

THE INFORMATION SYSTEMS IDENTITY CRISIS: FOCUSING ON HIGH-VISIBILITY AND HIGH-IMPACT RESEARCH¹

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Abstract

This paper presents an alternative view of the Information Systems identity crisis described recently by Benbasat and Zmud (2003). We agree with many of their observations, but we are concerned with their prescription for IS research. We critique their discussion of errors of inclusion and exclusion in IS research and highlight the potential misinterpretations that are possible from a literal

reading of their comments. Our conclusion is that following Benbasat and Zmud's nomological net will result in a micro focus for IS research. The results of such a focus are potentially dangerous for the field. They could result in the elimination of IS from many academic programs. We present an alternative set of heuristics that can be used to assess what lies within the domain of IS scholarship. We argue that the IS community has a powerful story to tell about the transformational impact of information technology. We believe that a significant portion of our research should be macro studies of the impact of IT. It is important for academic colleagues, deans, and managers to understand the transformational power of the technology. As IS researchers with deep knowledge of the underlying artifact, we are best positioned to do such research.

Keywords: IS identity crisis, transformational impact of IT, macro studies of IT

Introduction

In a recent "Issues and Opinions" article published in *MIS Quarterly*, Benbasat and Zmud (2003) presented a commentary highlighting why the Information Systems discipline needs to work toward establishing an identity. We agree with

¹Ron Weber was the accepting senior editor for this paper. Iris Vessey and Rudy Hirschheim served as reviewers.

many of their observations and believe that information technology is one of the most important driving forces in business in the 21st century. Our discipline is of vital importance to managers, academics, and business education. The technology is transforming organizations, industries, and markets. IS research should help key decision makers understand IT's potential and impact so they can take advantage of what technology offers. Around the world, however, the IS academic discipline has experienced great difficulty in establishing itself in business schools and other departments such as information science and computer science programs.

The impact of IS research has arguably been relatively small, especially compared with research in fields like finance with its capital assets pricing model, efficient markets hypothesis, and options pricing model. Our fear is that the information systems discipline may not survive in academia. Our conclusion is that the advice in the Benbasat and Zmud article may not necessarily move the field forward in the direction of greater relevance and impact. The purpose of this paper is to comment on the ideas set forth by Benbasat and Zmud and to offer an alternative research focus.

Benbasat and Zmud argue that a core set of concepts and phenomena exists that circumscribe and define the IS discipline. They describe a nomological net that assigns a focal place to the IT artifact. As antecedents and consequences of the artifact, the net includes constructs related to IT capabilities, IT practices, IT usage, and IT impact. They further suggest that IS researchers have committed errors of inclusion (i.e., addressing phenomena that are unrelated to the core set of concepts and phenomena), or errors of exclusion, (i.e., failed to study important questions within this core set). They conclude by presenting heuristics for evaluating whether a given research study falls within the general domain of their recommended nomological net. A central theme of their commentary is that IS researchers have failed to keep the IT artifact up front and center in their research efforts. They have thereby limited their opportunities for differentiation compared with colleagues in other disciplines.

Several aspects of Benbasat and Zmud's commentary resonate, and we applaud their effort at generating debate, discussion, and introspection in our community. Doubtless their writing will have an influential impact on future generations of IS scholars. We fully agree with their perspective that IS scholars are best situated to provide deep insights about the IT artifact, its construction, and management. We concur with their view that it is important for IS scholars to continue to work toward a unique identity that can be communicated compellingly to important stakeholders. However, we believe that other aspects of their perspective merit further elaboration. We fear that a literal reading of the Benbasat and Zmud article is susceptible to misinterpretations that might be dangerous to the IS community. Indeed, it might result in the very outcome that Benbasat and Zmud seek to avoid—namely, a loss of credibility and identity for IS.

In this commentary, we question some core assertions made by Benbasat and Zmud. The strong emphasis implicit in their arguments on the *artifact* has been questioned by others (e.g., Weber 2003) and is not the focus of our commentary. Rather, we point out that what is not said in their article is equally, if not more, important than what is said in moving IS toward a compelling value proposition. We reflect on the errors of inclusion and exclusion they identified, noting that a *literal* reading of their arguments could result in deflecting the attention of IS researchers from significant phenomena that we should be studying. In the spirit of the observations made by Ives et al. (2003) and DeSanctis (2004), we present an alternative lens for viewing our discipline and its core properties. We argue for the need to conduct research that has a greater macro focus. We conclude this commentary by reflecting on the danger of a narrow definition of IS research.

Since the publication of Benbasat and Zmud's article, the response from the IS community has been heartening. Many scholars have elected to engage in this debate and offer their perspectives on the field. As might be expected, these commentaries and perspectives offer divergent views on a variety of issues raised by Benbasat and

Zmud, such as the existence of a crisis, the need for a defined core for the IS field, and recommendations for the nature of this core. Table 1 summarizes the key assertions made in these articles. We acknowledge that such categorization inevitably requires simplification and does not do complete justice to the many nuanced arguments made in these papers. Our intent is to highlight the diversity of opinions and situate our own response in this rich stream of discourse.

