

Question 1: What is MIS?

Having read approximately half of the most cited papers in management information systems (MIS), it is quite clear that MIS as a discipline covers a wide variety of themes. Nevertheless, there are also clear commonalities across these themes which define the field, although they do not necessarily emerge immediately upon inspection. Based on the papers read so far and the commonalities between them, an overall definition of MIS must clearly include the key concepts designated by the three words that make it up: *management*, *information*, and *systems*. Below I will tackle each of these in turn, providing evidence of their treatment from the literature, before concluding by noting a fourth key concept in MIS: *organizations*.

Management

First and foremost, MIS deals with *management*. I believe this should be taken in at least two senses: management of organizations, and management of information systems. The first sense stems from the origination of MIS as a field and the application of information systems and technology to managerial tasks and strategies. In this vein, MIS includes studies of the strategic planning, design, implementation, and use of information systems and information technology. For example, Weill (1992) examined data on investments in IT in the valve manufacturing sector, categorizing it by the strategic objective of management and using four measures of performance. One of his major conclusions was that strategic use of IT can lead to “spectacular success” (p. 307), but only if it is adopted early. Those firms who adopt with the crowd will not gain any competitive advantage, since the technology and systems are now commonplace.

Many other MIS studies show an emphasis on managerial tasks and strategies. Those particularly stressing this perspective include Barua, Kriebel, and Mukhopadaya’s (1995) study of the impact on profits of strategic IT use; Brynjolfsson’s work on the once-apparent productivity

paradox between IS funding and employee productivity (Brynjolfsson, 1993; Brynjolfsson & Hitt, 1996); Bourgeois and Eisenhardt's (1988) examination of managerial decision making in the IT industry; Mata, Fuerst, and Barney's (1995) study that found increased managerial IT skills to provide sustained competitive advantage to firms; Brancheau and Wetherbe's (1987) survey of IS managers and general managers to identify their major concerns; and—to a certain extent—group support systems research (such as Dennis, George, Jessup, Nunamaker, & Vogel, 1988). The common link in most of these studies is the use of either firms, departments, or managers—or occasionally students pretending to be managers—as the unit of analysis. By focusing first and foremost on management, these studies explore, describe, and explain the role of information systems as strategically planned, implemented, and used by and for managers and managerial purposes.

The second sense, management of information systems, is present in most MIS research. Given the educational background of most researchers within MIS and the size of most systems of even semi-recent vintage, their management—at least in some form—is almost always considered. As such, citing numerous examples would not serve much useful purpose. In addition, this sense includes both *information* and *systems*, two other key concepts within MIS; as such examples of this sense can be found in those sections below.

Information

Second, MIS deals with *information*. Of course, it is not the only discipline to do so; information technology, library and information science, computer science, and communication also lay at least some claim to the concept of information. Information systems—without the word “management” placed before it—is also occasionally considered a separate discipline. These disciplines often overlap—and disagree—in their studies and conceptions of information;

MIS cannot claim that it is the alpha and omega of the study of information. Nevertheless, much MIS research focuses on information, especially within organizational or managerial contexts and with relation to systems and technology. Research in two themes in particular, media richness and group support systems, provide the best examples of information-centered MIS research.

Media richness. In media richness studies, the focus is on the processing of information in organizations—often by managers—and the ability of different media—e-mail, telephone, videoconferencing, face-to-face interaction, and so on—to capture the information to be exchanged (Daft & Lengel, 1986). While systems are certainly a large part of such studies—since almost all media require some form of technological system to allow the communication of information between sender and receiver—it is what is stored and transferred by the system—information in the form of communication—that is emphasized. Actual communicative messages or incidents are often used as the unit of analysis; Sproull and Kiesler's (1986) study of e-mail use within an organization and Daft, Lengel, and Trevino's (1987) study of the relation between managerial performance and different media are both examples of this. The latter study by Daft and colleagues also used surveys of individual managers to identify their information and media use habits, another approach sometimes used in media richness studies.

