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Power and Information Technology: A Review Using Metatriangulation

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POWER AND INFORMATION TECHNOLOGY: A REVIEW USING METATRIANGULATION

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Abstract

This study uses a metatriangulation theory building process to explore the relationships between power and information technology (IT) in a sample of 43 articles from 10 leading management and MIS journals. We explore the multiple paradigms underlying this research, describe patterns emerging from the previous power and IT studies, and recommend future directions for investigation.

1. INTRODUCTION

Baskerville and Smithson (1995, pg. 70) suggested "power is plainly a crucial warp thread in the theoretical fabric of IT and new organizational forms." However, the impact of power on IT is hardly new. Over the past two decades, the study of power and IT has been a regular, if not peripheral, part of management and management information systems (MIS) studies. In recent years, mainstream management and MIS researchers have shown an increasing interest in the intersection of IT and organizational power.

While many researchers view power as a recognizable and important aspect of organizations, defining and measuring the theoretical construct has proven difficult. Research in this area is further complicated by the multiple paradigms that have been used to understand the interrelationships among power, politics, and IT. These multiple paradigms are grounded in a number of disciplines including political science, management, sociology, and marketing. This diversity makes it difficult to generate continued discussion and to accumulate a research body.

In this study, we apply metatriangulation (Lewis and Grimes, 1999) to the existing power and IT research. Our purpose is to (1) explore the multiple paradigms that are used to understand how power impacts IT (and vice versa), (2) describe patterns that have emerged in research on power and IT over the last 20 years, and (3) recommend future directions and approaches to studying these relationships.

Metatriangulation is a theory building process that assists theorists in recognizing, cultivating, and accommodating diverse paradigmatic insights (Gioia and Pitre 1990; Lewis and Grimes 1999). A researcher uses the metatriangulation process to articulate the paradigms underlying extant theory; then, the uncovered paradigms can be used to create even richer theoretical bases for

understanding the phenomenon being studied. Lewis and Grimes (1999) suggest a three-phased model (ground work, data analysis, and theory building) 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. In this study, we focus only on the first two phases. Table 1 provides definitions of the steps in each phase and a description of the activities we conducted in each step.

Table 1. Metatriangulation Approach and Application to Study of Power and IT
(Adapted from Lewis and Grimes 1999)

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	We included studies that examined power and IT. Power was broadly defined to include power, politics, authority, influence, participation in decision making, decision rights, and centralization/decentralization.
Focus paradigm lenses	From a broad overview of the field, bracket or differentiate among varied sets of assumptions; specify what is and is not of interest; try to recognize underlying paradigms in extant and emerging literature and identify transition zones between paradigms.	From a preliminary review of the literature, we gathered a subset of articles. We surveyed them using an approach to bracketing used in many IT studies: technological imperative, organizational imperative, and emergent perspective.
Collect metatheroretical sample (data interpretable from multiple lenses)	Collect data interpretable from multiple paradigm perspectives	We searched leading MIS and management journals, ensuring that we selected a set of journals with empirical as well as theoretical slants. We included as our population all articles published in these journals from 1980 through 1999. We selected articles that included the phenomenon of interest (i.e., power and IT) in the title, abstract, or keywords. We used forward citing of four key power and IT articles to ensure that our selection process was complete.
Phase II. Data Analysis		
Plan paradigm itinerary	Determine plan for analyzing data, track down patterns in data and contrasting accounts of phenomenon	We set up an initial coding sheet for coding the data. To capture multiparadigms we included the theoretical viewpoint (i.e., technological imperative, organizational imperative, emergent perspective), paradigmatic language, and view of technology (objective, subjective).
Conduct multiparadigm coding	Breakdown, interpret and conceptualize data; study varied interpretations of data; alternative interpretations of the data are analyzed. Insights about the paradigms are created.	Four coding rounds were conducted to insure that the coding scheme was understood by all coders. In round one, five researchers coded five articles and worked on clarifying the coding categories. In the next two rounds, the five researchers each coded two additional articles. In round four, all articles were coded by two coders who worked together to resolve coding differences.
Write paradigm accounts	The results of data analyses are tabulated. Paradigmatic insights are recorded and compared.	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.
Phase III. Theory Building		
Explore metaconjectures	Conduct mental experiments and juxtapose the divergent views	Not included in this study.
Attain a metapradigm perspective	Develop a theoretical perspective capable of accommodating diverse representations.	Not included in this study.
Articulate critical self-reflection	Critique the resulting theory and theory building process	Not included in this study.

