Carola Schauer

Relevance and Success of IS Teaching and Research

An Analysis of the "Relevance Debate"

19

ICB-RESEARCH REPORT

UNIVERSITÄT
DUISBURG
ESSEN

Author's Address:

Carola Schauer

Institut für Informatik und
Wirtschaftsinformatik (ICB)
Universität Duisburg-Essen
Universitätsstr. 9
D-45117 Essen
Germany

carola.schauer@uni-due.de

Abstract

This report is part of a series of publications on the status and development of the North-American Information Systems (IS) field and Wirtschaftsinformatik (WI), its counterpart in German speaking countries. Information systems in businesses and organizations are the main subject of research in IS and WI. Hence, both disciplines are applied fields of research. Thus, the valuation of research results and graduates by business practice are vital indicators for the disciplines' status and success.

Between 1991 and 2001 a plethora of articles were published in leading Information Systems (IS) journals and conference proceedings addressing the issue of relevance of IS research and teaching. This research report provides a comprehensive content analysis of this „relevance debate" in the North-American Information Systems field. The perceptions, opinions, and recommendations of the contributors are presented structured according to statements of valuation, perception, explanation, and recommendation. The reconstruction of the main IS relevance debate indicates that all debate participants agree that relevance to practice plays a vital role for the IS discipline, but that the field largely lacks relevance in terms of research as well as in terms of teaching. The lack of relevance is, for example, illustrated by the general perception that research results rarely impact practice and that IT/IS professionals usually do not read academic IS journals.

In order to analyse if the debate has lead to any changes in terms of practice relevance of the IS field the most recent literature and studies available on IS relevance are evaluated. Analysis results indicate that no significant changes took place. But various IS researchers still report on problems in terms of acceptance and perception of IS degree programs and research. Based on the perspectives of experienced researchers from WI and other European IS communities the concluding remarks of this report attempt to explain the apparent lack of change in the North-American IS field and provide suggestions for improving the current status of the IS field in terms of relevance.

Contents

Tables

1 Introduction

This research report is part of a series of publications written in the context of the IFWIS project – a research project funded by the German Science Foundation (DFG) and aimed at comparing the development and status of the North-American Information Systems (IS) discipline and Wirtschaftsinformatik (WI), its counterpart in German-speaking countries. Against this background, this report focuses on the status and success of the IS field in terms of relevance to practice – including, for example, the field's achievements in addressing and solving problems of business practice – by analysing contributions to the so called "relevance debate" in IS.

Information systems in an organizational and business context comprise the general subject of research of the Information Systems (IS) discipline (e.g. Keen, 1980, p. 12; Ives et al., 1980, p. 910; Avgerou et al., 1999, p. 136; King and Lyytinen, 2004, p. 541). IS, therefore, is an applied field with a subject area of direct interest not only to academia but also to business practice (e.g. Hirschheim, 1984; Avison and Pries-Heje, 2005). Hence, one important aspect of the status and success of the IS discipline relates to its achievements in terms of producing research results that are – in some way – useful to business practice.

The results of the Porter and McKibbin (1988) study already indicated that all disciplines hosted at US business schools lack relevance to practice in terms of research as well as in terms of teaching.[1] Subsequently, the issue of relevance was picked up by various IS researchers. Particularly in the 1990s, we find a plethora of contributions to the so called "relevance debate" in IS. The discussion was held primarily by North-American researchers. Some European researchers also contributed to the debate (Lyytinen, 1999, Moody, 2000, Ben-Menachem, 2001).

Our primary analysis focuses on statements by North-American representatives of the IS field and on the primary period of discourse between 1991 and 2001. Section 2 provides the list of relevant publications and debate participants. A structured overview and analysis of the issues addressed in the relevance debate is given in section 3. Subsequently, the main aspects of the debate are summarized (section 4). In order to analyze the influence of the relevance debate on the current status of IS teaching and research, more recent studies and conference panels related to the question of relevance are discussed in section 5. Finally, conclusions are presented in section 6.

Note the particular format of this paper: It takes advantage of the unlimited length of ICB research reports and, thus, includes numerous detailed statements from all relevant contributions to the relevance debate. If appropriate, the presentation of statements related to an issue is preceded by a summary (in particular in section 3 and section 5). This allows skipping the detailed statements if fast reading of the paper is preferred.

2 Contributions and Participants

Table 1 provides an overview of published contributions to the debate on relevance of IS research. 47 North-American researchers have participated in the relevance debate during the primary period of discourse (1991-2001).

A key note address by Keen (1991) on an IS conference addressing the question of IS research methods can be viewed as the initial contribution to the debate. In 1997 the CIO Magazine published a critical article by Davenport on the lack of relevance in IS research and teaching. A series

---

[1] Selected references on the relevance debate at business schools in general are presented in Appendix A.

of contributions are published as opinion papers in academic IS journals (special issues of IRMJ 1998, MISQ 1999).

Years	Publication channel	Publication	Type of paper / empirical basis
1990s	Key note address	Keen, 1991	opinion
	Article	Davenport, 1997	magazine article
	Special issue IRMJ, 1998 (Winter)	Saunders, 1998	editorial introduction
		Robey and Markus, 1998	opinion
		Senn, 1998	opinion
		Kavan, 1998	based on personal experience and interviews
	Article	Westfall, 1999	opinion, scenarios
	Discussion in MISQ, 1999 (March)	Benbasat and Zmud, 1999	opinion
		Davenport and Markus, 1999	opinion
		Lee, 1999	opinion
		Applegate and King, 1999	case
		Lyytinen, 1999 (Finland)	opinion
2000/ 2001	Article	Moody, 2000 (Australia)	opinion
	Article	Watson and Huber, 2002	replies to an isworld posting
	Special issue CAIS, 2001 (March)	Gray, 2001	editorial introduction
		Alter, 2001; Amaravadi, 2001; Ben-Menachem, 2001 (Israel); Bhattacherjee, 2001; Borchers, 2001; Chatterjee, 2001 (Computer Scientist); Cresswell, 2001; Dalal, 2001; Dennis, 2001; Glass, 2001; Heart and Pliskin, 2001; Jennex, 2001; Munkvold and Khazanchi, 2001; Kohli, 2001; Mason, 2001; Mathieson and Ryan, 2001; Olfman, 2001; Paper, 2001; Ramesh, 2001; Rollier, 2001; Sein, 2001; Truex III, 2001; Weinberg, 2001; Westfall, 2001	24 short opinion papers (2 more papers focus only on side aspects)
	Panel at ICIS 2001	Kock et al., 2002 including: Klein, 2002; Gray, 2002; Myers, 2001 (New Zealand); Rockart, 2002a; Hoving, 2002	opinion
2005/ 2006	Panel at ICIS 2005	Desouza et al., 2006	summary of panel contributions
	Panel at AMCIS 2006	Benamati et al., 2006	summary of panel contributions

Table 1: Overview of contributions to the relevance debate in IS[1]

---

[1] In order to restrict the scope and focus of this article, we only include the primary sources to the relevance debate. Other aspects are closely related to the issue of relevance: Identity and status of a discipline might be affected by the perception of the relevance of its research; Keen (1980), King (1993), King and Lyytinen (2004), and George et al. (2005) have contributed to the identity debate. The

Westfall (1999) uses fictitious scenarios to describe the possible future development of the IS discipline. Because actual personal experiences are hard to distinguish from fiction in this paper, only fractions of this paper can be used for literature analysis.

In addition there were numerous unofficial contributions to the IS relevance debate. For example, Gray (2001) describes the "firestorm" of *ISWorld* messages on the topic of relevance of IS research in February 2001. The CAIS special volume on relevance of IS research (2001) is a follow up of that *ISWorld* discussion. The issue of relevance was also addressed on a panel at the International Conference on Information Systems (ICIS) 2001. The panelists' opinions are published in a CAIS article (Kock et al., 2002).

3 Definitions, Perceptions, and Recommendations

All contributions to the debate are based on personal experience and, in part, on communications with other IS researchers, e.g. through *isworld* mailings. Thus, each individual contribution represents the subjective perceptions and viewpoints of the respective author(s) on the field's status in terms of relevance. However, trans-subjectivity can be achieved by comparing and complementing the perceptions of all IS researchers who have participated in the debate. Hence, in this section we aim at reconstructing the status and success of the IS field in terms of relevance by structuring and comparing the perceptions expressed by the various debate participants.

The opinions, descriptive perceptions, and recommendations concerning the state of relevance in teaching and research can be structured according to a set of five categories:

- definitions of relevance or perspectives on relevance (see section 3.1),

- opinions concerning the importance of relevance for the field (see section 3.2),

- perceptions concerning actual relevance of IS research and teaching (see section 3.3),

- explanations giving reasons for the lack of relevance in IS research and teaching (see section 3.4), and

- recommendations to improve the current state of relevance in IS (see section 3.5).

3.1 Definitions and dimensions of relevance

Discussions on the concept or term of relevance can be distinguished according to those participants who implicitly interpret relevance as relevance to business practice and those who suggest a more abstract understanding – including IS managers as well as other interest groups – as possible groups of stakeholders.

Some suggested definitions of relevance to practice are rather vague (see Table 2): such as the requirement that relevant research must somehow relate ("pertain") to the challenges of business practice and the statement that there must be a "likelihood" that research results will lead to future solutions of business problems. Other definitions are more strict in that they require that relevant research must be valuable from the viewpoint of practitioners and useful for actually solving critical problems.

---

role of diversity of research topics and methods also possibly relates to the role of relevance; e.g. Benbasat and Weber (1996), and Robey (1996) have contributed to the diversity debate.

Research is relevant, if it …	References
pertains to the challenges of business practice	Senn, 1998
is likely to lead to the solution of (future) problems in business practice	Rollier, 2001
is valuable from the viewpoint of practitioners	Benbasat and Zmud, 1999 Kavan, 1998
is useful to solve critical problems in business practice	Saunders, 1998

Table 2: Definitions of relevance to business practice

All authors who have addressed the concept of relevance from a higher level of abstraction propose the "target audience" or "stakeholders" and their goals or interests as primary dimensions to determine research relevance (see Table 3). The target group of today's students is mentioned only in one article (Davenport and Markus, 1999). Authors of two papers argue that it is important to consider the time frame of relevance as well. One author mentions the general purpose of research (either to "advance knowledge" or to "serve the public good") as a criterion, which should be taken into account (Cresswell, 2001). Generalizability of the findings is suggested as an additional dimension to determine relevance of research (Kock et al., 2002).

Dimensions of relevance	References
target audience / constituents / constituencies / stakeholders (primarily: academia and practitioners)	Keen, 1991, Mathieson and Ryan, 2001 Munkvold and Khazanchi, 2001 Dennis, 2001 Kock et al., 2002
purpose, goal, or interest of the target group / stakeholders	Keen, 1991 Mathieson and Ryan, 2001 Munkvold and Khazanchi, 2001
target group: "today's students"	Davenport and Markus, 1999
time frame	Munkvold and Khazanchi, 2001 Cresswell, 2001
general purpose of research	Cresswell, 2001
scope, i.e. generalizability of the findings	Kock et al., 2002

Table 3: Suggested dimensions for relevance

The following subsections present the detailed statements concerning definitions and dimensions of relevance.

Note, in the subsequent sections of the paper (beginning with section 3.2), we focus on research relevance in terms of relevance to business practice – corresponding to the focus of the majority of contributions to the relevance debate.

3.1.1 Relevance to business practice / management

In an editorial preface Saunders (1998) presents a broad definition of relevant research focussed at usefulness for managers: "managers can use its results to successfully solve the critical problems with which they are faced [and] to use information technology to reshape the environments in which their organizations operate" (ibid, p. 4). According to Saunders (1998) such relevant research would go along with "managers becom[ing] active consumers of the research" and managers serving "in the roles as sponsors and/or collaborators in IT/IS research" (ibid, p. 4).

Senn (1998) defines research as relevant "when the topic or question of investigation does [..] pertain to the challenges faced by [the] intended recipient". He defines research as practical, "if findings can [..] be applied in practice, even if the question under investigation is not relevant" (ibid, p. 28).

Benbasat and Zmud (1999) explicitly limit their discussion to the question of relevance of IS research in the positivist, empirical research tradition. They provide a definition of relevancy in the context of IS research. According to their suggestions the following characteristics determine an article's relevancy: (1) There are two criteria related to the content: the topic being addressed and the kind of outcome ("provide real value" Benbasat and Zmud, 1999, p. 5) that can be implementable implications, synthesis of a body of research, or stimulated critical thinking. (2) An appropriate "style and tone" is described as being "just as important, if not more important, than an article's content" (Benbasat and Zmud, 1999, p. 5).

Rollier (2001) interprets relevance as "leading practice". He states that research is relevant if it has potential to lead to future solutions in business practice: „I believe that basic research is highly relevant if there is some likelihood that it might lead to solutions of future problems, and that we should engage in it." (ibid, p. 2).

Kavan (1998) suggests academics to search for new ways to provide practice with knowledge according to the demands in the different phases of the "Information-Gathering Model". This model suggests two general phases: "Awareness Stage" including "Exposure" and "Monitoring" and the "Search Stage" including "Investigation" and "Research" (Kavan, 1998, p. 19). That is, relevance of research or research results can be assessed according to their respective value to inform the practitioner in any of these stages.

3.1.2 Relevance in relation to stakeholders/constituents, to intention and time

Keen (1991) argues that "relevance [implies] a clear conception of the target audiences [a research community] wants to influence" (ibid, p. 27). According to his understanding, relevance implies a particular purpose for the target audience ("purposive") and contributes to "effectiveness" in that area (ibid, p. 27 ff.).

Mathieson and Ryan (2001) also propose a more general understanding of relevance: accordingly, research is always relevant in relation to a constituent (e. g. practitioner, student, dean) and his goals or interests. Hence, they suggest: "If you want to do relevant research, seek a match between a constituent's interests and your own." (ibid, p. 3).

In a similar way, Munkvold and Khazanchi (2001) – both researchers who worked in industry prior to their academic career – suggest expanding the notion of relevance as related to the more abstract question: "Who should be the target audience for IS research?" (ibid, p. 3). They list typical stakeholders of IS research (quoting an earlier article by Harvey and Meyers): "scholars, educationists, practitioners, users, politicians, economists, citizens (present and future)" (ibid, p. 4) and provide a list of the values/interest of each and related IS areas. They argue that the context the findings relate to as well as the time frame of applicability have an impact on the (perception) of the relevance of research (ibid, p. 5).

Dennis (2001) distinguishes two "constituencies" (ibid, p. 2) that IS researchers serve: academics by the creation of new knowledge ("exploration") and practitioners (including students as future practitioners) by the application of knowledge ("exploitation"). He sees a major challenge in managing "the natural tension between exploration and exploitation" (ibid, p. 3) in research.

Bhattacherjee (2001) argues that "any assessment of relevance" (ibid, p. 4) should take into account the intended audience/stakeholders, such as university administrators, that are "interested in quantifiable measures of research productivity", business managers "mostly interested in instruments

[and] checklists", or IS researchers "primarily concerned with theory and knowledge building" (ibid, p. 3). He also mentions the differentiation of basic and applied research (ibid, p. 5).

Davenport and Markus (1999) argue that "today's students" are "an equally important audience" for IS research than senior practitioners (ibid, p. 22). Similarly, Lee (1999) states that "textbooks (which distill our research) can also provide an avenue to relevance" (ibid, p. 32).