Group support systems (GSS). GSS research, while focused to an extent on the design and development of these systems, nevertheless often considers the information exchanged via these systems to be of prime importance. The tools developed in these systems are intended to be used to help managers and others hold meetings, make decisions, and generate ideas to be shared; in all three cases information is the currency of the day. For example, the Cognoter and Argnoter tools developed by Stefik et al. (1987) were, at their core, meant to support the

generation, editing, processing, and evaluating of information in the form of ordered outlines and written proposals. The work of Connolly, Jessup, and Valacich (1990) on the effects of anonymity and tone on the development of ideas—a form of information—in groups supported by GSS similarly focused on the quantity and quality of information these groups generated. The development of the systems themselves is certainly part of some articles and studies, but usually information processes are discussed as well (such as in Nunamaker, Dennis, Valacich, Vogel, & George, 1991).

Summary. While media richness and GSS research provide the best examples of information-centered MIS studies, all research falling within MIS considers information to some degree, even if only in the context of (a) the system it is stored within, (b) being used by managers, or (c) being managed by IS staff. MIS is one of only a few disciplines with a legitimate claim to the study of information. Especially when in conjunction with one or both of the other key concepts—management or systems—MIS can and should claim information as part of its definition as a discipline.

Systems

Finally, MIS deals with *systems*. This is perhaps *the* key characteristic of the discipline that differentiates it from other, similar fields. Business and management, for example, may include studies of management and information, but these do not always include formal systems within their scope. Library and information science, similarly, often considers the concept of information, but does not always include a focus on the system it is stored in (albeit it does more often than management). On the other hand, studies in MIS *always* incorporate the concept of a system. Some of the themes that have their strongest focus in this area include IS and

organizational change, user satisfaction, and system success; these are discussed below as examples.

IS and organizational change. Studies of the relationship between information systems and organizational change emphasize what happens when information systems are introduced into organizations, in terms of the employees, management, the organization as a whole, and the information system itself. Markus and Robey (1988) provide an overview of this area of research and an argument for the use of multiple perspectives for its study; Orlikowski and Robey (1991) then developed a theory based on Markus and Robey's arguments. Empirical studies under this theme have been both quantitative and qualitative; the latter is somewhat more common here than in most other areas of MIS, given the complexity of the problem and the multiple contexts that need to be considered. Orlikowski (1996), for example, used ethnographic methods and an approach based on the earlier work of Markus, Orlikowski, and Robey mentioned above to study how the introduction of an information system changed an organization over time, and vice versa. Studies of information systems and organizational change thus often use both the system and the organization as their unit of analysis, taking a case study approach to the problem. In other cases, as noted by Markus and Robey (1988, pp. 583-584), individuals, groups, or departments have been used as the unit of analysis, although they did not recommend this. Overall, the focus is clearly on the system in the context of the organization and vice versa, rather than on the information in the system or the management of the system (although these aspects do, of course, enter into these studies).

User satisfaction. Studies of the satisfaction of users with information systems naturally must focus on the system. It is notable, however, that many do also consider the information output by the system as a key aspect or factor (see especially Baroudi, Olson, & Ives, 1986, p.

234; as well as a few of the items used by Doll & Torkzadeh, 1988). Nevertheless, even in this research the stress is on how satisfied users are with the information system as a whole, not the information that is stored in it or that it outputs. Studies typically explore the role of user satisfaction with a system as both a dependent and independent variable, one that both causes and is caused by other variables. Some of the variables considered to cause user satisfaction included user involvement (Baroudi et al., 1986; Doll & Torkzadeh, 1988); perceived usefulness (Bhattacharjee, 2001); confirmation of expected benefits (Bhattacharjee, 2001); the overall quality of the system (Seddon, 1997); and net benefits to individuals, organizations, or society (Seddon, 1997). User satisfaction is often theorized to cause actual system usage (Baroudi et al., 1986), intention to continue use (Bhattacharjee, 2001), or expectations about use (Seddon, 1997). It has been argued, however, that satisfaction is not sufficient and that other measures of the effectiveness of a system are required (Melone, 1990). In all of these cases, it is the satisfaction with and effectiveness of the information system as a whole that is of primary interest.

