Lessons from the Trenches of Metatriangulation Research

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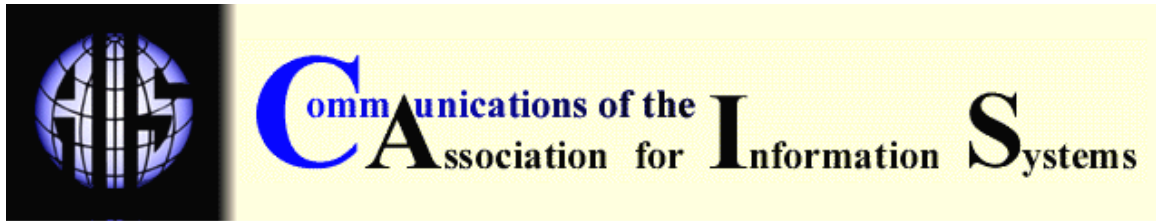*Univrsity of Pittsburgh*, bbutler@katz.pitt.edu

LESSONS LEARNED FROM THE TRENCHES OF METATRIANGULATION RESEARCH

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ABSTRACT

In this paper we describe our application of a relatively untried research approach called metatriangulation. Metatriangulation is a three-phased, qualitative meta-analysis process that may be used to explore variations in the assumptions of alternative paradigms, gain insights into these multiple paradigms, and address emerging themes and the resulting theories. In applying this method we encountered difficulties in selecting a sample, in reaching agreement among coders, and in our attempts to build theory from our results. From our experiences we developed a modified version of the metatriangulation method. We did find metatriangulation to be an excellent tool in understanding theoretical perspectives in MIS research and believe the use of our modified method will aid future researchers in this pursuit.

Keywords: metatriangulation, qualitative research methods, power and IT.

I. INTRODUCTION

The study of management information systems (MIS) is an interdisciplinary endeavor. Researchers in the MIS field draw upon theories, methods, and knowledge from many diverse disciplines including economics, management, communications, political science, psychology, sociology, and marketing. Such diversity makes it difficult to generate continued discussion and accumulate a foundational body of research.

Each discipline is based upon one or more *paradigms*. A paradigm is a general perspective or way of thinking that reflects fundamental beliefs, assumptions, and methodologies that are agreed upon by the researchers employing that paradigm [Gioia and Pitre, 1990, Kuhn, 1970]. It reflects the way that members in the research community look at problems and conduct their

research. Some disciplines such as the hard sciences have one paradigm that dominates the field of science until a revolution replaces it with another. However, many of the social sciences including MIS do not have one predominant paradigm, but rather a multiplicity of theoretical perspectives.

The IS research literature contains many areas in which a phenomenon is considered from many different paradigms. organizational impact of IS [Robey and Boudreau, 1999], power and IT [Jasperson et al., 2002], and knowledge management [Schultze and Leidner, 2002] are just a few areas where researchers recently noted that paradigmatic diversity resulted in a rich collection of studies with arguments that, when taken together (if they ever are) seem contradictory, confusing, and fragmented. Even these few areas of MIS research demonstrate that progress is hindered by the difficulties of identifying, comparing, and integrating the insights generated by research from disparate paradigms. Whether these difficulties are a symptom of MIS being a pre-paradigmatic discipline or a consequence of MIS phenomena being fundamentally complex, the presence of diverse theoretical perspectives is a characteristic of much of the MIS literature.

Because of our historical ties to reference disciplines, MIS researchers are unlikely ever to work under a single, unifying paradigm. While the value of relying on reference disciplines was debated recently [e.g., Benbasat and Weber, 1996, Robey, 1996], our research continues to be flavored by outside disciplines. Further, we were recently challenged not only to learn from reference disciplines but also to teach them [Baskerville and Myers, 2002]. As a result, MIS researchers are now and will continue to be challenged to conduct research that synthesizes multiple theoretical perspectives and corresponding results. To assist MIS researchers in benefiting from diverse theoretical perspectives, we describe our application of a new research strategy called metatriangulation.

Metatriangulation is "a strategy of applying paradigmatic diversity to foster greater insight and creativity" [Lewis and Grimes, 1999, p. 672]. It is a type of qualitative meta-analysis that helps theorists recognize, cultivate, and accommodate diverse paradigmatic insights. Researchers then use the uncovered paradigms to create even richer theoretical perspectives for understanding the phenomenon being studied and to encourage research across paradigms. While metatriangulation could reasonably be used to describe any method that uses multiple sources of information to draw inferences about some domain of interest, we used the term in a narrower sense as a particular approach for viewing published research across multiple paradigms. We applied metatriangulation to the study of power and information technology (IT), and published the results [Jasperson et al., 2002].

The present paper's purpose is to describe each phase of the metatriangulation process as we experienced it, give recommendations to MIS researchers who want to apply it to their research, and suggest modifications to the Lewis and Grimes' method growing out of our efforts to apply it. While Lewis and Grimes [Lewis and Grimes, 1999] lay a solid foundation for the metatriangulation approach by describing the method, its objectives, and the process, they discount the challenges (and messiness) that arise when applying metatriangulation. We attempt to extend the work of Lewis and Grimes with an insightful look into metatriangulation-in-use by highlighting the value and messiness of this method, while offering some key coping mechanisms.

II. USING METATRIANGULATION

Lewis and Grimes [1999] suggest a three-phased model to explore variations in the assumptions of alternative paradigms, to gain insights into the multiple paradigms, and to address emerging themes and the resulting theories. Table 1 provides guidelines for the activities involved in the three phases and briefly describes the manner in which we applied the guidelines in our study. The terminology that we use in describing the metatriangulation activities and their purpose is that coined by Lewis and Grimes (see Appendix I for a glossary of terms).

Table 1. Application of Metatriangulation to Current Study

Activity	Purpose in Metatriangulation	Application in This Study
Phase I. Groundwork		
Define phenomenon of interest	Broadly define common phenomenon of interest to focus on a topic, but allow interpretive flexibility	Our phenomenon of interest was the role of power in the management and use of IT.
Focus paradigm lenses	Form a broad overview of the field, bracket, or differentiate among assumptions; try to recognize underlying paradigms in extant literature; and identify transition zones between paradigms.	We bracketed articles using a common set of IT paradigm lenses: Technological Imperative, Organizational Imperative and Emergent Perspective. Later we added power paradigm lenses: Rational, Pluralist, Interpretive and Radical.
Collect metatheroretical sample	Collect data interpretable from multiple paradigm perspectives	Our original sampling frame was all articles published in 10 leading MIS and Management journals from 1980-1999. We selected 68 articles from this frame that studied our phenomenon of interest. Later we added 14 articles meeting the same criteria but published in non-North American journals.
Phase II. Data Analysis		
Plan paradigm itinerary	Determine a plan for analyzing the data	We developed an initial coding scheme to enable collection of data about multiple paradigms. Among other things, we captured the authors' predominant IT paradigm (i.e., technological imperative, organizational imperative, emergent perspective), and worldview (objective, subjective).
Conduct multiparadigm coding	Breakdown, interpret, and conceptualize data	Three coding rounds were used to refine and modify the coding scheme. Then the final coding scheme was applied by research pairs to all articles in the sample. Coders worked together to resolve coding differences.
Write paradigm accounts	Tabulate results; record and compare paradigmatic insights	Each researcher searched the data for patterns and wrote paradigm accounts. These paradigm accounts were discussed among the researchers and used to derive the findings and synthesize multiple theoretical perspectives of power and IT.
Phase III. Theory Building		
Explore metaconjectures	Conduct mental experiments and juxtapose the divergent views	We articulated metaconjectures by looking at the anomalies and similarities in a matrix of the combined lenses. We also explored the differences across theoretical perspectives.
Attain a metaparadigm perspective	Develop a theoretical perspective capable of accommodating diverse paradigm insights	We looked at each metaconjecture from multiple theoretical perspectives to gain a richer understanding of the phenomenon of interest.
Articulate critical self-reflection	Critique the resulting theory and theory building process	As we used our paradigm accounts to develop metaconjectures, each researcher attempted to critically examine whether new observations were consistent with previous conclusions and provided a richer understanding.

