One can also see the emergence of journals which have specifically recognized the need to publish scholarly pieces that are not necessarily informed by the functionalist paradigm: e.g. *Accounting, Management and Information Technologies*; *Scandinavian Journal of Information Systems*; *Information Systems Journal*; *Information Technology and People*; and *European Journal of Information Systems*. Note though how these journals are all very new (none of them is older than 1990). This shows that research communities addressing problems within different paradigms have developed enough of a critical mass to make their knowledge claims acceptable to a wider audience, but this is a relatively recent phenomenon.

Another positive sign is that the academic credibility of scholars within the field is not as interwoven with their choice of methods and perspectives as it once was. This new and refreshing openness is reflected in the growing number of alternative research works appearing in mainstream IS journals as was noted above. This in turn reflects the intent of many influential leaders in the IS field to truly let "many flowers bloom".

However, to continue with the metaphor, this is not to say that everything is coming up roses. Pressures still exist for "…quick and dirty, close to market output, both in teaching and research. This should keep functionalism alive and kicking…" [75, p. 706]. Researchers are unlikely to fully reorient themselves until criteria for tenure and promotion become more focused on diversity and quality of publications, and less focused on quantity. An individual academic institution is unlikely to change tenure criteria until other schools do the same. Breaking this logjam will most likely require collective action, or at least an initiative by top-ranked universities [78], neither of which is certain. What is more likely is that the trend towards greater acceptance of non-traditional research will gradually grow from a trickle to a respectable stream.

Yet in the long run, what is important is not so much the methods or paradigmatic groundings of scholars, but their ideas [78]. For example, Izak Benbasat is cited in the information systems literature not for his skill in multivariate statistics, but for his ideas on the adoption and impact of technology on individual behavior. Wanda Orlikowski is recognized not for her case study research methods, but for her ideas on organizational use of technology. Methods and perspectives are important. They provide standards on which to judge the rigor and relevance of a piece of research. But they are secondary to the contributions of ideas. This is where the true value of research diversity becomes apparent. To revisit the metaphor of "many flowers blooming", the seeds from which the flowers spring are the various and sundry research methods and philosophies intrinsic to the information systems field. The more these seeds are nurtured, the more flowers we will see.

Acknowledgements

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