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To whom Should Information Systems Research Be Relevant: The Case for an Ecological Perspective

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TO WHOM SHOULD INFORMATION SYSTEMS RESEARCH BE RELEVANT: THE CASE FOR AN ECOLOGICAL PERSPECTIVE

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Abstract

This theoretical article re-examines the issue of relevance in Information Systems (IS) research. It argues that the commonly presented view, in which IT practitioners (operating in a restricted range of roles and organisational settings) are seen as representing "IS practice", is limiting. A call is made for a deeper understanding of the concept of relevance, driven by a more thorough consideration of the dimensions of practice. An 'Ecology of IS Practice' perspective is proposed to help achieve this. An ecological perspective places the individual practitioner within a nested series of contexts for 'IS in Practice'. IS research can be seen as occurring within, or between, the ecological levels of individual, group, organisation, industry, community, and society. An ecological perspective also provides a useful context for framing three key questions about the relevance of IS research: What issue should the research be about?, To whom should it be relevant?, and What outcomes are needed? These questions can be applied at all levels of the ecology, and across the boundaries of different levels. A fourth 'relevance question' therefore arises: At what level(s) of the social ecology should IS research be relevant? It is argued that the adoption of an ecological perspective has the potential to deliver an enriched understanding of the domain of 'IS Practice', emphasising the diversity of possible stakeholders for IS research, and by doing so, enlarging the relevance agenda so that it better delivers to the Vision for the IS field (Weber, 1997).

Keywords: relevance of IS research, ecology of IS practice

1 INTRODUCTION

A recurring issue in the IS literature is the need to ensure that the IS field produces research that is of genuine relevance to IS practice. This 'relevance issue' typically arises in the context of the so-called *rigour versus relevance* debate, in which a tension is seen to exist between the requirements of academic rigour and those of relevance to IS practice. Surprisingly, the nature of what constitutes IS practice has been rarely debated, despite its key influence as a determinant of what is deemed relevant. This paper re-examines the issue of relevance, focusing in particular on understanding the nature of IS practice and the identity of potential IS research stakeholders. It argues that the commonly presented view, whereby 'practice' is equated with the needs of business and IT managers, is restrictive. Such as view risks driving a limited appreciation of the concept of relevance in IS research, which in turn constrains the research agenda. An argument is presented for a broader, multi-dimensional understanding of practice and, by extension, of the concept of relevance. An ecological view is proposed as a means of gaining this deeper understanding.

In the first section of this paper, the *rigour versus relevance* issue is outlined, and its main issues are summarised. Following this, two key problems that emerge from the literature are explored in more depth. The first problem is the lack of effective communication channels between the domains of research and practice, noted by Moody and Buist (2000) as being a fundamental barrier to delivering relevance. Two key relevance questions, *What should IS research be about?* and (2) *What outcomes are needed from IS research?* are seen as arising, and these are mapped against Benbasat and Zmud's (1999) four dimensions of relevance, *interest*, *applicability*, *currency* and *accessibility* to illustrate their fundamental nature.

The second issue considered is the way in which 'IS practice' is commonly framed in the IS literature. The question, *"To whom should IS research be relevant?"*(Keen, 1991) is proposed as a third key relevance question. In considering this question, and Weber's (1997) broad vision for the IS field is compared with the often limited 'relevance agenda' that emerges from existing literature. Finally, a new perspective is proposed for re-contextualising relevance: an *Ecology of IS Practice*. This ecological perspective highlights the complex, multidimensional nature of the IS practice and stakeholder community, placing it within a societal perspective. The potential of using an *Ecology of IS Practice* view for framing key questions to do with relevance in IS research is explored, along with the implications and limitations of this view.

2 THE RELEVANCE OF IS RESEARCH

2.1 The 'relevance versus rigour' dilemma

A recurring theme in the IS literature is the so-called *rigour versus relevance* dilemma. This issue centres on the fact that IS researchers are tasked with producing research that simultaneously meets the requirements of academic *rigour* and practical *relevance*. A tension is created through the existence of these apparently contradictory requirements (Robey & Markus, 1998). For research to meet the standards of *rigour*, it must exhibit the academic qualities of validity, replicability, and generalisability. Associated with the *rigour* issue is an anxiety about the legitimacy of IS, often described as a still-emerging field, and one which has dangerously indistinct boundaries. In order to help IS become a credible, stand-alone field of research; researchers have been exhorted to construct a distinct identity through a core of unique and unifying theory (Keen, 1980; Weber, 1997). In order to be rigorous, IS theory should be parsimonious and be readily transferable to a range of organisations, settings and contexts (Daft and Lewin, 1990).