GROUNDWORK PHASE

The groundwork phase of this approach includes such activities as: identify phenomenon of interest, focus paradigm lens, and collect metatheoretical sample. We identified power and IT as our *phenomenon of interest*. A phenomenon of interest is a topic of study. Our goal was to understand the role of power in the management and use of IT in organizational settings. Therefore, under the concept of power we included the topics of power, politics, authority, participation in decision making, influence, decision rights, and centralization of decision making. The concept of IT management and use included studies that investigated the management, adoption, implementation, or use of IT in organizational settings. This is consistent with the broad research focuses of IT research that were identified by Orlikowski and Barley [2001]. We began the groundwork phase by conducting an initial review of articles that related to our phenomenon of interest to ensure that a more complete review would be both manageable and worthwhile.

To focus our *paradigm lenses* we selected a set of lenses that is widely discussed in the MIS literature and appeared applicable to the initial set of articles [c.f. George and King, 1991, Orlikowski, 1992, Pinsonneault and Kraemer, 1993]. The selection of lenses is critical because it determines where the researchers focus their attention during data analysis and it sensitizes them to their theoretical inclinations. We selected the Markus and Robey [1988] "lenses (e.g., technological imperative, organizational imperative, and emergent perspective)."

A *metatheoretical sample* is data interpretable from multiple-paradigm perspective [Lewis and Grimes, 1999, p. 679]. In collecting our metatheoretical sample, we selected a sampling frame (i.e., a set of publications during a particular time period) and then determined selection criteria for drawing sample articles from it. First, we included only journal articles, and not books, dissertations, or proceedings papers. Second, we identified 10 top management and MIS research journals believed to publish the most relevant and rigorous research about our phenomenon. We relied on several published journal rankings of both management and MIS journals to determine which MIS and management journals to include in our sampling frame [c.f., Coe and Weinstock, 1984, Franke et al., 1990, Gillenson and Stutz, 1991, Gomez-Mejia and Balkin, 1992, Hardgrave and Walstrom, 1997, Holsapple et al., 1994, Johnson and Podsakoff, 1994, Mylonopoulos and Theoharakis, 2001, Walstrom et al., 1995, Whitman et al., 1999]. Further, we limited our inquiry to a twenty year time period (1980-1999).

We selected articles for our sample based on whether the article

- discussed the management or use of IT and

- addressed some aspect of the broadly-conceived power discussed previously.

We searched the title, abstract, and keywords of each article published in these journals from 1980 through 1999 for any mention of power, politics, participation in decision making, influence, authority, decision rights, and centralization. We excluded articles that

- only had a paragraph or two about power or

- focused exclusively on either power or politics, but not IT, or vice versa.

However, we included articles in which power was a variable, even if the article only discussed its impact minimally. To ensure that we had, in fact, captured all articles dealing with power/politics and IT in the targeted journals, we used the Web of Science to search the Social Sciences Citation Index and forward cited four frequently referenced articles on the subject of power and politics in IT implementation and use [Kling and Iacono, 1984, Lucas, 1984, Markus, 1983, Pettigrew, 1972]. We rechecked all articles in the ten selected journals that surfaced in the Web of Science search. From this complete review, we started the metatriangulation process with 97 articles that met our initial selection criteria. Multiple articles that failed to meet the criteria above (i.e., focusing on both power and IT) were later excluded, leaving us with a final sample of 68 articles. A breakdown of the number of articles per journal is shown in Table 2.

Table 2. Journals Included in the Final Sample of the Study

Journal	# of Articles
Academy of Management Journal	2
Academy of Management Review	1
Administrative Science Quarterly	2
Communications of the ACM	10
Decision Sciences	4
Information Systems Research	6
Journal of MIS	11
Management Science	11
MIS Quarterly	17
Organization Science	4
TOTAL	**68**

DATA ANALYSIS PHASE

The data analysis phase consists of three activities: planning a paradigm itinerary, coding, and writing paradigm accounts. A *paradigm itinerary* is "a planned order of paradigm analysis" [Lewis and Grimes, 1999, p. 681]. While *planning our paradigm itinerary*, we developed an initial coding scheme to capture characteristics of the sample studies that were critical to our methodological approach. Among other things, we captured the authors "predominant technology lens (i.e., technological, organizational, and emergent), the definition of power employed, the authors' worldview (i.e., objective or subjective), and the study's findings".

After the initial coding scheme was developed, five researchers participated in applying, refining, and modifying the coding scheme in three preliminary coding rounds. These researchers used the initial scheme to code five articles independently. The level of agreement across coders was relatively low (69% using Miles and Huberman's [1984] measure of interrater reliability). We discussed reasons for disagreement, modified the coding scheme to clarify coding categories, and each coder applied the modified scheme to two additional articles. While the level of agreement in the newly coded articles was higher (85%), the coders were still in frequent disagreement about the coding of the technology lens (i.e., technological imperative, organizational imperative and emergent perspective). Further discussion among the coders led to additional refinement of the coding scheme. Two additional articles were coded by the five researchers. The agreement remained at 85%[1]. At this point, we decided to make no additional refinements of the coding scheme.

Six researchers applied the final coding scheme to all articles in the sample. This work entailed interpreting the articles and seeing the data through each technology lens. For each article, a primary and secondary coder was assigned. Each researcher coded between 4 and 8 articles in common with each of the other coders[2]. After coding the assigned articles independently, pairs of researchers resolved differences and generated one coding sheet for each article. Coding

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[1]Many studies report interrater reliabilities for two or three raters. Our percentage is based upon the agreement of five researchers. As the number of raters increases it is likely that it becomes more difficult to gain agreement.

[2]The number of articles for each pair was originally relatively evenly divided; however, during coding some articles were excluded from further analysis. Therefore, the final number of articles per coding pair varied.

differences that could not be resolved by the coding pair were resolved collectively by all coders. (See Appendix II for an example of the Lotus Notes form used to apply the coding scheme to each article.) During coding, the coding pairs identified 29 articles that did not completely fit the context of the power and IT phenomenon. These articles were removed from further consideration (leaving 68 articles in the sample). The initial agreement among pairs of coders ranged from 57.1% to 92.5%, with an average agreement of 78.5%. Although the process of resolving coding differences was time consuming, it was also an enlightening experience and enabled us to surface the different theoretical perspectives of the research sample. At the end of coding, each research pair reached 100% agreement on the article coding.

All six researchers studied the final version of the coding and *wrote paradigm accounts.* Paradigm accounts are the researchers' written attempts to organize the disparate insights from the sample of articles and to speak in paradigmatic language. (See Appendix III for an example of a paradigm account.) The discussions ensuing from comparisons of the accounts showed the inadequacy of the technology lenses. In particular, this set of lenses did not capture disparities resulting from different conceptualizations of power. For example, King et al [1994] studied deep societal structures to understand how institutions used IT innovations to gain power and how these innovations subsequently altered the institutions' place in society. And, Dean, Yoon and Susman [Dean et al., 1992] portrayed a Marxist view when describing labor's use of advanced manufacturing IT to alter the balance of power. Thus, we concluded that an additional set of lenses was needed to allow us to understand our phenomenon of interest completely.