Our commentary is simultaneously different from and similar to several articles included in Table 1. We agree with the prognosis of scholars who believe that the IS field is in crisis. We disagree, however, with their specific recommendations regarding the nature of the core. We offer a view that is most consistent with that described by Robey (2003) when he notes "IS needs to strengthen its ties with contributing disciplines" (p. 353) and DeSanctis (2004) who argues that IS needs to pay "greater attention to research questions of current interest, even if they are peripheral to the artifact" (p. 360). In other words, we acknowledge the *multidisciplinary* nature of our discipline, and we urge scholars to focus on how as IS researchers we can add value to scholarship in other disciplines. Inevitably, our recommendations reflect our own perspective. Nonetheless, we believe they represent a viable alternative that merits consideration. As noted evocatively by Guthrie (2003, p. 560), "regardless of how the core is defined, the dialog in defining it will produce reflective scholars."

The contribution of this paper to the on-going discourse is threefold. First, we clarify some missing pieces in the arguments presented by Benbasat and Zmud (a clarification that has not been presented in other commentaries and that we believe is vital to ensure Benbasat and Zmud's arguments are not misinterpreted). Second, we offer an alternative set of focused heuristics to determine what lies within the boundaries of IS scholarship, noting that taking Benbasat and Zmud at face value could result in a greater emphasis on research that is less likely to move us toward greater legitimacy as a discipline. Finally, we extend arguments made by others such as

DeSanctis and Robey by making the case for more research on the transformational aspects of IT and presenting examples of the form such research might take. Technology is changing virtually all aspects of business, the economy, and society. As IS scholars, we have an opportunity to seize the intellectual space defined by such changes. Unfortunately, limited IS research addresses these transformations.

On Errors of Inclusion and Exclusion

Benbasat and Zmud present examples illustrating errors of inclusion and exclusion. We are concerned that their discussion does not tell the full story. Moreover, it might deter IS researchers from undertaking research that moves the IS field forward significantly. We present instances to show how their comments might be misinterpreted and questionable conclusions reached. We were alerted to the possibility of such misinterpretations during extensive conversations with junior colleagues and doctoral students. Almost consistently, those without personal knowledge of Benbasat and Zmud's perspective on the IS discipline tended to accept their arguments literally, drawing conclusions that we doubt Benbasat and Zmud intended.

Consider first the example of an error of exclusion. Benbasat and Zmud describe a hypothetical research model that examines client satisfaction as an outcome and includes task interdependency, member mutual understanding, and outcome clarity as independent, mediating, and moderating variables. They observe that were such a model tested in the context of software development groups, it would not, in their opinion, constitute a legitimate publication in an IS journal because it does not include the IT artifact nor its immediate nomological net.

We see at least two reasons why this example may be problematic. First, Benbasat and Zmud say nothing about the researcher's theorizing in developing the conceptual model. Suppose that

Table 1. Summary of Responses to Benbasat and Zmud

Author(s)	Is there a crisis?	Should IT research be focused around a defined core?	Proposed core or other suggested research directions	Other key points
Benbasat and Zmud (2003)	Yes.	Yes.	Information technology -related phenomena.	
Alter (2003a, 2003b)	Yes.	Yes.	Alter's work systems model	
Wu, Saunders (2003)	Yes. "Like other fledging disciplines, IS researchers are struggling with the field's identity" (p. 565).	Yes.	"The coalescence of [Benbasat and Zmud's and Alter's] constructs perhaps can address the issue better than either of them individually" (p. 566).	
Guthrie (2003)	Yes. "For the IS field, there is a sense of urgency to define ourselves" (p. 557).	Yes.	"Alter's Systems in Organizations broadly defines the IS discipline in an inclusive way...and makes IS distinct" (p. 557).	"Regardless of how the core is defined, the dialog in defining it will produce reflective scholars" (p. 560).
Deans (2003)	Yes. "The struggle to define the boundaries of a field... is not unique to IS" (p. 546).	Yes. "A well defined domain is necessary to evaluate the relevance of theory and imperial contributions to the evolving body of knowledge" (p. 547).	N/A	"The international business field is used as a comparable field to investigate" (p. 547).
Weber (2003)	Yes or no, it is a healthy question to debate.	Yes. "We need to identify and classify the types of phenomena that are the focus" of IT researchers (p. v).	Core should be information systems -related phenomena.	"The key to creating the core is [to build] theory that is novel." (p. vi)

Table 1. Summary of Responses to Benbasat and Zmud (Continued)

