INFORMATION SYSTEMS DIVERSITY: METAPHOR, MEANING AND MYTH

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Abstract

Diversity pervades our lives being both a salient feature of the world around us and an unavoidable characteristic of the human endeavor. In the IS discipline there have been great discussions over the many issues stemming from diversity in our research. However, much of the discussion has overlooked the more fundamental issue of research diversity itself. This paper contributes to current understandings of research diversity by making research diversity the prime focus. Theoretically, it looks at diversity through the alternative lens of concepts. Empirically, it explores the conceptual diversity of the organization – a key disciplinary concept. Grounded in Lakoff and Johnson's (1980) work with metaphors, the results show that the discipline's research may not be as diverse as initially thought. Of the three primary views of the organization; machine, organism and culture – the study finds a distinct bias toward conceptualizing the organization as a machine.

Keywords: Diversity, concepts, metaphor, myth

Introduction

The Information Systems (IS) discipline was conceived in the 1960's (Hirschheim and Klein 2003). Born of multiple parents that were "significantly different and partly incommensurate" (Swanson and Ramiller 1993 p.1), its rite of passage has not been easy. The hybrid nature of the discipline has added a whole new dimension of complexity to the normal disciplinary growing pains. This complexity is manifest in continual feelings of inadequacy (Lyytinen and King 2004) and the search for an authentic identity (Robey 2003), as well as the need to feel legitimate, valued and respected (Benbasat and Zmud 2003). Due to the variety and number of informing disciplines in the IS field, the scope and range of IS research has been the source of much interest within its own, and other, research communities. One study, conducted by Swanson and Ramiller (1993), identified eight thematic areas from a total of 397 articles submitted to the *Information Systems Research* (ISR) journal in a five-year period. The researchers urged the IS community to reflect on whether these outcomes showed a sufficient diversity in the field. Furthermore, they encouraged community discourse concerning the nature and proper direction of the field. From the debate that followed, evident in the literature, it appears they were successful on both counts.

Commentaries presented by both Benbasat and Weber (1996) and Robey (1996) interpreted Swanson and Ramiller's (1993) results as a clear indication that diversity in the IS field was alive and well. They argued this case on the basis that diversity existed in the three key areas of research problems, theoretical foundations, and methods. Diversity was both the "reality and the accepted norm" (Benbasat and Weber 1996 p.389). In 2003 both the *Communications of the AIS* (CAIS) and the *Journal of the AIS* (JAIS) devoted special sections to debate on central issues that stemmed from this assumption of diversity. This resulted in at least five articles in the JAIS (DeSanctis 2003; Galliers 2003; Hirschheim and Klein 2003; Lyytinen and King 2004; Robey 1996) and an initial ten part series in the CAIS that could be directly traced to the diversity debate. More recently, with the ICIS 2007 conference dedicating their conference theme to "Diversity in IS research and practice" shows that the issue of diversity is as topical today as it was more than a decade ago.

Despite all of this discussion over issues stemming from diversity in IS research there has been little attention paid to the more fundamental issue of research diversity. This paper contributes both theoretically and empirically to current understandings of research diversity by making diversity the direct focus of study. Theoretically, it provides an alternative to the current understanding of research diversity by looking at diversity through the lens of concepts. Empirically, it explores the conceptual diversity of one of the discipline's prime areas of interest - the organization. Grounded in Lakoff and Johnson's (1980) work with metaphors, the results show that we may not be as diverse in our research as the above discussions might lead us to believe. Of the three primary ways of viewing the organization; organization as machine, organization as organism and organization as culture – it finds a distinct bias toward conceptualizing the organization as a machine.

Diversity

The issue of research diversity has certainly resulted in a great deal of soul-searching for those in the IS field. For instance, it has forced us to ask complex and at times troubling questions concerning our disciplinary identity: Who are we? What do we do? And why should anyone care? Benbasat and Zmud (2003) were the first to raise these types of questions in relation to what they referred to as the "identity crisis" (p.183) of the discipline. They believed that due to the diverse set of topics IS scholars researched and taught, the discipline's central identity was being made all too ambiguous and that if the problem was left unattended it would threaten the viability of the IS discipline as a whole. The IS community was swift in their response to Benbasat and Zmud's (2003) call for action. At the next ICIS conference in Barcelona the president of the AIS, Phillip Ein-Dor, chaired a meeting to discuss these and other related matters. Additionally, Alter responded to the call by writing his own response to Benbasat and Zmud (2003). After submitting it initially to MISQ he decided instead to submit it to the CAIS. This was due to MISQ's time and length restrictions which Alter believed "interrupt[ed] rather than promot[ed] serious discussion" (Gray 2003 p.2). The editor at the time, Paul Gray, accepted the article in full. Furthermore, he agreed that the issue of identity – stemming from diversity - was so important to the IS community that it warranted further investigation and invited all associate editors of CAIS to contribute a think piece. Moreover, the CAIS introduced a special section in its journal devoted to the "debate on what the core of IS should be" (Gray 2003 p.1). And so started the "wave of discussion within the IS field" (Gray 2003 p.1) not only over matters of identity but many other

related issues such as practice (what we do) and relevance (who cares?) stemming from the central issue of research diversity.

As a discipline it could be argued that we have shown a certain amount of intellectual maturity (Deleuze and Guattari 1996) by broaching the above issues stemming from the diversity inherent in our research. However, it appears we have missed a more fundamental issue; that is, our understanding of research diversity remains virtually unexplored. The only known theoretical exploration is the one provided by Benbasat and Weber (1996). They state that research diversity can be recognized in three main ways: through the diversity in the problems addressed; the diversity in the theoretical foundations and reference disciplines used to account for IS phenomena; and the diversity in the methods used to collect, analyze and interpret data. This same framework has been relied on as a testament to the diversity in our research. However, this understanding overlooks the question of how diversity of research is defined at a more fundamental level. This study attempts to address this critical oversight by exploring the issue of diversity at deeper conceptual level.

Prior Studies in Information Systems

A number of meta-analyses of the research conducted in the IS discipline have also been used to form conclusions about the levels of diversity in research. However, there are very few empirical studies that have focused directly on the issue of research diversity. The only known study to do so was conducted by Vessey et al. (2002). This study built on the understandings of research diversity provided by Benbasat and Weber (1996) and added two further characteristics: research approach and research method. In their study they found what they believed to be a "considerable diversity in each of the key characteristics" (Vessey et al. 2002 p.129). Therefore, Vessey et al. (2002) confirmed the original observation made by Benbasat and Weber (1996) that diversity in research was both the "reality and the accepted norm" (p.389).

Like Vessey et al. (2002) this study seeks to address the paucity of empirical studies by addressing the issue of research diversity directly. Therefore, it asks the same broad research question, "How diverse is IS research?" (Vessey et al. 2002 p.131). However, this study departs from the study conducted by Vessey et al. (2002) in that it uses an alternative lens with which to view research diversity. That is, it looks at the fundamental level of concepts to gain insight. Furthermore, the study is exploratory and descriptive and so does not seek to provide an exhaustive nor comprehensive account of the discipline. Therefore, where Vessey et al. (2002) look at research diversity from a broader perspective this study makes its contribution by looking at the same issue at a deeper conceptual level.