Cresswell (20001) suggests a "frame of reference" (ibid, p. 1) for the term relevance including three aspects:

- if some research is relevant for <u>or</u> in the interest of that stakeholder
- if the work is intended to "advance knowledge" (ibid, p. 2) or if it is intended to "serve the public good, preferably in direct, tangible, and immediate ways" (ibid, p. 3)
- time: "what is pure science in one generation can become a whole new industry to the next" (ibid, p. 5)

Kock et al. (2002) recommend to consider "two main facets of IS research relevance": audience such as practitioners, which can be influenced directly or indirectly and scope in terms of the "generalization of findings beyond the scope of a research study" (ibid, p. 331).

3.2 Opinions on the importance of relevance

"Until Relevance is established, Rigor is irrelevant" (Keen, 1991, p. 27)

"Knowledge created but not shared [with practitioners] has no value" (Kavan, 1998, p. 18)

Many quotations can be found indicating the vital importance of relevance to business practice for the success of the academic IS field. For example, Paper (2001) quotes many other researchers' opinions on the need for – and thus on the importance of – more relevance.

Several authors emphasize the critical role of relevance to practice:

- Keen (1991) emphasizes that ideally relevance is a core characteristic of IS research: "[IS] research is purposive; it is intended to influence action in some domain [..]. IS [research] rests on contributing to some aspects of effectiveness" (ibid, p. 27). He argues that relevance comes first in relation to the rigor or quality of research, i.e. "until Relevance is established, Rigor is irrelevant" (Keen, 1991, p. 27), because relevance implies a particular "style of Rigor, suited to the aim of influence on a target audience" (Keen, 1991, p. 28).

- Kavan (1998) –an associate professor in MIS, former IS executive and current consultant – emphasizes that "Knowledge created but not shared [with practitioners] has no value" (ibid, p. 18), or in other words: "Knowledge for the sake of knowledge is self-defeating. Knowledge that can be applied (as in the case of a physician) is critical." (ibid, p. 22)

- Davenport and Markus (1999) point out that relevance is vital for IS research: "We see the goal of research relevance as critical to the long-term survival and success of our field" (ibid, p. 19).

Two authors argue that the relationship between IS research is – by nature – very unique compared to other academic fields:

- Glass (2001) states: "Perhaps nowhere is the rigor vs. relevance dilemma more difficult than in the field of Information Systems (IS). IS is, after all, the computing academic field

devoted to the application of computing solutions to business problems, a field with about as much potential relevance as one could imagine." (ibid, p. 2).

- Similarly, Ramesh (2001) argues that in IS/IT research the relationship to practice is quite unique, because some technological innovations were fostered by academia (mostly in the early days), and others by industry (mostly in recent times due to accelerating technological advancements) (ibid, p. 6).

Myers (2001) – an IS researcher from the University of Auckland, New Zealand, current AIS president, and former senior editor of MISQ and ISR – remarks that there is a contradiction of public statements concerning the value of relevance and the value system in research practice which discourages relevant research: "While relevance to practice is frequently proclaimed as a virtue in public, in reality practical relevance does not matter. What we say we believe we do is quite different from what we actually do. Our existing values and practices, embedded as they are in long-standing institutional practices, ensure that the frequent calls for IS research to become more relevant to practitioners are doomed to fail" (Myers, 2001, p. 339).

3.3 Perceptions of actual relevance in IS research and teaching

The debate contributions which discuss the (perceptions of the) actual status of relevance in IS research and teaching provide an ambiguous picture. In order to enable a differentiated discussion, the descriptive statements are separated according to four basic categories:

- reports on instances of initiatives and instruments to foster relevance in research and teaching (see section 3.3.1),

- descriptions of exemplary relevant research results that have contributed to business practice (see section 3.3.2),

- critical assessments concerning the relevance of contents and methods of IS research and teaching (see section 3.3.3), and

- critical assessments concerning the actual interaction of IS academics with IS professionals (see section 3.3.4).

3.3.1 Reports on instances of initiatives and instruments to foster relevance

Several contributions to the debate contain reports on initiatives and instruments that are in place fostering and documenting the relevance of research and teaching in IS (see Table 4). The activities of the SIM Advanced Practice Council are mentioned in six articles as particularly successful approaches to align academic research with business practice. Selected research centers supported by corporate sponsors are described in three contributions to the debate.

Westfall is convinced that "we received tremendous amounts of [financial support and external validation from practitioners] in the past" (Westfall, 1999, p. 16). He specifically mentions the IBM grants in the 1980s, which helped to establish IS programs at several universities.

Summarizing the responses to their isworld posting Watson and Huber (2000) list a number of approaches and initiatives to connect IS teaching programs with the business community. They also report on single instances of company sponsored faculty research and various approaches in place at universities to foster exchange between academia and practice. Remarkably optimistic, Watson and Huber conclude their summary of approaches to connect IS programs with business as follows: "it does seem, however, that proportional to its numbers, IS is taking a leadership role in the variety and quantity of interactions" (Watson and Huber, 2002, p. 27).

The following subsections present the detailed statements.

Category	Instrument/initiative	Mentioned in/by
Industry support of research	SIM / Advanced Practice Council	Watson and Huber, 2002 Robey and Markus, 1998 Senn, 1998 Bhattacherjee, 2001 Olfman, 2001 Saunders, 1998
	Research centers	Watson and Huber, 2002 Robey and Markus, 1998 Rockart, 2002a
	High-tech laboratories	Watson and Huber, 2002
	IBM grants in the 1980s	Westfall, 1999
	Company sponsored faculty research	Watson and Huber, 2002
Industry support of teaching	(various instruments)	Watson and Huber, 2002
Exchange between academia and practice	(various instruments)	Watson and Huber, 2002

Table 4: Reports on instruments and initiatives to foster relevance

3.3.1.1 Industry support of research

There are several authors who mention the *SIM Advanced Practice Council* (SIM/APC), organized in 1991, as supporters of IS research. Watson and Huber (2002) formulate the objective of SIM/APC as "to build long-term relationships between IS executives and IS researchers to develop comprehensive, practical recommendations for addressing important current and future issues" (ibid, p. 20). The authors describe the activities of the Council as follows: "The Council identifies issues that merit study, and through a competitive proposal process, faculty researchers are selected to study the issues. The researchers are given the financial resources and access to companies that are necessary to complete the research. Members of the Advanced Practices Council receive practical deliverables at project milestones, and have access to researchers and their findings while the projects are underway." (Watson and Huber, 2002, p. 20). They report, that 14 projects have been funded so far. More specifically, Robey and Markus (1998) report that SIM/APC has "supported numerous academic research teams throughout the 1990s, funding projects up to $ 50,000" (ibid, p. 9).

Very positive statements concerning support from SIM/APC are also given by Senn, Bhatterjee, and Olfman (Senn, 1998, p. 24; Bhattacherjee, 2001, p. 6; Olfman, 2001, p. 5). Saunders (1998) even points out that according to all papers in the IRMJ special issue the SIM APC is the only sponsor in industry with particular focus on sponsoring IS research.

A number of *research centers* supported by corporate sponsors are mentioned by Robey and Markus (1998, p. 9), Watson and Huber (2002, p. 18) and Rockart (2002, p. 341):

- FedEx Center for Supply Chain Management (formerly called Cycle Time Research Center) at the University of Memphis, established in 1993, focuses on Supply Chain Management and not specifically on IS research

- Center for Digital Commerce at Georgia State University (used to be part of the college of law, no current information available on the Web)

- Center for Innovation Management Studies, College of Management, North Carolina State University (formerly at Lehigh University), established in 1984, focuses on Technology Management and not specifically on IS research

- Lattanze Center for Executive Studies in Information Systems at the Sellinger School of Business and Management, Loyola College (Baltimore, Maryland), established in 1987

- Joe Ricketts Center in Electronic Commerce and Database Marketing at Creighton University, established in May 1999 is a focused research center and provides a specialized Masters degree in Information Technology Management.

- Center for Information Systems Research (CISR), Sloan School of Management, established in 1974, focuses on "field-based research on issues related to the management and use of information technology (IT) in complex organizations".[1]

Rockart (2002a) reports on his own experience with corporate sponsors at CISR: "An average of 20 corporate sponsors a year provided us with the money to do research – between $500,000 and a million a year. Perhaps more important, to ensure that their money is well spent, our sponsors provided us with insights into their key issues and served as research sites as well" (ibid, p. 341).

Watson and Huber (2002) describe so called "*High-tech laboratories*", which are IT and multimedia development centers sponsored by a group of companies at a university that "serve area industry" or – sometimes – exclusively the funding companies (ibid, p. 16).

Westfall (1999) vaguely reports that the "we received tremendous amounts of [financial support and external validation from practitioners] in the past" (ibid, p. 16). Specifically, he mentions the *IBM grants in the 1980s*: "IBM provided $26 million in the mid-1980s – grants of $2 million to 13 universities – to improve their IS programs" (Westfall, 1999, p. 16).

Single instances of *company sponsored faculty research* are described by Watson and Huber (2002, p. 18 f.).

3.3.1.2 Industry support of teaching

As responses to an isworld posting Watson and Huber (2002) list a number of approaches and initiatives to connect IS teaching programs with the business community. The following list summarizes the approaches:

- internships in a company (for IS Master of Science students),

- system development projects for a company,

- student groups or clubs that organize programs with speakers from the local businesses,

- additional courses or programs supported by specific companies or groups of companies and targeted at providing future employees with particular skills, e.g. mainframe or consulting, and

- training programs targeted at educating employees of a particular company (several examples can be found on p. 11-14 in Watson and Huber, 2002).

SAP University Alliance is mentioned separately: "As members of the SAP Alliance, schools receive free software, faculty training, and educational materials. In return, SAP expects schools to integrate SAP throughout the curriculum." (Watson and Huber, 2002, p. 15). Although the authors state that 100 schools have joined the initiative, they describe it as "costly" and caution that "considerable thought and commitment" is required before this initiative is undertaken.

---

[1] http://mitsloan.mit.edu/cisr/a-main.php (last access June 1., 2007)

3.3.1.3 Exchange between academia and practice

Typical approaches to foster exchange between IS academics and professionals are reported by Watson and Huber (2002, p. 21 ff.):

- industry advisory boards "provide a mechanism for insuring that the IS curriculum meets the needs of the marketplace",

- symposiums with speakers from industry or from academia provide a forum for practitioners from local companies to interact with students, i.e. future graduates, and faculty,

- "executives in residence" working as temporary professors,

- faculty internships are aimed at expanding the faculty's "knowledge base, make them much more aware of practical and organizational issues, lead to research and publications, and provide examples for use in the classroom".

3.3.2 Exemplary relevant research results

Exemplary and particularly relevant research results of the IS discipline are discussed in seven articles. Of those exemplary relevant research results mentioned by the different authors, there are only two direct contributions to practice explicitly mentioned by more than one author: group support systems and critical success factors (see Table 5).

Ramesh (2001) is one of few authors who is convinced that the IS field has contributed significantly to IS theory and practice: "it is my firm belief and conviction that the IS field definitely made seminal contributions to both IS theory and practice." (ibid, p. 2) He provides an extensive list of works in IS research that he considers "seminal" contributions with "lasting impact" in IS research and practice (see Table 6 on p. 12). However, many works mentioned seem to belong to other fields of research than IS (e.g. Simon, Chen, Codd etc.). This line of argument is taken on by Rollier (2001), who criticizes that research results that are considered achievements of the (M)IS discipline by many members of the IS community have to be attributed to other disciplines:

> „[IS researchers] talked about the need for basic research, and cited such developments as Arpanet, TCP/IP, the Mosaic browser, the World Wide Web, and all of the important products that came out of Stanford Research Institute and Xerox Parc from Douglas Engelbart and others. Information systems cannot take credit for such inventions; these researchers were all computer scientists, physicists, or mathematicians. The relational model, based on mathematical principles, was developed by E. F. Codd, and the Entity Relationship model by Peter Chen. Neither were MIS researchers." (Rollier, 2001, p. 2).

Klein (2002) argues that IS contributions to practice are not made directly – and are, thus, not perceived as contributions by academics – but rather through "complex social communication networks" (ibid, p. 334) of which practitioners are only the last element, "who supply the last missing link to create 'application knowledge'".

Category	Contribution	Mentioned by/in
General	Work done at CISR	Keen, 1991
	Work done by research institutions, consultants, software firms	Alter, 2001
	IS research results presented in textbooks	Alter, 2001 Olfman, 2001
	Seminal contributions to both IS theory and practice with lasting impact (see Table 6)	Ramesh, 2001
Technology / software concepts	Group support systems	Gray, 2002 Watson and Huber, 2002
	Telecommuting	Gray, 2002
	Multi-dimensional data bases	Gray, 2002
Management concepts	Critical success factors	Gray, 2002 Ramesh, 2001

Table 5: Perceived contributions of IS research to business practice

The following paragraphs provide further detailed statements related to the contributions listed in Table 5:

Work conducted at the CISR research center at MIT in the late 1970s and the 1980s is mentioned as exemplary in terms of its clear focus at "concerns of leading information systems managers" and the chosen style of presentation "suited to its audience" (Keen, 1991, p. 37). However, Keen (1991) notes that "CISR's work [was] at times [..] hard to distinguish [..] from consulting", but its contribution to its audience was "visible, acknowledged, fruitful and sustained" (ibid, p. 37).

Alter (2001) emphasizes that IS research is not only performed by IS researchers at universities but also in research institutions, consulting and software firms. He argues that IS research "obviously has had an impact by informing practice" (ibid, p. 4) and provides his textbook that relies on a number of IS research results as evidence.

Olfman (2001), too, argues that IS research results are integrated in IS textbooks (and other teaching material) and, thus, would influence students and future practitioners: He points out, that "MIS faculty research, as well as research in reference disciplines, does inform and impact MIS students" (ibid, p. 3) mainly via textbooks, in which research work and research case studies are cited but also via research articles that are read in class.

Gray (2002) lists "things" that were "invented" by IS researchers: "group support systems, telecommuting, multi-dimensional data bases, and critical success factors" (ibid, p. 338).

Watson and Huber (2002) also describe the development of a group support system at the University of Arizona (J. Nunamaker) funded by "a large number of firms" (ibid, p. 24) that was finally licensed by IBM as GroupSystems in 1989: "the software evolved over the years and was integral to a large number of theses and dissertations, research grants and contracts, consulting engagements, and executive development programs" (Watson and Huber, 2002, p. 24).

- Simon - without a question I believe his contributions are seminal to our field; we call him our own although I am not sure whether economists and computer scientists (and numerous other research communities where Simon has contributed) will agree with us.
- Shannon's mathematical theory of communication; DeLone and McLean's oft-cited paper on IS success bases its IS success model on Shannon and Weaver's theory of communication.
- Weiner's work in Cybernetics.
- Scott-Morton's work in describing fundamental concepts of MIS
- plus his work on DSS later with Keen.
- Ackoff's work in similarly describing the fundamental concepts about systems and MIS
- Keen's work on fundamental MIS concepts; plus his work on DSS
- Chen's work on ER modeling revolutionized our approach to systems analysis and design
- Codd's work on Relational Databases (although computer scientists will claim his work to be seminal to their field rather than to the field of MISalthough his theory of RDBMSs has shaped Information Systems to what they are today).
- Miller's work on cognitive limits which became the basis for all our modeling schemas in IS.
- Newell and Simon's work on human information processing.
- Tversky and Kahnemann's work on decision making under uncertainty (once again psychologists may call this work seminal in their field)
- Checkland's work in soft systems thinking
- Mumford's work on socio-technical systems
- Churchman's work on the systems theory and the philosophical foundations of information systems
- von Bertalanffy's work on general systems theory
- Langefors' work on general information systems theory
- Weinberg's work on systems theory, software engineering, and software quality
- Brook's work in software engineering and project management (The Mythical Man Month; No Silver Bullet articles are truly foundational)
- Rockart's work on Critical Success Factors.
- Couger's work on systems methodologies, computer personnel, and creativity
- Tiechrow's work with Konsynski, Nunamaker, and Welke on CASE technology

Table 6: Subjective list of seminal works by Ramesh (2001, p. 4)[1]

3.3.3 Critical assessments: IS research and teaching contents and methods

Critical perceptions concerning the status of relevance relate to teaching as well as research (see Table 7).