Author(s)	Is there a crisis?	Should IT research be focused around a defined core?	Proposed core or other suggested research directions	Other key points
livari (2003)	Unspecified	Yes	"IS as a category of IT artifacts, and especially the focus on IS development, can help to distinguish the IS discipline from its sister and reference disciplines" (p. 568).	"Emphasize more the nature of IS as an applied engineering-like discipline that develops various 'meta-artifacts'" (p. 568).
Holland (2003)	Unspecified.	No. "Diversity...should not be sacrificed to achieve theoretical neatness" (p. 605).	For the discipline "the integrating themes arise from the terms 'information' and 'systems' rather than from the technology" (p. 599).	"A multidisciplinary approach to IS research is the most appropriate way of conceptualizing IS problems, academic research and business practice" (p. 599).
Robey (2003)	Yes. "Agree with the need for change" (p. 352)	No. "IS should resist the allure of a dominant paradigm" (p. 352).	"Identity should be flexible and adaptive" (p. 352). "IS needs to strengthen its ties with contributing disciplines" (p. 353).	"We need to think cautiously about the process of changing our identity because change involves risks that may subvert out attempts to establish greater legitimacy" (p. 353).
Hirschheim and Klein (2003)	Yes. "Some underlying structural patterns in IS are in definite need of attention" (p. 239).	No. "Such singularity of focus is dangerous, because it tends to lead to rigidity and dogmatism" (p. 260).	"We propose that a discipline wide focus on a properly structured, core body of knowledge" (p. 262).	Action is required for "IS as a field [to] overcome its internal communications deficits" (p. 237).

Table 1. Summary of Responses to Benbasat and Zmud (Continued)

Author(s)	Is there a crisis?	Should IT research be focused around a defined core?	Proposed core or other suggested research directions	Other key points
El Sawy (2003)	"From the time of the first ICIS conference in 1980, the debate over the identity of IS research continues to flare" (p. 588).	No.	"It may be time for a natural shift of emphasis from the Connection view to the Immersion view to the Fusion view" (p. 588).	"IS researchers [should be] imaginative in their search for and use of meta-research models of IS" (p. 597).
McCubbrey (2003)	N/A	No. "Trying to adopt a narrow focus for IS research makes it difficult, and perhaps even counter-productive to attain our goal of relevancy" (p. 554).	"Focus our efforts on dealing with issues the practitioner community is struggling with today, and do so in a timely manner" (p. 554).	"Past problems with relevance can be avoided by engaging the academic and practitioner communities in setting a re-search agenda using an 'open source' approach" (p. 553).
Galliers (2003)	No. "Change in a field of study...[is] an opportunity for growth" (p. 339).	No. "A fixation on an old-fashioned core could lead to stasis" (p. 339).	The "appropriate locus of IS study is more broadly based than organizations or individuals" (p. 342).	"The trans-disciplinary nature of the phenomena we study dictates the need for trans-disciplinary scholars and approaches" (p. 346).
Myers (2003)	No. "The field of IS is now well established" (p. 584).	No. "The attempt to narrow the field to a core is misguided" (p. 582).	"Focusing on a defined core is potentially dangerous because what is seen as core now, may be seen as largely irrelevant later" (p. 586).	
Dufner (2003)	No. "Examined in terms of economic reality and historical investment, IS and IT do not suffer from either a lack of legitimacy or of learning" (p. 527)	No. "We are a heterogeneous group looking at a wide diversity of Information Systems" (p. 527).	"Artifacts are not adequate to define IT" (p. 527).	

Table 1. Summary of Responses to Benbasat and Zmud (Continued)

Author(s)	Is there a crisis?	Should IT research be focused around a defined core?	Proposed core or other suggested research directions	Other key points
Westland (2003)	No. "Rapid change and inherent fluidity in IT can be misrepresented as an 'identity crisis'" (p. 137).	No. "Rather than resolving an identity crisis, the prescriptions are likely to confound any search for identity by biasing future IS research in directions that do not move the field forward" (p. 136).	Positive science of IS [is] the best alternative to provide future research direction for the field" (p. 154).	"A positive science encourages the exploration, argument, and discovery centered on ideals and objectives that will keep the discipline relevant to industry" (p. 154).
Ives et al. (2003)	No. "We suspect that many IS researchers are unaware of, or unwilling to accept the identity crisis Benbasat and Zmud describe" (p. 110).	No. "Restrictive policies hinder both our relevance and potential survival" (p. 108-109).	"The discipline is best served by focusing on supporting diverse and novel research" (p. 108)	"We suggest administrative changes for the IS discipline to encourage and nurture creativity without sacrificing academic rigor" (p. 108)
Power (2003)	No. "IS is a legitimate area of scientific research and inquiry" (p. 539).	No. "We do not need to adopt one overriding paradigm for the IS discipline" (p. 544).	"We should encourage high quality research that is relevant to Information Systems" (p. 544).	"We are collectively constructing the IS discipline and no single model, nomological network, or approach can capture the identity of our discipline" (p. 544).
DeSanctis (2004)	No. "The legitimacy of the IS field is impressively high if it is viewed as a community of practice" (p. 361).	No. "Shifting boundaries in the field may be associated with its maturing" (p. 361).	"Greater attention to research questions of current interest, even if they are peripheral to the artifact" (p. 360).	"Greater communication of theory and empirical research results and continued attempts to build and sustain active membership" (p. 360).