Related Studies in Organizational Science

While not strictly looking at diversity per se, some within the organizational science area have found what they believe to be a conceptual bias in their discipline. While there are no known empirical studies to back up their assertions there certainly appears to be a great deal of theoretical work combined with anecdotal evidence to suggest that such a bias does indeed exist (Adams and Ingersoll 1985). Furthermore, this conceptual bias exists at the level of organizations, their key object of interest both in research and in practice. The rationale is based on the idea that organizations can be conceptualized using three primary or root metaphors (Schultz 1995). Note that while Morgan (1997) offers a total of eight metaphors Alvesson (1993), Schultz (1995) and Smircich (1985) contend that only three of these metaphors are primary ways of understanding organizations. These three metaphors are the organization as machine, organization as organism and organization as culture and are responsible for highlighting very different aspects of the organization. The machine metaphor views the organization as being a rational entity where attributes such as efficiency and effectiveness are critical. The organism metaphor views the organization as being driven primarily by the need to survive and adapt to its environment. The culture metaphor highlights the symbolic attributes of the organization. Each of these metaphors provides a very different view of the organization.

One of the key criticisms of some within the Organizational Science area is that there is an overemphasis on the machine and organism metaphors both in research and in practice. By focusing on these metaphors the view of the organization as a rational, stable and purpose driven entity completely dominates any research or practice that occurs within the discipline. In concentrating on these metaphors in preference to the culture metaphor a lack of diversity – at least in theory - at the most fundamental level is revealed.

This study builds on the foundational work of organizational science researchers by choosing to focus on the organization – a concept of mutual interest - as the single unit of analysis. It also relies on the prime assertion that

the metaphors of organization as machine, organization as organism and organization as culture are all equally important to our conceptualizations of organizations.

Theoretical foundations

"Concepts are the glue that holds our mental world together." (Murphy 2002 p.1). Being able to recognize a particular object or understand certain events is made possible only through our reliance on concepts. However, we are so utterly dependent on our concepts they have become ubiquitous and "almost invisible to consciousness" (Fauconnier and Turner 2002 p.v). So if we are largely unaware of our concepts how is it possible to uncover them in order to look at the diversity of our research at a deeper level? Fauconnier and Turner (2002) assert that our underlying concepts are made visible through language. Therefore language, both written and spoken, is an important evidentiary source for uncovering the hidden concepts stored in our minds. Lakoff and Johnson (1980) have built on the work of Fauconnier and Turner stating that our whole underlying conceptual system is "fundamentally metaphorical in nature" (Lakoff and Johnson 1980 p.3). Johnson (2005) prescribes the Critical Metaphor Analysis approach for uncovering what our concepts look like. This approach is based on two theories: critical discourse analysis and metaphor theory. The following sections provide further detail on these theories and how this particular study relies on them.

Critical Discourse Analysis

Research is an inherently social activity and as such is accompanied by much talking and writing, i.e. discourse. Therefore, in order to uncover the diversity of the underlying concepts in our research it is necessary to look at the associated discourse of the IS discipline. Like Johnson's (2005) analysis this study goes beyond the purely structural characteristics of discourse by looking at the social environment in which discourse is produced. This type of analysis – called a critical discourse analysis - recognizes that while structural characteristics of discourse are important the social environment in which they are produced is equally important. By employing a critical discourse analysis approach the analyst is not limited to performing a structural analysis, that is of "...the surface structures and meanings of [isolated, abstract] sentences" (Van Dijk 1997 p.99). They can go further to explore any context – social, cultural, historical or political - that will illuminate the meaning of their study object/s. Therefore, critical discourse analysis is employed in this study as a means of attaining a richer and more complete understanding of diversity in IS research.

While discourse analysis is primarily understood as a method, it is also embedded within a larger theoretical perspective on social life (Wood and Kroger 2000). In Johnstone's (2002) heuristic for conducting a discourse analysis he states:

1. Discourse is shaped by the world, and discourse shapes the world.
2. Discourse is shaped by language, and discourse shapes language.
3. Discourse is shaped by participants, and discourse shapes participants.
4. Discourse is shaped by prior discourse, and discourse shapes the possibilities for future discourse.
5. Discourse is shaped by its medium, and discourse shapes the possibilities of its medium.
6. Discourse is shaped by purpose, and discourse shapes possible purposes. (p.9)

Johnstone's heuristic is a useful basis for joining different levels and forms of discourse with sound theoretical analyses (Johnson 2005). This study relies on Johnstone's heuristic in that it recognizes that the ways in which we structure and find meaning in our world as researchers shape our discourse and vice versa. This study gives full recognition to the regenerating ability discourse has not only as a method but as a theoretical perspective on social life.

Metaphor theory

> Metaphor is a tool so ordinary that we use it unconsciously and automatically, with so little effort that we hardly notice it. It is omnipresent…It is conventional… and it is irreplaceable. (Lakoff and Johnson 1980 p.xi)

Fauconnier and Turner (2002) state that "Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature" (p.3). A metaphor establishes a cognitive link between a concrete source domain and a more abstract target domain; mapping the most salient characteristics from one to the other (Lakoff and Johnson 1980). So for example in this study the metaphor organization as machine, involves transferring the most salient characteristics of machines – the concrete source domain - to that of the organization – a more abstract target domain. Therefore, the way we think and talk about organizations is the way we think and talk about machines. We view them in terms of how efficient and effective they are, in terms of processes and products – just as we view the machine. Lakoff and Johnson (1980) also assert that this transferal is not limited to how we think and talk about a particular concept it impacts on what we actually do in terms of that concept. This is what Lakoff and Johnson (1980) refer to as a deeper experiential *gestalt*. Therefore, the organization as machine metaphor structures not only how we think and talk about organizations it structures our actions in the most fundamental of ways. As Morgan (1997) states "Organizational life is often routinized with the precision demanded of clockwork. People are frequently expected to arrive at work at a given time, perform a predetermined set of activities, rest at appointed hours, and then resume their tasks until work is over." (p.13). Therefore, the metaphor transcends the purely rhetorical and structures what we actually do. Furthermore, this is the ordinary way of acting in an organization: it is a metaphor we live by. Metaphors are so powerful because they are such an ingrained part of how we ordinarily think and act. Therefore, metaphors are not just figurative they are literal.

It is important to note that while metaphors highlight the similarities between concepts they hide the differences. As Morgan (1997) states, "Metaphor stretches the imagination in a way that can create powerful insights, but at the risk of distortion" (p.5). In the organization as machine metaphor certain aspects of the organization remain hidden. For instance, there is a complete oversight of the human aspects so important in modern organizations. Furthermore, to increase our understanding of a given concept multiple metaphors may be used to further reinforce the aspects of concepts we wish to highlight. In this particular study the organization as machine metaphor and the organization as organism metaphor highlight the stable, predictable and goal driven attributes of the organization. This is what Lakoff and Johnson (1980) refer to as the systematicity of metaphors. Furthermore, they state that it is this systematicity that can make it almost impossible to see the aspects of the concept we are hiding. This helps to explain why those in the organizational science area complain of a deep-seated bias in the discipline. That is, while the machine and organism metaphors provide insight into certain aspects of the organization they hide the human side. In order to capture the more human side of the organization, ones that are not stable, predictable or necessarily goal driven they urge that the culture metaphor be employed. To avoid any radical distortion all three metaphors are necessary due to the very different aspects of the organization each metaphor highlights.

In addition to the highlighting and hiding of conceptual attributes, metaphors can also exist in a natural hierarchy. This is where metaphors and their associated mappings are organized in hierarchical structures where lower mappings in the hierarchy inherit the structures of the higher mappings (Lakoff and Johnson 1980). In the organization as machine metaphor an example of a metaphor at a lower level in the hierarchy might be 'employee as part'. According to Lakoff and Johnson (1980) this metaphor is a sub-category of a major category or a sub-metaphor of a root metaphor, in that it reinforces a common entailment of machines. Machines are made up of many different parts that must interact efficiently and effectively with each other and so too are the employees envisaged in the organization. Using this as a subcategory helps to build a strong and powerful image of the organizational concept. This is because there is a natural coherence of the subcategory to the major category (Lakoff and Johnson 1980). The concept of a part is cognitively compatible with the concept of a machine (Johnson 2005) – in that a part is a logical entailment of a machine. Furthermore, the more elaborate the hierarchical structure the more powerful the resulting conceptual image. Therefore, in this study the relative strength of each metaphor can be determined by the existence of such hierarchies.