2. METHODOLOGY

2.1 Groundwork

We began the groundwork phase with two researchers conducting an initial review of articles relating power to IT. We broadly defined power, our phenomenon of interest, to include the topics of influence, politics, authority, participation in decision making, decision rights, and centralization. We concluded from the initial review that a more complete review would be both manageable and worthwhile. Next, an initial set of paradigmatic lenses were identified. The lenses chosen were three theoretical perspectives articulated by Markus and Robey (1988):

- *Technological imperative*: "views technology as an exogenous force which determines or strongly constrains the behavior of individuals and organizations" (Markus and Robey 1988, p. 585). Information technology is viewed as an independent variable that affects organizational structure.

- *Organizational imperative*: "assumes almost unlimited choice over technological options and almost unlimited control over the consequences….Human actors design information systems to satisfy organizational needs for information. Thus information technology is the dependent variable in the organizational imperative, caused by the organization's information processing needs and manager's choices about how to satisfy them" (Markus and Robey 1988, p. 587). The organizational imperative views IT as a dependent variable.

- *Emergent perspective*: uses and consequences of information technology emerge unpredictably from complex social interactions" (Markus and Robey 1988, p. 588). Information technology is both an independent and a dependent variable.

This set of lenses has been widely discussed in the MIS literature (e.g., George and King 1991; Orlikowski and Robey 1991; Pinsonneault and Kraemer 1993).

2.2 Sample Selection

The sample used in this study included relevant journal articles published in 10 top management and MIS research journals from 1980 through the end of 1999 (see Table 2). Our initial selection criteria were that an article had to (1) discuss IT and (2) address some aspect of the broad power definition discussed previously. The title, abstract, and keywords for every article published in these journals from 1980 to 1999 were scanned to identify articles for inclusion. We excluded articles that (1) only had a paragraph or two about power or (2) focused exclusively on either power or politics, but not IT, or vice versa. However, we included articles in which power was an independent variable, even if the article only minimally discussed its impact. Forty-three articles were selected for further analysis. Table 3 contains a listing of the articles that were included in the final study.

Table 2. Journals Included in the Study

Journals from which sample was drawn	Number of articles published in journal
Academy of Management Journal	2
Academy of Management Review	1
Administrative Science Quarterly	2
Communications of the ACM	7
Decision Sciences	1
Information Systems Research	4
Journal of MIS	9
Management Science	7
MIS Quarterly	8
Organization Science	2