the researcher, through intensive fieldwork, discovered that something idiosyncratic existed about the behavior of software development teams such that the effects of task interdependency on client satisfaction are both direct as well as mediated by member mutual understanding. Further suppose that the researcher argues that the moderating effect of outcome clarity is particularly potent in the case of software development projects because of the underlying complexity of the outcome and the ambiguity associated with the final product.

Indeed, continuing the hypothetical scenario, for non-software development groups, one might speculate that outcome clarity is an independent predictor of client satisfaction and not a moderator.² Thus framed, we would argue that this study investigates a central IS phenomenon. Moreover, important stakeholders (academic colleagues, school administrators, practitioners) would turn to IS scholars for insights into its nature. Our point is simple: by using Benbasat and Zmud's proposed nomological net as the benchmark for comparison and *not* stating what else is present or absent in the research study, what constitutes legitimate IS research can easily be misconceived.

A second reason the example concerns us is that the research still might be important even where the researcher did *not* explicitly draw upon the software development context to theorize. Suppose a field test of the model revealed that software development groups behave in ways different from what was theorized. Further suppose that the researcher was able to gain some rich understanding of why this outcome occurred. As a result, she developed, through *post hoc* reflection, a model predicting client satisfaction with IT-related products as an outcome of various facets of software development team characteristics. We argue that this research, albeit situated in the group and organizational behavior disciplines in its initial framing, is a core part of the IS body of

²We are not suggesting that the study is conducted with IS and non-IS teams. Rather, we are simply pointing out that our hypothetical researcher may use the non-software development team context to theorize particularly about the IS phenomenon under investigation.

knowledge and thus deserves to be considered for publication in an IS journal. We doubt that Benbasat and Zmud intended their commentary to have such a literal reading; however, we point out that this is one legitimate interpretation of their comments. Indeed, in both instances we describe, the IT artifact is implicit in the researcher's view of the world and pervades her logical reasoning and assertions.

Benbasat and Zmud illustrate their conceptualization of errors of inclusion through a research model in the domain of e-commerce. The model predicts the extent to which a consumer believes that "the shopping experience is helpful in evaluating a product" (p. 190), labeled perceived diagnosticity, as a function of visual control and functional control enabled by the capabilities of the Web site. They observe that two criticisms are often leveled against this study: one, that no construct captures buying behavior in the model; and two, that the study does not include "other factors" that potentially might influence buying behavior.

Benbasat and Zmud suggest that neither criticism is valid by asserting the danger in (1) increasing the degrees of separation between IS variables and the consequence under investigation and (2) decreasing the relative number of IS-related constructs in a research model. However, they follow this discussion with examples of instances where the degree-of-separation and relative-ratio arguments do not apply. We are puzzled by their characterization of errors of inclusion. What is the recommendation that follows? Is it that we should have only one degree of separation between IS and non-IS related constructs? That cannot be the case because of the following logical inconsistency. Benbasat and Zmud's proposed nomological net includes the relationship IT artifact → Use → Impacts. Their definition of *impacts* includes all manner of outcomes that are not directly influenced by the artifact. Indeed, a literal interpretation of their nomological net is that we *should* include purchase behavior (an *impact*), where the effects of the artifact (Web site features) are mediated by use (perceived diagnosticity).

Is the recommendation that a desired level of *nomological density* should exist in the study's research model. If so, what is that level? To illustrate the ambiguity surrounding this recommendation, we use Benbasat and Zmud's own example regarding successful strategic IT planning. It is plausible that a study of planning could include a multitude of independent, mediating, and moderating variables that are not IS constructs including, but not limited to, the structure and governance of strategic planning activities, organizational culture, industry, length of time strategic planning team members have served together, and level of trust among strategic planning team members. Here the ratio of IS to non-IS related constructs is small, yet in Benbasat and Zmud's view, this constitutes legitimate IS scholarship.

We believe that the errors of inclusion described by Benbasat and Zmud, therefore, raise more questions than they answer. We understand and agree with the spirit of their reasoning, but we fear that IS scholars will interpret Benbasat and Zmud's arguments in varied ways, potentially resulting in at least two undesirable outcomes. First, in an effort to satisfy the degree-of-separation heuristic, our research models may become too narrow and simplistic, thereby masking the complex reality of information systems *in situ* and reducing our legitimacy with peer disciplines. Second, in our search for IS constructs to satisfy the ratio requirement, we may needlessly overlook important organizational variables. Worse, we may define organizational variables narrowly (e.g., IS culture rather than firm culture), thereby limiting our ability to provide rich insights. Both outcomes are undesirable.