Method

The purpose of this study is to explore the diversity of IS research at a deeper level: at the level of concepts. However, before undertaking such an exploration two fundamental decisions must be made. The first concerns the

area of concepts: more specifically, why was the organizational concept chosen for the focus of the analysis? The second decision concerns the data source. What will form the evidentiary base for the initial textual discourse analysis? As is shown in the following sections, the final choice for the organizational concept was chosen because it is such an important concept in the IS discipline and ISR was chosen as the data source due to it's direct link with diversity in IS research.

Concept Choice

The work accomplished by those in Organizational Science, has great pragmatic value as far as this study is concerned. However, organizations have been an important concept since the very inception of IS as an academic field (Power 2003). Furthermore, the most prestigious journals in the IS discipline the *Management Information Systems Quarterly* (MISQ) and the ISR make clear the significance of organizations in the following editorial statements:

> [T]he editorial objective of the MIS Quarterly is the enhancement and communication of knowledge concerning the development of IT-based services, the management of information technology resources, and the economics and use of information technology with managerial and *organizational* implications. (MIS Quarterly 2007).
>
> The review processes will emphasize relevance to practice and the *organizational* realities of information systems as equally important along with academic rigor and theoretical contributions. (Sambamurthy 2007)

Moreover, in defining Information Systems individual researchers have made explicit the importance of organizations. For example: Alters (2003) notion of IT-reliant work systems, Omar El Sawy's (2003) three faces of IS identity and Benbasat and Zmud's (2003) nomological net, all highlight the significance of organizations in defining Information Systems. Since the inception of IS as an academic endeavor to the current time the organizational concept has retained its sense of importance in the discipline.

Data Source

Journals play a significant role in the dissemination of research. While researchers within the IS discipline have a number of journals available in which to publish their research, ISR and MISQ are widely considered to be the most prestigious. These top tier journals pride themselves not only on the quality of the research they publish but also on the appeal this research has to a broad audience: 'rigorous' and 'relevant' research. However, of these two journals ISR has been the most pivotal in seeding the diversity debate. Articles appearing in the ISR provided the initial evidentiary base for the meta-analysis conducted by Swanson and Ramiller (1993). Although the purpose of this meta-analysis was not to find out how diverse the field was, it certainly was taken as evidence to that effect by many in the field. A later study conducted by Vessey et al. (2002) was directly related to the issue of diversity. Their results tended to agree with the interpretations made of the earlier study by Swanson and Ramiller (1993) that the field was indeed diverse. Furthermore, they asserted that the journal ISR was the most representative of diversity, at least on the broader measures of diversity. These results would tend to confirm the open desires of the journal editors at ISR to attract diverse research. From 2000 onward the editors of the journal have been visibly active and transparent in their efforts to encourage submissions that put forth a wide variety of perspectives (Benbasat 2000; Benbasat 2002; Kemerer 2003; Sambamurthy 2005). Therefore, articles published in ISR – a journal noted for disseminating research believed to be highly diverse - during the period 2000-2006, a time of active and open encouragement of a diversity in article submissions, were selected for analysis.

Application

In conducting the metaphor analysis a combination of manual and research software was employed. For the analysis a manual approach was used and for coding and reporting purposes the software package HyperResearch (ResearchWare 1997) was used. The entire set of articles appearing in the ISR during the period 2000-2006 formed the evidentiary base for the analysis and coding. Each article was examined manually line by line for any reference to the target domain concept: organization. For example, the article might mention the organization itself or a synonym such as business, firm, company etc. Once this reference to the target domain concept had been found the surrounding text was examined for any reference to the source domain concepts of machine, organism and culture

concepts. This examination involved searching the surrounding text for any mention of 'machine-like', 'organism-like', or 'culture-like' terminology. For instance, in discussing the organization the author might stress 'organism-like' terminology such as adaptation and survival. When such text was identified it was coded using the software under the appropriate metaphor code. After this process was complete the textual excerpts were examined for different sub-domain mappings. This was to determine whether the root metaphors were supported by other sub-metaphors. In this study, due to the large number of excerpts available for the machine metaphor combined with its inherent complexity a number of sub-metaphors emerged from the analysis. However, this was not the case with the organism or culture metaphor. These root metaphors along with any associated sub-metaphors are discussed according to their ontology and their ensuing entailments in the next sections.

Results

This study, which focused its analysis on the organizational concept as its target domain, found a distinct bias in the way organizations are conceptualized. As outlined earlier the three root metaphors for understanding the organization were organization as machine, organization as organism and organization as culture. Each of these metaphors are necessary to provide a more balanced way of understanding and structuring the organizational concept. However, in this study a single root metaphor, the machine metaphor, emerged as the single most dominant metaphor. Use of 'machine-like' language when discussing the organizational concept was frequent and repeated. Furthermore, this bias toward the machine metaphor was evidenced not only by its repeated use but also through the elaborate construction of sub-metaphors. Therefore, the machine metaphor was thoroughly explored through its own and other supporting metaphors. On the other hand while the organism metaphor did emerge as a way in which articles conceptualized the organization this was only done at a relatively superficial level and the culture metaphor remained virtually untouched. The results of this study show that within articles published in ISR between 2000 and 2006, the organizational concept is structured and understood using a single dominant metaphor – the machine metaphor.

Organization as Machine

The success of the human race can be largely attributed to our ability to create and maintain an artificial world. This artificial world is full of tools, gadgets and gizmos that are with us from birth to death allowing us to push the limitations of nature like no other species on earth. We have overcome so many of nature's constraints that we are almost removed from it. We no longer think of ourselves as 'primitive' animals, but as a sophisticated and almost 'omniscient' form of being. For instance, in many cases we do not have to rely simply on nature's bounties for our own subsistence. Through the ages, we have created so many different machines that make the production of resources necessary for our physical survival we have been able to consider matters of a more metaphysical importance. We are left to consider our complex social, political, cultural and historical arrangements - to think, to ponder, to philosophize. Our reliance on the machinery we create to make these other endeavors possible is complete. Life as we know it is almost entirely dependent on a mechanized world, so much so that it is almost impossible to imagine how we could survive without it. Therefore, the significance and importance of machinery to the human race as a whole down to the minute details of our everyday lives is hard to over-estimate.

Perhaps because machines are such a pervasive feature of modern life they emerged as the single most dominant way of structuring and understanding organizations in this study. Machine-like terminology was frequent and repeated not only within but across articles. Moreover, when further analysis was conducted on this terminology several strong sub-metaphors were revealed. These sub-metaphors, each with their own detailed imagery, combined to create a rich and complete picture of the main machine metaphor. To show how each of these sub-metaphors contributed to the main metaphor their mappings are presented in Table 1 below and discussed in the following sections. This includes the source domains of the metaphor as well as the most common target domains discussed in the articles of ISR during the years 2000-2006.

Table 1. Sub-Metaphors for Organization as Machine

Source Domain	*Target Domain*
Purpose	Wealth generation
Product	Goods, services

Process	Tasks, routines, operations
Part	Departments, functional areas, people, technology, hardware, software

The way in which these seemingly different sub-metaphors are hierarchically arranged allows them to be understood as components or derivatives of the one overarching metaphor (Johnson 2005). As Johnson (2005) states, "the images produced by the lower mappings create cognitive space for the higher mappings" (p.630). In this particular example the hierarchy was as follows: A MACHINE is created for a particular PURPOSE; this PURPOSE is reached by and through a number of PROCESSES; the PROCESSES themselves are performed by various PARTS that work together. This "multi-layering" (Johnson 2005 p.630) of metaphors helps to provide a deep and rich understanding of the main root metaphor and also results in a number of entailments.