Table 3. Articles Included in the Sample

Author(s) and Year	Level of Analysis	Technology Studied	Study Type	Nature of Exploration
Articles with Technological Imperative				
Carter 1984	Organizational	Computerization in newspaper production	Field study/Survey Research	Hypotheses testing
Dennis et al. 1998	Individual and Group	Group Support System	Lab experiment	Hypotheses testing
Hitt and Brynjolfsson 1997	Organizational	No specific technology mentioned	Field study/Survey Research	Research questions explored
Ho and Raman 1991	Group	Group Decision Support System	Lab experiment	Hypotheses testing
Keen 1981	Intra-organizational	General MIS	Non-empirical	Research questions explored
Lee 1991	Individual	Office Information system (OIS)	Field study/Survey Research	Hypotheses testing
Lucas 1984	Intra-organizational	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Lucas and Palley 1987	Intra-organizational	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Nault 1998	Organizational	No specific technology mentioned	Other	Framework development
Saunders 1980	Intra-organizational	A properly designed MIS	Non-empirical	Propositions developed
Saunders and Scamell 1986	Intra-organizational	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Tan et al. 1998a	Individual	Computer Mediated Communication	Lab experiment	Hypotheses testing
Tan et al. 1998b	Group	Computer Mediated Communication	Lab experiment	Hypotheses testing
Weisband et al. 1995	Group	Computer Mediated Communication	Lab experiment	Hypotheses testing
Williams and Wilson 1997	Organizational	Groupware with email, database	Case study	Research questions explored
Young-Ybarra and Wiersema 1999	Inter-Organizational	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Zigurs et al. 1988	Group	Group Decision Support System	Lab experiment	Hypotheses testing
Articles with Organizational Imperative				
Barki and Hartwick 1994	Individual	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Franz and Robey 1984	Project	No specific technology mentioned	Case study	Research questions explored
George and King 1991	Organizational	No specific technology mentioned	Non-empirical	Research questions explored
Griffith et al. 1998	Individual	Group Support System	Non-empirical	Propositions developed
Hart and Saunders 1998	Inter-Organizational	Electronic Data Interchange	Field study/Survey Research	Hypotheses testing
Howell and Higgins 1990	Group and Organizational	Any IT	Field study/Survey Research	Hypotheses testing
Kim and Michelman 1990	Inter-Organizational	Hospital Information System	Non-empirical	Propositions developed
Lederer et al. 1990	Project	No specific technology mentioned	Case study	Research questions explored
Leonard-Barton and Deschamps 1988	Individual	Expert system	Field study/Survey Research	Hypotheses testing
Levine and Rossmoore 1995	Project	IT initiative to replace current system	Case study	Propositions developed
Markus and Bjørn-Andersen 1987	Intra-organizational and Project	No specific technology mentioned	Non-empirical	Framework development
McKeen et al. 1994	Project	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Nelson and Cooprider 1996	Group and Inter-Organizational	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Robey and Farrow 1982	Individual	Varied IT	Field study/Survey Research	Research questions explored
Robey et al. 1989	Project	Auto Insurance System development project	Field study/Survey Research	Hypotheses testing
Robey et al. 1993	Individual	No specific technology mentioned	Field study/Survey Research	Hypotheses testing
Romm and Pliskin 1997	Intra-organizational	E-mail	Case study	Framework development
Sillince and Mouakket 1997	Project	Housing application processing system	Case study	Research questions explored
Articles with Emergent Perspective				
Anand and Mendelson 1997	Organizational	No specific technology mentioned	Other	Framework development
Burkhardt and Brass 1990	Individual	Nutrient analysis and dissemination database	Field study/Survey Research	Hypotheses testing
Hart and Saunders 1997	Inter-Organizational	Electronic Data Interchange	Non-empirical	Propositions developed
Joshi 1991	Project	No specific technology mentioned	Non-empirical	Framework development
Kling and Iacono 1984	Project	Materials Resource Planning system	Case study	Research questions explored
Robey and Markus 1984	Project	No specific technology mentioned	Non-empirical	Research questions explored
Robey and Boudreau 1999	Organizational	No specific technology mentioned	Non-empirical	Research questions explored
Tractinsky and Jarvenpaa 1995	Project	No specific technology mentioned	Field study/Survey Research	Research questions explored

2.3 Data Analysis

We began data analysis by planning our paradigm inquiry. We developed an initial coding scheme to facilitate capturing characteristics of the sample studies that were critical to our methodological approach. Among other things, we captured the authors' perspective (i.e., technological, organizational, and emergent), the definition of power employed, elements of the paradigmatic language used by the authors, and the studies' findings. This initial coding scheme was applied and refined during four rounds of coding conducted by five researchers.

In round one, the coders separately coded five power studies using the initial coding scheme. The level of agreement for these articles was relatively low (69% using Miles and Huberman's (1984) measure of interrater reliability). The five researchers discussed the reasons for disagreement and modified the coding scheme to clarify coding categories. In the second round, two additional articles were selected for coding by all coders. While the level of agreement increased to 85%, there was still frequent disagreement about the coding of the theoretical perspective (i.e., technological imperative, organizational imperative and emergent perspective). Further discussion among the coders led to additional refinement of the coding scheme. In round three, five researchers coded two additional articles. The agreement remained at 85%.

