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ANALYZING THE PAST TO PREPARE FOR THE FUTURE: WRITING A LITERATURE REVIEW ▬▬▬▬▬▬▬▬▬▬▬

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A review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge. It facilitates theory development, closes areas where a plethora of research exists, and uncovers areas where research is needed.

In the information systems (IS) field, we see few published review articles. As a result, the progress of our field is impeded. To address this concern, the *MIS Quarterly* launched *MISQ Review* several years ago. The clear intention was to accelerate the accumulation of IS knowledge. A particular goal was to advance the state of theory within the IS field. The stated purpose of *MISQ Review* is to

> ...promote MIS research by publishing articles that conceptualize research areas and survey and synthesize prior research. These articles will provide important input in setting directions for future research.[1]

The lack of theoretical progress in the IS field may be surprising. From an empirical viewpoint, the IS field resembles other management fields. Specifically, as fields of inquiry develop, their theories are often placed on a hierarchy from *ad hoc* classification systems (in which categories are used to summarize empirical observations), to taxonomies (in which the relationships between the categories can be described), to conceptual frameworks (in which propositions summarize explanations and predictions), to theoretical systems (in which laws are contained within axiomatic or formal theories) (Parsons and Shils 1962). In its short history, IS research has developed from classification systems to conceptual frameworks. In the 1970s, it was considered pre-paradigmatic. Today, it is approaching the level of development in empirical research of other management fields, like organizational behavior (Webster 2001). However, unlike other fields that have journals devoted to review articles (e.g., the *Academy of Management Review*), we see few review articles in IS—and hence the creation of *MISQ Review* as a device for accelerating development of the discipline.

One reason we see so few theoretical articles in IS relates to the youth of the field. Another concerns the complexity of assembling a review in an interdisciplinary field. That is, constructing a review is a chal-

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[1]http://www.misq.org/misreview/announce.html

lenging process because we often need to draw on theories from a variety of fields. Moreover, we have so few theories of our own. Nevertheless, the literature review represents the foundation for research in IS. As such, review articles are critical to strengthening IS as a field of study.

Another challenge relates to methods of structuring and presenting these reviews. As the initial senior editors for *MISQ Review,* we quickly learned that many IS scholars are not familiar with the structure and format of reviews, which provided the motivation for this article. Unfortunately, this finding is not uncommon in other areas, as has been noted:

> Authors of literature reviews are at risk for producing mind-numbing lists of citations and findings that resemble a phone book—impressive case, lots of numbers, but not much plot. [In contrast] a coherent review emerges only from a coherent conceptual structuring of the topic itself. For most reviews, this requires a guiding theory, a set of competing models, or a point of view about the phenomenon under discussion [Bem 1995, p. 172].

Like Bem in psychology, we seek to encourage more conceptual structuring of reviews in IS. Drawing on our editorial experiences, as well as other editors' experiences in related areas (e.g., Daft 1985; Sutton and Staw 1995; Whetten 1989), we believe that we can help prospective *MISQ Review* authors and IS scholars in general by setting forth some guidelines and thoughts on how to write a review article.[2]

In this paper, we first consider who should write for *MISQ Review* and identify the types of articles that are appropriate. Next, we spend most of the paper providing advice to would-be authors based on what we have learned from our experiences. We then discuss the reviewing process. Finally, we conclude by summarizing our expectations for a review article.

Prospective Authors and Topics ■■■■■■■■■■■■■■■■■■■■■■■■

There are two points in a scholar's life that lend themselves naturally to writing a literature review. First, those who have completed or made substantial progress on a stream of research are well positioned to tell their colleagues what they have learned and where the field can most fruitfully direct its attention. Second, scholars who have completed a literature review prior to embarking on a project and have developed some theoretical models derived from this review are also potential authors.

From another angle, two types of reviews exist. First, authors could deal with a mature topic where an accumulated body of research exists that needs analysis and synthesis. In this case, they would conduct a thorough literature review and then propose a conceptual model that synthesizes and extends existing research. Second, authors could tackle an emerging issue that would benefit from exposure to potential theoretical foundations. Here, the review of current literature on the emerging topic would, of necessity, be shorter. The author's contribution would arise from the fresh theoretical foundations proposed in developing a conceptual model.