With respect to IS teaching it is criticized that IT topics dealt with in class are out of date from the view point of business practice (Davenport, 1997). The authors of one article describe their perception of a general low quality of IS teaching (Munkvold and Khazanchi, 2001). Davenport and Markus (1999) critically assess that IS research is typically not assigned as readings in classes; instead articles "produced by our non-academic competitors" are assigned.

Critical voices concerning relevance of IS research address (1) the lack of interesting topics, application-oriented research results and knowledge, (2) the lack of relevant research methods, and (3) the insufficient attractiveness of research articles from the view point of the practitioners' community.

---

[1] According to Ramesh (2001) "these seminal works are of lasting impact, and either fundamentally changed the way we view the world or created immensely novel opportunities for research and practice in the last few decades" (ibid, p. 3).

Category	Critique	Mentioned in/by
IS teaching	Out of date	Davenport, 1997
	General low quality	Munkvold and Khazanchi, 2001
	IS research papers not assigned as readings,	Davenport and Markus, 1999
IS research results and knowledge	IS is follower rather than leader of industry	Davenport, 1997 Amaravadi, 2001 Rollier, 2001 Robey and Markus, 1998
	No useful research results in the eyes of practice	
	No discovery of or solutions for critical problems	Senn, 1998
	Lack of application-oriented knowledge	Klein, 2002; Dennis, 2001
	Rarely providing new and vital approaches	Rockart, 2002a; Gray 2002
	Research poorly articulated in terms of relevance	Keen, 1991
	Current topics of interest for practitioners are hardly covered in IS research	Keen, 1991 Gray, 2002
IS research methods	Target audience not explicated, justified by methodology rather than demand in practice	Keen, 1991
	Due to lack of cumulative tradition lack of strong theoretical models that could serve as basis for "prescriptive action" (relates only to behaviourist research)	Benbasat and Zmud, 1999
IS research articles	Inappropriate "style and tone"	Benbasat and Zmud, 1999
	Literally unreadable	Robey and Markus, 1998
	Context frame unexplained (familiarity assumed) Emphasis on shortcomings and future work Time lag Intuitively obvious results	Kavan, 1998
	Complex language Constant changes in vocabulary	Klein, 2002

Table 7: Critique concerning the relevance of IS teaching and research

Ad (1): 13 authors criticize that the IS discipline has not been successful in producing research results and knowledge of value to practitioners. Several reasons are provided: research results do not address critical problems, the topics covered are not of interest anymore and IS research rarely produces new approaches and innovations.

Ad (2): Two articles specifically address the appropriateness of research methods and their applications to support practice relevance. Keen (1991) criticizes that there are many research papers that do not explicate the target audience but justify their research through the method applied rather than through the demand in business practice. Benbasat and Zmud (1999) comment on behaviourist research and argue that – due to lack of a cumulative tradition – there is a lack of strong theoretical models that could serve as basis for "prescriptive action" in business practice.

Ad (3): Six authors critically assess the insufficient readability and attractiveness of research articles from the view point of practitioners. Specific issues of critique relate to the prerequisite knowledge assumed, the emphasis on shortcomings and future work, the time lag due to long publication cycles, the complex language, and changes in terminology. One author criticizes that the insights presented in academic articles are sometimes "intuitively obvious" (Kavan, 1998, p. 29).

The following subsections present the detailed statements.

3.3.3.1 Relevance of IS teaching

Davenport (1997) wrote a critical paper on the (lack of) partnership between "universities and IT-oriented business" in terms of topics in teaching as well as in terms of research. He points out that "if [graduate business schools] teach much about IT at all, [they] are always dealing with yesterday's problems". He mentions strategic information systems, expert systems and reengineering as topics, which have been the subject of classes or are about to be added to the course catalog (reengineering) even though they have already "disappeared from business practice" or are not "on the rise" any more.

Two authors (both academics, one working in the US, one working in Norway) critically assert "an apparent 'dumbing down' of our IS educational system [..] from our own experiences and through anecdotal evidence from colleagues [..] " (Munkvold and Khazanchi, 2001, p. 6) and give a list of indicators of the low quality of IS teaching including "class sizes are too large"; "grades are given, not earned"; "students are rarely exposed to technical and expository material"; "students are not tested in a form that evaluates their knowledge of IS".

In 1998 Robey and Markus state critically that IS research results would not even be used for IS teaching: "academia hypocritically pursues 'rigorous research' that is curiously unknown in corporate boardrooms and in university classrooms" (ibid, p. 8). Similarly, Davenport and Markus (1999) critically assess that "IS academics produce research that our students cannot sue and assign readings produced by our non-academic competitors" (ibid, p. 22).

3.3.3.2 Relevance of research results, topics, and knowledge

> *"We do not seem to have the knowledge valued by industry [..] We follow rather than lead in a large number of areas" (Amaravadi, 2001, p. 2)*

Followers rather than leaders of industry

Amaravadi (2001) – an IS academic who worked with consultancies – summarizes the relevance problem the IS field is faced with as follows: "As a field, we do not seem to have the knowledge valued by industry. We also lack the technical expertise to advise on issues such as how to configure a distributed system and the managerial experience to advise an IT manager on how to transition to a new technology. We follow rather than lead in a large number of areas and continue to be amazed by the innovations that arise from industry (and non-IS sources) and take control of our discipline." (ibid, p. 2).

Rollier (2001) tells an exemplary story on how IS researchers start studying the usage and interface of a technology after it has come to the market (ibid, p. 3 ff.). His main question is: "How can we lead practice if we are asking them questions instead of providing answers?" (ibid, p. 4).

According to Davenport (1997) research topics are not up to date from the viewpoint of business practice: "scarcely a manager today cares about decision support systems or group decision support, yet these topics appear regularly in academic journals".

Robey and Markus (1998) critically note that managers are interested to learn about a technology "when it is new", but that researchers from academia would produce results "only after practical interest has cooled" (ibid, p. 8). Hence, they argue that it is not IS academics who influence and shape practitioners opinions on new technologies but consultants and practitioner magazines (Robey and Markus, 1998, p. 8). Similarly, Davenport and Markus (1999) point out that the discipline lags in terms of the invention of "relevant business IT concepts and approaches" (ibid, p. 21). From their experience, "the ideas that shape how managers think about IT [such as reengineering, mass customization and virtual organizations] have come from consultants" (Davenport and Markus, 1999, p. 21).

No useful research results in the eyes of practice

Senn (1998) states, that "typically" IT professionals "do not use the frameworks or models developed within the academic community" and neither the "discovery of" nor the "solution to critical problems occur" within the academic research community of IS (ibid, p. 23). Furthermore, Senn argues that "typically" even long term funded research programs "have not delivered products or methods that are having a broad impact on practice", except a few exceptions (Senn, 1998, p. 24).

Klein (2002) states that "IS as an application-oriented discipline, is most deficient in research into the ethical and application knowledge [..], but relatively successful with theoretical and technical knowledge" (ibid, p. 335). Similarly, Dennis (2001) declares a satisfactory state (maturity, success) of the discipline in terms of knowledge exploration, but an unsatisfactory state in terms of knowledge exploitation.

Keen (1991) assesses the contributions of IS research to practice very critically by pointing out that "The contribution of IS [research] are mainly to IS [research] itself, not to a wider sphere of either research or practice." (Keen, 1991, p. 29). Keen concludes that it is "frustrating [...] to see how poorly articulated so much IS [research] work is in terms of relevance" (Keen, 1991, p. 42).

Rockart (2002a) describes his impressions concerning the contribution of IS faculties as follows: "much of what I see being turned out by many IT faculty looks to be merely extending theory, often in minor ways, and rarely providing new and vital approaches to the field " (ibid, p. 341). Similarly, Gray (2002) argues that "we don't encourage invention so that we can stay ahead of industry. We spend our time studying what is" (ibid, p. 337).

Current topics of interest not covered in IS

Gray reports that topics discussed in practitioner journals, such as Computerworld and CIO magazines are "hardly" taught in IS and not much research is done on them (Gray, 2002, p. 337).

In 1991 Keen reports that there are numerous issues of concern and themes, where his "own target audience whishes eagerly to find advice", but that are hardly covered by IS research (Keen, 1991, p. 46). These topics include: "Managing the true economics of information capital", "Technology platforms" (including architecture, integration, and vendor strategies), and "IT strategies for the transnational firm" (ibid, p 46).

3.3.3.3 Relevance of research methods

> "[Too many IS researchers] tend to justify their own research in terms of its methodology or its theory" (Keen, 1991, p. 38).

Benbasat and Zmud (1999) relate specifically to behaviourist empirical research and provide the following critical assessment concerning the relevance of IS research articles: They see a tendency to emphasize rigor over relevance in journals and in promotion and tenure criteria. They state that a cumulative research tradition is needed in order to build strong theoretical models that can serve as a reliable basis for "prescriptive actions" (ibid, p. 6) for industry practice. However, the authors do not see such a cumulative tradition in IS: there are no "common tools" and there is no "shared language". The authors criticize that the dynamism of technological innovation in combination with long publication cycles lead to out dated articles in current journals: "Too often, studies that focus on new technologies are published far past the date when the technology could be considered new".

Keen (1991) criticizes that he has seen too many IS researchers, which do not explicate the target audience of their research, but "tend to justify their own research in terms of its methodology or its

theory" (ibid, p. 38). Furthermore, he explains that often IS research is not accepted by colleagues of the respective reference disciplines, because of insufficient quality of the research: "I do know that many scholars I work with in some of these [reference] fields dismiss IS [research] as a whole because they see downright mistakes in a few of its articles in terms of the authors' application of methodology that they themselves know well and that is a core tool of their own trade" (ibid, p. 39).

The difficulty of choosing a relevant research topic and applying accepted methods is exemplified by a case, described by Applegate and King (1999): A P.h.D student had been urged by her advisor to choose a student experiment research approach to investigate a focused research question rather than to conduct research in a particular company aimed at identifying an approach "that managers could take in implementing technology-enabled organizational change" (ibid, p. 17). However, she was not able to publish the research results in top-tier journals, because from the reviewers' perspectives the gained insights were considered not new, the scope was too narrow, and the results were not sufficiently generalizable. She therefore intended to do field research, but faculty members cautioned her that this type of research was risky and might lead to the same criticism in terms of generalizability as her previous research, because she would investigate only one firm.

3.3.3.4 Attractiveness and readability of research articles

> *"From a practitioner's perspective, academic writings are literally unreadable."*
> *(Robey and Markus, 1998, p. 8)*

Various authors comment on the need for a better readability of research papers in order to tailor them better to the needs of practitioners; Benbasat and Zmud (1999), for example, speak of the need for an appropriate "style and tone" (ibid, p. 5).

Some statements can be found which explicitly describe the actual status of "attractiveness" of academic research articles from the view point of practitioners:

- Kavan (1998) criticizes the "bottom-up" approach of academic research articles for practitioners: academic research "assumes familiarity with the subject and offers no context frame" (ibid, p. 20). He suggests that a "top-down" approach which first sets the context "would be more useful for practitioners" (ibid, p. 20). Other issues of critique are the "time lag" and the emphasis on shortcomings and future work instead of implementation related consideration. He even states that "some practitioners view these descriptive (but grounded) models as intuitively obvious and therefore of little value" (ibid, p. 20). According to Kavan, all these factors have lead to the fact that "outcomes of academic research hardly build respect and a burning appetite for similar research among practitioners" (ibid, p. 20).

- Robey and Markus (1998) explicitly state that "from a practitioner's perspective, academic writings are literally unreadable" (ibid, p. 8).

- Klein (2002) explains that according to his view "action-relevant knowledge" does exist, but is not sufficiently accessible, because of complex language and "constant changes in vocabulary" (ibid, p. 334).

3.3.4 Critical assessments: interaction of academics with professionals

Many statements found concerning the interaction of academics with practitioners point out that there is a severe lack of exchange. They specifically relate to the dissemination of academic publications among practitioners and to different forms of interaction between industry and academia.

Table 8 summarizes the main issues. Four authors state that academic IS journals are rarely read, subscribed, or valued by IS professionals. Single articles contain additional criticism, such as the

lack of practitioners submitting articles for publication in academic IS journals (Senn, 1998) and the problem that IS journals are not (even) valued by academics from other disciplines (Keen, 1991).

Category	Assessment	Mentioned by/in
Academic publications	Academic IS journals are rarely or not subscribed, read, and/or valued by professionals.	Senn, 1998 Keen, 199 Davenport, 1997 Benbasat and Zmud, 1999
	Practitioners do not submit articles for publications in academic journals.	Senn, 1998
	Academic IS journals not valued by other disciplines.	Keen, 1991
Interaction	Media of practice are rarely used to communicate research findings.	Senn, 1998
	Academics and practitioners rarely attend the same conferences.	Gray, 2002
	Academics are insufficiently exposed to practical contexts.	Benbasat and Zmud, 1999
	Specifically, few academics are hired by companies as consultants.	Davenport, 1997

Table 8: Critique concerning the interaction of academics with professionals

Related to other ways of interaction it is criticized that academics do not use the media of practice to communicate their research findings and that academics and practitioners rarely attend the same conferences. Additionally, two papers discuss the issue of IS academics' insufficient experience with today's business and technology environment.

The following subsections provide the detailed statements related to the perception of academic IS publications by practitioners and the general lack of interaction of IS academics with practitioners.

3.3.4.1 Academic publications rarely read by practitioners

Senn (1998) describes a number of indicators for a lack of relevance, which are according to his perception "typical" (ibid, p. 23) to the IS field: IT professionals "do not routinely seek out or read academic research publications or white papers", they "do not subscribe to academic journals", and "do not submit articles for publication in academic journals" (ibid, p. 23). Based on an interview study with IS executives, he states that there are four major reasons why research published in academic IS journals is not read, because it is "not relevant", "not readable", "not practical" and "not timely" (Senn, 1998, p. 26).

Keen (1991) critically states that IS journals are neither valued by practitioners he has met ("Information Systems managers, research-oriented consultants, and business executives", p. 42) nor by scholars of other fields (see Keen, 1991, p. 42). Many other authors agree, that a lack of relevance of IS research articles can be derived from the obvious fact that practitioners rarely read academic IS journals (e.g. Davenport, 1997; Benbasat and Zmud, 1999; and ISWorld discussion).

Sein (2001) argues that while practitioners do not read academic IS journals, they would also not read "most practitioner literature either". Hence, it would not be reasonable to conclude from this fact that IS research is not relevant (ibid, p. 2 f.). This attitude is contrasted by the opinion of Senn (1998) – an IS research who "regularly interacts with business leaders": He explains that it is obvious that practitioners do not read academic journals, which is exemplified by the SIM Board who cancelled the prior bundling of MIS Quarterly subscription with SIM membership; however, he argues that "the services of such organizations as the Gartner Group, Giga Information Group, and

Forrester Research are widely subscribed in corporate and government IT settings" (Senn, 1998, p. 24).