System success. A related area is that of system success, most notably covered by DeLone and McLean (1992). Their analysis incorporated studies of satisfaction in a review of a substantial portion of the MIS literature focusing on systems, discussing those variables that had been considered as dependent variables, that is, antecedents to the success of a system. They broke these into six categories: (a) system quality, (b) information quality, (c) information use, (d) user satisfaction, (e) individual impact, and (f) organizational impact. DeLone and McLean argued additional research was required into measures of organizational impact and their relation to system success, while they felt information quality in particular was too subjective to be adequately measured. Discarding this and discounting information use—which is now a broad and popular research topic in library and information science—the remaining measures of system

success all clearly focus most strongly on the system or organization, rather than the information in it or its management.

Conclusion: Management, Information, Systems, Organizations

To summarize, MIS research includes examination of management, information, and systems, in various combinations. Simply having two of these in a research study does not normally place it within the MIS literature and field, although some studies with the “information systems” combination do overlap with MIS. Individual themes and areas within MIS place their focus differently on the management, information, or system aspects, as detailed above, but usually include at least a little of all three.

A fourth key concept that emerges from a significant portion of the literature is that of organizations; much MIS research takes place in companies, firms, non-profits, schools, universities, and the like, as evidenced by many of the examples discussed above. Other research still features organizations of a more informal nature, such as groups supported by GSS. Therefore, a useful definition of MIS should include all four of these key concepts: management, information, systems, and organizations.

So what is MIS? Based on the literature above—at least as I interpret it—MIS is a discipline that studies and practices the processes and concepts of management, information, and systems and how they interrelate and operate in formal and informal organizational contexts. Thus, MIS covers all four concepts and their interrelations, as shown in the examples given above. Research that only includes one or two concepts does not fall within MIS; for example, a study of information in an organization that does not consider the use of a system or the role of a manager should fall under information science or organization science, not MIS. If, however, at

least three concepts are included—and preferably all four—then this is research in the field of management information systems.

Question 2: Important MIS Themes

Most of the twelve themes within MIS research we have read about so far are of at least some importance to a subset of the academic field. For example, issues surrounding the Internet and trust (Hoffman, Novak, & Peralta, 1999; McKnight, Choudhury, & Kacmar, 2002) are of clear importance to those conducting research on the use of Web sites and intranets as information systems, strategies for their management, and on encouraging their use. Similarly, group support systems research (Connolly et al., 1990; Dennis et al., 1988; DeSanctis & Gallupe, 1987; Ellis, Gibbs, & Rein, 1991; Nunamaker et al., 1991; Stefik et al., 1987) has historically been of great interest—and still is in some circles—to those studying the design and use of systems to support managers' collaborative meetings and decision making processes. However, topics such as these are limited in scope, and do not have broad applicability and importance for the field as a whole.

Four of the themes we have covered are sufficiently broad enough to apply to the whole MIS academic field: (a) the productivity paradox, (b) IS and organizational change, (c) user satisfaction, and (d) system success. Of these, research on the productivity paradox (Brynjolfsson, 1993; Brynjolfsson & Hitt, 1996) is of clear historical importance, and any academic researcher in MIS needs to have knowledge of it. However, it is perhaps of less current and future relevance—as with group support systems—than the other three themes. User satisfaction (Baroudi et al., 1986; Bhattacharjee, 2001; Doll & Torkzadeh, 1988; Melone, 1990) and system success (DeLone & McLean, 1992; Seddon, 1997) are clearly related; the primary exhibit of this relation is DeLone and McLean's (1992) seminal article on the various dependent

variables that have been used to measure success in MIS research. Measures of success other than satisfaction have been and still are important, particularly those of individual and organizational impact. Nevertheless, satisfaction has been studied the most historically, and currently still has, I feel, the most importance to academic MIS researchers in general. DeLone and McLean, however, also raised the need for studies into how systems impact individuals and organizations. Given this need and the ever-increasing use and integration of information systems by and into organizations, the theme of IS and organizational change is also clearly important for academic research into information systems and their impacts on individuals, managers, and organizations. These themes, and evidence for their importance in the literature we have read, are discussed below.