Because literature reviews are more time-consuming and have fewer outlets than research articles, prospective authors should contact the current senior editor of *MISQ Review* prior to commencing. An

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[2]While this article is centered around *MISQ Review*, we believe much of what we say has general value for most IS literature reviews.

outline of the review will enable the senior editor to advise whether another author is currently working on the topic and to give broad guidance on the direction of the work.

Writing a Review Article ████████████████████████████

To assist you in crafting your paper, we indicate the broad structure of a review paper and provide several suggestions on executing your review. We reflect on some pragmatic issues (e.g., what should be included in the introduction to your paper?) and some more ambiguous issues (e.g., how can you justify a proposition?). Throughout, we provide examples from past articles in a variety of fields to give you exemplars of how others have addressed these issues.

Beginning Your Article

In some papers we have received, the topic does not "emerge" until well into the article. Moreover, the contributions are not clear. In contrast, to hook your reader early, the introduction to your paper needs to motivate your topic, provide a working definition of your key variable(s), and clearly articulate the paper's contributions. Ways of demonstrating contributions include providing a new theoretical understanding that helps to explain previously confusing results, noting that little research has addressed this topic, providing calls from well-respected academics to examine this topic, bringing together previously-disparate streams of work to help shed light on a phenomenon, and suggesting important implications for practice.

The next section of your paper should provide more elaborate definitions of your key variables and set the boundaries on your work. Boundaries include issues like level(s) of analysis, temporal and contextual limitations, the scope of your review, and your implicit values (Bacharach 1989; Whetten 1989). For example, you should clearly state the unit or units of analysis undertaken in the review; however, be wary of trying to go beyond a single unit unless you can provide a strong rationale for a multilevel perspective. Further, if your theory applies only to certain contexts (e.g., types of occupations, organizations, or countries) or to certain time periods, this should be identified for the reader. You also need to support the scope of your review: state what literature and fields you will draw upon and why these define an appropriate boundary for the chosen topic and level of analysis. Finally, identify the values bounding your theory—that is, your implicit assumptions concerning whose interests are served (such as top manage-ment, IS professionals, users, or other stakeholders: Bacharach 1989; Iivari et al. 1998).

To show how these suggestions might be implemented, consider Griffith's (1999) paper on "technology features." She motivates her topic by providing examples of practice ranging from aboriginals' use of the steel axe to users' concerns with Pentium chip errors (p. 472). She then articulates the contributions by (1) outlining past research and highlighting its gaps, (2) suggesting that she will address these short-comings by proposing new theory, (3) listing academics who have called for this research, and (4) indicating that this research has important implications for practice (pp. 473-474). Her subsequent sec-tions provide definitions of her key concepts and delineate the boundaries on her research (pp. 474-478).

Identifying the Relevant Literature

A high-quality review is complete and focuses on concepts. A complete review covers relevant literature on the topic and is not confined to one research methodology, one set of journals, or one geographic

region. However, a comment we receive frequently from reviewers is that *MISQ Review* submissions focus solely on North American or a small set of "top" publications. As one reviewer tellingly noted:

> *Studies of the IS literature have consistently been limited by drawing from a small sample of journals. Even though the [ones] investigated here may have reputations as our top journals, that does not excuse an author from investigating "all" published articles in a field....I just can't see the justification for searching by journal instead of searching by topic across all relevant journals.*

We recommend a structured approach to determine the source material for the review:

(1) The major contributions are likely to be in the leading journals. It makes sense, therefore, to start with them. While journal databases like ABI/Inform (ProQuest) accelerate identification of relevant articles, scanning a journal's table of contents is a useful way to pinpoint others not caught by your keyword sieve. You should also examine selected conference proceedings, especially those with a reputation for quality.

Because IS is an interdisciplinary field straddling other disciplines, you often must look not only within the IS discipline when reviewing and developing theory but also outside the field. Malone and Crowston (1994) provide an excellent example of reviewing literature in related areas like computer science, economics, operations research, organization theory, and biology. Robey et al. (2000) present another admirable example of reviewing two major streams of research to inform their research topic.

(2) *Go backward* by reviewing the citations for the articles identified in step 1 to determine prior articles you should consider.