To address this issue, we selected an additional set of lenses to supplement our original choice of lenses. We again modified our coding to apply a framework developed and used by Bradshaw-Camball and Murray [1991] to understand power and organizational politics. This framework is a modified version of Burrell and Morgan's [1979] framework of sociological paradigms. Another modified version of Burrell and Morgan's work was applied in other MIS research by Hirschheim and Klein [1989]. Because of the extensive descriptions and applications of the Burrell and Morgan framework, the modified framework described by Bradshaw-Camball and Murray [1991] is relatively well-defined. Given its well-articulated theoretical base, the Bradshaw-Camball and Murray framework is, arguably, one of the easiest sets of paradigm lenses to apply to the murky concepts of power associated with IT management and use. The major lenses (and their respective definitions) in the Bradshaw-Camball and Murray framework are:

- *Rational (functionalist) perspective* -- is primarily concerned with objective reality and is based on an assumption of a super-ordinate goal. Politicking and conflict are not expected. Decision making is viewed either as the individual decision maker applying economic or mathematical models or within an organizational framework that promotes decision rights and authority.

- *Pluralist (functionalist) perspective* -- is also primarily concerned with objective reality but has no assumption of a super-ordinate goal. Overt politicking is expected. In fact, the organization tends to be regarded as a loose coalition with differences in stakeholder goals and individual and group interests. Decision making is also based on the coalition model. While conflict is considered inevitable, its resolution can have positive impacts.

- *Interpretive perspective* -- attempts to understand and to explain the social world primarily from the point of view of the actors involved in the social process. People inter-subjectively and symbolically construct and sustain their organization realities with heavy reliance on language, symbols, and meaning. Theories constructed in the context of this paradigm are anti-positivist.

- *Radical perspective* -- focuses on deep social structure and its radical change. Critical theory represents the principal line of development. The goal of theory is to free organization members from sources of alienation, exploitation, and repression.

In an additional round of coding, all six researchers independently coded the sixty-eight articles into one of these four paradigms. Then all six researchers met together to determine collectively the final coding for each article. Gioia and Pitre [1990] note that while a multiparadigm

perspective is desirable, it is nonetheless rooted in a specific paradigm depending on the ground assumptions of the observer. Thus, our categorization was based upon what we perceived to be the dominant paradigm in each article.

THEORY BUILDING PHASE

In the third and final phase we

- explored metaconjectures,
- attained a metaparadigm perspective, and
- attempted to engage in critical self-evaluation.

Metaconjectures are propositions that can be interpreted from multiple paradigms. We used metaconjectures to explore the multiple perspectives emanating from previous research on power and IT. We developed metaconjectures by engaging in mental experiments [Weick, 1989]. For example, we created a matrix of twelve cells by juxtaposing the four power lenses with the three IT lenses. We populated the matrix with the articles based on their dominant paradigm for these two lenses. Then we looked for the anomalies and similarities across articles in each of the twelve cells.

Our progress in this phase was hampered by trying to develop all-encompassing metaconjectures. Of course, all-encompassing metaconjectures were about as easy to find as uncovering the "Eternal Truths." We eventually developed metaconjectures that were both intriguing and that helped us differentiate or integrate portions of two or more paradigm lenses. We were not able to develop metaconjectures that incorporated all tenets of all paradigm lenses. Rather than integrate multiple paradigms, metatriangulation is designed to accommodate divergent theoretical perspectives and have these perspectives inform each other in developing more enriched theories and reaching higher levels of abstractions. Below are three sample metaconjectures that were generated when we looked at predominantly emergent articles across each paradigm in the power lenses.

> ***Metaconjecture 1:*** *In situations where the IT function and/or developers lack formal authority or resources, there is greater emphasis placed upon generating acceptance of a formal methodology which in turn alters the formal structures of authority.*

> ***Metaconjecture 2:*** *In organizations/groups where the IT function and/or developers have high levels of formal authority or resources, the emphasis on educating top management is greater and on negotiating is less.*

> ***Metaconjecture3:*** *Once power-altering IT has been introduced, it takes some time for the organization to reach a new equilibrium state. The indicators of IT's impact on a new equilibrium state are evidenced by new power structures, language, and symbols.*

We articulated critical self-reflection by critiquing the emerging *metaparadigm perspective*, its implications, and the process. Gouldner [1970, p. 495] considers self-reflection to be "the deepening of the self capacity to recognize that it views certain information as hostile, to recognize the various dodges that it uses to deny, ignore, or camouflage information that is hostile to it, and to strengthen its capacity to accept and to use hostile information." Self-reflection can be undertaken at four different levels:

(1) Researchers question whether they have applied appropriate approaches to understanding a phenomenon,

(2) Researchers identify their theoretical perspectives and those of others who influence their research,

(3) Researchers conduct a multiparadigm inquiry to appreciate different paradigmatic languages and methodologies, and

(4) Researchers attempt to transcend paradigmatic boundaries in developing metaparadigm theory [Lewis and Kelemen, 2002].

Through our development of metaconjectures, we reached the third level of reflexivity. We attempted to reconcile new observations based on the metaconjectures with previous conclusions to verify whether we could develop a consistent theory regarding the role of power in the management and use of IT. A more detailed discussion of the non-process oriented findings is available in [Jasperson et al., 2002].

In the future, we will attempt to *attain a multiparadigm perspective*. An initial attempt at attaining a *multiparadigm perspective* is presented in Table 3. As we become more aware of the diversity across perspectives, we should find ourselves more open to theoretical choice. We should be more aware of our own theoretical predilections and we will have been exposed to a wider realm of viewpoints and literature.

Table 3. Evaluation of Metaconjectures 1 - 3

Power Lens	Metaconjecture specific to lens	Illustrative study	Strategy?
Rational	Formal IT methodologies help achieve organizational goals	Kling and Iacono, 1984	Formal IT methodologies identify the best approach to develop systems designed to meet organizational goals, but do not result in power shifts.
Pluralist	When IT function/ developers lack formal authority, they introduce formal IT methodologies to extend their power	Kling and Iacono, 1984	IT function/developers gain power through the use of formal IT methodologies that can be implemented only by highly-trained IT professionals. In time, shifts due to expertise power lead to changes in formal structures of authority.
Interpretive	When IT function/developers lack formal authority, they educate top management to realize the value of a formal IT methodology.	Kling and Iacono, 1984	*When IT function/developers lack formal authority*, they create a social construction of the value of the methodology and the IT professionals who implement it. Over time, the value of the IT professional's work leads to shifts in power. *When IT function/developers possess formal authority*, they use the speedier alternative of negotiating for resources that will further their interests.
Radical	Formal structures of authority evolve to reflect the institutionalization of the methodology	King et al., 1994	The IT methodology is formally accepted at a societal level and it is institutionalized with formal institutes offering training on the methodology and a language that is understood by all. The importance of the methodology is reflected in new organization structures.

III. LESSONS LEARNED

As we proceeded through the different phases of the metatriangulation approach, we encountered and resolved different problems. Some problems were caused by a lack of specific guidance by the method developers, while others were caused by implementation decisions we

made. In this section, we describe the problems we encountered and offer suggestions to help reduce the problems that future users of this approach may encounter.