User Satisfaction

User satisfaction has had the most historical impact on the academic field of MIS as it stands today, and thus is the most important theme of those we have covered. Many researchers have tried to identify which factors and variables impact users' satisfaction with information systems, and thus, they have theorized, lead to initial and continued use of such systems. They have also developed ways of measuring these factors, building particularly on the work of Fishbein and Ajzen and their Theory of Reasoned Action (TRA). The combined breadth and depth of this research, along with calls for alternative approaches to the usual research in this area, shows its importance to the field as a whole and to academic MIS research in particular.

Two of our readings presented factors of interest and ways they could be measured. Baroudi, Olson, and Ives (1986) focused on the factor of user involvement in the process of designing and developing such systems. They adapted previous work in this area to develop an instrument for testing the relationships between user involvement, user information satisfaction,

and system usage. Their findings agreed with Fishbein and Ajzen's theory: "user involvement leads directly to user information satisfaction and has both direct and indirect"—via satisfaction—"effects on system usage" (p. 236). Here can be seen the importance of the construct of satisfaction in MIS, albeit at a relatively early stage in its development. Naturally, Baroudi and his colleagues argued for continued study of and research into user satisfaction.

Doll and Torkzadeh (1988) provided such a continuation, developing five subscales to measure aspects of end-user computing satisfaction with information systems. Like Baroudi et al., Doll and Torkzadeh found user participation to positively correlate with user satisfaction, as well as with each of the aspects they measured. Both studies clearly show the importance measuring user satisfaction had to academic MIS researchers at the time. In addition, Doll and Torkzadeh specifically mentioned a "lack of adequate mechanisms to evaluate the effectiveness of end-user computing" and a need for "the MIS research community to move towards a standard instrument for measuring end-user satisfaction" (p. 272). While one standard instrument has not emerged, well-tested measures from multiple instruments have been adopted more recently (see e.g. Bhattacharjee, 2001). As such, the importance of instruments to measure user satisfaction continues today, albeit not in the sense and context of "end-user computing" emerging in the 1980s.

Melone (1990) provided a review of user satisfaction from a theoretical perspective, one much-needed at the time due to its "central role" and "widespread use" in the academic field (p. 76), statements that again show the historical importance of the theme. She focused on the aspect of attitudes present in Ajzen and Fishbein's TRA, arguing that satisfaction is an attitude and thus not an outcome variable, but rather a predictor or independent variable. The substantial grounding of satisfaction and its measures in theory in Melone's article was a key turning point,

showing its increasing importance and significance to the field. She also noted the lack of use of cognitive-based approaches to user satisfaction in MIS, corresponding to Markus and Robey's (1988) emergent perspective and to interpretive research. This shows that user satisfaction was sufficiently important to attract the attention of the growing interpretivist school of MIS researchers. Melone further suggested the dynamic nature of attitudes—and thus satisfaction—required the use of “longitudinal designs that track user attitudes and behavior” and that go beyond satisfaction to consider system efficiency in general (Melone, 1990, p. 88). Such an argument shows the broadening importance and significance of user satisfaction research in all its forms, taking multiple approaches to study of it, its effects, and related concepts such as system efficiency.

Bhattacharjee (2001) focused his attention on *continuing* use and satisfaction, rather than simply initial use. In this way, he indirectly addressed some of the concerns Melone had raised (albeit while ignoring others). His model had clear parallels to TRA's modeling of beliefs (perceived usefulness), attitudes (satisfaction), and intents (to continue use). The findings supported user satisfaction's role as “the strongest predictor” of use intent—in this case the intent to continue use of a system (p. 364)—stressing its importance as a construct. Bhattacharjee argued post-acceptance satisfaction was a better measure than the entirely cognitive, belief-based measures of initial satisfaction previously in use. As such, his study can be seen both as confirming the importance and significance of user satisfaction as an important construct in MIS research and as taking its development further, informed by not just cognitive beliefs and attitudes but also by the use (and continued use) of a system.

In sum, then, user satisfaction in MIS is an important construct to measure and use to predict the usage and success of an information system. The development of measures by

Baroudi et al. and Doll and Torkzadeh, amongst others, shows the importance of user satisfaction to the success of such systems and as a key variable of interest for MIS academics. The evidence of arguments for alternative methodological, epistemological, and theoretical approaches to its study also increases its importance. For its historical impact alone, user satisfaction is the most important theme covered so far; nevertheless, such impacts are felt today and will continue to be felt in the future, as user satisfaction continues to be an important MIS research theme.