For Whom Do We Toil? ██████████

Benbasat and Zmud argue that errors of inclusion have three³ adverse consequences: IS researchers expend energy making marginal

³They present four adverse consequences of which we take issue only with three.

enhancements to theories from other disciplines instead of developing original theory about IS, IS faculty develop allegiance in disciplines other than IS, and we are less likely to make important contributions to the "principal consumer of our research—the IT practice community." We challenge these conclusions.

First, we wonder why it is a problem that IS researchers develop allegiance to other disciplines. If, via their study of constructs in other disciplines, IS researchers develop greater understanding of the role of IS and can conduct fruitful conversations with other academic communities, all participants in the dialog benefit. In this spirit, DeSanctis (2004, p. 261) observes, "Shifting boundaries in the field may be associated with its maturing." Second, as Benbasat and Zmud themselves note, the study of IS is fundamentally an interdisciplinary pursuit. Indeed, that characterization is true of any disciplines that coexist with IS in business and other schools. Finance draws upon economics for its core theories, organizational behavior and marketing on psychology, strategy on economics and sociology, management science on mathematics and statistics, and information science on psychology and cognition. IS draws upon all of these disciplines and perhaps computer science to understand the nature and construction of this artifact. If we believe this perspective, we question the allocation of intellectual resources to develop unique theories in the IS domain⁴ when our time might be better spent understanding how existing theories can be fruitfully adapted to the unique nuances of the IT context. Finally, we disagree with the perspective that the practice community is the *principal* consumer of our research. Clearly we should seek to address problems that practitioners consider important and interesting. However, we should not forget that an equally important stakeholder to the practitioner is the scholarly community for which

⁴Weber (2003) notes that it is important for IS researchers to build "powerful, generic theories" to explain phenomena that are uniquely IS. We agree with this perspective; we are simply observing that these unique theories may not be necessary for all types of IS phenomena.

extending, refuting, or otherwise enhancing existing theory is a significant contribution.

On the Need for an Organizational Identity for IS and its Nature

Drawing upon institutional and ecological theory, Benbasat and Zmud observe that it is important to evolve a dominant design for the IS discipline. In the absence of such a design, they argue it is difficult to establish legitimacy and to determine the proper boundaries for research (p. 185). They further note that IS's cognitive legitimacy (i.e., a broadly held understanding and agreement among key stakeholders about the core phenomena that IS researchers study) is less than desirable, due to the topical diversity that pervades our research and the lack of a central unifying theme that "connotes the essence of the IS discipline" (p. 183).

In principle, the point raised by Benbasat and Zmud is valid. In practice, we disagree with the specific prescriptions they offer (i.e., using the proposed nomological net as a way of defining the essence of the IS discipline). Implicit in Benbasat and Zmud's arguments is the notion that IS should follow the same path to legitimacy as other more-entrenched, mature disciplines such as marketing and finance. However, we believe that IT is the "glue" that binds the enterprise together, and IS has an impact on every aspect of organizational life. This belief implies that our unique identity lies not in focusing attention exclusively on the immediate nomological net surrounding the IT artifact. Rather, our strength as a scholarly community derives partly from our study of the first-order, second-order, and third-order effects of IT that span multiple functional areas and business processes. One way we can differentiate ourselves in a more-compelling manner is by positioning IS scholarship to transcend traditional functional boundaries. We suggest that IS research should adopt a more-holistic view of the social systems (groups, organizations, societies) that we study. Thus, we disagree with Benbasat

and Zmud's observation (p. 190) that it is a matter of concern when "IS research models involve the examination of constructs best left to scholars in other disciplines." The *power* and not the weakness of IS research models is precisely that they situate IS constructs within constructs that other disciplines study.

By following closely the suggestions in Benbasat and Zmud and the nomological net, our fear is that our research will become focused on narrow issues that are only of interest to IS researchers and of little interest to the practitioners that Benbasat and Zmud argue are the primary consumers of our work. We doubt that our colleagues in finance or many practitioners will be impressed if IS research is *dominated*, for example, by studies of how to best design an IT artifact. We believe that a narrow focus, if followed *exclusively* by IS researchers, could portend the end of the IS field as an academic discipline. We are *not* suggesting that IS researchers abandon current research, only that we expand our focus to include a broader view of the contributions of IT. It is our view that the field needs a balance among types of research; there is too little research on the transformational aspects of IT in the field's current research portfolio.