The need for *relevance* arises from the fact that IS is an applied rather than a pure discipline. It is based on inquiry into 'real world' problems and the professions, and so needs to produce research that is strongly relevant to practitioners (Moody and Buist, 1999; Lee, 1999; Adams and Courtenay, 2004). IS research should therefore be current, interesting, applicable, and accessible to its users (Benbasat and Zmud, 1999; Martensson and Lee, 2004). Rather than focusing on developing new theory, IS researchers should use any theory that is pragmatic for the research question (Venkatraman, 1989; Lee et al, 1997). Transferable, parsimonious theories are considered to be of less value than "rich prescriptions that capture the uniqueness and complexity of their own organisational settings" and so can be directly applied by practitioners (Benbasat and Zmud, ibid, p.9). These issues have contributed to a polarised view whereby "the relationship between academic rigor and practical relevance is widely believed to be inverse; the greater the rigor, the less the relevance, and vice versa" (Robey and Markus, ibid, p.9).

2.2 The 'relevance' crisis

There is no consensus about how to tackle the *rigour versus relevance* dilemma. However, a body of literature zeroes in on *relevance* as the crux of the issue, tackling it in more depth. The need for rigour is not disputed, but *relevance* is seen as the more critical determinant of the field's legitimacy or long term survival. As Moody and Buist (1999) put it, "IS will not achieve legitimacy by the rigor of its methods or its theoretical base, but by being practically useful" (p.645). Robey and Markus (1998) reject the idea of a dichotomy between rigour and relevance, reframing the issue as a *relevance crisis*. They claim that IS research is becoming increasingly irrelevant to practice, recommending four strategies for redressing this: cultivating practitioner sponsorship, adopting new research models, producing consumable research and supporting non traditional research outlets.

In a similar vein, Benbasat and Zmud (1999) offer practical prescriptions for relevance, addressing what they see as "a credibility gap in the business community" (p.3). They identify four dimensions of relevance (*interest*, *applicability*, *currency* and *accessibility*) and propose a range of solutions to improve topic selection, article purpose, readability, and the editorial process. Their recommendations include the need to focus on the future interests of key stakeholders, identify topics from IS practice, reach agreement within the academic community as to likely future research issues, focus on outcomes that can influence practice; develop cumulative, theory-based, context-rich bodies of research that make prescriptions, portray results in ways that help practitioners justify IT related decisions, develop frames of reference to organise phenomena, and provide contingency approaches to managerial action (p.14).

Other authors promote the use of 'real life' research methods, such as action research, case studies and ethnographies, as ways of achieving relevance (Adams and Courtenay, 2004; Martinson & Lee, 2004). Adams and Courtenay (ibid) propose a multi-methodological framework that aims to satisfy the needs of relevance and rigour, combining action research and grounded theory with design science and systems development. Further suggestions for relevance come from Davenport and Markus (1999), who call for researchers to reconsider their traditional value judgements and to better meet the needs of practitioners by publishing in practitioner journals and by emulating the practices of consultants.

2.3 The issue of knowledge transfer

While a wide range of solutions (as summarised above) have been suggested for the relevance issue, Moody and Buist (1999; Moody (2000)) argue that what is really needed is a clearer understanding of the problem. A demand for both rigour and relevance exists in all applied disciplines, yet fields such as medicine, engineering and architecture do not demonstrate the kind of credibility gap that IS does. The real source of the relevance crisis, as they see it, is a lack of ability on the part of IS researchers to *ask the right questions*. This in turn arises from *a lack of effective knowledge transfer*, or a

fundamental disconnect, between the communities of research and practice. IS researchers and IS practitioner are independent communities, with little overlap and few points of knowledge transfer. Circulation of ideas and problems to do with IS occurs within but not between these communities, as illustrated in Figure 1.