GROUNDWORK LESSONS

The activities of the groundwork phase are very much like the activities performed at the beginning of any research project: the "what," "how," and "where" questions are answered. We defined the phenomenon of interest to decide "what" research question to address. Once the "what" was developed, we focused our paradigm lenses to decide "how" we would study it. The selection of a metatheoretical sample determined "where" to search for articles addressing the phenomenon of interest

Lesson 1 -- Set Boundaries on the Sampling Frame

Our first lesson came during the collection of the metatheoretical sample. It quickly became apparent that we needed some rules about which articles to include and which to exclude. Underlying the criteria we used for selecting sources and specific articles is a key principle of metatriangulation: the metatheoretical sample is just that, a *sample,* not a collection of everything ever written about the phenomenon. However, as with any sample, our metatheoretical sample should be representative of the population of interest.

As with any other empirical study, it is crucial that researchers interested in metatriangulation be able to describe the nature of their sample and explain how its characteristics strengthen or weaken their conclusions. Because it is unlikely that a single study will include the entire population of relevant articles, creating appropriate and manageable rules for selecting the sample becomes a true challenge. In answering the "where" question, logical, consistent decisions must be made about the phenomena being considered, nature of sources to be sampled, the disciplines and research communities to be included, and the search approach.

The sample may be drawn from articles, books, proceedings papers, and various other reports. To keep our study manageable, we selected only articles in ten top-ranked journals. This selection criterion assumed that the high-quality proceedings papers, dissertations, and key ideas from books would find their way into journals. Because our focus was on power at the intersection of IT and management, we included management and IT journals. Subsequent analysis suggested that other disciplines, especially marketing, could offer additional insights about power as it relates to IT.

Several different approaches may be used to select sources. The approach that we used relied upon published rankings of top management and MIS journals. One side effect of this strategy was that it introduced a potential bias by only including journals that are published in the US. Although this bias was not complete because many non-North American researchers publish their work in these journals, it was necessary to address the concern that the sample might not accurately represent the range of theoretical perspectives that are present in the international IS research community.

To address this limitation, we added 14 articles drawn from *European Journal of Information Systems* and *Journal of Management Studies,* two highly rated journals that publish many studies by non-North American IS researchers. We used the same article selection criteria and coding approach that we applied in the original 68 articles. After coding the articles and incorporating the findings into our theory building efforts, we also compared the overall characteristics of the two samples. Chi-square tests indicated that while the samples differed in terms of study type and the nature of exploration, there were no significant differences with respect to the level of analysis, IT phenomena, technology lens, and power paradigms. While a full examination was beyond the scope of our study, these results suggested that the bias in our sample resulting from our journal selection criteria would not unreasonably limit our analysis and results.

An alternative approach to identifying articles is to rely on keyword searches of online article collections. However, this approach is not as straightforward as it appears. One of the researchers discovered this phenomenon when involved in another metatriangulation study

which attempted to incorporate this approach on a topic that is much more clearly defined than power: IT-facilitated interorganizational relationships (ITIOR). Here are some of the problems that were encountered when employing a search-by-topic approach:

1. Which tool should be used for the search? A number of tools could be argued to be appropriate, but our use of two different tools (e.g., ABI/Inform and EBSCO) in the ITIOR study resulted in thousands of articles. The articles selected by each tool were markedly different.

2. The group of articles retrieved by the search engines differed from day-to-day, even when searching the same database using the same search terms, dates and other specifications (i.e., refereed, not-refereed).

3. The search of refereed journals returned approximately 2,000 articles on EBSCO, the search tool used in the ITIOR study. Since the researcher's library did not subscribe to many of the journals, it was not feasible to read the articles to ensure their appropriate selection. Hence, it is conceivable that viable articles were eliminated on the basis of abstract (often a summarization written by the owner of the search tool and not the abstract written by the original authors) and title alone (though in some cases we also had keywords). Then, the ITIOR study was prolonged due to delays in the receipt of the selected articles from Interlibrary Loan.

4. Probably the most problematic aspect of selecting articles solely by topic using a database of articles was that many of the articles retrieved were poorly written. Even though refereed, they clearly were not of the quality that is found in top-ranked journals. Most journals were not ranked, or ranked very low in published rankings of journals; therefore, many articles published in these journals were basically devoid of theory -- an element that is especially critical in metatriangulation studies. Thus, the search by topic in all journals was time-consuming and not very fruitful in terms of identifying theoretical underpinnings.

DATA ANALYSIS LESSONS

Planning the paradigm itinerary and coding are iterative, as well as time- and labor-intensive activities. We decided to use multiple coders to comb through the large sample we had drawn.

The first lesson we learned during data analysis is that achieving agreement across multiple researchers is not easy. In planning our paradigm itinerary (i.e., designing the coding scheme), our team required three rounds of applying the coding scheme on sample articles to be confident we were in agreement. In retrospect, we see that the disagreements ultimately helped us clarify our different points of view and assumptions. However, our team discussions were often filled with frustration and exasperation as one or more members tried to articulate and reconcile their point of view with that of the other team members. The remaining lessons learned from the data analysis phase all deal with disagreements that arose during development, modification, and application of the coding scheme. We discovered three root causes of our coding disagreements: coder biases, views of objectivity/subjectivity, and research inconsistencies.

Lesson 2 -- Use Tools to Reduce the Impact of Coder Biases

The first root cause of coding disagreements arose from *coder biases*. The researcher's coder bias could be traced to their own theoretical predilection that sometimes clouded their ability to see alternative theoretical perspectives. Many coding disagreements occurred during our early attempts to code the initial paradigm. A Lotus Notes form aided our efforts at coding the articles. We discovered that using fields on the Lotus Notes form to capture coder biases significantly improved coding agreement. At the beginning of the research process, each researcher tended to code articles largely into the theoretical perspective that primarily reflected his/her own bias. Adding fields to record textual evidence for particular perspectives reduced the effects of coders' biases by forcing each coder to attend to specific statements by the author(s), as opposed to relying on general impressions. The extra fields led to coding of paradigms that was more rule-

driven, more clearly articulated, and less influenced by the coder's own worldview. It also helped highlight rater biases. Reliability of the coding across coders required a lack of coder bias. We attempted to increase the reliability of our coding by proceeding in rounds. After each round, we calculated the level of agreement across coders and discussed reasons for coding differences. These discussions highlighted underlying assumptions of the multiple paradigms and yielded rich insights about the paradigm lenses that we were using. In an effort to increase reliability, we worked in pairs. When a pair of coders could not resolve their differences, a group discussion including all six researchers at the end of the round yielded a consensus coding and clarification of associated theoretical issues.

A second area of coding disagreement came from the difficulty in coding the worldview. We thought we could use the author's worldview as additional evidence in understanding the paradigms evident in the sample studies. However, we encountered difficulty in coding the author's underlying view as objective or subjective. After additional discussion, we determined that two aspects of objectivity were evident in our sample articles -- the view regarding technology and the view regarding people. Our difficulty in coding this category was substantially reduced when we changed the Lotus Notes form and coded all articles as to whether the technology was perceived objectively or subjectively, and whether the organizational actors were perceived objectively or subjectively. We further addressed the problem of coding objectivity and subjectivity when we realized that the technology paradigms force classification into bifurcated categories of objectivity/subjectivity based upon some preexisting reality. This dichotomy precludes an alternative view in which meaningful reality is created inter-subjectively. The introduction of the power paradigms provided a broader worldview to supplement the technology paradigms. For example with the interpretive perspective, some authors suggest that meaning and the world as we know it is created through language and symbols that are shaped through social interactions.