(3) *Go forward* by using the Web of Science[3] (the electronic version of the Social Sciences Citation Index) to identify articles citing the key articles identified in the previous steps. Determine which of these articles should be included in the review.

A systematic search should ensure that you accumulate a relatively complete census of relevant literature. You can gauge that your review is nearing completion when you are not finding new concepts in your article set. Of course, you will miss some articles. If these are critical to the review, however, they are likely to be identified by colleagues who read your paper either prior to or after your submission.

Structuring the Review

A literature review is concept-centric. Thus, concepts determine the organizing framework of a review. In contrast, some authors take an author-centric approach and essentially present a summary of the relevant articles. This method fails to synthesize the literature. The two approaches are easily recognized, as illustrated in Table 1.

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[3]http://www.webofscience.com/

Table 1. Approaches to Literature Reviews

Concept-centric	Author-centric
Concept X … [author A, author B, …] Concept Y … [author A, author C, …]	Author A … concept X, concept Y, … Author B … concept X, concept W, …

Table 2. Concept Matrix

Articles	Concepts				
	A	B	C	D	…
1		✖	✖		✖
2	✖	✖			
…			✖	✖	

Table 3. Concept Matrix Augmented with Units of Analysis

Articles	Concepts														
	A			B			C			D			…		
Unit of analysis	O	G	I	O	G	I	O	G	I	O	G	I	O	G	I
1					✖			✖							✖
2	✖				✖	✖	✖								
…							✖	✖			✖				

Legend: O (organizational), G (group), I (individual)

To make the transition from author- to concept-centric, we recommend that you compile a concept matrix as you read each article (Table 2), an idea we have adapted from Salipante et al. (1982). When your reading is complete, synthesize the literature by discussing each identified concept. Before commencing this step, take some time to develop a logical approach to grouping and presenting the key concepts you have uncovered.

You might need to add a further dimension to the concept matrix to handle the unit of analysis (Table 3). For example, Te'eni (2002) found that the concept "communication strategy" had different meanings when considered from the organizational, group, individual, and cognitive utterance levels. Isolating concepts by unit of analysis should result in a crisper review because it is easier to detect when you let a concept stray outside the scope of its domain.

Tables and figures can be an effective means of communicating major findings and insights. Nonetheless, tables cannot be merely lists of articles. They need to add value by categorizing articles based on a scheme that helps to define the topic area, such as types of variables examined, level of analysis, gaps in the literature, or other important theoretical issues.

For instance, DeLone and McLean (1992) include a set of tables summarizing the literature on IS success by level of analysis, type of study, and success measures. As another example, Bem (1995) describes a review in which past research is categorized by whether the studies support one of three competing models—by doing so, the authors are able to discover a recognizable pattern supporting one of the models. Alavi and Leidner's (2001) table of knowledge taxonomies makes it easy for the reader to quickly determine the meaning of a particular knowledge type, which is especially useful in a long article. Finally, the six figures and 13 tables in Te'eni's (2001) review article help to communicate his message more clearly.

A review succeeds when it helps other scholars to make sense of the accumulated knowledge on a topic. We believe that sense-making is enhanced when a review is logically structured around the topic's central ideas and makes good use of tables and figures to convey economically the key findings and relationships.

Tone

A successful literature review constructively informs the reader about what has been learned. In contrast to specific and critical reviews of individual papers, tell the reader what patterns you are seeing in the literature. Do not fall into the trap of being overly critical, as Daft (1985, p. 198) argued when describing why he rejected some journal submissions:

> …another indicator of amateurism was an overly negative approach to the previous
> literature.…Previous work is always vulnerable. Criticizing is easy, and of little value; it
> is more important to explain how research builds upon previous findings rather than to
> claim previous research is inadequate and incompetent.

Respect the work of those who labored to create the foundation for your current work by keeping in mind that all research is flawed (McGrath 1982). Of course, you cannot cite others' work blindly—sometimes research is poorly designed and conducted, and you will need to make hard decisions about whether to include this work in your review or to downplay its significance. Further, if a research stream has a common "error" that must be rectified in future research, you will need to point this out in order to move the field forward. In general, though, be fault tolerant. Recognize that knowledge is accumulated slowly in a piecemeal fashion and that we all make compromises in our research, even when writing a review article.