The metaphor of organization as a machine was manifest through a continual and repeated focus in many articles on three high-level entailments of machines. These entailments include accuracy, effectiveness and efficiency and correspond to the descriptions outlined by Pepper (1948):

- Things can be expressed in exact, quantitative terms.
- There is an effective relationship between the PARTS that contributes to the overall effectiveness of the organization.
- The efficiency of the organization is paramount, even to the exclusion of the qualities of the individual PARTS.

In the following paragraphs specific examples will be given from the articles appearing in ISR during the years 2000 through 2006. In terms of the first entailment concerning accuracy, some articles reveal the assumption that even the most ingrained human behavior can be measured and accounted for. For example, McKnight et al. (2002) state that even trust can be measured. In their study they propose 16 constructs for measuring trust in an e-commerce relationship. Furthermore, they propose that trust in this relationship can be modeled by four major constructs: disposition to trust, institution-based trust, trusting beliefs and trusting intentions. Similarly, in an article by Jiang et al. (2005) the behavior of lying is viewed as "input distortion" (p.131). They propose two methods in which this distortion provided by users can be "modified" (p.131) to increase the "accuracy" (p.131) of their expert system. From the most obvious of actions which are suited to measurement such as procurement, ordering and inventory to the most intricate of human behavior there is a continual focus in many articles on the precision with which things can be accounted for.

The effectiveness with which an organization achieves its predetermined goals, like that of the machine, is a key concern in the majority of articles reviewed. All PARTS in the machine are expected to work together to produce the most effective result. Even the relationships between people are conceptualized as interacting PARTS of the organizational MACHINE. Levina (2005), while not depending solely on the machine metaphor, still discusses the collaboration between people in terms of how effective the relationship is. Furthermore, not only is the relationship between like PARTS the subject of scrutiny but the interaction between disparate PARTS is also scrutinized in terms of how their effectiveness can be increased. Johnson and Marakas's (2000) article looks at the relationship between end-users and computers as a "construct" (p.402) and derive an empirical model of this constructs efficacy that they term the "computer self-efficacy construct" (p.402). This construct is not only accurately identified but it is measured with the specific intent of improving the "performance" (p.402) between the end-user PART and the computer PART. The overall assumption in many articles was that a clear identifiable relationship or even a law (Pepper 1948) existed between each PART of the organizational MACHINE and that this relationship could be not only accurately identified but measured.

Another dominant entailment of the MACHINE metaphor in the articles examined was a clear focus on organizational efficiency. As stated in the above paragraph, there was a clear relationship not only between how effective the relationship between the PARTS of the organizational MACHINE was but how efficient it was. The focus in many articles was on the manipulation of various PARTS of the organizational MACHINE to increase its efficiencies. For example, March et al. (2000) state "The transformation of physically networked computers into an effective and efficient distributed system requires methods and techniques for building a systems architecture, establishing rigorous controls, and optimizing the system performance." (p.329) Furthermore they state that it is this

type of optimization research that will drive the organizational MACHINE toward its PURPOSE of meeting the many challenges of globalization, interactivity and high productivity. Ba et al. (2001) highlight the view that organizations, like machines, are seen as encompassing many PROCESSES that can be not only accurately identified and measured but also modified with the goal of making them more efficient: "We believe that market-based supply chain coordination [previously described as a PROCESS] can be run efficiently with the proper information systems support." (p.11). During the analysis, it was evident that there was a clear concern for how to maximize the efficiency of the organization and its underlying PARTS and PROCESSES in order to drive the organization toward a clearly defined PURPOSE.

Establishing an overall PURPOSE for the organization was critical to the MACHINE metaphor. The articles tended to confirm Clancy's (1999) notion that the main purpose of the organization as machine was to generate wealth. Terms such as "profit maximizing" (Thatcher and Pingry 2004 p.268) and "profit optimizing" (Lilien et al. 2004 p.225) were used to refer to this ultimate goal of the organization. This was the case regardless of the type of firm discussed or the specific contextual conditions faced by the organization. For instance, Alavi and Leidner (2001) talk of the drive toward "economic gains" (p.3) in the post-secondary education sector and Thatcher and Pingry (2004) relate the importance of "profit-maximizing behavior" (p.268) in the healthcare industry. Articles were also quick to position their own or other research in terms of how it would enable the organization to reach its overriding purpose of wealth production. Straub et al. (2002) discuss how uses of the Internet "contribute to corporate bottom lines" (p.118) and Belanger et al. (2001), situates their study of technology requirements for telecommuters in terms of how technology enables "profitability in a global, fast-paced economy" (p.155). A repeated and consistent reference in the articles to wealth generation as the ultimate PURPOSE of the organization was critical in establishing the MACHINE as the dominant metaphor for organizations.

To drive the organization toward its PURPOSE of maximizing wealth the organization generated one or many types of PRODUCTS. The product itself was generally typified either as a good or a service or both. For example, Kauffman et al. (2000) refers to "network goods, products or services" (p.61). Many times, though, the PRODUCT is simply referred to as a "product" (e.g. Thatcher and Pingry 2004 p.268). However, some of the more interesting things that were conceptualized as a PRODUCT included decisions (Dey and Sarkar 2000), ideas (Garfield et al. 2001) and even a post-secondary educated workforce (Alavi and Leidner, 2001). Additionally, many articles were keen to contextualize their research in terms of how it would enable efficiencies in PRODUCT creation. For example, Thatcher and Pingry (2004) state: "Investments in IT infrastructure that enable a firm to design, develop, and manufacture a product of given quality faster and cheaper increase production efficiency (or reduce the marginal cost of improving product quality)." (p.269). The PRODUCT was so critical to achieving the overall PURPOSE of the organization that not only did the authors explore the concept in detail they were also careful to contextualize their research or ideas in these terms.

Seeing the organization in terms of its underlying PROCESSES is essential in viewing it as a machine. As Basu and Blanning (2003) state, "An important purpose of organizations is to implement processes" (p.337). The PROCESS itself is seen as an operation or work that transforms a certain input into a desired output - the PRODUCT. Basu and Blanning (2003) provide further detail by defining a PROCESS as "a collection of tasks that transform a given set of inputs into a desired set of outputs. The inputs and outputs may be informational, such as documents (e.g., loan applications), or physical (e.g., raw materials or subassemblies), and the tasks may be information processing tasks such as credit checks, or physical tasks such as machining or shipment" (Basu and Blanning 2003 p.337). Articles that build on the machine metaphor see almost any kind of activity carried out in the organization as a PROCESS – and one that can be made more efficient and effective. For instance, even the formation of beliefs is seen as a PROCESS that can be modeled. When Dey and Sarkar (2000) discuss decision-making they state that there is an important sub-PROCESS involved called "belief revision" (p.1). Belief revision is an important sub-PROCESS as it contributes to the overall quality of the decision made by the decision-maker. Therefore, modeling this PROCESS precisely into a scheme that is "closed, consistent and complete" (p.1) is of the utmost importance. The user (the decision-maker) of such a scheme is expected to attach a quantifiable number to how unsure they are of particular input data. This is so uncertainty in the decision-making process can be accounted for. Paradoxically enough in this research even the unknown becomes precise, quantifiable and knowable. Therefore, even activities that are not immediately seen as PROCESSES are structured in these terms which in turn contributes to the pervasiveness of the MACHINE metaphor throughout the articles.

Locating and specifying the PARTS of the organization were integral to establishing the MACHINE as a dominant metaphor throughout the articles. Some of the more common things to be conceived as PARTS within the organization were IT and its associated hardware and software, departments or functional areas and even people.