3.3.4.2 Lack of cooperation and exchange between academia and practice

Senn (1998) criticizes that the "obligation" to communicate IS research findings in the language and through the media of practice is "woefully unmet" (ibid, p. 27).

Gray (2002) argues that – although both groups "are trying to find solutions to the same problems" – academics rarely attend practitioner conferences ("trade show[s] (other than Comdex in Las Vegas)", p. 336) and it is "even rarer for a practitioner to appear at an academic meeting unless specifically invited" (ibid, p. 336).

Benbasat and Zmud (1999) state that IS academics are typically insufficiently exposed to "the practical contexts where IT-related usage and management behaviors unfold" (1999, p. 5). In particular they declare a lack of "sufficient exposure to current and future technological environments" (Benbasat and Zmud, 1999, p. 7) mostly due to insufficient financial resources.

Davenport (1997) describes his perception that "few academics are hired by companies as consultants".

3.4 Explanations for the current lack of relevance

[Our] institutional environment has not encouraged the pursuit of relevance."
(Benbasat and Zmud, 1999, p. 7)

Statements which attempt to explain why IS research has not been as relevant mainly relate to the promotion system and institutional factors (see Table 9). The main reason provided are the requirements of tenure and promotion committees that largely determine acceptable research methods and publication outlets. The particular emphasis on highly ranked academic journals, which focus on theoretical, rigorous research rather than on application-oriented and relevant research is described as another main reason.

Hoving (2002) and Gray (2002) comment on the affect of the organizational setting of IS researchers. It is argued that most work is done by single authors, which determines the kind of research that can be pursued. Additionally, it is stated that the time available for IS faculty to interact with practitioners and to stay current with technology is frequently limited by institutional circumstances and by promotion requirements.

Category	Reason to explain lack of relevance	Reference
Reward and incentive systems	Expectations of tenure and promotion committees focusing on rigor over relevance.	Davenport, 1997 Saunders, 1998 Davenport and Markus, 1999
	Specifically: emphasis on highly ranked academic journals	Davenport and Markus, 1999 Westfall, 2001 Jennex, 2001
	Specifically: rigorous research was necessary to overcome perceived low quality of IS research	Benbasat and Zmud, 1999
	Specifically: internal reward system does not promote innovation	Paper, 2001
	External granting agencies have emphasized the pursuit of rigor.	Benbasat and Zmud, 1999
	Audience and reviewers of academic IS journals are primarily academic; journal policies typically disregard relevant research	Myers, 2002
Institutional and organizational setting	Single author work limits the kind of work that can be pursued.	Gray, 2002
	Institutional circumstances severely limit the time available to stay current with technology.	Hoving, 2002
	IS academics tend to teach the subject of their own dissertation thesis	Gray, 2002

Table 9: Approaches to explain the current lack of relevance

Reward and incentive systems

Looking for reasons for the lack of partnership between academia and business practice Davenport (1997) points out that the tenure system requires academics on a tenure track to "do research that appeals to their colleagues". And business school professors "have been striving hard to be rigorous" as defined by disciplines like economics and physics.

Saunders (1998) comments that all articles of the IRMJ special issue "hint at constraints posed by the North-American promotion and tenure system" (ibid, p. 5). Similarly, Davenport and Markus (1999) point out, that IS researchers experience the same "institutional pressures toward irrelevance as other business school faculty", such as promotion and tenure evaluations based on publications in highly ranked academic journals and assessments from academics and not from practitioners (ibid, p. 19).

Benbasat and Zmud (1999) explain that the tendency to emphasize rigor over relevance is due to the disciplines response to the perceived lack of quality of IS research in comparison to other business disciplines in the 1970s. Furthermore, according to their perception "internal (university) and external (federal) granting agencies have emphasized the pursuit of rigor [..] [Our] institutional environment has not encouraged the pursuit of relevance." (Benbasat and Zmud, 1999, p. 7).

Supporting this opinion, Paper (2001) argues that the (reward) system does not encourage researchers to work on innovative research questions: "The issue at hand is whether or not the current promotion system rewards innovation and state-of-the-art thinking. I believe that the current system within which we operate does not promote innovation." (Paper, 2001, p. 3).

Westfall (2001), too, asserts that IS research lacks relevance, because "institutional factors gradually destroy[ed] our desire and ability to do relevant research" (ibid, p. 3). He supports his argu-

ment by describing the preferences of leading schools for publications records of high class journals etc. Jennex (2001) also criticizes the reward system focusing on high ranked journal publications.

Myers (2002) explains that there are two reasons that mutually affect the relevance of IS research: the audience and reviewers of academic IS journals are primarily academic and journal policies typically disregard relevant research; at the same time they play a vital role in the reward system: "*MIS Quarterly* and *Information Systems Research*, became more theoretical and less practical over the past decade. In fact both journals no longer accept what used to be called 'application articles'. Rather, all articles now need to have a strong theoretical base. [..] Our entrenched promotion and tenure systems in universities reward the publication of academic articles in these outlets." (Myers, 2002, p. 340).

Institutional and organizational setting

Gray (2002) notes that because most research work is "single author" ("the work of a single PhD candidate), "we cannot [..] tackle large or interdisciplinary problems" (ibid, p. 337 f.).

Hoving (2002) explains that IS academics are having problems with "connecting well with the world of practice" because, they are given only very limited time to "keep up with industry trends" and "many academics have never had practical experience" (Hoving, 2002, p. 342).

Gray (2002) additionally reports that IS academics tend to teach the subject of their own dissertation thesis, thus "new topics take a long time to enter the curriculum".

3.5 Recommendations for improving relevance in IS

> "The academic community must recognize that it can only transform or change itself: it
> cannot mandate changes in the business community." (Kavan, 1998, p.22)

Many recommendations are given that should help improve the relevance of IS research and teaching. These suggestions can be differentiated according to those recommending certain values or attitudes (see section 3.5.1) and those recommending specific action or initiatives (see section 3.5.2).

3.5.1 Recommended values or attitudes

Table 10 summarizes the suggested values and attitudes related to relevance. Several authors suggest more appreciating relevant research and diversity:

- Davenport and Markus (1999) argue that it is not necessary for all researchers to do relevant research in terms of applied or practical research, but that "all need to value it" (ibid, p. 22).

- Mathieson and Ryan (2001) propose that "the discipline should support academic communities with different goal profiles. [..] The standards of one group should not be used to judge another, without due reflection on differences in goals and constraints." (ibid, p. 5)

- It is suggested to learn from consultancies' successful influence on practice through "readability" and implementing results (Davenport and Markus, 1999, p. 21). In general, consultant research should be respected as "an alternative way to acquire and share knowledge" ((Davenport and Markus, 1999, p. 21).

Recommendation	Mentioned by/in
More appreciate relevant research and diversity.	Davenport and Markus, 1999 Mathieson and Ryan, 2001
Respect consultancy research as an alternative.	Davenport and Markus, 1999
Do not view rigor and relevance as conflicts.	Robey and Markus, 1998 Benbasat and Zmud, 1999 Mason, 2001
Wait until you are tenured and then start doing relevant research	Myers, 2001 Rockart, 2002a Hoving, 2002

Table 10: Recommended values and attitudes related to relevance

The relationship between "rigor" and "relevance" is addressed in three articles:

- Robey and Markus (1998) point out that "there is no inherent conflict between these two pressures [rigor and relevance]; it is not only possible, but also desirable, for IS researchers to fulfil both directives" (ibid, p. 7).

- Similarly Benbasat and Zmud (1999) state that "relevancy does not imply that research needs to be carried out in a less rigorous fashion" (ibid, p. 5).

- Mason (2001), who started two consulting firms before he began his career in academia, also argues against the "notion of a linear, unidimensional research space or continuum along which one must choose an operating point" (ibid, p. 2) in between a maximum of rigor or relevance, theory or practice. He provides examples of research in which the "quest for understanding" as well as "the considerations for practical use" have played a vital role. Calling this notion of research in the "Pasteur's quadrant" he states that "The implications of focusing more on Pasteur's quadrant are that we will direct our energy toward significant practical problems and use our research efforts and creativity to develop the understandings that lead to solutions." (Mason, 2001, p. 5)

Myers as well as Rockart and Hoving, a practitioner and SIM representative emphasizes, recommend untenured faculty to stick to the current rules and to wait with doing actually relevant work until tenure is achieved:

- "While I agree that proclaiming our relevance to practice (or saying we should be more relevant) is a very worthwhile activity, I advise young IS researchers not to take these proclamations too seriously. The most practical thing they can do is to focus on their research. That way they are far more likely to succeed in having their research articles published in peer-reviewed academic journals." (Myers, 2001, p. 340)

- "Every untenured faculty member needs to know what the real rules of gaining tenure are and should not listen to the siren of 'relevance', especially if he is on the faculty of one of the 'top' schools. Developing new theory or extending old in major ways is what is rewarded…no matter what is stated. There may be places where this is not true, but I have not found them. " (Rockart, 2002a, p. 341)

- "Until the reward structures in academia change, professors aspiring for tenure must do theoretical research and publish papers for other academics to read. Those papers should not pretend to be relevant for practitioners. Once tenure is out of the way, I would hope professors would be willing to interface closely with industry, find out what are the relevant topics and issues, and then go about researching for insightful conclusions. We practitioners really need this help. We need it from people whose motives are primarily to share knowledge rather than to sell consulting services. " (Hoving, 2002, p. 343)

3.5.2 Recommended action

Specific recommended actions and initiatives relate to (1) improving the relevance of IS research and (2) improving the acceptance of relevant research in academia. Table 11 provides an overview of the recommendations.

Various approaches to foster the exchange between academics and practitioners are discussed in six articles. Four further articles focus on law and medical schools as suitable examples for the IS discipline on how to organize interaction between academic researchers and professionals in business practice.

Category	Recommendation	Mentioned by/in
Improve relevance of IS research	Foster exchange between academics and practitioners (various approaches).	Kohli, 2001; Borchers, 2001 Benbasat and Zmud, 1999 Alter, 2001; Kavan, 1998 Watson and Huber, 2002
	Specifically: emulate law and medical schools.	Davenport, 1997 Davenport and Markus 1999 Klein, 2002; Lee, 1999
	Strive for particular (relevant) types of research questions and results.	Davenport, 1997; Senn, 1998 Davenport and Markus, 1999 Robey and Markus, 1998 Westfall, 1999; Westfall, 2001 Rollier, 2001; Klein, 2002 Gray, 2002
	Specifically: change priorities in selecting research questions and methods.	Keen, 1991 Benbasat and Zmud, 1999
	Produce better consumable research articles.	Senn, 1998; Kavan, 1998 Robey and Markus 1998 Benbasat and Zmud, 1999
	Strive for external funding	Senn, 1998; Olfman, 2001 Gray, 2002
	Take advantage of opportunity to influence students.	Davenport and Markus, 1999
Improve acceptance of relevant research	Reward publications in practitioner outlets.	Davenport and Markus, 1999 Robey and Markus, 1998 Sein, 2001; Jennex, 2001 Rockart, 2002a
	Establish new publication outlets.	Keen, 1991; Senn, 1998 Munkvold and Khazanchi, 2001 Dennis, 2001; Gray, 2002
	Change academic journal policies.	Benbasat and Zmud, 1999 Westfall, 1999, Hoving, 2002
	Broaden acceptable dissertation research.	Gray, 2002

Table 11: Recommended actions and initiatives to improve relevance

The authors of nine articles emphasize the need to better focus on particularly relevant types of research questions and results. With a different focus, Keen (1991) as well as Benbasat and Zmud (1999) argue that there is the need to change priorities in selecting research questions and methods. Recommendations for changes in the outline and style of research articles in order to improve the readability from the view point of practitioners are discussed in four papers. Davenport and

Markus (1999) are the only ones who suggest influencing students as future professionals to improve the future exchange between academia and practice.

With respect to improving the acceptance of relevant research, the authors of five articles recommend rewarding publications in practitioner outlets for promotion and tenure. The authors of five other contributions discuss the need to establish new publication outlets that foster relevant research. Changing academic journal policies is explicitly recommended in three articles. Gray is the only author who suggests broadening not only acceptable research in general but specifically acceptable dissertation research.

The following subsections present the detailed statements related to recommended actions and initiatives.

3.5.2.1 Improve relevance of IS research

Foster exchange between academics and practitioners

Kohli (2001), an internal consultant and project leader in a healthcare industry firm, suggests ways for more interaction with practitioners: interaction of PhD students with practitioners, "for professors to take sabbaticals at business organizations in their field of expertise", and „programs that have senior IS professionals in Academia-Industry [..] residence for periods of a year or more provide benefits the entire IS faculty." (Kohli, 2001, p. 3 f.).

Borchers (2001) – who himself earned a Doctor of Business Administration degree – suggests to encounter the shortfall of IS professors and practice experience of current faculty by implementing part-time doctorate degree programs for "truly top professionals […] with extensive industry experience" and to differentiate these from tradition PhD programs by differing degree names, such as DBA (Borchers, 2001, p. 3).

Alter (2001) suggests publishing each research article in two formats, a short and a longer version targeted at practitioners and at academics, respectively. Benbasat and Zmud (1999) recommend that "the vast majority of IS research articles should be crafted in a clear, simple and concise manner [..] accessible by *all* the potential readership" (ibid, p. 12).

Kavan (1998) suggests different ways to foster communication and knowledge exchange between academia and practice. His recommendations correlate to different phases of the "Information-Gathering Model". In order to support practitioners in the "Monitoring" phase Kavan suggests to foster better partnerships between the "research outlets and the vendor community", for example by "authoring clipping services to provide reprints of special topical information". He makes several recommendations to ease the access to better information in the "Investigation" phase (Kavan, 1998, p. 21):

- research frameworks could serve as context frames with links to "more detailed information, research in progress, vendors, and information providers",

- electronic collaboration over the Internet could foster "tighter coupling of academic researchers and practitioners with specialized common interests",

- "more special issues of journals devoted to singles subjects [..] would be well received by practitioners"

- "smaller, more frequent, and applied conferences concentrated in specific topic areas would be useful".

According to the "Information-Gathering Model", the practitioner performs "direct research [..] in terms of pilots, prototypes and proof of concept tests" (Kavan, 1998, p. 21) in the final stage. Here, he recommends that academic researchers participate in these research efforts and foster

incentives for practitioners by creating win-win situations. Additionally, Kavan suggests that academics participate actively in practitioner organizations, such a AITP and SIM, which could "provide an opportunity to participate with the practitioner in action research" (Kavan, 1998, p. 22).

Watson and Huber (2002) provide ideas for ways of IS researchers and professionals to interact by providing a list of existing initiatives (see section 3.3.1 in this report).

Emulate law and medical schools

Davenport (1997) suggests better emulating "our colleagues in law and medical schools, who have climbed down the ivory tower to actually make contact with the real world" than following the business school culture.

It is suggested to emulate other applied fields, such as medicine and law, rather than those in business schools (Davenport and Markus, 1999, p. 19). That way IS researchers could distinguish themselves "by conducting more relevant and timely research than other management fields" (Davenport and Markus, 1999, p. 20).

Lee argues that in order to do research relevant to practitioners it is necessary not to only conduct research "in the manner of the natural sciences" but to include research that "emulates inquiry in the professions" (Lee, 1999, p. 29).

Klein (2002) states that there is the need to "create a better understanding of how successful communities of practice (such as medicine or law) create and transfer application knowledge" (ibid, p. 335). He suggests to start investigating the network of IS knowledge production and communication, which eventually leads to knowledge which is "actually applied in a practical situation" (Klein, 2002, p. 336).