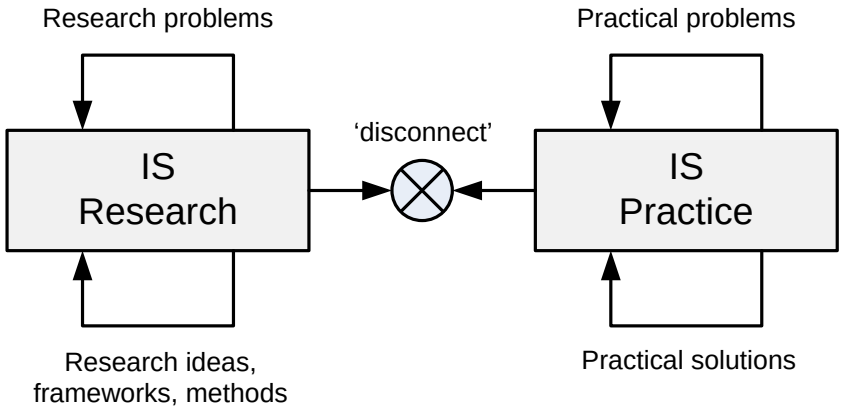

Figure 1: "What currently happens" (Moody & Buist, 1999; Moody 2000)

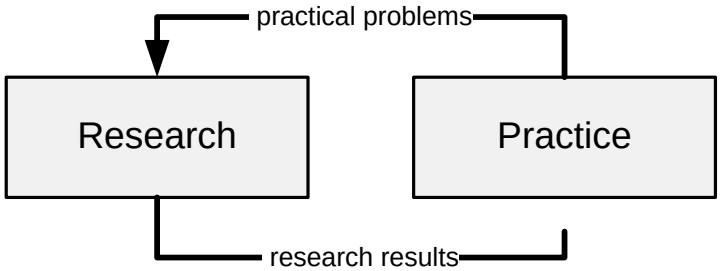

Figure 2: "What should happen" (Moody & Buist, 1999; Moody 2000)

In Figure 2, they outline *what should happen* in a model of two key information flows. The key flows are: (1) practice provides the primary source of information about problems, and (2) research outputs contribute to ultimate improvements in practice. To improve the formal and informal information flows between research and practice, Moody and Buist (ibid) propose a collaborative model for IS research, based on evidence-based medicine. This approach combines joint university-industry appointments, a 'retailing'-type approach to the dissemination of research, systematic syntheses and reviews of research, action research, and new relevance-based criteria for reviewing research.

3 KEY RELEVANCE QUESTIONS

In addition to its usefulness in exposing an underlying communication problem, Moody & Buist's information flows can be seen as highlighting two key relevance questions faced by IS researchers. These are (1) ***What should IS research be about?*** (What kind of *practical problems*?) and (2) ***What outcomes are needed from IS research?*** (What kind of *results*?) The essential nature of these questions can be seen when they are mapped against Benbasat and Zmud's (1999) four dimensions of

relevance. The question, *What should the research be about?*, relates directly to the dimensions of *interest* and *currency*, and governs the relevance of topic selection. The second question, *What outcomes are needed?*, relates to the remaining two dimensions of relevance: *applicability* and *accessibility*. This question governs decisions of relevance concerning research frameworks, methods, and communication style. The relationship between the proposed 'key relevance questions', Moody & Buist's model, and Benbasat and Zmud's four dimensions of relevance is outlined in Figure 3 below.