Just as the engineer designs the network of interconnecting PARTS to be as smooth-flowing and friction-free as possible, so too was the network of parts that make up the organization designed. There was a distinct focus on how the performance between the PARTS could be made as efficient as possible – regardless of what the PART was. One of the more interesting examples of the conceptualization of people as PARTS as well as the corresponding focus on their combined performance is visible in Garfield et al.'s (2001) article. They assert that "Many of these firms [previously described as innovative and creative] have created 'idea factories', in which teams brainstorm using e-mail, Web-based groupware, and face-to-face meetings, with the goal of generating ideas that change existing business paradigms" (p.322). In this statement the PARTS of the organizational MACHINE are made clear. The PARTS are the individuals who make up the teams whose clear purpose is to "generate" (p.322) ideas. These PARTS interact not only with each other but with dissimilar PARTS such as e-mail, Web-based group-ware etc. to carry out the sub-PROCESS (brainstorming and face-to-face meetings) of the main "idea generation" (p.322) PROCESS. In their conceptualization of individuals as PARTS, any human-like characteristics are removed. For example, there is no acknowledgement of individuals as PARTS having their own agendas or engaging in other irrational actions that do not align with the PURPOSE of the organizational MACHINE. They simply exist for the pre-defined purpose of producing a particular PRODUCT. Furthermore, viewing individuals as PARTS also suggests that individuals are easily changed and replaced just as a cog is in a MACHINE. Conceiving the organization as a collection of inter-operating PARTS was vital in establishing the MACHINE metaphor as the dominant way of structuring and understanding organizations in this study.

The sub-metaphors whose source domains were PURPOSE, PRODUCT, PROCESS and PART were some of the more common sub-metaphors of the organization as machine root metaphor. These sub-metaphors were firmly established and explored in the articles. This helped ensure a rich and elaborate image of the organization to emerge from the articles. The organization is rational, purpose-driven and ultimately predictable. This metaphor allows us to feel a certain safety and security in knowing what will happen, when it will happen and why. However, there are times when a reliance on the metaphor does not seem appropriate and tends to distort the phenomena under scrutiny. For instance, constructing people as PARTS may work in some organizations such as the manufacturing or fast food industries but it has serious limitations beyond these boundaries. Nevertheless, there is a clear tendency in the articles to use the metaphor even when a different perspective seems not only appropriate but necessary.

Organization as Organism

Since the beginning of time we have attributed life and life-like processes to things that are clearly not living. For example, in ancient times primitive animism was common - thunder, lightning and wind were all conceptualized as being people. Although this may sound odd to us now we still understand many phenomena in this way. As Clancy (1999) states, most modern religions are "imbued with the idea of a benevolent creator" (p.92), a creator that is very similar to us. Even those who do not believe in religion are likely to believe in some higher guiding force and many will find it hard to accept that there "is only matter and electricity and that our own consciousness is some epiphenomenon" (p.92). Therefore, life and its processes have always provided us with a way of structuring, understanding and finding meaning in our world.

In this study, it is somewhat surprising that while the organism metaphor provides such a powerful way of understanding and structuring organizations this propensity was not more clearly reflected in the articles. Morgan (1997) asserts that viewing an organization as an organism relies on the view that it is "a living system, existing in a wider environment on which it depends for the satisfaction of various needs" (p.33). Following this definition there are three basic entailments of the organization as organism metaphor:

1. It is a living system,
2. It interacts with a larger environment,
3. It must fulfill its needs.

In comparison to the machine metaphor these fundamental entailments of the organization as organism remained under-developed and under-explored. More specifically, while there were examples of rich organism-like terminology such as Moore's (2001 p.34) article which talks of the "the current stampede [of businesses] toward electronic commerce" and Subramani and Walden's (2001) "new breed of net firms" (p.135) the use of such terminology stopped short of forming a rich and complete image of the organization as an organism. One of the main reasons for this was a lack of clear sub-metaphors for the organism metaphors that were so evident with the

machine metaphor. Moreover, while some primary entailments of the organism metaphor were explored this was done either in an anthropomorphic sense or were established only superficially in order to pursue the machine metaphor in more depth. For all these reasons the organism metaphor was dominated by the machine metaphor as a way of structuring and understanding organizations.

While the image of the organization as an organism remained, on the whole, incomplete, some articles brought into sharp focus some particular aspect or attribute of the metaphor. They did this through relying heavily on some aspect of one of the three fundamental entailments of organisms: being a living system, a focus on its interaction with the environment, and the fulfillment of needs. For example, Sabherwal and Chan (2001) take a typically organic view of the organization when they look at the alignment between IS strategy and the overall business strategy which is "widely believed to improve business performance" (p.11). This view necessarily relies on the living sub-system entailment concept of the organism metaphor – the parts acting together to influence the stability and success of the whole. This article also builds on the organism entailment of interacting with the environment. Organizations are referred to here as having strategies that are employed in the wider environment to succeed against "competitors" (p.16), which make them "defenders, analyzers and adopters" (p.16). This type of classification is transferred from the variety of species notion apparent in organisms to that of the organization. That is, different organizations and different organizational behavior are more successful under certain conditions than others just as some species of organisms are more successful than others under certain environmental conditions. Nault and Vandenbosch (2000) provide an even more arresting image of the lengths the organization as organism will go to in order to survive, "Firms such as Intel, Hewlett Packard, and Motorola have maintained their lead over several product generations by "eating their own lunch": launching products which cannibalize their current leading products." (p.304). While articles such as these relied heavily on some aspect of the organism metaphor there was no clear and elaborate construction of the kind of sub-metaphors that were evident in the usage of the machine metaphor either within or across articles.

The relatively weak position of the organism metaphor was further enforced by the tendency to not only mix the organism and machine metaphors but to use them anthropomorphically or in a clearly dominant-recessive way. For instance, Hu et al.'s (2004) clearly use organism-like terminology: "OES providers may have to provide more value-added services in the future, or this business model may not *survive*." (p.246). However, it is not really clear whether the organization is being structured with the organism metaphor or not. Survival is clearly an organic trait, but what seems odd is that in this same assertion by Hu et al. (2004) it is the business model that is surviving. It is odd, because although we might say a business survives when we build on an organism metaphor we wouldn't normally talk in terms of the model of a business surviving. That is because models are typically used in a more mechanistic way (which is essentially the way they are used here). Attributing the model to the business is reverting to the machine metaphor in order to structure the organization and not using the organism metaphor. This is a common behavior that Clancy (1999) refers to as attributing "organic, even anthropomorphic, characteristics to inert matter" (p.92). Furthermore, despite Hu et al.'s (2004) statement of "how different types of traders and OES providers behave in electronic markets…" (p.245) which clearly attributes organism attributes to the organization, their preferred structuring of the organization through the machine metaphor is made clear not long after when they state their primary research outcome: "we established a profit maximization model and proposed an optimal service fee scheme for monopolist OES providers. Our analysis demonstrates that the OES provider may reach the optimal profit level by choosing an optimal fee rate that balances the trade-off between single trade profit gain and a moderate adoption rate. Finally, we conducted a numerical study to further explore the OES profit maximization problem" (p.245). Therefore, articles such as these contributed to the subordination of the organism metaphor in relation to the machine metaphor by using the organism only superficially as a way to understand organizations.