In the final coding round, two researchers coded each article. For each article, a primary and secondary coder was assigned. Each researcher coded three to five articles in common with each of the other coders. After coding the assigned articles separately, pairs of researchers resolved differences and generated one coding sheet for each article. The initial agreement among the pairs of coders ranged from 61.9% to 100%, with an average agreement of 76.8%. Resolving coding differences was time-consuming, but enlightening, and helped surface the different paradigmatic bases of the research. Afterward, all researchers studied the final coding for each article and wrote paradigm accounts.

3. FINDINGS

Some general trends about the nature of IT/power research were observed as a result of the sample selection process. As may be observed in Figure 1, studies relating power, politics, and IT have been published on a fairly steady basis in mainstream management and MIS journals. The largest number of articles applied the organizational perspective; however, there appears to have been resurgence in the technological imperative over the last five years.

In this section, we categorize the findings into two general categories: (1) findings discovered as part of the process (or methodological approach) and (2) findings that emerged from the process as outcomes. Our study, to the best of our knowledge, is the first application of the metatriangulation method in IT; thus, we tried to explicitly identify difficulties encountered in the process with the hope of assisting future researchers who employ the approach. Furthermore, we feel the research outcomes may ultimately be useful in integrating and understanding the multiple paradigms that have been applied in IT/power research.

3.1 Process Findings

We discovered two root causes of our coding disagreements: coder biases and research inconsistencies.

Coder biases. Much of our coding disagreement stemmed from our attempts to code the theoretical perspective. We discovered that using fields to capture researcher 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. By adding fields to record the evidence in each article that would lead a researcher to determine the perspective used by the author(s), the selection of an imperative became more rule-driven and less influenced by the researcher's own view of the world.

Research inconsistencies. In addition to uncovering our own biases, we observed that authors often set the research frame indicating that they were adopting one perspective while, in fact, they were operationalizing another perspective. Most often this was the case with authors who used the emergent perspective. This perspective is difficult to test empirically and, consequently, actual tests employed the organizational or technological imperative. For example, Barley (1986), in his classic study of CT scanners, suggests that IT adoption creates an "occasion" for IT to impact organizational structure and for the IT to be molded by the organization; however, the empirical study does not actually demonstrate how the technology was modified by its users. In other studies, two or more perspectives were applied. For example, Zigurs et al. (1988) describe a predominantly technological imperative viewpoint regarding the impact of GSS on group decision making. However, the emergent perspective is introduced in a small section of the article describing a qualitative study showing how a group's assimilation of GSS technology impacted influence distribution and performance in the groups. The lack of a clear theoretical perspective made the process of writing paradigm accounts and building a general account of our findings more challenging.
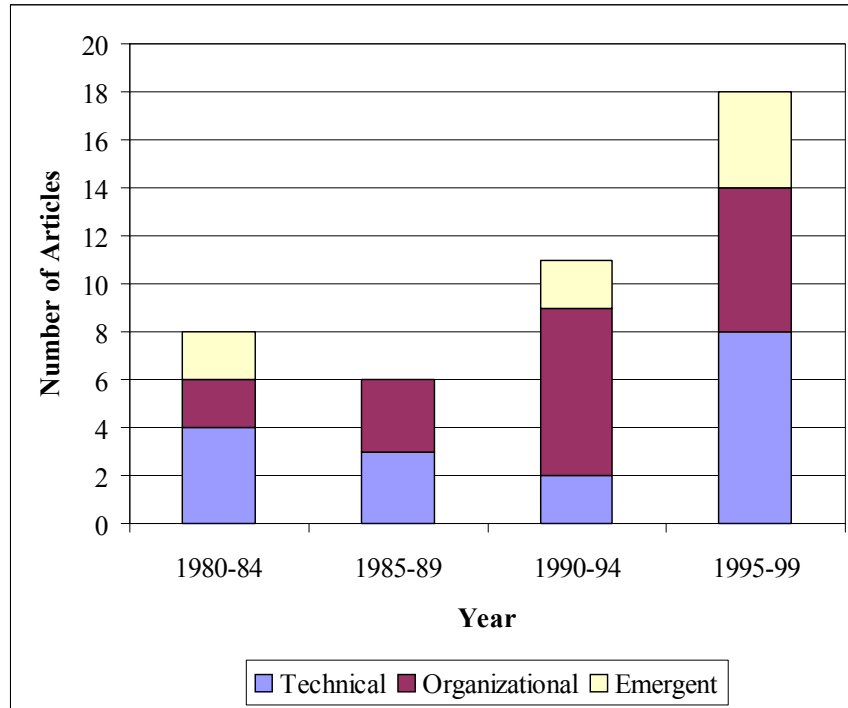
Figure 1. Trends in Power Research