Tense

Opinion is varied on whether when writing about prior research you should mainly use the present or past tense. When either tense can communicate equally effectively, we opt for the present for several reasons. First, it gives the reader a greater sense of immediacy. Second, when discussing concepts, and in line with our concept-centric approach to literature reviews, it is logical to use the present tense because concepts are always here and now. Third, the present tense is terser and thus faster for the reader to process. There is an exception to this recommendation. An author's opinions can change with time. When attributing a statement or idea to a person, therefore, use the past tense: "Max Weber may no longer be saying what he once said" (Starbuck 1999).

Theoretical Development in Your Article

A review should identify critical knowledge gaps and thus motivate researchers to close this breach. That is, writing a review not only requires an examination of past research, but means making a chart for future research. For example, the *MISQ Review* articles by Alavi and Leidner (2001) and Te'eni (2001) pinpoint questions for future inquiry.

Highlighting the discrepancy between what we know and what we need to know alerts other scholars to opportunities for a key contribution. Usually, this roadmap is accomplished by developing a conceptual model with supporting propositions. In this paper, we focus on this traditional approach. However, there are other means of making a significant contribution (Whetten 1989). For instance, showing how competing theories or philosophical assumptions explain an important phenomenon can be very influential (e.g., Allison's [1969] analysis of the Cuban missile crisis).

Extending current theories or developing new theories will create directions for future research. However, extending or developing theories is a difficult task and is often the weakest part of a review. Nonetheless, it is the most important part of a review and generally needs the most elaboration. Here, we provide some recommendations for researchers who wish to develop a model and justify its propositions.

Conceptual models are generally derived from variance (factor) or process theories (Markus and Robey 1988; Mohr 1982). Variance theories incorporate independent variables that cause variation in dependent variables. In contrast, process theories use events and states to help explain dynamic phenomena. Thus, models may look very different in the two approaches (see Figure 1 of Langley [1999] for examples of these two types of models). Of course, review articles may draw from both variance and process research to develop conceptual models to guide future research. In fact, DiMaggio (1995, p. 392) argued that "many of the best theories are hybrids, combining the best qualities" of these approaches. Moreover, Sabherwal and Robey (1995) demonstrate how the two approaches can be reconciled in one study. Thus, do not treat the results of variance and process research as independent elements of a review. Rather, make every effort to show how these two approaches reveal a deeper understanding of the topic. For example, the explanatory power of a process model might be contingent on the strength of a particular variable, as Newman and Sabherwal (1991) illustrate.

Models and propositions capture relationships between variables, but do not, on their own, represent theory (Sutton and Staw 1995). For example, Griffith's (1999) proposition 1a (p. 480) states that, "New/adapted concrete features are more likely to be experienced as novel than new/adapted abstract features." Rather, the reasoning or justification for these relationships represents the crucial part of the theory-development process.

The reasoning for propositions may come from three main sources: theoretical explanations for "why," past empirical findings, and practice or experience. The why or logical reasoning is the most important component of the explanation. It must always be part of any justification. It represents "the theoretical glue that welds the model together" (Whetten 1989, p. 491). Past empirical research also should be included if it exists. If it does not exist in the specific area of interest, however, empirical research in related areas should be presented as (weaker) support (Gay and Diehl 1992). Experience, if available, can also help to justify a proposition; it may arise from the author's own experiences in interacting with organizations or from the practice literature. Nonetheless, while past findings and experience can help to support a proposition, keep in mind that they are not a substitute for logical reasoning (Sutton and Staw 1995).

As justifying propositions often represents one of the most challenging aspects of a review paper, let us look at several examples. First, if we examine Griffith's research concerning technology features, we see

that she draws on each of the three types of justification sources at various times. For example, for one proposition, she provides a theoretical explanation (concerning verification) and gives an example from practice (Lotus Notes). For another proposition, she draws on past empirical research in a related area (concerning reward systems) and provides an example from her own experience (at several automobile assembly plants).

As another example, examine Moorman and Miner's (1998) paper on organizational memory. Many of the propositions use all three types of justification sources. For example, to justify a proposition concerning procedural memory and speed, the authors first draw on theory about the automatic quality of procedural memory (from cognition), then report on empirical support from a related area (teachers), and end with an example from practice (improvisation during war).