Organization as Culture

Human beings are essentially social creatures. Without this interaction we are more likely to suffer both mentally and physically – no surprise then that one of the most severe punishments for a person is solitary confinement based on the much older form of punishment of being banished from the tribe. In our essential interactions with others we form what is more commonly known as a culture - the shared norms, values and beliefs that bind us together. These norms, values and beliefs manifest themselves in symbolic and ideational ways (Smircich 1985). So, through myths, legends, stories, rituals, ceremonies and meetings the culture of a collective is realized. It allows us to evaluate not only our own actions within a particular collective but also the actions of others. We know not only how to act appropriately but also how we should expect others to behave (Morgan 1997). It is a code of conduct, the

rules we live by. In short, the culture of a social grouping allows us to feel a certain security. This is because not only does culture gives us a sense of how we should behave and interact with others but it provides us with a way of understanding our world - a world that is not entirely predictable. Therefore culture, is both the social 'glue' that binds us together and the foundation on which we structure and make sense of our social world.

While culture offers a powerful way of understanding and making sense of our world it did not appear as a way in which organizations were conceptualized in this study. There certainly were articles that made use of culture-like terminology. For instance, in McKnight et al. (2002), who wrote that "Institution-based trust comes from sociology 1 which deals with the structures (e.g., legal protections) that make an environment feel trustworthy (e.g., the United States immigrant culture of the 1800s, Zucker 1986)" (p.339), the culture term is referenced directly. However, articles such as these only used the term infrequently and relied on the other metaphors of machine and to a lesser extent the organism to structure and understand the organization. Similarly, the few articles that relied more heavily on culture-like terminology treated culture as a variable and not as a root metaphor. For example, in Lee et al.'s (2004) article they talk of "culture-specific business knowledge" (p.117) but only in relation to "the transfer of technical knowledge between firms" (p.117) which impacts on the "benefits of congruent outsourcing strategies over non-congruent actions" (p.117). Here we see culture as a variable of organizations and in this case a feature of the organization as organism. Kirsch (2004) also talks of culture in a little more detail with comments such as "socializing individuals to a common set of norms and values" (p.375). However, later in the article these norms and values are conceptualised as a variable that requires "adjustments in control" (p.386). Therefore although culture-like terminology was visible its use was minimal and the few articles that relied more heavily on the terminology established the culture as a variable and not a root metaphor. This distinction corresponds to that as outlined by Alvesson (1993) when he states that organizations are structured and understood not as "objective tangible and measureable but as constructed by people and reproduced by the networks of symbols and meanings that unite people and make shared action possible" (p.14). Therefore, while the culture metaphor provides a real alternative to the machine and organism metaphors it was not relied on as a way of structuring and understanding organizations in this study.

Discussion

The most significant finding from this exploratory study is a lack of diversity at the most fundamental levels of IS research. By using a critical metaphor analysis to break through the broader understandings of diversity this study revealed a distinct bias in the conceptualizations of organizations – a key concept in IS research. Relying on the understanding that organizations can be conceptualized using three root metaphors - organizations as machine, organizations as organism and organizations as culture - this study found the machine metaphor was the single most dominant way of structuring and understanding organizations. The organization as a machine emerged as such a powerful image due to the creation of several supporting metaphors. Each of these sub-metaphors – complete with detailed imagery of their own – contributed to the creation of a rich and complete picture of the organization as a machine. However, while this metaphor created great insight into the organization it also contributed to what Morgan (1997) calls 'distortion' of many important aspects of the organizational concept. That is, the machine metaphor hid the more life-like and symbolic aspects so important in the organizational concept – aspects best viewed through the lens of the organism and culture metaphors. However, in comparison to the powerful image of the organization as machine no similar imagery emerged for the organization as organism or the organization as culture. This resulted not only in a drastically distorted view of the organizational concept but more importantly resulted in a lack of diversity at the most fundamental level – the level of concepts.

Strengths and Weaknesses of the Study

Like metaphors, the very strengths of a study are usually its weaknesses – so too with this study. A major strength of this study is that it is a narrow and deep exploratory study that provides rich detail at a level not even considered previously. However, this is also one of its major weaknesses. In being narrow and deep it is not comprehensive or exhaustive. In being exploratory its results are not necessarily representative. While this study finds a lack of diversity at the conceptual level, this does not necessarily mean that this is the situation for all research being conducted within the entire field of IS. Furthermore, this study is limited to one journal over one period of time. The same results do not necessarily apply for other journals or even for the same journal over a different period of time. Furthermore, while this study has gained a great deal of insight into the conceptual diversity of IS research

through a critical metaphor analysis, herein lies another major weakness. A study that relies on critical metaphor analysis is also an interpretive study. Any interpretive study is limited in that we all have different interpretations from one another. It is rarely the case that any two people will agree exactly on an event or even any two groups of people. Therefore, the typical measure of replication is hard to guarantee in such a study. While this study has its strengths these same strengths also reveal some significant weaknesses.

A possible explanation

The results of bias at a conceptual level in one of our most prestigious journals – a journal noted for its diversity - may come as a surprise to some. However, there is reason to suggest it is simply a reflection of a larger bias existing in society today. As Clancy (1999) states the concept of business as a machine relies on the rational perspective that is "a strong current in modern thought" (p.77). This rational perspective is itself believed to be a mono-myth by anthropologists. That is, the world at large depends on the "comprehensive frame of reference, or structure of belief" (Morgan 1997 p.146) the rational perspective provides. The myth of rationality helps us to make sense of the world providing us with a way in which we can "negotiate day-to-day experience and help to make it intelligible" (Morgan 1997 p.146). Therefore, if the myth of rationality exists as a larger mono-myth in society it should not be too surprising that such a bias toward it exists in one of our top journals. Our discourse as researchers is present in many forms, but of course one of the primary sources is our journals. Therefore, if our primary way of negotiating the world is through the myth of rationality then it is logical that such a bias toward it would appear in one of our journals. As Morgan (1997) elaborates "Modern organizations are sustained by belief systems that emphasize the importance of rationality, and their legitimacy in the public eye usually depends on their ability to demonstrate rationality and objectivity in action" (p.146). Therefore, as a typical modern organization and one of our top journals ISR has much to lose if it does not conform to the myth of rationality. As a journal ISR has an enviable reputation to defend within both the IS community and the larger academic community. Therefore, if indeed this hypothesis is correct, it follows that ISR, in defending its position as a top-flight journal, is replete with such a bias – a bias that exists as part of a larger myth in modern society.

Implications

In the paragraphs below some preliminary observations are ventured on what this lack of diversity might imply for the journal, individual researchers and the discipline. These implications are of course limited by the exploratory nature of the study and should be taken as such. They are given in the spirit of encouraging reflection and promoting further ongoing discussion in this critical area. In concluding the paper several areas for future research are provided.

ISR Journal

Perhaps the stakeholder most directly affected by the results of this study is the journal ISR. While this journal is noted for its diversity in IS research this study indicates that this diversity appears to be fundamentally limited in its treatment of a core concept – the organization. For a journal that has been so open and transparent in its efforts to encourage diversity the results of this study may be disappointing. If these results are indeed more widespread and if, as the ISR editorial statement asserts, "ISR appears on the tenure and promotion lists of most academic departments. Publishing in the journal is considered to be evidence of high quality scholarship in the information systems community and affiliation with its editorial board is highly sought." (Sambamurthy 2007) then there would appear to be a need for ISR to increase its diversity at a conceptual level. ISR due to its prestige holds great importance in the working lives of individual research activities. Therefore, it holds a certain power over the lenses researchers use in their daily research activities.

However, with this power comes responsibility. Responsibility to individual researchers, the IS community and the larger academic as well as general community of which we are a part. Furthermore, due to its power the journal has a certain ability to impact on the levels of diversity at a more fundamental level. If indeed, the boons of diverse research are to be realized the results of this study highlight a great opportunity for ISR in attaining these bounties. While there are general statements from the editorial board of ISR encouraging more diverse submissions this study provides more specific directions. That is, to openly and transparently encourage submissions that explore alternative conceptualizations not only of organizations but of other important IS concepts. A particular action that

ISR might consider in this direction is to promote this exploration in the form of a special issue/s. Actions such as these will do much to promote intellectual freedom and give researchers the courage to explore alternative conceptualizations of important IS concepts. Given ISR's prestigious position within the community the journal has considerable power and responsibility to increase the diversity in our research at the most fundamental level.