3.2 Outcome Findings

The outcome findings are a result of aggregating the individual paradigm accounts of the researchers. The findings are grouped by the imperative (or paradigm lenses) chosen at the onset of the data analysis.

4.2.1   Technological Imperative

The technological imperative was found in the older writings and in more recent reports of GSS studies. The only exception to this was the relatively recent study of the impact of office information systems on users' power (Lee 1991). In the technological imperative, most researchers view information systems as tools to help users better deal with uncertainty and/or process information and deal with cognitive limitations as they make decisions. The user is viewed as organizationally rational (or boundedly rational). The authors perceive decision makers entering decision situations with known objectives that determine the value of possible consequences of an action. Hence decision makers gather appropriate information, develop a set of alternative actions, and select the optimal alternative for the organization. From this perspective, authors in the technological imperative attempt to understand (1) the change in the exercise of power that is caused by the introduction of IT to an organization's decision making process or (2) the changes in organizational power structures caused by the introduction of IT to the organization.

GSS studies. Seven of the studies adopting the technological imperative are GSS studies (Dennis et al. 1887l Ho and Raman 1991; Tan et al. 1998a, 1998b; Weisband et al. 1995; Williams and Wilson 1997; Zigurs et al. 1988). With the exception of the study by Williams and Wilson, which uses qualitative methods, these researchers use lab experiments to test hypotheses about the impact of GSS use on individual influence. In general, these studies investigate the ability of GSS to dampen influence effects. The influence phenomenon was investigated through the use of majority influence (i.e., conformance pressure from the majority; Dennis et al. 1998; Tan et al. 1998a) and status influence (i.e., conformance pressure from someone with higher status; Ho and Raman 1991; Tan et al. 1998b; Weisband et al. 1995).

The GSS findings suggest that influence effects can be dampened in some GSS environments (Dennis et al. 1998; Tan et al. 1998a, 1998b). However, in general, the introduction of GSS did not result in greater equality of participation, i.e., the balance of power in the group was not altered (Dennis et al. 1998; Weisband et al. 1995; Zigurs et al. 1988).

IT function studies. Another set of articles predominantly adopting the technological imperative focus on the power of the IT function (Lucas 1984; Lucas and Palley 1987; Saunders 1980; Saunders and Scamell 1986). These articles implicitly assume that IT would create conditions favorable to increasing the power of the IT function. However, empirical tests by Lucas, by Lucas and Palley, and by Saunders and Scamell using similar measurements clearly indicate that the IT function had little power.

Other studies. The remaining articles with a technological imperative do not have strong common linkages. Two are field studies focusing on participation in decision making and decision rights (Carter 1984; Hitt and Brynjolfsson 1997). Nault (1998) uses an economic model to explore the collocation of decision rights and information. Keen (1981) employs a conceptual approach to offer suggestions for avoiding social inertia. Social inertia is a construct that should be unique to the technological imperative since it assumes that technology is a force of its own.