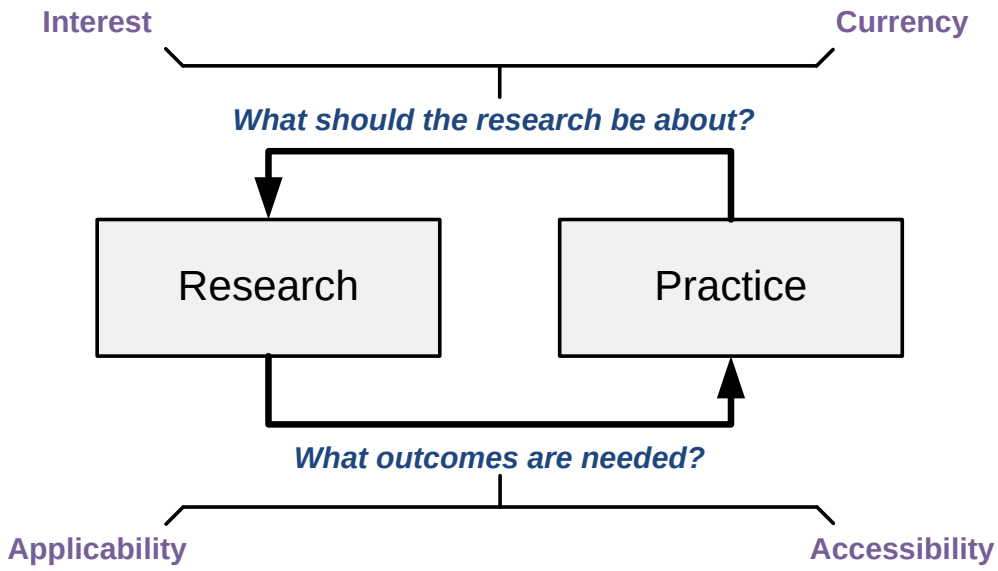

Figure 3: Key relevance questions, mapped against Benbasat and Zmud's (1999) four dimensions of relevance (Adapted from Moody & Buist, 2000; Moody 2001)

Although Moody and Buist are insightful in identifying a key source of the relevance issue, it is notable that, in their analysis, they appear to view the 'community' of IS practice as a fairly homogenous group. They express concerns about the fragmented nature of the research community, quoting Banville and Landry's (1989) description of it as a "fragmented adhocracy", but give no reciprocal consideration to the complexity of the community of IS practice. Moody's description of practitioners as people who "rarely refer to scientific evidence to solve problems or make important decisions, but instead rely on their own experience, their peers, or advice from vendors or consultants" (2000, p.358) reflects a view of practice that, while aligned with the view commonly presented in the IS literature, is somewhat one-dimensional. The next section of this article will consider the way in which 'IS practice' is conceived of in the literature, and will explore how a limited view of IS practice can create boundaries to what is deemed relevant.

3.1 To Whom Should IS Research be Relevant?

The fundamental premise of the relevance argument is that the needs and concerns of 'practice' should determine what constitutes relevance in IS research. The way in which *IS Practice* is conceived is therefore critical in terms of setting, and delimiting, the research agenda. Given this fact, it is surprising that the question, *"To whom should IS research be relevant?"*, has received relatively little critical attention in the literature. An exception is a book chapter by Keen (1991), in which he highlights the need for a clearer conception of the target audiences that IS Research should influence, noting the failure of many conference and journal papers to connect with any domain of practice. As Keen identifies, the question, *"To whom should IS research be relevant?"*, is a vital one for

researchers to consider. It impacts strongly on the selection of research topics and on the applicability, accessibility, and usefulness of research outcomes. It could be described as the missing key relevance question in the relevance debate.

When considering the question, *"To whom should IS be relevant?"*, a useful starting point is Weber's (1997) *Ontological Foundations of Information Systems*, which surveys the origins of the IS field and outlines its high level goals. Weber describes the overarching goal of IS as being "to better understand and to predict phenomena associated with the development, implementation, maintenance, use and management of information systems". Its purpose is "so that individuals, groups, organisations, societies, and nations can use information systems more effectively and more efficiently" (p.1). Weber paints a broad picture in which IS can operate at, and be relevant to, multiple levels of human society. It is interesting to consider how closely the IS literature corresponds with this broad view.

IS literature is frequently underpinned by the implicit (or explicit) assumption that it is the needs of senior managers and IT professionals, in organisational settings and in profit-orientated commercial environments, that matter most. A scan of any shelf of IS textbooks is likely to reveal a proliferation of subtitles and chapter headings to do with managing IS to increase competitiveness and efficiency, based in the settings of commercial organisations or enterprises. Analyses of IS research literature have painted a similar picture. Crowston and Myers (2004) analysed a random sample of 196 research articles drawn from six leading IS journals and an international conference. They found that most IS research was conducted at the organisational level of analysis (51%), followed by the individual (21%) and group (11%) levels of analysis. Only 4% of the studies in the sample were conducted at an industry level of analysis, 1% at a community level, 3% at a national level, and 2% at a trans-national level (see Table 1).

Breakdown of the sample of IS articles by level of analysis

Level of analysis	Total	95% confidence interval
Individual	41	21 (18.7, 23.4)
Group	21	11 (9.4, 12.1)
Organization	100	51 (47.5, 54.5)
Industry	7	4 (3.1, 4.1)
Community	2	1 (0.9, 1.2)
National	5	3 (2.2, 2.9)
Transnational	4	2 (1.8, 2.3)
Other	16	8 (7.1, 9.2)
Grand total	196	

Table 1: Breakdown of the sample of IS articles by level of analysis (Source: Crowston & Myers, 2002)

The dominance of an organisational perspective is also suggested by Bacon and Fitzgerald (2001), who note that "...ever since the days of MIS, there has been an underlying recognition that the field has a fundamental concern with information in the organizational environment" (p. 55).