Evaluating Your Theory

Once you have developed your theory (such as model, propositions, and justifications), how do you know if it is good? This evaluation is difficult and nebulous.

Writers argue that good theories should be memorable and provide answers to why. They should explain, predict, and delight (Weick 1995). Others propose that they should be interesting (Davis 1971) yet parsimonious, falsifiable, and useful (Sutton and Staw 1995). Some argue that theories should be built from multiple paradigms (metatriangulation). Thus, they should exhibit creativity, relevance, and comprehensiveness (Lewis and Grimes 1999, p. 685).

Reviewers are looking for good theories, but there is no cookbook approach to accomplishing this. One important way to assist you in this evaluation process is to have colleagues read and comment on your work before submitting it for review (Bem 1995). As Daft (1985, p. 207) observed:

> With each revision, the paper ripens. Expose your paper to the fresh air and sunshine of collegial feedback. With each discussion, new ideas emerge. The ripening process is facilitated with hard work and frequent revisions.

Creating Your Discussion and Conclusions

Some reviews end abruptly with a short conclusion. However, even though you have completed the majority of your review paper at this point, you can still tell your colleagues more. For instance, returning to Griffith, we see that after she justifies her propositions, she goes on to demonstrate how her work extends past research, to suggest ways that her theory can be empirically examined, and to draw implications for practice and future theorizing (pp. 484-486).

The Reviewing and Revision Process ■■■■■■■■■■■■■■■■

A review paper embodies the "state of the field." As such, it represents a benchmark for others conducting future research in your area. You should reap the benefits of citations to your article for years to come because your work should hew a path for others. Because of the value and importance of a high-quality review for the field, the first choices for reviewers are current *MIS Quarterly* Associate Editors. We also

contact senior experts conducting research on the particular topic of the review. Thus, reviews are written by well-qualified, accomplished scholars. The benefit is that you will receive a detailed, developmental review. The downside is that these reviewers will recognize many opportunities for you to improve the quality of your work. As a result, the revision will take more effort than the revision for a regular article.

What concerns have reviewers generally pointed out in their comments on *MISQ Review* papers? "What's new?" always seems to be highlighted by reviewers, and earlier we listed ways of demonstrating the contributions of your paper. However, reviewers are looking for not one, but a combination of contributions. Saying that "it hasn't been done before" on its own will not convince your reviewers. More generally, and consistent with Whetten's (1989) most-frequently occurring types of reviewer concerns, we have found that reviewers are looking for contribution ("what's new?"), impact ("so what?"), logic ("why so?"), and thoroughness ("well done?"). You will be well on your way to a publishable paper if you can address these four major concerns when first submitting your paper.

Responding to the reviewers' concerns differs from a traditional research paper in two major aspects. First, the revision process is generally longer because it takes time to reread and reinterpret the literature on which your article is based. You also will need to read and integrate articles suggested by the reviewers. Second, because a revision to a long paper can involve many changes, it is helpful to develop a plan for the review and share it with the editor and reviewers. A plan clarifies how you will handle the possibly disparate recommendations of reviewers. If the reviewers disagree on how you will reconcile their advice, then considerable time and anguish is saved if this divergence of views is sorted out before you launch on a major revision. *MISQ Review* does not require authors to submit a plan prior to revision, but we certainly urge you to consider this option.

Summary ▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪

An *ideal* article:

- motivates the research topic and explains the review's contributions
- describes the key concepts
- delineates the boundaries of the research
- reviews relevant prior literature in IS and related areas
- develops a model to guide future research
- justifies propositions by presenting theoretical explanations, past empirical findings, and practical examples
- presents concluding implications for researchers and managers.

And on top of this, the exemplary review article should be explanatory and creative!

MISQ Review articles are significantly longer than regular *MIS Quarterly* articles, so authors have the space to develop such an ideal article. Nevertheless, this task is not straightforward. We challenge you to craft such contributions for *MISQ Review* to move the field forward. Like Sutton and Staw's (1995, p. 380) conclusion about organizational research, we believe that

> Without constant pressure for theory building, the field would surely slide to its natural resting place in dust-bowl empiricism.

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