Although the authors of the technological imperative studies attempt to demonstrate that technology can be used to alter the power bases in an organization, the evidence collected by these authors provides little support for this idea. IT organizations were found to have no perceived power. However, the three articles in the sample that specifically examined this phenomenon were all conducted in the mid-1980s. The impact of IT on organizational power bases may have changed since that time. Further, the GSS studies provide limited support for the proposition that technological interventions can successfully dampen influence effects in some decision-making situations. However, equality of participation did not result.

3.2.2   Organizational Imperative

In contrast to the rational decision making model found in the technological imperative studies, almost half of the studies adopting an organizational imperative highlight the political model of decision making (Franz and Robey 1984; George and King 1991; Kim and Michelman 1990; Lederer et al. 1990; Levine and Rossmoore 1995; Robey et al. 1993; Romm and Pliskin 1997; Sillince and Mouakket 1997). Research on politics and IT tends to focus on ways in which managers or users employ technology to achieve their own objectives. The political approach appears in the earliest writings about IT and power (e.g., Kling and Iacono 1984; Markus 1983; Pettigrew 1972). In this approach, technology may impact decisions made in organizations. Here, organizations are viewed as political systems containing coalitions of people who have competing interests. Frequently in the political model, decisions are individually focused and follow the desires/choices of the most powerful people. Further, those in power may use technology to change the power structure to their advantage.

Relative to the rational studies, which assume that individuals have consistent objectives based on the organization's goals, organizational imperative studies with an underlying political model are more concerned about conflict arising from differing personal objectives. (Barki and Hartwick 1994; Levine and Rossmoore 1995; Robey and Farrow 1982; Robey et al. 1989, 1993).

> Conflict over scarce resources, divergent priorities, access to specialized knowledge, and the like, is normal in organizations. An individual's ability to control resources, priorities, or knowledge is a measure of his or her power. Political behavior, then is the use of power to resolve conflict in one's favor, usually at the expense of others. (Levine and Rossmoore 1995, p. 116).

Conflict, influence, and systems development. One stream of work investigates the role of influence in systems development (Barki and Hartwick 1994; McKeen et al. 1994; Robey and Farrow 1982; Robey et al. 1989, 1993). These researchers find that user participation leads to influence that can create constructive conflict (Deutsch 1969). Satisfactory resolution of this conflict results in more successful systems. The common operationalization of influence, with the exception of McKeen et al., is perceived influence.

Managerial influence. A second set of articles using the organizational imperative focus on managerial influence (George and King 1991; Griffith et al. 1998; Howell and Higgins 1990; Leonard-Barton and Deschamps 1988; McKeen et al. 1994; Nelson and Cooprider 1996). These studies view the use of technology as reflections of the preferences of powerful people. For example, in their study of facilitator power, Griffith et al. describe tactics that facilitators use to maintain their power in group decision-making situations. Empirically, these studies substantiate the belief that managers exhibit more influence tactics than non-managers (Howell and Higgins 1990), and perceived managerial influence is more likely to impact low-performing subordinates than high-performing ones (Leonard-Barton and Deschamps 1988).

Overall, the organizational imperative studies suggest, and somewhat support, the notion that political actors in an organization attempt to influence the IT development process and IT use in an organization in ways that reinforce and potentially enhance existing power bases. IT development and use are viewed as politically charged processes with outcomes that are managed to the advantage of those in charge of their management.

3.2.3   Emergent Perspective

Two main contexts have been studied by the authors predominantly using the emergent perspective: (1) the interrelationships among organizational structure, IT, and power (Anand and Mendelson 1997; Burkhardt and Brass 1990; Robey and Boudreau 1999) and (2) some aspect of information systems development (ISD) (Kling and Iacono 1984; Joshi 1991; Markus 1983; Robey and Markus 1984; Tractinsky and Jarvenpaa 1995).

Structure, IT, and Power. Two structure articles deal with the redistribution of power. In these articles, the authors propose that introduction of technology may potentially alter power distributions among organizational members. Further, even though this perspective is difficult to test, these authors empirically explore the extent to which powerful individuals manipulate the application and use of IT to support their power bases (Barley 1986). Robey and Boudreau use a conceptual approach to focus on the political behavior of groups with opposing interests. These groups use IT as a resource to support their political activity. They propose that understanding the organizational consequences of IT occurs as researchers and practitioners recognize and understand the interests of both the promoters and opponents of IT transformations.