Strive for particular (relevant) types of research questions and results

Davenport (1997) states that "since academics have largely dropped out of the race to invent concepts and approaches that help managers deal with IT in business, the field has been mainly left to consultants". Thus, he suggests that IS academics focus on the strategic issues that are too small ("not lucrative enough") from the view point of consultants.

Senn (1998) suggests establishing a research program which addresses topics that are based on the top information systems issues as identified in the annual critical issues studies, conducted by SIM and the Computer Science Corporation (CSC).

Davenport and Markus (1999) describe three ways for "excellent practical research" (ibid, p. 20): (1) the "'applied theory' approach, in which researchers apply appropriate academic theories to practical problems", (2) "evaluation research, [which] applies practical as well as theoretical criteria to the assessment of an intervention", (3) "policy research, [which] focuses on resolving an identified policy problem" (Davenport and Markus, 1999, p. 21, similarly: Robey and Markus, 1998, p. 10).

According to Westfall (1999), who worked in industry for many years before he started his career in academia, the first stage to achieve more relevance entails changes in the issues investigated in (empirical) IS research: He argues that the competitive advantage of IS academic research lies in its independence from immediate industry customers and longer time frames that can be used for research (Westfall, 1999, p. 19). Thus he suggests concentrating on the following "research categories" (Westfall, 1999, p. 8):

- Issues contrary to commercial interests

- Unsolved problems

- Issues economically unattractive to commercial researchers

- Issues where management aspects are more important than technical aspects

- Research on teaching IS

In a later contribution Westfall points out, that IS researchers in academia should pick research topics that suit their competitive advantages over commercial organizations (such as Forrester and Gartner) who conduct "IS/IT research" (Westfall, 2001, p. 6). His arguments are primarily related to empirical studies. He gives further suggestions on how to address relevant research questions and how to make research accessible (Westfall, 2001, p. 8 ff.).

Rollier (2001) suggests starting to do research on a technology before it hits the market: "The products of the future will emerge from laboratories such as this one, and we are not participating in design or development. We should be. We should be helping to determine how such products will be used, how the user interfaces should be designed, how the new technology should be introduced in an organization, and what the benefits and costs are likely to be." (Rollier, 2001, p. 3)

Hoving a practitioner and SIM representative emphasizes that – from the viewpoint of practice – "the material [studied] needs to be important to what's on [the practioners'] minds, not what the academic wants to research" (Hoving, 2002, p. 342).

Klein (2002) recommends that research should be conducted aimed at four different types of knowledge, of which each should be given "the same level of recognition" (Klein, 2002, p. 335): theoretical, ethical, technical, and application knowledge. More specifically, he recommends to put more emphasis on application knowledge, which should be more appreciated as "requiring a separate type of research, for which the current stock of research methods and refereeing standards are not well suited" (Klein, 2002, p. 336). He suggests action research with a "detective mindset" as one suitable method.

Truex makes the rather contingent suggestion to "occasionally apply research methods that require relevance" (Truex III, 2001, p. 6), such as "action research" and "improvement research" (ibid, p. 6). Gray agrees to the writings of March and Smith, who emphasize the role of design in IS reseach (Gray, 2002, p. 338).

Change priorities in selecting research questions and methods

Keen (1991) points out that IS researchers must not focus as much on topics and methods but on selecting a research question relevant and purposive to a particular target audience and apply a research method that allows to convince the respective audience: " I suggest that the research goal and target audience should drive the choice [of a research method]" (ibid, p. 42). He summarizes his recommendations for improving IS research in three steps or aspects (Keen, 1991, p. 44):

- Improve relevance by first, choosing your "target audience of influence" and second, by identifying "the concern within the target audience that you are addressing".

- Improve rigor by "plac[ing] the study in its wider intellectual context" and by contemplating on the reasons for choosing the methodology you are using.

- Improve impact by identifying the (potential) contributions you are making to your target audience, to the "cumulative tradition" of IS research, to the "wider research environment" and to "Rigor".

Benbasat and Zmud (1999) suggest increasing the relevance of positivist empirical IS research by changing the topics studied and the research results or outputs:

- Select research topics related to the future interests of key stakeholders

- Look to practice first to identify a research topic

- Foster discussions on the core research issues of the field and communicate results

- Consider likely outcomes of a research project to decide for or against it

- Produce more cumulative, theory-based research

- Develop frames of references (conceptual languages) that allow practitioners to organize complex phenomena

- Create outputs that can be used by practitioners to "justify and rationalize IT-related initiatives" (ibid, p. 11)

Produce better consumable research articles

Several authors provide recommendations to improve the readability of IS publications. Of these, some give suggestions on how to write texts specifically targeted at practitioners (Senn, 1998, Robey and Markus, 1998, Kavan, 1998), other give advice on how to improve the readability of research papers in general (Benbasat and Zmud, 1999).

Senn (1998) explicitly demands that academic researchers should produce two types of research publications (1) for academic journals and conferences and (2) for "reports and presentations" that "add to knowledge in a form that is useful in practice" (ibid, p. 27). He gives several suggestions on how to prepare research reports specifically targeted at IT professionals; compared to papers prepared for academic journals these articles should (Senn, 1998, p. 27):

- be "shorter and more concise, more clearly written, and much better illustrated"

- make "key principles [..] explicit"

- focus on the "the results and their implications, more than on the process"

- discuss implications with "meaningful examples"

- explain "why a particular principle or practice is relevant"

Robey and Markus (1998) suggest four "key characteristics" of academic research reports specifically targeted at practitioners (ibid, p. 11 ff.):

- An *accessible style* includes use of first person perspective simple writing style with a direct focus on practical implications, use of bulleted lists, summary tables. Moreover, they recommend to use a simpler language and to be more sensitive to changes in practitioner jargon.

- *Story lines* should be novel, critical and constructive

- While style and story lines are essential, a *credible evidential base* is still considered a "core requirement" of academic writing.

- "Theory used should not be oversimplistic disregarding the complexity perceived by practitioners." Specifically it is suggested that "understanding organizational change as a dialectical and emergent process, [..] is more useful than thinking about IT as an autonomous force effecting complex changes in organizations" (Robey and Markus, 1998, p. 13).

Kavan (1998) makes the following suggestions that should help practitioners to better understand research articles (ibid, p. 20):

- "write in a top-down fashion thereby creating an appropriate text frame"

- "communicate effectively in the language of practitioners"

- "anchor concepts with realistic examples"

- "recognize that [..] few senior practitioners hav[e] received formal training in the [IT] discipline"

- "recognize the varying practitioner backgrounds and compensate in explanation by bridging the educational gap"

- "care must be taken not to confuse the practitioner"

Benbasat and Zmud (1999) implicitly suggest improving the relevance of academic publications by listing the following characteristics of articles that "tend to be read by IS professionals" (ibid, p. 5): these articles

- are shorter

- use more exhibits

- use everyday language, rather than esoteric or stilted language

- have less discussion of related literature

- have less discussion of a study's methods

- have ore contextual description

- have more prescriptions

Amaravadi (2001) views the "overlap and multiplicity of research areas" (ibid, p. 2) as a problem for the consumption of research results. He, thus, advises to "deliver [better] consumable products" by "clarifying the channels [and] making progress visible" (Amaravadi, 2001, p. 6). Amaravadi (2001) suggests consequently differentiating "fundamental", "applied" and "disciplinary" areas of research. He recommends to better structure the research work by defining sub-areas for each of this area and appropriate methods. Every research should adhere to theses areas and standards and overlap of areas in conferences and journals should be avoided (Amaravadi, 2001, p. 5). The reward systems should also be adapted to reflect the three basic areas and appreciate research work done in these areas.

Strive for external funding

Gray (2002) stresses the need to establish a culture that appreciates external funding: "many of us will need to go against business school culture that thinks it is somehow beneath academics to obtain corporate and government funding to do research" (ibid, p. 339). Encouraging consulting and projects funded by practice is also suggested by Olfman (2001).

Senn (1998) suggests striving for strategic partnership with industry, because "strategic partners serve as critics of theory, research approaches, and findings" (ibid, p. 27).

Some specific recommendations on how best to approach company sponsored research are reported based on the experiences of Bob Zmud (Watson and Huber, 2002). It is emphasized that one should start with what practitioners are interested in and not to "'sell' faculty driven projects". Workshop discussions are suggested as useful instruments to identify and discuss the projects a particular company is interested in.

Take advantage of opportunity to influence students

Davenport and Markus (1999) recommend taking into account the needs of students when conducting or "producing" research (ibid, p. 22). Furthermore, they explain that IS academics have the opportunity to grow "the audience of 'reflective practitioners' consuming our research" by using "our research enterprise and our presence in the classroom" (Davenport and Markus, 1999, p. 22).

3.5.2.2 Improve acceptance of relevant research in IS

"[It is us] who must change the criteria we use to access research for publication and career progress" (Davenport and Markus, 1999, p. 22)

Reward publications in practitioner outlets

Davenport and Markus (1999) recommend that IS academics should support publication outlets that are read by practitioners and publish valuable research from their perspective "by submitting research to them and by counting them heavily in promotion and tenure evaluations" (ibid, p. 21). In another article Markus and Robey (1998) suggest following non-traditional publication outlets (ibid, p. 13 ff.): Sloan Management Review, Communications of the ACM, books and edited volumes, business and technology press, and Internet distribution. Internet publications are suggested because of the important advantage in publication speed.

Rockart (2002a) suggests to change the reward systems to also "provide tenure to outstanding 'clinical' researchers in our schools." (Rockart, 2002a, p. 341)

Sein (2001), who worked in practice prior to his academic career, argues that articles published in publication outlets for practitioners should be more rewarded by the academe, but should not replace or be of equal value to academic publications: "I believe that we should encourage and reward publications aimed at practitioners. However, I do not believe that it should replace academic research, nor should it be viewed and rewarded on an equal basis. We are academics first, and a vital part of our mission is to create knowledge, not simply disseminate knowledge. Our job is taking a critical approach to research findings. We cannot let un-moderated writings nor unreviewed articles become part of the field's knowledge. Writing in practitioner outlets should complement, not supplement academic publications." (ibid, p. 5)

Opposed to Sein, Jennex (2001), who has worked for many years in practice prior to earning his PhD, recommends equalizing the journal rankings in order to enable researchers to disseminate more research to practitioner outlets (ibid, p. 5).

Establish new publication outlets

Keen (1991) recommends that more emphasis should be put on conferences and books, which provide a collection of research relevant to a particular audience and with a specific purpose, rather than assembling special issues and conferences or books around particular topics (ibid, p. 37). Dennis (2001) suggests establishing more publication outlets that support knowledge exploitation work.

Senn (1998) suggests "IS World" as a "powerful communication and publication system" which should serve as model for a similar communication platform targeted at practitioners (ibid, p. 27). He reiterates that the "IS research community has an obligation to communicate its research findings, where investigations are meaningful, to practitioners in the language and through the media of practice" (Senn, 1998, p. 27). Gray (2002) also stresses the important role of "electronic publishing" (ibid, p. 339).

Munkvold and Khazanchi (2001) do not see much value in creating more practitioner tailored publication outlets, "simply because practitioners do not have time to read journals or magazines." (ibid, p. 9). Hence they provide suggestions for more interaction with practitioners (ibid, p. 8).

Change academic journal policies

Benbasat and Zmud (1999) suggest that editors should reexamine their current policies so that an appropriate "balance between rigor and relevance" can be achieved.

According to Westfall (1999), in order to reach considerable higher levels of relevance it is necessary to change the policies of academic journals: "increase electronic access to journal contents, reduce review cycle times, involve practitioners in reviews, revise norms for style and tone" (ibid, p. 10).

Hoving (2002) formulates the following expectations regarding good academic publications from a practitioners viewpoint (ibid, p. 342): rigor should not be given too much emphasis ("they should back off the sanctity of rigor and accept the notion of getting things approximately right"), cycle times should be significantly shortened in order to "publish applied IS research in time for maximum use", readability of papers should be improved by lessening the complexity and length of words and length of papers.

Broaden acceptable dissertation research

Gray (2002) states that an opportunity for improving relevance is to broaden "our model for what is acceptable for dissertations or research, [such as] creating something new [..]" (ibid, p. 339).

4 Preliminary Summary

The relevance debate as described in the previous section paints a mostly coherent picture of the North-American IS discipline concerning the role of relevance for the IS field, the success of the field in achieving relevance, and IS researchers' recommendations for improving the current status.

Definitions

Although there are a number of articles in the debate that discuss different aspects of relevance, such as target audience, stakeholders or purpose of research, the majority of contributions focuses on the issue of relevance to business practice. The analysis of the various definitions of "relevance for practice" indicates that different authors interpret the term relevance in different ways: ranging from research that in some way relates to business practice to research that is useful to solve current problems in business practice (see section 3).

Importance of relevance

All participants in the debate, who discuss the role of relevance for the field, emphasize that relevance to practice is vital for the success of the IS discipline and should ideally be a core characteristic of the field (see section 3.2).

Perceptions

Reports on instruments and initiatives that are in place fostering and documenting the relevance of IS research and teaching can be found in eight articles. The SIM / Advanced Practice Council (mentioned in six papers) and research centers (mentioned in three articles) are the most frequently mentioned instruments to foster relevance (see section 3.3.1).

Six articles include a discussion of actual IS research results the authors perceive as particularly relevant. The types of results listed, however, differ quite considerably. Only three results are described as relevant research results in more than one article, i.e. in two articles: group support systems, critical success factors, and – more general – IS research results presented in textbooks (see section 3.3.2).

The analysis of critical statements related to contents and methods of IS teaching and research includes only three papers specifically discussing the lack of relevance in IS teaching and 13 articles which address the lack of relevance of IS research in general or – more specifically – of IS research

articles (see section 3.3.3). The main criticism related to research relevance focuses on the lack of research results and knowledge produced that are of value to business practice (10 articles). Four articles address the problem of academic IS publications typically being hardly understandable for practitioners.

The most frequently discussed issue related to the interaction between academics and practitioners is that academic IS journals are rarely read, subscribed, or valued by IS professionals (addressed by four of five articles that discuss critique concerning the interaction of academics with professionals, see section 3.3.4).

Explanations

Apparently, all debate participants agree that the lack of relevance to practice can be explained by the institutional environment (business schools) in general and promotion and tenure systems in particular. The reward system is said to typically only reward publications in academic publication outlets, which tend to emphasize rigor over relevance. Some argue, that there is a lack of time for IS faculty to stay current with technology, thus affecting the relevance of teaching and research (see section 3.4).

Recommendations

Eight articles address the need to change values or attitudes related to relevance. Two of these suggest more appreciating relevant research and diversity. Three articles discuss the need to not view rigor and relevance as conflicts. Interestingly, there are three articles which recommend waiting until you are tenured and then to start doing relevant research (see section 3.5.1).

The majority of contributions to the debate provide recommendations for instruments and initiatives to improve the relevance of IS research and teaching to practice. These suggestions address the perceived drawbacks identified in the earlier sections. The following contains all aspects discussed in at least three articles (see section 3.5.2.1):

- Foster exchange between academics and practitioners; in particular, emulate other professional schools, such as medicine and law (suggested in ten articles).

- Strive for particular relevant types of research questions and results (suggested in nine articles).

- Produce better consumable articles (suggested in four articles).

- Strive for external funding (suggested in three articles).

13 articles provide specific suggestions on how to improve the acceptance of relevant research in academia. They include the recommendation to reward publications in practitioner outlets (suggested in five articles), to establish new publication outlets (suggested in five articles), and to change academic journal policies (suggested in three articles).