In addition to the emphasis on organisational level studies, it appears that certain industries may be better represented than others in IS research. Chiasson and Davidson (2005) surveyed 272 research articles in two top-tier IS journals published from 1997-2004. (MISQ and Information Systems Research). In the 42% of cases where industry was mentioned, they found that five industry categories accounted for 71% of the industries examined: manufacturing, high-tech, banking/finance, retail and insurance. A limited representation of IS practice may even underpin surveys that form key inputs into IS research. In 2003, a survey of IT executives (from the American Society for Information

Management (SIM) and The Conference Board) was undertaken to identify the key issues facing IT executives. Out of 301 practitioners surveyed, 57% came from three industry sectors: finance, IT and manufacturing (21%, 19% and 17% respectively). Only 13% of respondents came from sectors that focus on non-commercial, societal level outcomes: Education (6%), Government (3%) and the Non-profit sector (4%). This survey's sample is undoubtedly an representative cross-section of SIM and TCB membership, but it could be seen as providing a significant bias if the 'key issues' highlighted are interpreted as being representative of the domain of IS practice that researchers should study[1].

Bacon and Fitzgerald's (2001) *Framework for IS* is another case worth considering. The framework was created using grounded theory, synthesising 'top down' inputs (from researchers) with 'bottom up' inputs (from practice). The practice dimension was represented by fifteen practitioner surveys/studies of key management concerns. A further input to the framework was an analysis of tertiary syllabi and texts dealing with 'managerial and organisational aspects' of IS. It is unsurprising that the resulting framework has a strong focus on the organisational and business dimensions of IS.

The above examples suggest that a limited view of IS practice may be unintentionally reinforced by the range of practitioner inputs that inform IS research. This resulting view commonly construes relevance in terms of the needs of IT managers and profit orientated organisations, and may be unintentionally skewed towards a particular group of industries. This is not very surprising, given the origins of IS as MIS, the field's longstanding association with business schools, and the uptake of IS-related research issues by disciplines that have their own practitioner journals. However, the limited view of practice that results can constrain the research agenda by placing limits on what is seen as relevant. In comparison to Weber's multi-dimensional vision for IS, it provides only a partial view. It is a relevance agenda from which the voices of certain stakeholders of IS practice are absent; notably those of government, of the public sector (including social services such as health and education), of the not-for-profit sector, and of society as a whole.

4 RECONCEPTUALISING RELEVANCE: AN ECOLOGICAL VIEW

This article has highlighted how the boundaries of IS practice, as they are typically perceived, play a role in delimiting the concept of *relevance* in IS research. A limited view of IS practice places an emphasis on the needs of IT managers and CIOs, generating studies that are focused primarily at an organisational or enterprise level. While the needs of individual businesses are commonly emphasised, there appears to be a comparative shortage of research focused on needs at an industry or sector level, or around community and societal level outcomes (whether economic, educative, or social in nature). The practitioner literature that informs IS research, and in which researchers are exhorted to publish, is often targeted at IT managers, CIOs and senior executives, within a limited range of business contexts. IS researchers who operate in areas such as education or health must find alternative outlets, in order to reach the audience to whom their research is relevant. There is a risk of reactive, self-reinforcing cycle, whereby the agenda for the relevance of IS research is defined in terms of the status quo. Such a narrow agenda for relevance falls well short of Weber's holistic vision for the field of IS.

How can the concept of IS relevance be broadened so that it better fits with the high level vision and purpose of IS? Lyytinen (1999) has lamented the focus on "immediate solutions for CIOs" (p.25), arguing that research in IS should be driven not only by the interests and needs of practitioners, but also by public interest and by the needs of society. (The public interest argument underpins a sub-set

[1] A 2004 IDC survey of CIOs conducted in NZ and Australia had 25% representation from public sector agencies. This appears to be unusually high, and may reflect the greater proportion of investment in IT by the public sector IT in these countries, compared with the USA. It outside the scope of this article to explore this further.

of IS research, relating to the 'digital divide' and community informatics.) Lyytinen goes on to suggest that "the relevance of practice …(should also be) about what the researcher sees as practice and what elements are relevant in understanding and changing that practice" (p.25). It can be argued that in order to achieve this, researchers must be able to more clearly 'see' the available range of opportunities for relevance. A much broader perspective is needed when selecting topics and when answering the question, *'To whom should IS research be relevant?*". This broad perspective needs to take account the needs of individuals, groups, organisations, societies, and nations in order to be true to Weber's vision for the IS field. An ecological view can be seen as providing such a broad perspective.