IS and Organizational Change

The theme of information systems and organizational change, while perhaps slightly less historically significant than user satisfaction, also has great importance to MIS as an academic field. Markus and Robey (1988, p. 583) claimed that “the relationship between information technology and organizational change is a central concern” of the field and stated “few researchers in the IS field question [its] importance.” However, they also argued previous research under this theme had been unreliable, “conflicting ... unclear” (p. 583), and “ungeneralizable” (p. 584), and proposed that a focus “on the *structure* of theory” was required, within the areas of causal agency, logical structure, and level of analysis. Central to their argument was a call for better theoretical framing of research within the possible structural options. They particularly argued for what they termed “the emergent perspective,” which “holds that the uses and consequences of information technology emerge unpredictably from complex social interactions” (p. 588). Thus, Markus and Robey’s article shows that the relationship between organizational change and information systems and technology is an important one, requiring study that is grounded solidly in theories and in “clear and conscious choices regarding the causal structures of [said] theories” (p. 596).

Orlikowski and Robey (1991) extended Markus and Robey's (1988) work to developing and proposing an actual theoretical framework "for guiding more productive research" (p. 144), based on Giddens's structuration theory. Despite its previous lack of use in MIS, the authors felt it should and could integrate subjective and objective views of information technology and the role of information systems in organizational change together, considering the shaping of individuals, groups, organizations, and information systems and technology by each other simultaneously. As such, they conceived of information technology as "both an antecedent and a consequence of organizational action" (p. 151), presenting a research agenda where this approach could be applied to the study of "the process of systems development and the social consequences of information technology" (p. 158). These are both important areas with clear application to the relation between information systems and organizational change; Orlikowski and Robey's call for research in this area stresses the importance of this theme. Critically, their agenda also included a call for studies that *integrated* systems development with consideration of social and organizational implications, an area they argued would be especially "informative" and important to explore (p. 163). Orlikowski and Robey's article thus shows a continued emphasis on the importance of the theme of information systems and organizational change.

Swanson (1994) stressed the importance of innovation in employing information systems and technology in organizations, calling it "fundamentally strategic" to ensure "survival and success" (p. 1069). He identified a gap in the literature in that there was little discussion of "the nature and significance of" IS innovation until recently, choosing to fill it with an argument for adapting Daft's "dual-core model of organizational innovation" to account for innovation in information systems (p. 1070). While this has not become one of the leading theories in MIS (J. George, personal communication, Sept. 10, 2010), the theoretically grounded approach Swanson

took paralleled that of Orlikowski, Markus, and Robey. Swanson also presented a good overview of the breadth of empirical research in IS innovation, showing the substantial interest in IS and organizational change and thus its clear historical importance as a major theme in MIS research.

Finally, Orlikowski (1996) focused on organizational change “premised on the primacy of organizing practices,” change that takes place slowly and subtly and is based in situated, ongoing practices within the organization (p. 65). Her ethnographic study, highly interpretive in nature, was informed by Giddens’s structuration theory in its consideration of “change as inherent in everyday practice and as inseparable from the ongoing and situated actions of organizational members” (p. 67). It showed the importance of such situated changes causing emergent organizational change throughout the introduction of a new technology, and persuasively argued the need for such changes to be studied by MIS researchers in greater detail and with greater theoretical and epistemological backing than previously accomplished.

Conclusion

To summarize, both user satisfaction and the relation between information systems and organizational change have been important themes in MIS research. Both historically and currently, they have applicability within many different subfields, as well as a number of cognate disciplines. While user satisfaction has historically—and, I would argue, is currently—of greater importance to the field, the importance of IS and organizational change will only increase further in the future. Ten years from now, both themes will likely still be important to the field, but my personal feeling is that it is quite likely their relative positions will be reversed. Nevertheless, they are essentially joined at the hip (DeLone & McLean, 1992), and all MIS researchers should be knowledgeable about and in the past and current literature on both themes.

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