Determining Legitimacy and Relevance: An Alternative View

Given the variety and complexity of phenomena that IS researchers study (as Benbasat and Zmud themselves note), we suggest that it is difficult, and perhaps even misleading, to identify broad categories of errors of inclusion and exclusion as a way of ascertaining what is within the boundaries of IS scholarship and what is beyond. Rather, we offer the following three questions to help determine if research is relevant to the IS field: (1) Is there a non-trivial aspect of the underlying theory that draws upon the unique nature of the IT artifact? (2) Would the phenomenon have been approached differently were the IT artifact not in-

volved? (3) Does the research illuminate scholarly and practitioner understanding related to the construction, management, and effects of the IT artifact?

Notice that the questions are not inconsistent with the heuristics proposed by Benbasat and Zmud. They merely clarify and extend the heuristics to cover a broader domain of IS scholarship. Applying this lens implies that studies of online consumer behavior, to the extent that they entail mediation of the merchant-consumer relation by IT, are well within the purview of IS researchers. Likewise, studies of knowledge management, when they reflect the unique challenges of encoding knowledge in electronic repositories or knowledge seeking and providing behaviors in the context of an electronic system are, in our view, IS scholarship. Online communities, to the extent they are a forum enabled by IT and, indeed, a unique structural form that could not exist in the absence of IT, are worthy of the attention of IS researchers.

Using these guidelines as the basis for assessing legitimacy arguably broadens the scope of what lies within the domain of IS scholarship. Within this broadened scope, we believe it is appropriate to deliberately expand our research to focus on macro and transformational issues.

Revisiting the Nomological Net: Adding a Macro Research Focus

Researchers in information systems have an exciting, powerful story to tell. By focusing primarily on narrow studies, we are selling ourselves and our research short. Fifty years from now, historians will look back on the last half of the 20th century and describe it as being as significant as the Industrial Revolution in changing the world. The technology we study has had a profound impact on individuals, organizations, industries, and economies. We believe that a major part, *but not all*, of the research in IS should focus on the

impact of the IT artifact rather than the artifact itself.

In the discussion that follows, we classify research that has a narrow focus as *micro* while we consider research on the transformational aspects of IT as more *macro* in focus. An example of a hypothetical micro study would be research that adds one variable to a popular model like TAM to see how this added variable affects outcomes. A hypothetical macro study examines the way in which the Internet has and is transforming the recorded music industry. Our distinction between micro and macro research parallels that drawn in the organizational sciences (e.g., see Klein et al. 1999) where micro research is generally viewed as being at the individual or group level of analysis, while macro research focuses on “organizations, environments, and strategy” (Klein et al. p. 243). We include work related solely to the IT artifact in the former category. To the extent that macro research seeks to understand how technology is changing organizations, environments, and strategy, we label such research as transformational in nature.

Why is such a shift in emphasis appropriate now? Why has the IS field not focused on the transformational nature of technology in the past? Technology has always been a story about change; organizations implement IT to alter and improve the *status quo*. Before the Internet, these changes were mostly incremental, and they occurred over a long period of time. If one compared technology in the financial or manufacturing industries in the 1960s to that of the 1980s, there were many changes, but they were gradual. The Internet, however, is a “frame-breaking” change; it provides an easy-to-use infrastructure that instantly provides connectivity with hundreds of millions of individuals around the world. The Internet is an innovation that has dramatically increased the ability of information technology to bring about transformations, and all types of organizations have integrated it into their strategy and operations.

Information technology has changed

1. The tasks that individuals perform.

From the factory to the office, the tasks individuals perform differ dramatically from the days of little or no technology. Factory workers monitor automated equipment instead of performing manufacturing operations themselves. Thousands of college professors, managers, and office workers are their own secretaries, keyboarding papers, reports, memos, and correspondence.

2. The nature of customer service.

Organizations are making a concerted effort to have customers interact with them directly using technology to provide better service and to reduce labor costs. Students register for classes, obtain class material, and receive their grades online. Shippers use the Internet to track goods in transit. We make airline reservations on the Internet and check in at the airport at an automated kiosk, or print a boarding pass at home from the airline's Web site. Customers entering their own orders and paying for them online is becoming a widely common practice.

3. The way in which we all communicate.

Electronic mail has dramatically changed the nature of communications through its asynchronous nature and our ability to communicate easily across time zones. E-mail has introduced efficiencies in communication. It has led to a decrease in the number of letters and the volume of first class mail in the United States. E-mail enables virtual work on a global scale. Cellular communications provide constant phone access. In the near future, cellular devices may become a primary means for connecting to the Internet.

4. All types of work processes from manufacturing to service to office work.

Work-flow software lets service companies automatically route and track documents. Bar

coding and radio frequency identification devices enable manufacturing control systems to keep track of the location of work in process. Sophisticated systems use this information to plan and schedule production in a factory.

5. Education and the nature of research.

The Internet is transforming education. Students of all ages use it to locate material. Schools use classroom support systems like Blackboard and WebCT to distribute materials, host discussion groups on class topics, and communicate regularly with students. This technology has created an industry of online schools and education.