5 Developments following the Debate

The need for change in order to fulfill the objective of improved relevance of IS teaching and research is explicitly expressed by all debate participants. The primary time of discourse of the relevance debate in IS as presented in the previous sections ended about six years ago. Hence, we want to complement the analysis by investigating changes in the state of the North-American IS discipline in terms of relevance since the end of the main debate in 2001. Recent studies and publications, which address the topic of relevance to practice of IS research and teaching, are referred to in order to analyze possible changes over time.

One dedicated effort to support the publication of research results targeted at professionals is the journal MISQ Executive (MISQE). It was established in 2001 and published its first issues in March 2002. Rockart (2002b), at that time the editor in chief describes the journal's objective as follows: *"MISQE* will be the premiere source of information systems articles that target a managerial audience." (ibid, p. ii). The intention to publish particularly relevant research is underlined by the objective "to ensure that our articles are written in a way that is very readable and communicates new insights, concepts and frameworks leading to action" (Rockart, 2002a, p. ii).

Based on an analysis of journal articles published between 2000 and 2004 in top-ranked IS journals Srivastava and Teo (2005) conclude that the relevance of research published in these journal articles has increased significantly since 2001. However, they investigate only one aspect of "relevance": if the topic under investigation is related to one of the topics of the SIM top-20 list of key issues for IS executives published in 2003.

Opposed to these two rather positive statements, the results of an interview study and of recent conference panels do not report on the implementation of any of the recommendations discussed in the previous sections and indicate that the status of the discipline in terms of relevance to practice has generally not improved:

The results of an interview study (with eight experienced IS researchers from the US) conducted in the context of the IFWIS project show that the interviewees' perceptions concerning the status of cooperation of IS researchers with practitioners are ambiguous: Some report that building strong relationships to practice is generally possible and some kind of interaction is done by most researchers. However, two state that actual cooperation with practitioners is (still) the exception rather than the rule and heavily depends upon individual researchers (Lange, 2005b, pp. 46 f.). The perception of the IS discipline by practitioners is also critically assessed: All interviewees – with only one exception – report that IS research in general and IS research results in particular are typically not perceived as valuable by IS/IT professionals (Lange, 2005b, pp. 48 f.).

An ICIS 2005 panel, with panelists from the US and Europe, addressed the question of the role of research on critical societal problems (Desouza et al., 2006). Two panelists, (one from the US) emphasize that the IS field would – still – have to work on improving relevance to practice. Thus, addressing problems from business practice would be the discipline's main responsibility. Two other panelists (one from the US) argue that the discipline should (also) address significant and critical societal problems.

The statements of panelists (all from the US) on AMCIS 2006 indicate that the actual role and appreciation of relevance to practice in the IS discipline has not changed significantly (Benamati et al., 2006). The panelists discuss the question if the IS field is on a "slippery slope" in terms of its "quest for relevance". In essence, the authors argue that "the discipline's current model [still] encourages irrelevance, both in our research and in our teaching" (Benamati et al., 2006, p. 659).

The following subsections provide more detailed information on each study and panel.

5.1 Relevance of research topics (Srivastava and Teo, 2005)

Based on an analysis of the topics addressed in research articles published in MISQ, ISR and Journal of MIS between 2000 and 2004 the authors attempt to identify the actual relevance of IS research (Srivastava and Theo, 2005). The list of key issues for IT executives, which resulted from the SIM survey in 2003, serves as measure for relevance to practice. According to the authors' analysis the percentages of articles that address one of the top twenty key issues are as follows:

- 69 % for MISQ,
- 90 % for ISR, and

- 84 % for JMIS.

The "journal relevance coefficient" weights the different key issues according to the ordering of the list. The calculated coefficients across the 5-year time period are as follows: 0,43 for MISQ, 0,61 for ISR, and 0,54 for JMIS.

Based on the analysis of the development of the journal relevance coefficient over time, the authors identify "an increase in relevance of the articles after 2001-2002", and, thus, conclude that "this indicates a realization by the IS academic community [..] to address the needs of the IS practitioners" (Srivastava and Theo, 2005, p. 1300).

5.2 Interview study with IS researchers (Lange, 2005b)

In the context of the IFWIS project an interview study was conducted in 2005 with eight researchers of the North-American IS discipline; six of these have been members of the field for over 30 years[1]. The selection procedure, interview conduction and interpretation process are described in detail by Lange (2005a). The complete study results are discussed in a separate research report (Lange, 2005b). Aspects of interest related to the issue of relevance that were discussed with the interview partners include the actual status of cooperation of IS researchers with practitioners and the perception of the discipline and its members by IT/IS professionals.

5.2.1 Cooperation of IS researchers with practitioners

The interviewees provide positive as well as negative statements w.r.t. the current status and potential of cooperation (see Table 12). On the one hand, cooperation with practitioners to get access to data is assessed as generally possible and most researchers are said to have some connection to industry practice, which makes the IS field "better than most" in terms of the ability to cooperate and work with practitioners. On the other hand, actual cooperation with practice is relatively rare and close connections are "the exceptions, rather than the rules". This ambiguity can be explained by differing expectations as to the type and strength of cooperation; for example, the statement by Davis indicates that he interprets cooperation in this context rather vague as "some direct connection".

A number of reasons are given to explain the shortage of IS researchers cooperating with industry (see Table 13). In addition to the reasons already provided by the participants of the primary relevance debate (tenure and promotion requirements), it is mentioned that when you do a Ph.D. in the US you usually do not go to industry but plan an academic career, which is why incentives for relevant research would be missing. The difficulty of cooperating with industry is explained by differing view points and language on the one hand and, on the other hand, by a downturn in practice demand, which is why businesses are more reluctant to allow access to their organizations.

---

[1] Interviewers were Ulrich Frank and Rolf T. Wigand; interview partners from IS were Gordon B. Davis, Paul Gray, Rudy Hirschheim, William R. King, M. Lynne Markus, Richard O. Mason, John F. Rockart, and Robert W. Zmud.

Cooperation with practitioners is…	
Positive	**… done by most:** • "I'd say that perhaps 75 percent of IS research has some direct connection to industry practice, either studying it or modeling it or perceptions, or getting data, or working with either case studies [..], so that you finally end up with a strong tie to what's going on. IS research has not, at least not very much, ignored what organizations are doing." (Gordon B. Davis) • "I think this field is better than most in terms of its ability to work with its practitioners." (Richard Mason)
Negative	**… is rare:** • "Except for a chosen few, I don't think that there is a lot of cooperation." (M. Lynne Markus) • "there are some touch points [for cooperation with practice] where it is good. And pretty strong. But those are the exceptions, rather than the rules." (Bob Zmud) • "It's heavily dependent upon individuals. Some individuals are able to develop these relationships [and] get good access to industry." (Gordon B. Davis) • "Never as good [..] as we would like it to be", (William King) • "Not what I would like to see." (Jack Rockart)

Table 12: Assessment of the status of cooperation with practice (see Lange, 2005b, p. 47)

Academic career path and requirements – missing incentives
"When you do a PhD in the US you don't go to industry [as opposed to Germany for example; so there is less] ability to form relationships between industry and academia"
"Cooperation with industry fits with incentives to be a better teacher, and to be a better researcher. [But] there is no financial incentive. [..] There's nothing which requires that [i.e. cooperation with practice] to happen."
Differing view points and languages – difficulties in understanding
"I don't think both parties speak the same language. I think it works, but not without a lot of effort, and they certainly know a lot of shortfalls for every major hit."
"They [i.e. industry practice] have been willing to serve as test beds [and] have shovelled money at us" there is no cooperation in terms of actual research, because industry is taking a completely different view point."
Downturn in practice demand – recently increased difficulty
"[cooperation with practice used to be better] because the companies needed our students and they had to agree to these things. [..] Now, our students are not getting access because these companies are not hiring and they're saying sorry, we don't have the time to give you."

**Table 13: Approaches to explain the relatively low level of cooperation with practice
(see Lange, 2005b, p. 47)**

5.2.2 Perception by IS/IT professionals

The interviewees' assessments of the discipline's perception by IS/IT professionals range from relatively positive statements, such as "I think [the IS discipline is perceived] generally positively" and "by comparison we have a fairly strong bond with practitioners" to completely pessimistic statements, such as "I don't think they know we're there." This mismatch of answers can partly be resolved by taking into account the different contexts the interviewees refer to: The perception of the IS discipline can be differentiated into the perception of the educational program, the research activities and the research results (see Table 14).

According to the interviewees perceptions, practitioners think relatively highly of the educational program in IS. The perception of IS research, however, is not described as positive. One expresses his concern that IS researchers and professionals would not have common interests and researchers are "too academic". Another points out, that a large number of practitioners does not care about IS research. While most practitioners would be skeptical, one interviewee notes, that there are some

individual researchers that are perceived positively by practitioners. Another interviewee comments on his positive experience with SIM, where interaction between researchers and professionals takes place.

The perception of research results is assessed quite negatively: on the one hand interviewees state that research results are – still – not presented in a way appropriate for IT professionals and, on the other hand, that the limited number of research results that has disseminated into practice is by practitioners not perceived as stemming from IS research.

Educational IS program
"They have a very positive perception of programs that turn out people with a combined business and technology expertise and interest." "In terms of our educational program, they think normally pretty highly of it."
IS research
Negative perceptions: • "a large number of them don't care much about our research" • "I think the practitioners in IS/IT, don't like what we're doing because we're too academic. We [..] don't address the kind of problems that they need to solve. We don't go to the same conferences. We don't share their problems. Too many of our academics [..] have never spent any time out in industry with IS organizations." Depends: • "Obviously there are differences. The practitioners that deal with the Jack Rockarts and the John Hendersons and the Peter Wiles and so forth, I'm sure they think that academia is fine, but most practitioners are tolerant to skeptical." Positive: • "About 15 percent of [SIM members] are academics, which means that in general, the CIO's want to work with academics wherever they can. So I think in general, the reception is very positive."
IS research results
"Typically they don't appreciate them [i.e. the research results, because] most of the research is not written in that mold" "Very little of what we have done individually has permeated into industry. I think some things cumulatively have [permeated into industry] and [..] Human Computer Interaction is an example. [..] Young people had seen this idea in the university and took it with them. Then they didn't know where it came from."

Table 14: Perception of the educational program, IS research, and IS research results (see Lange, 2005b, p. 49)

5.3 ICIS Panel (2005): "IS research that really matters"

An ICIS 2005 panel addressed the general issue of "research that really matters". The basic thesis to initiate discussion was that IS research should not only be relevant but should focus on "responsibility" and "reverberation" and address "critical societal problems" (Desouza et al., 2006).

The participating panelists from the US, UK, and Germany can be divide into two groups according to their interpretation of "significant" research. Two panelists value the issue of relevance to practice – with the business community being the main stakeholder, who determines if research "really matters" – as more important than solving critical societal problems:

• Omar A El Sawy (US): "If my research can help advance our understanding of critical issues which improve business performance and the management information systems, then I am satisfied that it is making a significant impact" (ibid, p. 343).

• Claudia Loebbekke (Germany): "I think the major stakeholders are those who contribute the money to the research" (ibid, p. 347).

Galliers and Watson, however, view societal issues as very important for the IS field and demand to focus more research on critical societal matters:

Robert D. Galliers (UK) views the subject of research in IS as including societal issues as well (e.g. IS in society, the digital divide, impact on society etc.). Hence, he argues that "stakeholders will differ depending on which aspect of our field one is concerned with" (ibid, p. 345). He explains, that (only) researchers from the Scandinavian IS community and from the UK (particularly LSE) are doing research that "matters" from a societal view point.

Richard T. Watson (US) defines significant research as follows: "Significant IS research creates wealth or solves societal problems" (ibid, p. 348). In particular, he urges that "we need to consider the most pressing problems of our times, global warming" (ibid, p. 348). He views overpopulation as the "root cause" of global warming, and, thus, concludes that "IS scholars should address this issue [of education for developing countries], which seems to the most amenable to our skills" (ibid, p. 348).

Fundamentally, the question needs to be raised, if the IS discipline is at all responsible and competent to address societal matters, such as overpopulation and global warming, because they are not directly connected with the primary subject of research in IS.

5.4 AMCIS Panel (2006): "Slippery Slope"

The panelists of an AMCIS 2006 panel (all from US) discussed the question if the IS field is on a "slippery slope" in terms of its "quest for relevance". In essence, all panelists agree that "the discipline's current model encourages irrelevance, both in our research and in our teaching" (Benamati et al., 2006, p. 659). All three panelists emphasize, that the IS discipline is in a difficult stage or even on a "slippery slope". This difficult stage is mainly characterized by a drop in enrollment numbers and lack of appreciation by other business school disciplines and students (see Table 15).

Additionally, the panelists comment on how well – according to their perception – the IS discipline keeps up with change as one particular challenge when trying to do relevant research and teaching over time.

• "Our credibility as a profession continues to get hit, making it harder to claim our place at the table. The student recession of 2002-2004 really hurt." (ibid, p. 666)
• "A lot of our current suffering in MIS is due to reduced enrollments, which in turn puts pressure on business schools (where most of us are housed) to shift resources to other disciplines." (ibid, p. 668)
• "It helps somewhat that many of us succeeded in making the MIS core course required for all MBA students, but now the course contains a hostile audience instead of self-selected technology 'groupies'." (ibid, p. 661)
• "MIS lacks responsibility from others in business schools and in the universities." (ibid, p. 661)

Table 15: Statements describing the difficult stage of the IS field (Benamati et al., 2006, pp. 661 ff.)

Harris argues that "most IS professors do an acceptable job in keeping up with changes in the field" (ibid, p. 667). But he emphasizes that curricula have to be updated "almost yearly" in order to "keep up" (ibid, p. 667). Another panelist expresses his concern, that "we do not move in lockstep", because he perceives that "some schools are up to the minute with new technologies", while "others lag significantly" (ibid, p. 671).

One author remarks that sufficient experience with a technology is needed in order to answer particular research questions. Thus, he urges for patience, because, while it might take five to ten years to study a technology thoroughly, "that interval is but a tiny fraction of our history" (ibid, p. 664).

With this argument, however, the panelist completely neglects the issue of relevance and usefulness of research results for business practice at the time when the technology is actually applied in practice.

The recommendations given by the panelists to improve the stage of the field in terms of relevance to practice relate to similar issues that have already been discussed in the main relevance debate. Some new suggestions specifically relate to improving the relevance of teaching:

- Help each other in improving courses by sharing teaching material and experiences (ibid, p. 664).

- Create specialized (model) curricula for the specialized career fields in IS (ibid, p. 668).

- Create – and change – course names to reflect the changes in content: "we found that any course name that lasts for ten years will be seen as obsolete. Contrary to my preferences, I now believe we should adopt trendy courses with current course names and then eliminate/replace them as needed every few years. This is not to deceive, but to gain deserved credit for what we are already changing." (ibid, p. 663)

Further recommendations relate to the relevance of IS research (and teaching):

- Foster public relations initiatives at your university (ibid, p. 664).

- Connect better with industry in research and teaching. Actually talk to Industry Advisory Groups (ibid, p. 667).

- IS faculty should attend conferences of other business disciplines; interdisciplinary publications should be rewarded by tenure and promotion committees (ibid, p. 664).