Power and systems development. Two articles focus on the ISD process in general (Robey and Markus 1984; Tractinsky and Jarvenpaa 1995). These articles demonstrate that the political model also can be viewed from the emergent perspective, and that it need not be viewed from the organizational imperative as discussed earlier. Robey and Markus (1984) suggest that the life cycle of the ISD process creates opportunity for parties with diverse interests to exert influence over one another. They even propose that seemingly rational actions during ISD are politically motivated (such as sign-offs and user participation). The implication is that individuals who are naive to the political undercurrents during ISD will have the wool pulled over their eyes. Tractinsky and Jarvenpaa find that although issues of power and politics are considered during ISD design decisions, they are not the most critical issues considered.

Three articles focus more on the implementation phase of the ISD process (Kling and Iacono 1984; Joshi 1991; Markus 1983). Joshi goes so far as to say that issues of power and politics can be avoided if the equity-implementation model is used during ISD projects. Power issues and political agendas can be overcome because each individual can carefully weigh all outcomes and inputs occurring as a result of the IT implementation. During this comparison of the potential equity changes, the individual considers power issues as only one of many other issues. Joshi's implication is that power and politics do not play a role in implementation since equity evaluations can be made without interacting with other people. More likely, however, making equity evaluations without interacting with other people or interested groups results from simple ignorance of the power and political issues related to the systems development process.

Kling and Iacono examine the developmental trajectory of a computer-based information system (CBIS). They conclude that the system did not simply evolve or drift. Rather it was pushed in a specific direction to increase the power and control of key actors within the organization. Key organizational actors campaigned to build support or quiet opposition for the CBIS. Thus, they controlled the development trajectory of the system.

Markus examines user resistance during IT implementation. Because many information systems are designed in ways that non-randomly redistribute the information required to cope with uncertainty, these systems may alter organizational power. "In general, one would not expect people who are disadvantaged in their power position by a system to accept it (gracefully), nor would one expect people who gain power to resist" (Markus 1983, p. 442). The power-related implication of these two articles (i.e., Kling and Iacono 1984; Markus 1983) is that powerful individuals and/or groups significantly impact the manner in which an implemented IT is used within the organization.

The Hart and Saunders (1997) study differs from the other emergent perspective articles regarding the context that was studied. This article primarily focused on the use of one organization's power to influence the second organization's adoption and use of EDI.

4.   DISCUSSION

Definitions of power in our sample ranged from politics, influence, or authority, to overcoming resistance, resource dependence, and decision structures. While French and Raven (1959), Hickson et al. (1971), Pfeffer (1981), and Pfeffer and Salancik (1978), are widely viewed as seminal research in the social sciences' exploration of power, none of these were consistently cited in our sample. Furthermore, the concept of power was often included in the theoretical development, discussion, and/or conclusion sections of sample articles without defining the term or citing the source of the authors' conception of it. In attempting to trace the concept of power to the previously mentioned seminal sources, we discovered issues surrounding the authors' level of analyses and their power targets.

Level of analysis. Definitions of power include many levels of analysis. French and Raven argue that individuals accumulate power from the following bases: rewards, punishments, legitimacy, expertise, and reference. Pfeffer and Salancik focus on organizational or intraorganizational bases of power (e.g., resource provision, resource irreplaceability, and network centrality). Given the many types of power, it would seem essential for researchers to provide the definition of power used in their research. Yet, nine of the 43 studies provide no definition of power. Furthermore, a number of studies do not have a good grounding in the theoretical bases of power. For example, one study indicates that its view of power is based on the theory of strategic contingencies and cites Markus and Bjørn-Andersen (1987) instead of Hickson et al., the original source. Another study focuses on the individual level of power; however, the authors use a theoretical view of power derived from the literature on intergroup power relations, "since there is no existing literature directly addressing the topic of this study at the individual level." In contrast to this study, a number of other studies effectively use the work of French and Raven to explore personal power.