4.1 An 'Ecology of IS Practice' Perspective

An ecological perspective on IS Practice (*Ecology of IS Practice*) is proposed as a means of addressing the problem that has been outlined in this paper: a limited view of IS Practice, leading to a limited view of what is seen as relevant. Adoption of an ecological perspective when considering the IS research agenda would provide a more holistic view of IS Practice, encouraging a broader view of what is deemed as relevant in IS research.

An ecological perspective is one that places the individual within a series of nested, hierarchical and interdependent contexts, comprising a social ecology. These contexts operate at the interpersonal, organisational, community and societal levels (Bronfenbrenner, 1979; McLeroy et al, 1988). An ecological perspective has successfully underpinned much sociological research and has been adopted in the field of health promotion, where it has led to a focus on customised interventions targeted at appropriate levels, to promote changes in practice. In the field of organisational science, an ecological perspective of populations has been adopted by Hannan, M. and Freeman, J. (1977) for investigating the relationship between an organisation and its environment. They identify five levels of analysis: members, subunits, individual organisations, populations of organisations, and communities (or populations) of organisations; noting a lack of research at the upper levels of the ecology.

The proposed *Ecology of IS Practice* (as illustrated in Figure 4) is a perspective that places the individual practitioner within a series of possible contexts, or dimensions, for the application of IS in society, in a way that is strongly compatible with Weber's vision: Starting at the level of the individual (a practitioner or user), it moves outwards through the interpersonal/group level, to the organisational/institutional level, to the level of groups and populations of organisations (such as industries, clusters, and sectors), and then to the outermost levels of community, society and nation.

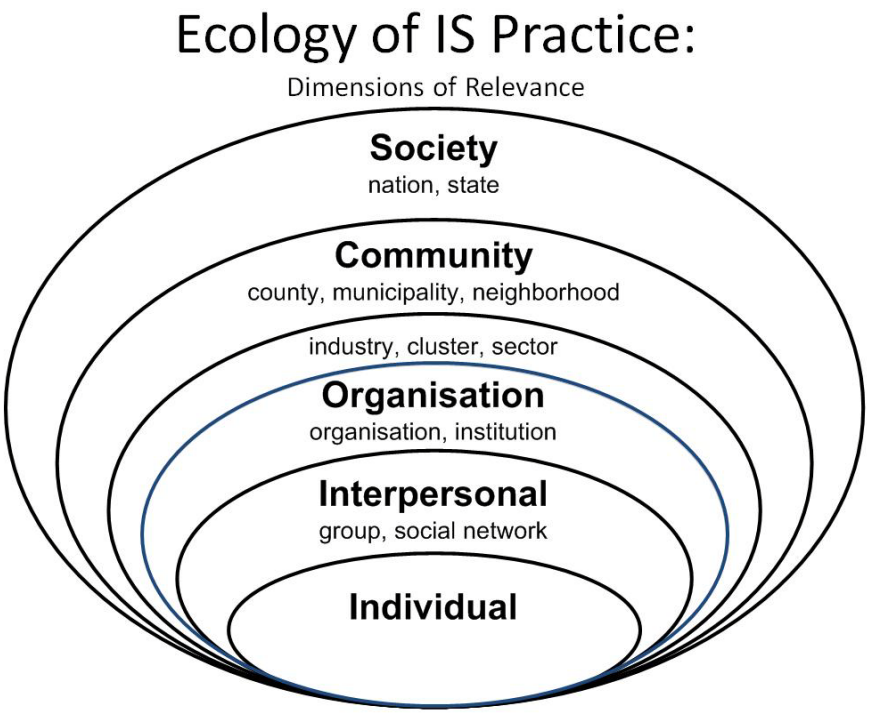

Figure 4: An Ecology of IS Practice (adapted from McLeroy et al, 1988)

Using an *Ecology of IS Practice* to contextualise the practitioner-focused view of IS relevance offers several advantages. It locates the practitioner and the organisation within a broader context (industry, sector, and society); it highlights the various possible 'levels of relevance' for IS research, and it suggests the potential for research that has cross-boundary (cross-level) relevance. An ecological perspective of IS practice could also provide a useful reference point for the framing of key IS research questions, such as *"To whom should the research be relevant?"*.