IS Researchers

Hopefully the results of this study will give individual researchers cause to reflect over how diverse their own research is at the conceptual level. A lack of diversity in our research at the most fundamental level represents a serious threat to what we do and how we impact the world around us. In terms of the problems we see, how we go about solving them and the significance of our solutions to those that rely on us. All of these areas are limited by the bias in how we structure and understand our key research concepts. Distortions at such a fundamental level not only place limitations on what we see as research but as Morgan (1997) states, and this study confirms, can create "constructive falsehoods" (p.4). This is where the reliance on a particular perspective is taken to the extreme and used inappropriately. At best research conducted under such a guise will be, illogical but at worst it could be insensitive and potentially damaging. Due to the potential impact of a biased perspective IS researchers may wish to reflect on their own conceptualizations in an effort to see how diverse they really are.

By unearthing our key conceptualizations of organizations this study has made visible a lack of diversity in our research at a fundamental level. While this may point out a lack of diversity in what we do as researchers currently it is by no means a *fate compli*. On the contrary, if indeed diversity in our research represents "a wish for the years to come" (Rivard and Webster 2007), we have been presented with a great opportunity. Not only has this study pointed out the dominant ways in which we conceptualize organizations it also points out the alternatives. By exploring the alternative conceptualizations in our research we have the opportunity to redress the current lack of diversity at a fundamental level.

IS Discipline

As a disciplinary community the findings of a lack of diversity at the most fundamental level have important implications. This is especially the case if indeed there is a real desire on the behalf of the community for continual growth in this area. If the desire is not empty then we may have some critical reflecting to do. Perhaps, one of the most significant areas we may have to reflect on is how we might increase the levels of diversity in our research. One way in which diversity is believed to be increased is through the notion of an open market-place of ideas and keeping the boundaries of the discipline porous (Sambamurthy 2007). This logic relies on the idea that what is on the other side of the boundary is going to be different to what is already contained within the discipline. However, as organizational science researchers have attested to there may not be anything very different happening on the other side of the IS disciplinary boundary. Furthermore, if the bias is simply a reflection of current societal thought – the myth of rationality – then it is hard to see how diversity will be increased regardless of how porous our disciplinary boundaries are. Therefore, if as a discipline we are going to become more diverse at a fundamental level the change will have to come from within – within individual IS researchers, IS journals, and the IS community as a whole.

While the results of this research highlight the need for change it is important not to underestimate how difficult changing the current bias at such a fundamental level will be. Changing the current state of IS research to include alternative ways of structuring and making meaning of our key concepts is fraught with difficulty. Historically, politically and socially it is difficult to change a dominant view. Individuals risk being ostracized and journals and disciplines also risk their reputations. However, remaining insular comes at the expense of straitjacketing the field and those within it. Furthermore, it is important to realize that with risks come potential pay-offs and in this area the pay-offs are potentially very lucrative. Not only, will we potentially have more to offer our immediate audience – those that currently rely on us for advice and expertise– but we also have the potential to broaden our audience. By increasing our diversity at such a fundamental level – a change that by all accounts is yet to occur in other disciplines – we might secure a position of intellectual independence and leadership in the wider academic community. This represents a rare chance in the history of the IS discipline to repay the debt of borrowing more from other disciplines than we contribute back: phenomenologically, theoretically, and methodologically.

Future Research

While the results of this exploratory study have yielded important insights into the relatively unexplored area of diversity in IS research it raises many further questions. Due to the myriad of different questions that arise from this study only the most obvious are presented below:

- Is the lack of conceptual diversity found in this study a more widespread phenomenon? The same approach reflected in this study could be applied to the same journal over a different time period, other IS journals, and even more broadly to other disciplines. It could also be applied by using different IS concepts and even to our concept of research.
- Do IS researchers actually hold the same limited conceptualizations as are revealed in this study? While this study has revealed a lack of conceptual diversity in a particular medium it would be interesting to see whether IS researchers are similarly restricted in their viewpoints. Similarly, what about IS practitioners? Are their conceptualizations as restricted as those revealed in this study? What are the similarities and difference between the two groups of IS researchers and IS practitioners?
- Another significant question arising from this study is "Why?". Why is there such a fundamental lack of diversity in our research? Is there any truth in the hypothesis that the results are simply a reflection of the larger societal myth of rationality? Or are there other social, historical political or even cognitive reasons that might explain why such a bias exists?
- What are the ways in which we can explore the alternative conceptualizations of organizations in Information Systems? How do they link in with our other key concepts in Information Systems. What practical advice can we give to IS practitioners in using the organism and culture metaphors in their day-to-day working lives?

These are just some of the questions that come to mind from the results of this study. However, because we know so little about diversity in our discipline there is a myriad of questions to be asked both theoretical and empirical. Therefore, to use a metaphor, the research area of diversity is virgin territory and as such holds some potentially lucrative opportunities just waiting to be explored.

References

Adams, G., and Ingersoll, V. "The Difficulty of Framing a Perspective on Organizational Culture," in *Organizational Culture*, P.J. Frost, L.F. Moore, M.R. Louis, C.C. Lundberg and J. Martin (eds.), Sage Publications, Beverly Hills, CA, 1985, pp. 223-234.

Alavi, M., and Leidner, D. "Research commentary: Technology-mediated learning – A call for greater depth and breadth of research," *Information Systems Research* (12:1), March 2001, pp. 1-10.

Alter, S. "The IS Core - XI Sorting out Issues about the Core, Scope, and Identity of the IS Field," *Communications of the Association for Information Systems* (12), 2003, pp. 607-628.

Alvesson, M. *Cultural Perspectives on Organizations* Cambridge University Press, New York, 1993.

Ba, S., Stallaert, J., and Whinston, A. "Research Community: Introducing a Third Dimension in Information Systems Design - The Case for Incentive Alignment," *Information Systems Research* (12:3), September 2001, pp. 225-239.

Basu, A., and Blanning, R. W. "Synthesis and Decomposition of Processes in Organizations," *Information Systems Research* (14:4), December 2003, pp. 337-355.

Belanger, F., Collins, R., and Cheney, P. "Technology Requirements and Work Group Communication for Telecommuters," *Information Systems Research* (12:2), June 2001, pp. 155-176.

Benbasat, I. "Editorial notes," *Information Systems Research* (11:3), September 2000, pp. i-ii.

Benbasat, I. "Editorial notes," *Information Systems Research* (13:1), March 2002, pp. iii-v.

Benbasat, I., and Weber, R. "Research Commentary: Rethinking "Diversity" in Information Systems Research," *Information Systems Research* (7:4), December 1996, pp. 389-399.

Benbasat, I., and Zmud, R. W. "The Identity Crisis within the IS discipline: Defining and communicating the disciplines core properties," *MIS Quarterly* (27:2), June 2003, pp. 183-194.

Clancy, J. *The Invisible Powers: The Language of Business* Lexington Books, Oxford, 1999.

Deleuze, G., and Guattari, F. *What is Philosophy* Columbia University Press, New York, 1996.

DeSanctis, G. "The Social Life of Information Systems Research: A Response to Benbasat and Zmud's Call for Returning to the IT Artifact," *Journal of the Association for Information Systems* (4), December 2003, pp. 360-376.

Dey, D., and Sarkar, S. "Modifications of Uncertain Data: A Bayesian Framework for Belief Revision," *Information Systems Research* (11:1), March 2000, pp. 1-16.