6. The organization and operation of supply chains.

Technology has made it possible for supply chain partners to share information on product demand and availability. The customer's purchase in a store creates a scanner record that the retailer transmits to a supplier. The supplier can share this and other information with its suppliers, creating more-efficient supply chains. Wal-Mart is famous for its innovative use of technology to help keep its prices down.

7. The way in which we structure organizations.

One of the most exciting contributions of technology is the way it enables organizations to develop innovative new structures. Companies can use IT to become virtual, assigning projects to task forces scattered around the world who communicate electronically. The technology encourages firms to outsource work because one can instantly route orders to a manufacturing or fulfillment partner. A company can easily concentrate on its core competence and use technology to make it easier to distribute work to partners.

8. The emergence of new industries and the restructuring of old ones.

Electronic commerce has been responsible for the creation of new businesses. It has disintermediated some businesses and created new intermediaries in others. Before the Internet, there were no portals or search engine companies. Auctions took place physically in a single location, although a remote bidder might be able to bid by phone. eBay has changed the way in which individuals and organizations shop. eBay Motors has created a national used car market, something that would have been difficult to accomplish before the Internet.

9. Individual national economies and the global economy as a whole.

The impact of IT on an economy is difficult to measure. A Brookings study (Litan and Rivlin 2000) estimated that the Internet has contributed 0.25 to 0.50 percent to growth in the economy in Year-2000 prices. Anecdotal stories of Internet adoption in developing countries suggest that significant economic and social benefits arise from using the technology.

What is the bottom line from the impact of information technology?

- It dramatically alters cost structures and provides new opportunities for revenue.
- It provides new levels of customer service and convenience.
- It compels organizations to continually reassess and realign their strategies in response to changes in technology.
- It creates new industries and innovative forms of business, which generate positive economic activity.
- It enriches people's lives. From a welfare standpoint, people who have access to this technology are better off.

Implications for Research ████████

We are calling for more research focused on the transformational aspects of the technology to communicate its significance to individuals, organizations, industries, and the economy. We are *not* suggesting, however, that researchers abandon micro-focused studies; we are simply arguing that the time is right for macro studies to become a significant component of the IS research picture. Over time, the emphasis will shift so that a balance exists between micro and macro studies.

The nomological net proposed by Benbasat and Zmud includes the components we believe have high priority in IS research, but many colleagues have and will interpret Benbasat and Zmud as arguing for more micro-level research. How might the variables in the net fit more macro, transformational research topics? Figure 1 in Benbasat and Zmud presents the IT artifact as embedded within a structure and a context, with arrows running from contexts to structure to tasks to the IT artifact. Our view inserts a set of arrows running the opposite direction as well; the IT artifact has had a dramatic impact on tasks, structures, and the context of organizations and industries.

The nomological net in Benbasat and Zmud's Figure 2 includes a variable called "impact," which is defined to be the

(direct and indirect, intended and unintended) impact of these artifacts on the humans who directly (and indirectly) interact with them, structures and contexts within which they are embedded, and associated collectives (groups, work units, organizations) (p. 186).

It is possible that Benbasat and Zmud agree with our call for more macro research given the inclusion of the impact variable in their nomological net. However, their paper does not suggest a need for macro-oriented research, nor does it discuss the transformational nature of information technology.

In particular, the impact (or a new set of variables) should include the transformation of industries, firms, and individual tasks as well as new bases for competition and new business models. We also recommend expanding the definition of the IT artifact from “enabling or supporting some tasks” to specify IT as the integration of the processing logic found in computers with the massive stores of databases and the connectivity of communications networks. The IT artifact includes IT infrastructure, innovations with technology, and especially the Internet.

What kind of research do we envision? Research on the impact of online brokers and electronic communications networks (ECNs) on the retail brokerage industry is one example of work concerned with an industry transformation (Bakos et al. 2005). Research that identifies technology-induced transformations could include an analysis of the commercial printing industry, which has moved from a high-skill, labor-intensive operation to service industry using extensive technology in the production process. A researcher on systems in an information science or computer science department could trace the impact of a system on the organization and industry deploying it. Researchers might examine the supply chain from the standpoint of the impact of IT on time-to-market and manufacturing costs at firms like Dell and Cisco. IT also threatens the way business has been done for years in industries like those that sell digital goods including music and video content. Another avenue of high-impact research is to examine new industrial forms like the value nets that emerge from extensive outsourcing to partner organizations.

What is the contribution of macro-level research? For practitioners, understanding the impact of technology stimulates ideas on future applications of IT in other contexts. This understanding helps managers anticipate the potential negative impact of IT on their business models (e.g., the movie industry learning by observing the recording industry) and develop alternative models. Macro studies should convince our colleagues in other academic disciplines of our belief that IT is a key business driver in the 21st century and that it is a

vital component of our research and teaching mission.