Lesson 3 -- Authors Rarely Explicitly Specify Paradigms Applied

The third root cause of coding disagreement is the *difficulty in identifying an author's dominant paradigm*. Although others made a similar observation, we learned firsthand that authors rarely explicitly specify the paradigm applied in their work [Lewis and Grimes, 1999, Smircich, 1983], or even define key constructs. When authors did explicitly discuss their underlying assumptions, they typically focused on their methodology and its implications for their approach to data collection and analysis. In addition, we observed that authors who set the research frame indicating that they were adopting one perspective often operationalized another. Most often this change occurred when authors theorized from an emergent perspective. This perspective is difficult to test empirically and, consequently, actual tests used the organizational or technological imperative. In other studies, two or more perspectives were applied and we had to choose which paradigm seemed to be the dominant paradigm applied by the authors. The lack of a clear theoretical perspective made the process of writing paradigm accounts and building a general account of our findings more challenging, but also more illuminating.

THEORY BUILDING LESSONS

Metatriangulation is an iterative process. We completed several iterations between the data analysis and the theory-building phases.

Lesson 4 -- Select All Appropriate Lenses for Viewing the Phenomenon

First, the set of paradigm lenses we chose did not provide a thorough view of our phenomenon of interest. The technology side was well articulated, but the sample's divergent views of power were obscured. In retrospect this outcome is not surprising. When Lewis and Grimes applied metatriangulation their phenomenon of interest was advanced manufacturing technologies. We, instead, examined the *relationship* between power and IT. We addressed the shortcoming by selecting a second set of paradigm lenses (one specific to power), modifying our inquiry, and recoding the articles in the sample. The technology lenses enabled us to characterize how prior

work in power and IT viewed IT in organizations, while the power lenses allowed us to explore the alternative conceptualizations of power that were applied. In retrospect, this lesson suggests that the selection of lenses must be capable of providing insight about all major constructs of the phenomenon of interest. In short, we did not select the wrong lens; we failed to select all appropriate lenses.

Lesson 5 -- Use Tools to Assist in Managing Data Volume

Our second lesson learned while engaged in theory building activities was about data volume. As with most qualitative methods, metatriangulation generates a great deal of data. With each iteration, more data is added. As we iterated between data analysis and theory building, our understanding of the phenomenon of interest changed -- leading to additional data as we tried to reconcile new observations with prior conclusions. Building theory from this mountain of data requires tools and planning. Lotus Notes provided a means of capturing and updating the data and, importantly, it was available at the researchers' universities. In addition, Notes' support for view creation allowed the researchers to slice through the data in attempts to glean insights. Thus, Lotus Notes offered a tool to handle the data volume in an organized manner, and still allowed the individual researchers the ability to examine the data. Other tools are often used for purely qualitative research (e.g., NUDIST) but the need from a tool in this sort of study is the ability to guide researchers in *what to capture* as well as the ability to manipulate the captured data and create different views.

Lesson 6 -- Critical Self-Reflection Is a Process Not a Stage

A third theory building lesson is that critical self-reflection is not a stage that comes at the end of the process. In metatriangulation, the traditional approaches to establishing theoretical validity and internal consistency cannot be applied as easily [Eisenhardt, 1989, Lewis and Grimes, 1999]. Thus, we found that we needed to critique our emerging theory multiple times rather than wait until we arrived at the end of the theory development process. Furthermore, we discovered that over time, our understanding of our phenomenon of interest evolved. Therefore, as we made iterations between the theory building activities and data analysis activities, theoretical holes were uncovered in observations that were once considered valid.

FINAL LESSON FOR ALL PHASES

A final lesson learned applies to all three phases. As with most research methodologies, we realized that each decision made during a previous phase impacts subsequent phases to some extent. Without a clear vision of what the research outcome would be, we risked developing a paradigm itinerary that did not include key elements required for theory building; however, vision for the research outcome might prematurely narrow our focus. In addition, if we chose to "cast a wide net" and code everything that might be important, the mountain of data could be insurmountable. We opted to code those things that would help us categorize sample articles into various views and to capture the key findings from each article. Further, we attempted to capture our reasons for coding selections at the time selections were made. We also addressed this problem by conducting our research in a series of iterations.

IV. CONCLUSION

Metatriangulation is the tool that successfully guided our interpretation of the literature investigating the role of power in the management and use of IT. Based on our experience, we offer several recommendations for researchers interested in applying metatriangulation to investigate other MIS phenomenon.

- Table 4 provides a summary of the lessons we learned and our suggestions for a revised metatriangulation process. We learned that, as with any research method, careful planning and execution are critical to the production of significant outcomes.

Table 4. Summary of Lessons Learned and Recommended Revisions

Activity	Lesson Learned
Groundwork	
Define phenomenon of interest	The phenomenon of interest must be defined in specific fashion to guide metatheoretical sample selection.
Focus paradigm lenses	Lens selection must be comprehensive; all major constructs in phenomenon must be viewable. Lenses must be well-specified so that they can be easily applied.
Determine sampling frame (added)	Identify best sources of information about phenomenon of interest.
Collect metatheoretical sample	This is a sample. All information need not be included, but sample must be representative of phenomenon of interest.
Data Analysis	
Plan paradigm itinerary	Items included in itinerary must be parsimonious but thorough. Information overload is a threat. Need proper tools and planning. Researcher thoughts while coding should be captured also.
Pilot test the itinerary (added)	All coders need to test the itinerary using articles similar to those in the sample.
Conduct multiparadigm coding	Coding must be iterative. Agreement among coders is vital to theory building, but it also is a useful way to ascertain the completeness and clarity of paradigm itinerary.
Write paradigm accounts	Knowledge repository should be built to collect not only the accounts but the tools researchers used to construct the accounts (i.e., tables, notes, other views of the data)
Theory Building	
Explore metaconjectures	Don't be surprised if this phase reveals problems in earlier phases. Plan to iterate. Don't equate the development of metaconjectures to the discovery of "Eternal Truths."
Attain a metaparadigm perspective	This activity requires more iteration. Developing a single all-encompassing theory is unlikely.
Articulate critical self-reflection	This step actually occurs throughout the data analysis and theory building stages. You should frequently question observations and conclusions to determine if they can be integrated with the developing theory.

We added two steps to help enhance the execution of this approach:
- determine a sampling frame in the Groundwork Phase; and
- pilot test the itinerary to enhance coding consistency across coders.

It is critical for the researchers to establish a rationally-defensible sampling frame. The search approach may either contain articles from a sampling of journals or a search by topic. If a search by journal is used, researchers must attempt to use all journals that could provide alternative perspectives. This search may require including international journals that are not typically ranked in published journal rankings. If a search by topic is employed, the researchers should review the journals returned carefully and select only those that tend to include a strong theoretical underpinning in their articles. The desire to create a manageable sample that can be analyzed in a timely fashion must be offset by the selection of articles (and books, proceedings, etc.) that adequately present multiple paradigms. Because many of the concepts are murky or ill-defined, a pilot test of the itinerary is invaluable. A pilot test can help coders understand better the complexity of the task and jointly define the topics to be coded.

Our lessons learned can be summarized around three major points.