El Sawy, O. "The IS Core IX: The 3 Faces of IS Identity: Connection, Immersion, and Fusion," *Communications of the Association for Information Systems* (12), November 2003, pp. 588-598.

Fauconnier, G., and Turner, M. *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* Basic Books, New York, 2002.

Galliers, R. D. "Change as Crisis or Growth? Toward a Trans-disciplinary View of Information Systems as a Field of Study: A Response to Benbasat and Zmud's Call for Returning to the IT Artifact," *Journal of the Association for Information Systems* (4:13), November 2003, pp. 337-351.

Garfield, M., Taylor, N., Dennis, A., and Satzinger, J. "Research Report: Modifying Paradigms - Individual Differences, Creativity Techniques, and Exposure to Ideas in Group Idea Generation," *Information Systems Research* (12:3), September 2001, pp. 322-333.

Gray, P. "Introduction to the Debate on the Core of the Information Systems Field," *Communications of the Association for Information Systems* (12), December 2003, pp. 781-787.

Hirschheim, R., and Klein, H. K. "Crisis in the IS Field? A Critical Reflection on the State of the Discipline," *Journal of the Association for Information Systems* (4:10), October 2003, pp. 237-293.

Hu, X., Lin, Z., Whinston, A. B., and Zhang, H. "Hope or Hype: On the Viability of Escrow Services as Trusted Third Parties in Online Auction Environments," *Information Systems Research* (15:3), September 2004, pp. 236-214.

Jiang, Z., Mookerjee, V., and Sarkar, S. "Lying on the Web: Implications for Expert Systems Redesign," *Information Systems Research* (16:2), June 2005, pp. 131-148.

Johnson, E. "WAR in the Media: Metaphors, Ideology, and the Formation of Language Policy," *Bilingual Research Journal* (29:3), Fall 2005, pp. 621-729.

Johnson, R., and Marakas, G. "Research Report: The Role of Behavioral Modeling in Computer Skills Acquisition - Toward a Refinement of the Model," *Information Systems Research* (11:4), December 2000, pp. 402-417.

Johnstone, B. *Discourse Analysis* Blackwell, Malden, 2002.

Kauffman, R., McAndrews, J., and Wang, Y. "Opening the "Black Box" of Network Externalities in Network Adoption," *Information Systems Research* (11:1), March 2000, pp.61-82.

Kemerer, C. F. "Editorial Notes," *Information Systems Research* (14:3), September 2003, pp. iii-v.

Kirsch, L. J. "Deploying Common Systems Globally: The Dynamics of Control," *Information Systems Research* (15:4), December 2004, pp. 374-322.

Lakoff, G., and Johnson, M. *Metaphors We Live By* The University of Chicago Press, Chicago, 1980.

Lee, J. N., Miranda, S. M., and Kim, Y. M. "IT Outsourcing Strategies: Universalistic, Contingency, and Configurational Explanations of Success," *Information Systems Research* (15:2), June 2004, pp. 110-122.

Levina, N. "Collaborating on Multiparty Information Systems Development Projects: A Collective Reflection-in-action View," *Information Systems Research* (16:2), June 2005, pp. 109-122.

Lilien, G. L., Rangaswamy, A., Van Bruggen, G. H., and Starke, K. "DSS Effectiveness in Marketing Resource Allocation Decisions: Reality vs. Perception," *Information Systems Research* (15:3), September 2004, pp. 216-220.

Lyytinen, K., and King, J. L. "Nothing at the Center? Academic Legitimacy in the Information Systems Field," *Journal of the Association for Information Systems* (6:5), June 2004, pp. 220-246.

March, S., Hevner, A., and Ram, S. "Research Commentary: An Agenda for Information Technology Research in Heterogeneous and Distributed Environments," *Information Systems Research* (11:4), December 2000, pp. 327-341.

McKnight, H., Choudhury, V., and Kacmar, C. "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research* (13:3), September 2002, pp. 334-359.

MIS Quarterly. "MISQ Central," MIS Quarterly, Minneapolis, viewed 4 May 2007, <http://www.misq.org/>

Moore, S. "A Foundation for Flexible Automated Electronic Communication," *Information Systems Research* (12:1), March 2001, pp. 34-62.

Morgan, G. *Images of Organization* SAGE Publications, Thousand Oaks, 1997.

Murphy, G. *The Big Book of Concepts* Massachusetts Institute of Technology, Cambridge, 2002.

Nault, B., and Vandenbosch, M. "Research Report: Disruptive Technologies – Explaining Entry in Next Generation Information Technology Markets," *Information Systems Research* (11:3), September 2000, pp. 304-319.

Pepper, S. *World Hypotheses* University of California Press, Berkeley, 1948.
Power, D. "The IS Core - II: The Maturing IS Discipline: Institutionalizing our Domain of Inquiry," *Communications of the Association for Information Systems* (12), November 2003, pp. 539-545.
ResearchWare, Inc. "About HyperRESEARCH – Qualitative Analysis Software," *ResearchWare Inc*., viewed 4 May 2007, <www.researchware.com/hr/index.htm>.
Rivard, S., and Webster, J. (Program Co-Chairs) "Conference Theme/Tracks," *Association for Information Systems*, viewed 4 May 2007, < http://business.queensu.ca/icis/themes.htm>.
Robey, D. "Research Commentary: Diversity in Information Systems Research: Threat, Promise and Responsibility," *Information Systems Research* (7:4), December 1996, pp. 400-408.
Robey, D. "Identity, Legitimacy and the Dominant Research Paradigm: An Alternative Prescription for the IS Discipline: A Response to Benbasat and Zmud's Call for Returning to the IT Artifact," *Journal of the Association for Information Systems* (4), December 2003, pp. 352-359.
Sabherwal, R., and Chan, Y. "Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders," *Information Systems Research* (12:1), March 2001, pp. 11-33.
Sambamurthy, V. "Editorial Notes," *Information Systems Research* (16:3), September 2005, pp. 235-237.
Sambamurthy, V. "Editorial Statement," INFORMS, viewed 4 May 2007, < http://iol-a.informs.org/site/ISR/index.php?c=3&kat=Editorial+Statement>.
Schultz, M. *On Studying Organizational Cultures* Walter de Gruyter, Berlin, 1995.
Smircich, L. "Is the Concept of Culture a Paradigm for Understanding Organizations and Ourselves," in *Organizational Culture,* P.J. Frost, L.F. Moore, M.R. Louis, C.C. Lundberg and J. Martin (eds.), Sage Publications, Beverly Hills, CA, 1985, pp. 55-72.
Straub, D., Hoffman, D., Weber, W., and Steinfeld, D. "Measuring e-commerce in Net-enabled organizations: An introduction to the special issue," *Information Systems Research* (13:2), June 2002, pp. 115-127.
Subramani, M., and Walden, E. "The Impact of E-Commerce Announcements on the Market Value of Firms," *Information Systems Research* (12:2), June 2001, pp. 135-154.
Swanson, E. B., and Ramiller, N. C. "Information Systems Research Thematics: Submissions to a New Journal, 1987-1992," *Information Systems Research* (4:4), December 1993, pp. 299-330.
Thatcher, M. E., and Pingry, D. E. "An Economic Model of Product Quality and IT Value," *Information Systems Research* (15:3), September 2004, pp. 268-219.
Van Dijk, T. *Discourse as Social Interaction* Sage, London, 1997.
Vessey, I., Ramesh, V., and Glass, R.L. "Research in Information Systems: An Empirical Study of Diversity in the Discipline and its Journals," *Journal of Management Information Systems* (19:2), Fall 2002, pp. 129-174.
Wood, L., and Kroger, R. *Doing Discourse Analysis: Methods for Studying Action in Talk and Text* Sage, Thousand Oaks, 2000.