6 Conclusions

Numerous researchers of the North-American IS field participated in the relevance debate. Various issues were brought up by the debate participants, ranging from the question of how to define relevance of research, the valuation of relevance, perceptions on the actual status of relevance, and recommendations for improving the relevance of research as well as the acceptance of relevant research in academia. It seems remarkable that only few articles rely on other contributions to the relevance debate. Even fewer authors critically examine previous arguments and concepts – except relatively frequent references to Benbasat and Zmud (1999). To overcome this state of a fragmented discussion, this report provides a common structure differentiating vital issues of the debate and an analysis comparing definitions, valuations, and perceptions expressed by the participants.

All contributors to the main debate (1991-2001) expressed their perception of a lack of practice relevance in IS and the need to implement changes to overcome the current situation. The results of an analysis of the most recent literature (2005-2006) indicates that, so far, the debate has not lead to any significant changes concerning the actual role of relevance in IS research or the perception of the value of IS research by IS/IT professionals.

How can the lack of change notwithstanding the obvious need to act in order to "save" the discipline from a "slippery slope" (Benamati et al., 2006) be explained? Possible explanations have already been provided by the participants of the primary IS relevance debate (see section 3.4): (1) Institutional pressure in business schools is frequently mentioned as reason for the lack of relevant research. Since 2001, many IS degree programs in business schools have apparently suffered from a decrease in student numbers (see section 5.4). Hence, this increasing lack of 'power' of IS faculty at business schools increases the difficulty of influencing criteria for tenure and promotion and, thus, of creating acceptance of relevant IS research in academia. (2) Requirements from editorial boards

are also mentioned as a primary reason for the low level of relevance in IS research. In response to this fact, three experienced researchers explicitly recommend that junior faculty should act opportunistically, i.e. they advise to stick to the current standards until you are tenured and then to start doing relevant research (see section 3.5.1). Hence, if junior faculties take this advice seriously, changes in research relevance are not likely to happen quickly, if at all.

Both aspects serve as reasonable explanations for the actions of individual IS researchers and, particularly, novices to the field. However, they do not explain why the discipline as a whole has not changed in response to its critical situation. Because, in principle, it is the (senior) members of the IS discipline itself, who assemble editorial boards of those journals which serve as criteria for tenure and promotion of IS faculty. As stated by Davenport and Markus (1999):"It is we who must change the criteria we use to assess research for publication and career progress" (ibid, p. 22).

Experience and perceptions not only from the North-American field of research but from other international IS communities, too, are likely to enrich the debate and might serve as fruitful for developing new approaches to overcome the current situation and increase the relevance of academic IS research. Frank (2006), a researcher from the German-speaking IS (Wirtschaftsinformatik, WI) community, provides an explanation for the tendency of the IS field to stick to the predominant model of behaviorist research, which emphasizes rigor over relevance. He states that the discipline's striving for legitimacy has been the main reason why it took and still sticks to "the wrong path":

> "[..] the main reason for this somewhat bizarre situation is probably the need for legitimacy. From the viewpoint of the discipline's peers, giving up the prevailing paradigm [i.e. behaviorist research] would not only jeopardize the discipline's reputation, it would also devalue their qualification as researchers, since it is based on applying the behaviourist paradigm." (ibid, p. 8).

Lyytinen[1] (1999), at that time IS researcher in Finland, supports Frank's assumption that different levels of relevance have been achieved in IS research for different types of research. Lyytinen states that highly relevant research has come mostly "from constructive and innovative technology development and transfer projects" and the situation would be "bleaker" for (purely) empirical research (ibid, p. 26). The importance of choosing research methods that foster the relevance of research results is also mentioned briefly by Gray (2002) and Klein (2002). The high potential of construction or design oriented research methods to increase relevance not only of IS research but also of IS teaching is supported by the results of an interview study conducted with six experienced WI researchers from the German-speaking countries (Lange, 2006). The interviewed researchers agree that a main strength of the WI field is the ability of its members to identify problems of business practice and create problem solutions through construction oriented research methods (Lange, 2006). According to the interviewees' perceptions, relevance to practice has been a vital force in creating the discipline and establishing its legitimacy in the eyes of practice and academia. Furthermore, they report, that close cooperations with professionals are common not only in research but also in teaching, e.g. through development and consulting projects, and joint theses.

Hence, enriching the portfolio of research methods by construction-oriented research approaches might serve as one way out of the IS-field's current difficulties in improving its relevance. However, the criteria for comparing and evaluating research results have to be extended at the same time. To this end, Frank (2006) – urging for a "pluralistic conception of science" – presents a framework of essential characteristics of scientific research, including concepts such as knowledge contribution, research subject, justification criterion and process (ibid, p. 42). Thus, the provided concepts and relationships can be used for describing and – in this way – comparing different types of research work.

---

[1] Detailed statements of Lyytinen and other researchers from outside the North-American IS community are presented in the appendix.

To summarize the conclusions: It is rather unlikely that the IS field will make progress in terms of relevance as long as it sticks to its traditionally dominant approach of gaining legitimacy, i.e. following the natural science model of research by applying behaviorist research methods. Hence, new sources of legitimacy for academic IS research must be identified, e.g. through extended criteria of scientific research as suggested by Frank (2006). This, however, might require choosing innovative institutional settings for IS departments and new ways for publishing research results that are more open to or suitable for a pluralistic conception of IS research.

7 References

AACSB international (1997): Research Relevancy Remains a Challenge for Business Schools, Newsline, Spring

Alter, Steven (2001): Recognizing the Relevance of IS Research and Broadening the Appeal and Applicability of Future Publications, Communications of the Association for Information Systems, Vol. 6, No. 1.

Amaravadi, Chandra S. (2991): Improving Consumption, Communications of the Association for Information Systems, Vol. 6, No. 1.

Applegate, Lynda M.; King, John L. (1999): Rigor and Relevance: Careers on the Line, MIS Quarterly, Vol. 23, No. 1, pp. 17 ff.

Avgerou, C.; Siemer, J.; Bjørn-Andersen, N. (1999): The academic field of information systems in Europe, European Journal of Information Systems, Vol. 8, No. 2, pp. 136-153.

Avison, David; Pries-Heje, Jan (eds.) (2005): Research in Information Systems – A handbook for research supervisors and their students, Elsevier, Information Systems Series.

Ben-Menachem, Mordechai (2001): IT/IS Management and Research Directions, Communications of the Association for Information Systems, Vol. 6, No. 1.

Benbasat, I.; Weber, R. (1996): Research Commentary: Rethinking "Diversity" in IS Research, Information Systems Research, Vol. 7, No. 4, pp. 389-399.

Benbasat, Izak; Zmud, Robert W. (1999): Empirical Research in Information Systems: The Practice of Relevance, MIS Quarterly, Vol. 23, No. 1, pp. 3-16.

Bhattacherjee, Anol (2001): Understanding and Evaluating Relevance in IS Research, Communications of the Association for Information Systems, Vol. 6, No. 1.

Borchers, Andrew S. (2001): Adding Practitioner Scholars to Our Faculties, Communications of the Association for Information Systems, Vol. 6, No. 1.

Benamati, J.; Serva, M.A;. Galletta, D.; Harris, A.; Niederman, F. (2006): The Slippery Slope Of MIS Academia: A Discussion Of The Quest For Relevance In Our Discipline, Communications of AIS, Vol. 18, Article 32.

Chatterjee, Samir (2001): Information Systems Research and Relevance, Communications of the Association for Information Systems, Vol. 6, No. 1.

Cresswell, Anthony M. (2001): Thoughts on Relevance of IS Research, Communications of the Association for Information Systems, Vol. 6, No. 1.

Dalal, Nikunj P. (2001): What Does It All Mean? A Meta-Inquiry, Communications of the Association for Information Systems, Vol. 6, No. 1.

Davenport, Tom (1997): Think Tank – Storming the Ivory Tower, CIO Magazine, April 15.

Davenport, Thomas H and Markus, M. Lynne (1999): Rigor vs. Relevance Revisited: Response to Benbasat and Zmud, MIS Quarterly, Vol. 23, No. 1, pp. 19 ff.

Desouza, K.C.; El Sawy, O.A.; Galliers, R.D.; Loebbecke, C.; Watson, R.T. (2006): Beyond Rigor and Relevance Towards Responsibility and Reverberation: Information Systems Research That Really Matters, Communications of the Association for Information Systems, Vol. 17, pp. 341-353.

Dennis, Alan R. (2001): Relevance in Information Systems Research, Communications of the Association for Information Systems, Vol. 6, No. 1.

Frank, U. (2006): Towards a Pluralistic Conception of Research Methods in Information Systems Research, ICB Research Reports, No. 7, Institute for Computer Science and Business Information Systems (ICB), University Duisburg-Essen.

Glass, Robert L. (2001): Rigor vs. Relevance: A Practitioner's Eye View of an Explosion of IS Opinions, Communications of the Association for Information Systems, Vol. 6, No. 1.

Goldberg, Michael A.(1996): The Case Against "Practicality" and "Relevance" as Gauges of Business Schools: Responding to Challenges Posed by Criticisms of Business School Research, Journal of Management Inquiry, No. 5, pp. 336-349.

Gray, Paul (2001): Introduction to the special volume on relevance, Communications of the AIS, Vol. 6, Nor. 1, pp. 1-12.

Gray, Paul (2002): Relevance as a "unfulfilled promise", presentation at ICIS 2001 panel, in Kock et al. (2002).

George, Joey F.; Valacich, Joseph S.; Valor, Josep (2005): Does Information Systems Still Matter? Lessons for a Maturing Discipline, Communications of the Association for Information Systems, Vol. 16, No. 1, pp. 219-232.

Heart, Tsipi; Pliskin, Nava (2001): Making Academic IS Research More Relevant to Industry Via Open-Architecture Models for Career Paths in Academia, Communications of the Association for Information Systems, Vol. 6, No. 1.

Hildebrand, C. (1999): Needs Improvement - MBA Programs, CIO Enterprise, pp. 40-47.

Hirschheim, Rudy (1984): Information Systems Epistemology: An Historical Perspective, in Mumford, E.; Hirschheim, R. A.; Fitzgerald, G.; Wood-Harper, T. (eds.): Research Methods in Information Systems, Proceedings of the IFIP WG 8.2 Colloqium, Manchester Business School, 1-3. September 1984, pp. 9-33.

Hoving, Ray (2002): Commments on the presentations by Klein, Gray and Myers, discussion at ICIS 2001 panel, in Kock et al. (2002).

Ives, B.; Hamilton, S.; Davis, G. (1980): A framework for research in computer-based management information systems, Management Science, Vol. 26, No. 9, pp. 910-934.

Jennex, Murray E. (2001): Research Relevance-You Get What You Reward, Communications of the Association for Information Systems, Vol. 6, No. 1.

Kavan, C. Bruce (1998): Profit through knowledge: The application of academic research to information technology, Information Resources Management Journal, Winter 1998, Vol. 11, No. 1, pp. 17-22.

Keen, Peter G.W. (1980): MIS Research: Reference Disciplines And A Cumulative Tradition, Proceedings of the First International Conference on Information Systems, pp. 9-18.

Keen, Peter G.W. (1991): Relevance and Rigor in Information Systems Research: Improving Quality, Confidence, Cohesion and Impact, In Nissen, H.-E.; Klein, H. K.; Hirschheim, R.: Information Systems Research: Contemporary Approaches and Emergent traditions, North-Holland, Amsterdam et al., pp. 27-50.

Kock, N.; Gray, P.; Hoving, R.; Klein, H.; Myers, M.; Rockart, J. (2002): IS Research Relevance Revisited: Subtle Accomplishment, Unfulfilled Promise, or Serial Hypocrisy? In: Communications of the Association for Information Systems. Vol. 8, pp. 330-346.

King, J. L., Lyytinen, K. (2004): Reach and Grasp, MIS Quarterly, Vol. 28, No. 4, pp. 539-551.

King, J. L. (1993): Editorial Notes, Information Systems Research, Vol. 4, No. 4, pp. 291-298.

Klein, Heinz (2002): Relevance as a "subtle accomplishment", presentation at ICIS 2001 panel, in Kock et al. (2002).

Kohli, Rajiv (2001): Industry-Academia Interaction: Key to IT Relevance, Communications of the Association for Information Systems, Vol. 6, No. 1.

Lange, Carola (2005a): Development and status of the Information Systems discipline: An interpretive evaluation of interviews with renowned researchers, Part I – Research Objectives and Method, ICB Research Reports No. 2, University Duisburg-Essen, Institute for Computer Science and Business Information Systems.

Lange, Carola (2005b): Development and Status of the Information Systems / Wirtschaftsinformatik Discipline - An Interpretive Evaluation of Interviews with Renowned Researchers: Part II - Results Information Systems Discipline, ICB - Research Reports, No. 3, University Duisburg-Essen, Institute for Computer Science and Business Information Systems.

Lange, Carola (2006): Entwicklung und Stand der Disziplinen Wirtschaftsinformatik und Information Systems – Interpretative Auswertung der Interviews: Teil III – Ergebnisse zur Wirtschaftsinformatik, ICB - Research Reports, No. 4, University Duisburg-Essen, Institute for Computer Science and Business Information Systems.

Lee, Allen S. (1999): Rigor and Relevance in MIS Research: Beyond the Approach of Positivism Alone, MIS Quarterly, Vol. 23, No. 1, pp. 29 ff.

Lyytinen, Kalle (1999): Empirical Research in Information Systems: On the Relevance of Practice in Thinking of IS Research, MIS Quarterly, Vol. 23, No. 1, pp. 25 ff.

Mathieson, Kieran; Ryan, Terry D. (2001): A Broader View of Relevance, Communications of the Association for Information Systems, Vol. 6, No. 1.

Mason, Robert M. (2001): Not Either/Or: Research in Pasteur's Quadrant, Communications of the Association for Information Systems, Vol. 6, No. 1.

Moody, D. L. (2000): Building links between IS research and professional practice: improving the relevance and impact of IS research. In Proceedings of the Twenty First international Conference on Information Systems (Brisbane, Queensland, Australia). International Conference on Information Systems. Association for Information Systems, Atlanta, GA, pp. 351-360.

Munkvold, Bjørn Erik; Khazanchi, Deepak (2001): Expanding the Notion of Relevance in IS Research: A Proposal and Some Recommendations, Communications of the Association for Information Systems, Vol. 6, No. 1.

Myers, Michael (2002): Relevance as "serial hypocrisy", presentation at ICIS 2001 panel, in Kock et al. (2002).

Olfman, Lorne (2001): We ARE Doing Relevant IS Research: It's The Truth, Communications of the Association for Information Systems, Vol. 6, No. 1.

Paper, David J. (2001): IS Relevance: Are We Asking the Right Questions? , Communications of the Association for Information Systems, Vol. 6, No. 1.

Pfeffer, Jeffrey; Fong, Christina T. (2002): The End of Business Schools? Less Success Than Meets the Eye, Academy of Management Learning & Education, Vol. 1, No. 1.

Porter, L. W.; McKibbin, L. E. (1988): Management education and development: Drift or thrust into the 21st century. New York: McGraw-Hill.

Ramesh, Ram (2001): IS Relevance: Myth or Reality, Communications of the Association for Information Systems, Vol. 6, No. 1.

Robey, D. (1996): Research Commentary: Diversity in Information Systems Research: Threat, Promise, and Responsibility, Information Systems Research, Vol. 7, No. 4, pp. 400-408.

Rockart, J. (2002a): Comments on the Presentations by Klein, Gary, and Myers, discussion at ICIS 2001 panel, in Kock et al. (2002).

Rockart, J. (2002b): Editor's Comments, MISQ Executive, Vol. 1, No. 1.