Power target. Another dimension that emerged during our analysis was the target upon which power was exercised. When individuals, groups, departments, or organizations exercise power, it can be targeted at others of lower, equal, or higher status. The former case is often referred to as positional power (Hickson et al. 1971); the latter case is most often seen in participation power (Hickson et al. 1971; Sillince and Mouakket 1997). Positional power was operationalized in our sample as managerial influence (Howell and Higgins 1990; Leonard-Barton and Deschamps 1988), influence of a leader or facilitator (Griffith et al. 1998; Ho and Raman 1991) and status influence (Tan et al. 1998b). Participation power was evidenced in a number of forms including mutual influence (Nelson and Cooprider 1996), majority influence (Dennis et al. 1998; Tan et al. 1998a), locus of decision making (Carter 1984), decision rights and points (Anand and Mendelson 1997; Nault 1998), participation in decision making (Lucas 1984; Lucas and Palley 1987; Saunders and Scamell 1986; Williams and Wilson 1997), and in the relationship between participation and influence (Barki and Hartwick 1994; McKeen et al. 1994; Robey and Farrow 1982; Robey et al. 1989; Robey et al. 1993).

5. FUTURE RESEARCH

5.1 Research on Power and IT

Our review suggests a resurgence of interest in power in information systems research. In addition to exploring more traditional topics such as the political uses of information systems and the impact of GSS on influence in group decision making, new approaches and new types of power are being studied. In particular, Anand and Mendelson (1997) and Nault (1998) introduced economic models as a way of exploring how the collocation of decision rights and information influence profits. The studies by Hart and Saunders (1997, 1998) and Young-Ybarra and Wiersema (1999) are examples of a growing body of research exploring interorganizational power. These research streams offer rich potential for future research.

An increased number of cross-level studies highlight the importance of studying power within a context. For example, many of the more recent GSS studies are designed to study an individual's influence within the group context. This cross-level focus can build upon social psychological theories such as that proposed by French and Raven (1959). However, if a researcher chooses to study power and IT across multiple levels of analysis, the study design, variable measurement, and data analysis must also have an appropriate cross-level focus.

One area of power research that appears dead is research on the power of the IT function. There were a number of studies and conceptual writings on this topic in the 1980s (e.g., Lucas 1984; Lucas and Palley 1987; Markus and Bjørn-Andersen 1987; Robey and Markus 1984; Saunders 1980; Saunders and Scamell 1986). Perhaps the 1990s proved more favorable to the IS function than did the 1980s. As a result, the IT practitioners are less interested in bringing attention to their newly-won power—that is, if you have power you don't want to talk about it.

There is little commonality of measures in IT/Power research. This may change as the research base grows and becomes more rigorous. To derive greater benefits from having a body of research, researchers will need to devote more effort to defining their constructs and ascertaining the psychometric properties of their operationalizations.

5.2 Application of Metatriangulation Approach

The metatriangulation approach is an excellent tool for ferreting out the multiple paradigms underlying information systems research on power. Our review, while extensive, could be expanded to include a wider range of journals. For instance, the journals that we selected tend to showcase the work of North American researchers, although a number of researchers from the Pacific

Rim are represented in our sample. Other paradigms could emerge as a result of including journals not published in the United States. These could include *Journal of Management Studies, European Journal of Information Systems,* and *Journal of Strategic Information Systems.* These journals, unlike the journals that we included, may use the writings of social or political theorists such as Marx or Fouccault. Further, while our sample included several studies of interorganizational power, it did not include a stream of research on interorganizational power and dependencies found in marketing journals. Expanding the research to include top marketing journals and a Web of Science search on key marketing research could provide even more paradigms of interest.

Finally, the last stage of the metatriangulation approach was not applied in this study. In this final stage, researchers attempt to build theory by viewing the metatheoretical sample through each paradigmatic lens. The context of power and IT is ripe for such theory building. This is an obvious next step for this area of study.

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