- First, the metatriangulation activities suggested by Lewis and Grimes are not a set of sequential steps that if followed will lead one to the holy grail of unified MIS theory. While a certain amount of time-ordered linearity is evident in the activities (for example, it is difficult to conduct coding activities before a sample is collected), we found moving from one activity to another often consisted of taking one step forward and two steps back (e.g., after writing paradigm accounts, we returned to focusing the paradigm lens as we discovered an additional set of lenses was required to interpret our data). Thus, we emphasized the iterative nature of several activities in Table 4 (i.e., conduct multi-paradigm coding, explore metaconjectures, and articulate critical self-reflection).

- Second, metatriangulation work is messy. For example, the authors of the sample articles did not provide explicit evidence of the paradigms. Therefore, we relied on the judgment of the coders. Unfortunately, coders are limited in their ability to process information. Thus, between the time an article was coded and the time the coding pairs met to reconcile differences, the coders often forgot the context of the situation that existed as a particular coding decision was made. Consequently, in Table 4, we suggest that researchers supplement data analysis efforts by not only recording the outcomes of decisions made during data analysis activities, but also by capturing the thoughts and discussions that led up to the decisions or conclusions. Further, because metatriangulation is messy, we suggest assigning a primary coder to each article. It is the primary coder's responsibility to ensure that coders' differences are discussed and resolved, and that an entry is made to reflect the final coding agreed upon by all coders.

- Third, critical self-reflection should not be left to the end of the process. Researchers who put off critical self-reflection as the last step will discover that their theory development is not complete. We propose beginning critical self-reflection during data analysis as the researcher writes paradigm accounts.

Robey and Boudreau [1999] suggest meta-analysis as a means of resolving inconsistent results among studies in MIS research. Metatriangulation is a powerful qualitative meta-analysis method whose intent is to aid researchers in understanding and linking divergent research results into a consistent set of theories. It is especially well-suited to areas that are rich in theoretical, not empirical, conflict. It is a good tool for interpreting the underlying assumptions and language in a field of study where researchers use the same terms to describe substantially different concepts and different terms to describe the same concept. For example, in our study it soon became obvious that researchers used the term "power" to describe a wide range of phenomena.

The theory-building step in Lewis and Grimes' approach to meta-triangulation should be approached with reasonable expectations. The idea of developing a single theory that fully integrates multiple theoretical perspectives is contingent on the maturity of the field under study. At one extreme, the coding and analysis may reveal that the body of research is characterized by a set of paradigms that are all minimally developed. In this case, an important result of a metatriangulation study may be to highlight the structure, strength, and weaknesses of the literature associated with each approach. In a slightly more mature body of research, it may be the case that each paradigm is solid, but boundary-spanning work that examines where the paradigmatic assumptions mix or breakdown is needed. Here the metaconjectures may be used to blend the multiple paradigms and call attention to questions that arise in contexts where the assumptions of multiple paradigms are satisfied simultaneously. Finally, in literature where both multiple theoretical perspectives and boundary spanning work is present, metatriangulation can serve as the basis for development of a comprehensive theory. It respects opposing perspectives and juxtaposes the partial understandings that they inspire [Lewis and Kelemen, 2002]. Whichever the case, by bringing to the surface fundamental differences, metatriangulation provides a tool for strengthening the theoretical foundations of a body of research because it raises the paradigm consciousness of researchers in the field and it fosters greater self- and

social reflection about the body of research. We hope others can benefit from our experience as they apply metatriangulation in their own research efforts.

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APPENDIX I. GLOSSARY OF TERMS

Table A-1 contains a listing and short definitions of metatriangulation terms.

Table A-1. Glossary of Metatriangulation Terms

Term	Definition
Coding scheme	A set of rules to apply to the data during data analysis that assists the researchers in categorizing the data.
Metaconjecture	A metaconjecture is a proposition that can be interpreted from multiple paradigms.
Metaparadigm perspective	A metaparadigm perspective is developed by a researcher as s/he attempts "to juxtapose and link conflicting paradigm insights (X and Y) within a novel understanding (Z)" [Lewis and Grimes, 1999, p. 673]. A metaparadigm perspective helps theorists manage their bounded rationality and, thereby, accommodate opposing views within a metaparadigm perspective...'Accommodation' does not imply unification or synthesis but, instead, the ability to comprehend paradigmatic differences, similarities, and interrelationships" [Lewis and Grimes, 1999, p. 675]
Metatheoretical sample	A metatheoretical sample is data interpretable from multiple-paradigm perspectives" [Lewis and Grimes, 1999, p. 679].
Metatriangulation	Metatriangulation is a "strategy of applying paradigmatic diversity to foster greater insight and creativity" [Lewis and Grimes, 1999, p. 672]. It is a type of meta-analysis that helps theorists recognize, cultivate, and accommodate diverse paradigmatic insights.
Multiparadigm perspective	A multiparadigm perspective is a view of the phenomenon of interest from multiple disparate paradigms.
Paradigm	A paradigm is a general perspective or way of thinking that reflects fundamental beliefs, assumptions, and methodologies that are agreed upon by the researchers employing the paradigm [Gioia and Pitre, 1990, Kuhn, 1970].
Paradigm account	A paradigm account is a summary written by a researcher used to organize disparate insights from the sample and to speak in paradigmatic language. (See Appendix III for an example of a paradigm account.)
Paradigm itinerary	A paradigm itinerary is "a planned order of paradigm analyses" [Lewis and Grimes, 1999, p. 681].
Paradigm lens	A paradigm lens is a perspective from which the phenomenon of interest is examined.
Phenomenon of interest	The phenomenon of interest is the topic of the study. The thing the researcher is examining.

APPENDIX II. CODING FORM

Figure 1 contains the Lotus Notes form we used to assist coders in applying the final coding scheme. Coders were able to enter any text data in most fields. Choices were constrained through the use of checkboxes if more than one choice could be indicated and through drop-down lists if only one choice could be made. Available choices for drop down boxes are indicated in parentheses.

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Article Log

Manuscript Number: Volume: Number: Pages:

Author:

Journal: Year:

Title:

Level of Analysis

- [ ] Individual   [ ] Intra-organizational   [ ] Societal
- [ ] Group   [ ] Organizational
- [ ] Project   [ ] Inter-Organizational

Sample Size:

Sample Nature:

Whose power is being studied?:

Study Type

- [ ] Case study   [ ] Lab experiment   [ ] Non-empirical
- [ ] Field experiment   [ ] Analysis of archival information   [ ] Other
- [ ] Field study/Survey Research   [ ] Meta analysis

Length of study: (cross-sectional, or longitudinal)

Areas of Application:

Type of technology:

Theoretical basis:

Nature of Exploration: (hypothesis testing, framework development, propositions developed, research questions explored)

Independent Variables:

Dependent Variables:

Power Measures:

Definition of Power:

Other Variables:

Imperative: (technological, organizational, or emergent)

Evidence of -

 Technological Imperative:

 Organizational Imperative:

 Emergent Perspective:

Findings:

Citations

- [ ] Blau (1964)   [ ] Hickson et al (1971)   [ ] Pfeffer and Salancik (1978)
- [ ] Deutsch (1969)   [ ] Kling and Iacono (1984)   [ ] Weber (1947)
- [ ] Emerson (1962)   [ ] Markus (1983)   [ ] None of the Above
- [ ] French and Raven (1959)   [ ] Pettigrew (1972)

Technology Belief   People Belief

○ Objective ○ Subjective	○ Objective ○ Subjective

Evidence of -

 Technology Belief:

 People Belief:

Paradigmatic Language:

Paradigm: (rational, pluralist, interpretive, radical)

Primary Coder:

Secondary Coder:

Logged by:

Figure 1. Lotus Notes Coding Form

APPENDIX III. SAMPLE PARADIGM ACCOUNT

The material in this appendix comes from a paradigm account written by one of the authors during the data analysis phase. In this appendix, we are not trying to provide a complete explanation of the pluralist studies from our sample, rather, our intent is to provide an example of a raw paradigm account that we used in applying the metatriangulation research approach. Therefore, although we edited the content slightly for grammar and readability, for the most part, the text is as originally written and provided to the other members of the research team. We also edited the paradigm account to include complete citations and a reference list. Lastly, some articles mentioned in the account were later excluded from our final sample.