Rollier, Bruce (2001): Information Systems Research: Reversing the Orientation, Communications of the Association for Information Systems, Vol. 6, No. 1.

Robey, Daniel; Markus, M. Lynne (1998): Beyond rigor and relevance: Producing consumable research about information system, Information Resources Management Journal, Winter, Vol. 11 No. 1, pp. 7-16.

Saunders, C. S. (1998): The Role of Business in IT Research, Information Resources Management Journal, Vol. 11, No. 1, pp. 4-6.

Schmalensee, Richard (2006): Where's The "B" In B-Schools?, Business Week, November 27.

Sein, Maung K. (2001): The Relevance of IS Academic Research: Not As Good As It Can Get, Communications of the Association for Information Systems, Vol. 6, No. 1.

Senn, J. (1998): The challenge of relating IS research to practice, Information Resources Management Journal, Vol. 11, No. 1, pp. 23-28.

Srivastava, Shirish C.; Theo, Thompson S. H. (2005): Relevance in Information Systems Research: An Empirical Analysis, Proceeding of the Pacific Asia Conference on Information Systems, pp. 1292-1304.

Truex III, Duane P. (2001): Three Issues Concerning Relevance in IS Research: Epistemology, Audience, and Method, Communications of the Association for Information Systems, Vol.6, No. 1.

Watson, H. J.; Huber, M. W. (2000): Innovative ways to connect information systems programs to the business community. Communications of the AIS, Vol. 3, Article 11.

Weinberg, Paul (2001): Relevance of MIS Research to the Business Community, Communications of the Association for Information Systems, Vol. 6, No. 1.

Westfall, Ralph D. (2001): Dare To Be Relevant, Communications of the Association for Information Systems, Vol. 6, No. 1.

Westfall, Ralph (1999): An IS Research Relevancy Manifesto, Communications of the Association for Information Systems, Vo. 2, No. 1.

8 Appendix A: Relevance debate at business schools

The discussions on relevance of research and teaching at business schools were initiated by the Porter and McKibbin study in the late 1980s (1988). Subsequent contributions to the debate include articles in academic journals (such as Goldberg, 1996 and Pfeffer and Fong, 2001), in professional magazines (such as Hildebrandt, 1999 and Schmalensee, 2006) and by the accreditation agency for business schools itself (AACSB, 1997).

The contribution by Goldberg (1996) can be seen as seminal work in the relevance debate.

Goldberg points out that typical thinking and objectives in business and academia complement each other. Describing the „endpoints of a continuum" (ibid, p. 338) business is characterized by short-term views, an operational focus and issue or demand driven research leading to „proprietary and private knowledge" (ibid, p. 338). Academics, on the other hand, generally „take a long-term view [..], focus on generalizable findings and constructs, [and] research is curiosity driven".

The author sees clear advantages in the characteristics of typical academic research work: theoretical, general and abstract work can lead to practical and relevant contributions for businesses in the long run. He reports on various successes from the finance sector that support his argument.

Goldberg describes the importance of independence, openness, integrity and credibility as the main features of academic research (ibid, p. 344 ff.). While he assess privatizing business schools generally as valuable he cautions the reader that such institutions must stay non-profit organizations: "Public and private nonprofit universities are credible because their research and teaching activities occur in a climate of openness and independence, where truth in its diverse forms is sought, not short-term profits and investor returns. [..] Moving closer to the business [..] communities places at risk the core academic values of research independence and excellence"(ibid, p. 345)

The author recommends business schools to adapt their research strategies in two ways: First, he sees a need for academic research not to be alone curiosity driven, „but to respond as well to current concerns and problems facing business" (ibid, p. 348). Second, he suggests to "take up the challenge of encouraging and fostering greater diversity in intellectual pursuit [and add] research that spans functional areas and indeed other disciplines found outside business schools in engineering, the science, social sciences and humanities."

He concludes by reinforcing that the academic community should make contributions to practice by taking advantage of its strengths: "the academic community can, and indeed must, contribute what we really have: perspective, analytical power, and integrity. In the end, our independence of opinion and findings is our greatest, most relevant and practical contribution to business, government, and society" (ibid, p. 349)

He provides a brief description of two types of business school research as exemplified by the Harvard Business School (case-based, inductive approach, professional research, consulting, immediate relevance) and the MIT or Chicago Business School (theoretical, analytical, scholarly community as primary audience, traditional academic research).

His discussions also include arguments in support for (keeping) the tenure status in order to foster independence and openness.

9 Appendix B: Voices on IS relevance from other perspectives

Kalle Lyytinen (1999): Finland

Lyytinen notes that relevance does not imply merely to provide "immediate solutions to CIOs", but that "relevance is something that can elevate and reshape professionals' thinking and actions in a longer perspective" (Lyytinen, 1999, p. 26).

Lyytinen reports on his experience of relevant IS research in Europe: "My own experiences from highly relevant research are mostly from constructive and innovative technology development and transfer projects [combining constructive and empirical elements], which necessitated a thorough dialogue between the technical and social theoretical frames as well as between everyday experiences and employed theoretical frames" (Lyytinen, 1999, p. 26).

Referring to the impact of the world-wide IS discipline Lyytinen states, that there are several innovations that can be "traced back" to IS academics (Lyytinen, 1999, p. 26):

- Megapackages (SAP)

- Component-based architectures

- Approaches to IS strategy and design

Lyytinen admits that "the situation is bleaker" in terms of the impact of empirical IS research, but indicates that many practices in related fields of practice are "driven by theory-based research" (Lyytinen, 1999, p. 26).

Lyytinen argues that textbooks play an "immensely important role in shaping the minds of future generations" (Lyytinen, 1999, p. 26) and thus have an impact on practice. But she criticizes that textbooks are quickly outdated and that many contents of textbooks do not relate to IS research findings (Lyytinen, 1999, p. 26). Furthermore, she states that – from a European perspective – the "well packaged" textbooks used in IS classes in North-America lead to graduates not being able to read anything else but those "well-packaged 'teaching hamburgers'" (Lyytinen, 1999, p. 26). She supports this statements by her own experience, that "many European practitioners are more inclined to read research texts" (Lyytinen, 1999, p. 26).

Lyytinen views the question of relevance in IS research from a European perspective. She notes that the institutional context of IS researchers – lacking a critical mass and strong IS institutions – makes it difficult to "establish good relations with industry in order to really understand and shape industrial practices" (Lyytinen, 1999, p. 25).

In contrast to Benbasat and Zmud, Lyytinen argues that IS education should be changed, so that future practitioners are more adept to read more complex research papers: "I would expect that we educate our practitioners to appreciate brilliant intellectual efforts! Several IS phenomena are hard to understand and may demand difficult and esoteric language" (Lyytinen, 1999, p. 26).

Allen Moody (2000): Australia

Moody – an IS researcher from Australia closely related to industry practice – argues that "practical credibility" is at least as important as "academic respectability" in an applied discipline, such as IS (Moody, 2000, p. 352). He gives some even stronger statements concerning the importance of IS research relevance to practice: "In an applied discipline, researchers are the *producers* of research knowledge while practitioners are the *consumers* of this knowledge"; "Research knowledge is not intrinsically valuable; it only becomes valuable if it is used in practice" (ibid, p. 354 f.)

He speaks of a "disconnection" between research and academia in the IS field: practitioners tend not to read academic journals, and that they "rarely refer to scientific research to solve problems or make important decisions" (ibid, p. 353).

Moody critically states that textbooks – while frequently mentioned as a way to transfer research knowledge to industry – are a "very slow and inefficient way to transfer information", because it would take too long for research results to "filter into textbooks and university courses" and "students forget much of what they learn" and "graduates are not in a position to influence practice" when they go into practice (ibid, p. 355).

He describes new ways for interacting with practitioners according to the example of the medical field: "create joint university/industry positions [to open] direct knowledge transfer between research and practice" (ibid, p. 355).

He suggests to do research aimed at synthesizing research findings and make the available in a form suitable for decision making in practice (ibid, p. 358).

Moody suggests that – according to the example of the medical field – "editorial boards and program committees should have equal representation from academics and practitioners" (ibid, p. 358). He furthermore recommends revising the criteria for the quality of research considering the following aspects (ibid, p. 358): relevance (addressing a practical need), theoretical soundness, methodological rigor, utility (practical significance), contribution to knowledge (theoretical significance), and understandability by practitioners.

Samir Chatterjee (2001): Computer Science, US

A Computer Scientist contributing to the relevance debate in a CAIS article remarks that a lack of a clear identity is "one of the biggest problems facing IS as a discipline today" (Chatterjee, 2001, p. 4). He points out that he has never heard any of his Computer Science colleagues complain about "issues like relevance or impact" (ibid, p. 4).

Weinberg (2001): Computer Scientist, practitioner

Weinberg (2001), a practitioner with Computer Science background, gives a number of reasons and supporting examples, why research does not necessarily have to be directly relevant for business practice (ibid, p. 3 f.): "abstract finding" that have to be applied to practice, "future gains, beyond the current business planning horizon". His examples relate to concepts and programming languages or network protocols developed in research that were (later) applied in practice. Thus, with his arguments Weinberg relates to his Computer Science background not to typical IS research results.

Mordechai Ben-Menachem (2001): Israel

Ben-Menachem (2001), an author from an IS Engineering department at a university in Israel also contributed to the CAIS special issue on relevance. He views IS as an engineering discipline: "IT/IS is not an exact science. IT is much more an 'engineering discipline'" (ibid, p. 2). He differentiates relevance as "serv[ing an] interest" or "useful to someone" from "significance" and "applicability" (ibid, p. 2). According to his opinion for research to be relevant it has to "add [something] new to human [or existing] knowledge". He concludes that the issue of relevance of IT/IS research cannot yet be addressed because more basic questions concerning a definition of the discipline and of what IT/IS research is are still needed (ibid, p. 5).

Previously published ICB - Research Reports

2007

No 18 (May 2007)
Schauer, Carola: "Rekonstruktion der historischen Entwicklung der Wirtschaftsinformatik: Schritte der Institutionalisierung, Diskussionen zum Status, Rahmenempfehlungen für die Lehre"

No 17 (May 2007)
Schauer, Carola; Schmeing, Tobias: "Development of IS Teaching in North-America: An Analysis of Model Curricula"

No 16 (May 2007)
Müller-Clostermann, Bruno: "Using G/G/m-Models for Multi-Server and Mainframe Capacity Planning"

No 15 (April 2007)
Heise, David; Schauer, Carola; Strecker, Stefan: "Informationsquellen für IT-Professionals – Analyse und Bewertung der Fachpresse aus Sicht der Wirtschaftsinformatik"

No 14 (March 2007)
Eicker, Stefan; Hegmanns, Christian; Malich, Stefan: "Auswahl von Bewertungsmethoden für Softwarearchitekturen"

No 13 (February 2007)
Eicker, Stefan; Spies, Thorsten; Kahl, Christian: "Softwarevisualisierung im Kontext serviceorientierter Architekturen"

No 12 (February 2007)
Brenner, Freimut: "Cumulative Measures of Absorbing Joint Markov Chains and an Application to Markovian Process Algebras"

No 11 (February 2007)
Kirchner, Lutz: "Entwurf einer Modellierungssprache zur Unterstützung der Aufgaben des IT-Managements – Grundlagen, Anforderungen und Metamodell"

No 10 (February 2007)
Schauer, Carola; Strecker, Stefan: "Vergleichende Literaturstudie aktueller einführender Lehrbücher der Wirtschaftsinformatik: Bezugsrahmen und Auswertung"

No 9 (February 2007)
Strecker, Stefan; Kuckertz, Andreas; Pawlowski, Jan M.: "Überlegungen zur Qualifizierung des wissenschaftlichen Nachwuchses: Ein Diskussionsbeitrag zur (kumulativen) Habilitation"

No 8 (February 2007)
Frank, Ulrich; Strecker, Stefan; Koch, Stefan: "Open Model - Ein Vorschlag für ein Forschungsprogramm der Wirtschaftsinformatik (Langfassung)"

2006

No 7 (December 2006)
Frank, Ulrich: "Towards a Pluralistic Conception of Research Methods in Information Systems Research"

No 6 (April 2006)
Frank, Ulrich: "Evaluation von Forschung und Lehre an Universitäten – Ein Diskussionsbeitrag"

No 5 (April 2006)
Jung, Jürgen: "Supply Chains in the Context of Resource Modelling"

No 4 (February 2006)
Lange, Carola: "Development and status of the Information Systems / Wirtschaftsinformatik discipline: An interpretive evaluation of interviews with renowned researchers, Part III – Results Wirtschaftsinformatik Discipline"

2005

No 3 (December 2005)
Lange, Carola: "Development and status of the Information Systems / Wirtschaftsinformatik discipline: An interpretive evaluation of interviews with renowned researchers, Part II – Results Information Systems Discipline"

No 2 (December 2005)
Lange, Carola: "Development and status of the Information Systems / Wirtschaftsinformatik discipline: An interpretive evaluation of interviews with renowned researchers, Part I – Research Objectives and Method"

No 1 (August 2005)
Lange, Carola: „Ein Bezugsrahmen zur Beschreibung von Forschungsgegenständen und -methoden in Wirtschaftsinformatik und Information Systems"

The Institute for Computer Science and Business Information Systems (ICB), located at the Essen Campus, is dedicated to research and teaching in Applied Computer Science, Information Systems as well as Information Management. The ICB research groups cover a wide range of expertise:

Research Group	Core Research Topics
Prof. Dr. H. H. Adelsberger Information Systems for Production and Operations Management	E-Learning, Knowledge Management, Skill-Management, Simulation, Artificial Intelligence
Prof. Dr. P. Chamoni MIS and Management Science / Operations Research	Information Systems and Operations Research, Business Intelligence, Data Warehousing
Prof. Dr. F.-D. Dorloff Procurement, Logistics and Information Management	E-Business, E-Procurement, E-Government
Prof. Dr. K. Echtle Dependability of Computing Systems	Dependability of Computing Systems
Prof. Dr. S. Eicker Information Systems and Software Engineering	Process Models, Software-Architectures
Prof. Dr. U. Frank Information Systems and Enterprise Modelling	Enterprise Modelling, Enterprise Application Integration, IT Management, Knowledge Management
Prof. Dr. M. Goedicke Specification of Software Systems	Distributed Systems, Software Components, CSCW
Prof. Dr. R. Jung Information Systems and Enterprise Communication Systems	Process, Data and Integration Management, Customer Relationship Management
Prof. Dr. T. Kollmann E-Business and E-Entrepreneurship	E-Business and Information Management,E-Entrepreneurship/ E-Venture, Virtual Marketplaces and Mobile Commerce, Online-Marketing
Prof. Dr. B. Müller-Clostermann Systems Modelling	Performance Evaluation, Modelling and Simulation, SAP Capacity Planning for R/3 and mySAP.com, Tools for Queueing Network Analysis and Capacity Planning, Communication Protocols and Distributed Systems, Mobile Systems
Prof. Dr. K. Pohl Software Systems Engineering	Requirements Engineering, Software Quality Assurance, Software-Architectures, Evaluation of COTS/Open Source-Components
Prof. Dr.-Ing. E. Rathgeb Computer Networking Technology	Computer Networking Technology
Prof. Dr. R. Unland Data Management Systems and Knowledge Representation	Data Management, Artificial Intelligence, Software Engineering, Internet Based Teaching
Prof. Dr. S. Zelewski Institute of Production and Industrial Information Mangement	Industrial Business Processes, Innovation Management, Information Management, Economic Analyses

For more information visit us on the Web: **http://www.icb.uni-due.de**