Observations on Methodologies

Research on information systems has made use of a number of different methodologies including economic modeling, case studies, surveys with statistical analysis, experiments, and econometric analyses. The underlying disciplines include organization behavior, psychology, and economics. Some of these methodologies apply to the macro research we have described above. We are most familiar with IS researchers located in business schools where there is more of a focus on organizations than might be the case in an information science or computer science department. Scholars from these backgrounds could contribute their in-depth knowledge of the technology to an effort to assess the larger impact of an IT innovation.

Researchers will make use of capital budgeting, cost/benefit frameworks, change theory, and the techniques of economic history. This latter research follows transformations similar to those of interest to the IS field. Economic historians look for trends and their causes and document major trends in the economy or an industry. The economic historian uses economic principles to reason about historical trends and to offer a causal analysis of them. One possible methodology for macro IS research is to examine broad industry trends and then to conduct an in-depth study at a firm in the industry that is an exemplar of IT-induced transformations. Historical approaches to research are more typical of the humanities than the social sciences and have an important role to play in IS research.

Theories of change from the organization studies literature are also appropriate. In particular, concepts like “technological discontinuity” (Tushman and Anderson 1986) describe major changes and suggest ways to provide evidence to characterize them. Change is a continuing theme in our sug-

gested macro research focus for the field. Qualitative and intensive research that involves detailed observation and interpretation would be useful to study such evolving phenomena.

Why should IS researchers conduct the kind of research envisioned here rather than faculty from management or history departments? Here the IT artifact is important; IS researchers understand the true essence of the technology and can, therefore, extend this understanding to how IT contributes to organizations and the kind of changes it brings about. They have a better sense than other faculty about causal relationships and the context of IT in different domains. Researchers in other disciplines often treat the technology as a black box. We are reminded of a paper a number of years ago by two prominent organization theorists who found that companies with larger IT budgets had more first-line supervisors. Their conclusion was that technology led to the need for more supervisors (even though the research was cross-sectional). We believe that an IS researcher who understands the process by which companies integrate technology would reach a different, more plausible conclusion: the early adopters of technology in those days were large companies, and large companies tended to have more first-line supervisors than small companies.

The knowledge that IS researchers have is important for understanding technology-led transformations; the research we propose should not be delegated to sociologists, economists, or historians. One approach is to form interdisciplinary teams of researchers to conduct macro technology research, being sure that some team members are from the IS discipline, especially researchers who have deep knowledge of the technology, such as those with information and computer science backgrounds. Given these skills, the research team will be able to move beyond a black-box characterization of the technology to explain the mechanism of a technology-enabled transformation.

As an anonymous reviewer pointed out, the IS field, particularly in North America, prepares its doctoral students to focus on narrow problems. Current faculty are successful because they have

been able to conduct and publish similar studies, so it is natural to prepare students to do the same. Another approach could threaten their careers. Once trained to conduct research according to one lens, it is hard to shift, and without journals calling for different kinds of papers, there is little incentive to do so. How can we break this cycle? One way is for our journals to encourage the submission of some papers that use nontraditional (for IS) research methodologies. Another way is to encourage some of our doctoral students to become familiar with nontraditional methodologies in addition to traditional ones. Are faculty members able and willing to undertake this challenge? Are journal editors and reviewers willing to accept papers that do not necessarily follow the historical pattern of IT research? Hirschheim and Klein (2003) have also raised this point.

Contributions

One way to judge an academic discipline is by its contributions to knowledge and the application of that knowledge to improving the human condition. We think a more macro focus for IS research will help answer some of the following important questions:

- What is the contribution of IT to the economy, specific industries, and individual organizations?
- What opportunities does technology provide for transforming business models, organizations, and industries?
- What is the value of investing in IT?
- What are the significant management issues in an organization undergoing a technology-enabled transformation?

Concluding Comments

Benbasat and Zmud have written a widely cited paper addressing the identity crisis within the IS

discipline. The crisis is real and threatens our ability to grow and thrive as a field. If a micro focus dominates IS research, we are likely to end up conducting narrow research on matters that are of limited interest. The consequences in terms of resources, maintaining an IS presence in the curriculum, promotion and tenure, and the existence of the field potentially are dangerous.

Benbasat and Zmud presented a nomological model that places the IT artifact at the center of inquiry, a model that has its major focus on micro IS research issues. We propose that the IS profession has a powerful and exciting story to tell, but that this story requires us to focus on more macro questions as well. We may also have to open our journals and review process to different kinds of research methodologies, such as those employed by researchers in economic history and the humanities (Hirschheim and Klein, 2003). We subscribe to some of Benbasat and Zmud's recommendations and agree that interesting research studies arise directly from their proposed net. Nonetheless, we believe the future of the field depends on a significant number of researchers undertaking research on more macro topics to demonstrate the powerful transformational impact of information technology and its potential for the future.

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