PLURALIST FINDINGS

The pluralist perspective of power, like the rationalist, is subsumed within the functionalist paradigm. Here, power is perceived as objective reality and there are structural bases from which power is derived, but in the pluralist perspective a super-ordinate goal and overt politicking is not expected. In fact, the organization tends to be regarded as a loose coalition with differences in stakeholder goals and individual and group interests; this diversity is emphasized. Researchers typically investigate the key players, how much power they have, and from what bases the power comes.

In the pluralist perspective, conflict is considered to be inevitable, but not necessarily dysfunctional. The resolution of conflict can include positive or functional aspects. The source of conflict usually is associated with attempts to control resources or gain power. The resolution of conflict often necessitates the use of power.

In our sample, 37 studies exhibit language and assumptions consistent with the pluralist perspective. Examples of the evidence criteria used for categorizing studies as pluralist included: the study of coalition building [Kling and Iacono, 1984, Romm and Pliskin, 1997], conflict [Barki and Hartwick, 1994, Robey and Farrow, 1982, Robey et al., 1989, Robey et al., 1993], bargaining [Clemons and Row, 1993], or implementation politics [Keen, 1981, Levine and Rossmoore, 1995, McKeen et al., 1994, Newman and Noble, 1990]. Some confirmation for the categorizations made is provided by the citations used by these studies. They most often cited and the number of citations are Emerson (8), Markus (7), Pfeffer (7), Pettigrew (6).

DEFINITION OF POWER

Twenty-eight studies defined power in terms of the ability to influence an outcome, including engaging in overt political activities. This definition of power tends to be based on Emerson's social exchange theory (i.e., "the dependence of Actor A upon Actor B is (1) directly proportional

to A's motivational investment in goals mediated by B and (2) inversely proportional to the availability of these goal to A outside the A-B relationship" [Emerson, 1962, p. 32]. Three studies looked at divisional power as defined by Hickson et al [1971], 2 looked at power rather than influence (e.g., sanctionary power and bargaining power), and 1 looked at coalition building.

Power in this perspective is gained from the control of one of many bases of power. These bases of power include status, legitimate, and expert power at the individual level, and resources at the interorganizational level. For example, the interorganizational pluralist studies use objective definitions of power that are derived from resource dependency and control of strategic contingencies. Sometimes power is potential rather than exercised in the pluralist perspective.

FINDINGS

Findings fall into three broad areas: IT implementation, inter-organizational processes, and group processes.

Implementation

The relationship between power and IT implementation is often characterized as political actors responding to a perception that power is either gained or lost as a result of the new system. Depending on the level of analysis, examples include individuals responding to a potential loss of expert power [Watson et al., 1999], or a department responding to a loss of network centrality [Markus, 1983].

Within the implementation studies in our sample, two distinctively different camps were found: the first assumes that legitimate authority is not challenged the second assumes all bases of power are in play.

First Camp

The first camp includes those who suppose that the implementation scenario includes an actor or actors with legitimate authority, and that legitimate authority is being exercised to engender a common goal for those involved in the implementation. This arrangement would typically be indicative of a rationalist perspective and studies that look at managerial influence or top management support. Within the pluralist perspective the difference is: legitimate authority is only one of several bases of power, and individuals may be pursuing goals in addition to the one they share with the project team.

In this camp, the source of conflict are described as a difference of opinion about how best to achieve the common goal [Barki and Hartwick, 1994]. Left unchecked, conflict can develop into incompatible goals and interests. In these situations, actors are engaging in political behavior when they do not have legitimate authority to make something happen, but they believe their actions will have an impact (i.e., participatory influence [Barki and Hartwick, 1994, Franz and Robey, 1986, Newman and Noble, 1990, Robey et al., 1989]). Conflict may be resolved to the mutual satisfaction of all parties or may be resolved to the satisfaction of the most powerful. The following papers in our sample fall into this camp: [De Brabander and Thiers, 1984]; [Beath, 1991]; [Barki and Hartwick, 1994]; [Franz and Robey, 1984]; [Robey et al., 1989]; [Robey and Farrow, 1982]; [McKeen et al., 1994]; [Newman and Noble, 1990]; and [Robey et al., 1993].

Most of these papers investigate the conflict/resolution model of systems development. They typically propose that conflict is constructive -- it stimulates creativity and innovation, and prevents domination. The general findings suggest that IT development participants come together with a common project goal (i.e., to build a system), as they participate in the development process learning occurs [Newman and Noble, 1990], this learning can uncover some content-oriented differences of opinion among these interdependent factions [Barki and Hartwick, 1994] resulting in conflict (Robey studies [Franz and Robey, 1986, Robey and Farrow, 1982, Robey et al., 1989, Robey et al., 1993]), the level of influence the users believe they can exert directly impacts the belief that the resolution of the conflict is mutually acceptable [Newman and Noble, 1990].

Two papers investigated different aspects of legitimate authority during IT implementation: champion actions [Beath, 1991] and sanctionary power [De Brabander and Thiers, 1984]. Beath focused on the power champions gleaned from the support of IT personnel, and DeBrabander investigated the use of sanctionary power by IT specialists and the negative response this power produced in the non-specialist user.

Second Camp

In the second camp, several studies investigated the political actions of persons and/or groups involved in IT implementation without any assumption of a common goal. Studies in this camp were: [Hann and Weber, 1996]; [Kling and Iacono, 1984]; [Kim and Michelman, 1990]; [Keen, 1981]; [Watson et al., 1999]; [Levine and Rossmoore, 1995]; and [Markus, 1983].

Levine's view would suggest that conflict arose because legitimate authority was neither exercised nor delegated. Hence, participants were forced to vie for power/influence. It would follow that resolution is impossible, instead a lot of politicking and irrational decision making will ensue.

Interorganizational Power

All of the studies in our sample dealing with interorganizational power [Clemons and Row, 1993, Hart and Saunders, 1997, 1998, Iacovou et al., 1995, Premkumar and Ramamurthy, 1995, Young-Ybarra and Wiersema, 1999] are pluralist and adopt a subjective view of people. These studies predominately focus on social relationships rather than attributes of persons. Not surprisingly, the unit of analysis of these studies is at the interorganizational level. The source of power was rooted in dependence in the trading partner.

These papers adopt a positive sum view of power in which both parties may gain from the political process. Implicit in these articles are patterns of commitment, dependency, interdependency, and reciprocity that are developed over a long period of time. Even when power is applied coercively in the short-run, mutual benefits ultimately may accrue from a positive, trusting relationship in which both parties integrate IT such as EDI into their internal operations [Hart and Saunders, 1997, 1998, Iacovou et al., 1995, Premkumar and Ramamurthy, 1995] or join an IT alliance [Young-Ybarra and Wiersema, 1999].

Several of these authors [Hart and Saunders, 1997, Iacovou et al., 1995], find the distinction between potential versus exercised power to be important. When exercised, the least dependent trading partner exerts power over the more dependent one to encourage the adoption of the technology or the technology alliance. Conflicts of interest are clearly more obvious when power is exercised than when power is potential. For example, less willing partners may be forced into adopting EDI because the more powerful trading partner wants them to do so. The articles in this group suggest that conflicts must ultimately be resolved and both parties must perceive/derive benefits or satisfy internal needs from the adoption of the technology. Hence, success is ultimately measured by the satisfaction of both parties.

Several articles in this stream note that conflicts of interest may be avoided if persuasive, rather than coercive, power is applied [Hart and Saunders, 1997, 1998, Iacovou et al., 1995, Premkumar and Ramamurthy, 1995]. For example, Iacovou et al., recommend that EDI initiators pursue promotional efforts to improve partners' perceptions of EDI benefits, provide financial and technological assistance to partners with low organizational readiness, and carefully select and enact influence strategies to reduce resistance. Premkumar and Ramamurthy [1995] suggest providing incentives and training, and treating extended users in the same way that these firms would treat their internal users.

Measures of power in the Hart & Saunders [1997], Premkumar & Ramamurthy [1995] and Young-Ybarra and Wiersema [1999] studies employ Likert-scale questionnaire items focusing on relative influence/dependency. Hart & Saunders [1997] and Young-Ybarra and Wiersema [1999] focus on alternatives. Iacovou et al.'s approach is slightly different in that it uses interviews to determine external pressures, including those from the trading partner, to adopt EDI.

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The Clemons and Row [1993] study serves as an exception in this group of studies. Unlike the focus on dependence demonstrated in the other interorganizational studies, Clemons and Row's measure of bargaining power is based on the pricing strategies of manufacturers and the response of retailers. Their study does not offer a definition of power, though the importance of bargaining power is acknowledged implicitly. Further, Clemons and Row adopt a zero-sum, rather than positive sum, approach to power. In this study, IT can lead to changes in bargaining power because of the information that is made available to the manufacturers to allow them to implement policies that are to their advantage. When manufacturers apply bargaining power by using information to limit retailers' investment buying, conflict emerges. Power becomes a zero-sum game because one party's gain is the other's loss.

Computer Mediated Communications (GSS and E-mail)

The three GSS studies from a pluralist perspective [Griffith et al., 1998, Romm and Pliskin, 1997, Williams and Wilson, 1997] adopt a subjective view of people. Three [Romm and Pliskin, 1997, Watson et al., 1999, Williams and Wilson, 1997] are set in the field rather than in a laboratory. All three studies are concerned with the ability to influence and address the individual, as well as the group or organization.

Williams & Wilson [Williams and Wilson, 1997, p. 914-915] argue that only two previous GSS studies address power and influence: Zigurs, Poole and DeSanctis [1988] investigated influence behavior in computer-mediated, decision–making groups, while Ho and Raman [1991] focuses on the effects of GSS on leadership in small groups. Our approach found one other study of status influence prior to 1997 [Weisband et al., 1995], two later studies of minority/majority influence [Dennis et al., 1998, Tan et al., 1998a] and one study of status influence [Tan et al., 1998b].

Williams & Wilson [1997] argue that the contribution of their study lies in its ability to provide insight into the effects of GSS on power and influence in organizations. Williams and Wilson, based on the work of French and Raven, define power as ' the ability to influence decision outcomes', whereas influence is 'the ability to affect a change in beliefs' [Williams and Wilson, 1997, p. 915]. They found that GSS exerts an equalizing force on power and influence by increasing participation in decision making, improving access to persons, improving access to information, reducing power distance, and providing increased opportunities to influence the opinions others. Codependence on a data base in the new system was viewed as affecting all organizational members equally. Further, the GSS was perceived to increase the opportunities for individuals throughout the organization to be heard and to participate in the decision-making process at many levels across the organization, especially for individuals with good communication skills. While important organizational decisions still were made by an elite few, the GSS was perceived to be an equalizing force in the organization by increasing participation and communication. Thus, power and influence within the organization were perceived as becoming more equal. Power is derived from information exchange and participation in decision making. While the article was positioned at the organizational level, the data gathering and analyses were at the individual level. Unlike all other GSS studies, the group is not a specific level of focus.

The Williams and Wilson [1997] paper does not demonstrate any political maneuvers or instances of conflicting choices/interests of organizational players. Implicitly it implies that the members are working toward a common organizational goal. Hence, this article may bridge the rational and pluralist views.

Like the Williams and Wilson [1997] study, the Griffith et al. [1998] study takes a socio-technical approach. It focuses on both the group and individual levels of analysis. An individual, the facilitator can use technology (GSS) to influence the group's performance [Griffith et al., 1998]. Thus, group performance can be improved by the individual influence attempts. Unlike the other GSS studies, the individual's goals (facilitator's) may not be consistent with the group's goals. However, this study, like Williams & Wilson [1997], adopts a positive sum view of power in which success is measured by the ability to satisfy the goals and interests of all stakeholders. The

authors discuss means of stemming the inappropriate conflict that occurs when the facilitator's individual interests create role conflict and influence the content of the group discussions. The facilitator's power is based on legitimate power, status and expert power.

The Romm and Pliskin and Watson et al. case studies appear to adopt more of a zero sum view of power in which one party's gain is the other's loss. For example, in Romm & Pliskin's article, striking faculty use email successfully to gain their strike's goals; The President/administration uses email to manipulate a large group of employees and to quell opposition; A department chair's use of email was viewed as harmful by the president and the department chair was asked to step down. IT (email) was used in a political manner in all four cases to deal with visible conflict. As a matter of fact, conflict was viewed as a circumstance that prompted political behavior. Sometimes the technology led to unintended consequences.

Power was not formally defined by Romm and Pliskin, nor were the sources of power explicitly discussed. Sometimes power was based on position, but they note that political power can also be exerted in an upward, as well as in a downward, direction. Power in three of the four cases was derived by joining a coalition.

Watson et al. [1999] describe the political use of email in a teledemocracy. Power was defined as the politician's influence in decision-making, and the base of power was information. Politicians feared that rapid and easy electronic distribution of information from the telecommunications system threatened their influence and position in the local party. Power in this article was viewed as a zero sum game. Politicians believed that the system would alter the balance of power such that they would lose power and others who derived more information from the system than they previously had would gain in power. As was the case in the Romm and Pliskin [1997] study, power was not formally measured.

Other Pluralist Studies

The following pluralist studies have no apparent patterns:

- Huber is the only objective people/objective technology paper. In this paper, if parties want to become political, they will pick the appropriate DSS (that is, the DSS is not modified to meet political needs.) this is a bridging paper.

- Some structural considerations [Burkhardt and Brass, 1990, Saunders, 1981, Tractinsky and Jarvenpaa, 1995]

- Has role in political process for decision making…. Determining weighting ([Huber, 1981] - DSS; [Sabherwal and King, 1992] - SIS; [Weill and Olson, 1989] - IT investment decisions)

- IT can help gain control of uncertainty ([Burkhardt and Brass, 1990, Saunders, 1981])

- Sillince and Mouakket [1997] discuss multiple perspectives of power

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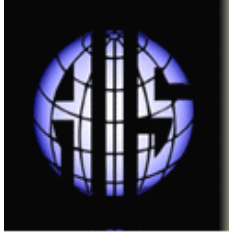
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