Adoption of an ecological view is not suggested as a silver-bullet solution, but it could help to redress the relevance crisis by surfacing the options, refocusing researchers' attention on the many possible dimensions of relevance. IS research can be based within, or between, any of the ecological levels. When selecting topics, researchers would consider the appropriate ecological level, or levels, of relevance. This would in turn lead to a deeper consideration of the audience, or stakeholders, for IS research. The answer to the question, *"To whom should IS research be relevant?"*, is likely to differ according to the level at which the research is focused. For example, if IS research is targeted at a societal level, it might be most relevant to government strategists, possibly across more than one sector. If it is based at community level, then local funding bodies may be the key stakeholders of IS practice. There may also be relationships between ecological level and industrial sector. For example, a focus on the application of IS at a societal level is likely to involve considerations of the role of the public and/or non-profit sectors. This may help explain the imbalance in industry representation in research that has been noted.

In order to complete the cycle of twin information flows identified by Moody and Buist (ibid), the IS research must lead to ultimate improvements to IS practice. However, if IT practitioners, CIOs, and even CEOs are viewed as the only people to whom IS research is relevant, then IS research is unlikely to lead to improvements above the organisational level. In order for IS research to reach its potential, a deeper understanding of the dimensions of practice, and of relevance, is required. Moody and Buist (ibid) have used the metaphor of producers and consumers when describing the relationship between

researchers and practitioners. The ecological perspective would reposition the IS practitioner as only one member of a richer web of consumers.

An *Ecology of IS Practice* also provides a useful context for framing the three 'relevance questions' that have been previously introduced: *What issue should the research be about? To whom should it be relevant?* and *What outcomes are needed?* These three questions are relevant at all levels of the ecology, and/or across two or more levels of the ecology. A fourth relevance question therefore arises: *At what level(s) is the research relevant?* Figure 5 revises Moody and Buist's (2000) model for the framing of key relevance questions (see Figure 2), illustrating how four 'key relevance questions' are associated with, and arise from, the ecological view of IS practice. These four questions, in combination, provide a more 'rigorous' way of addressing the relevance of research, helping to determine how research should be approached, what kind of outcomes are required, how these outcomes should be communicated, and to whom. The existence of multiple potential audiences (and therefore forums) for IS research is also strongly underlined.

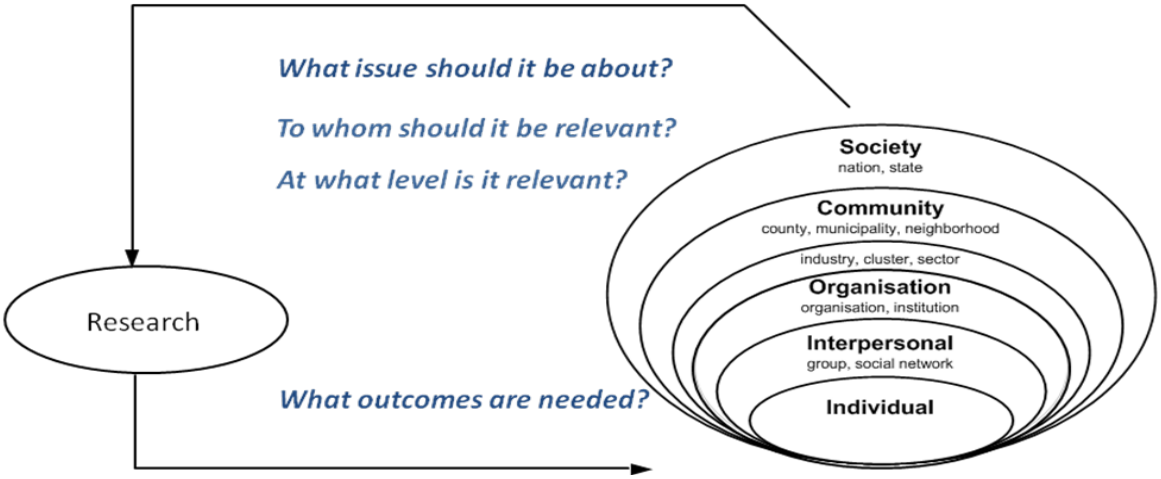

Figure 5: Relevance in IS Research: Key questions from an ecological perspective

5 DISCUSSION AND CONCLUSION

The argument that has been presented here is for the use of an ecological *perspective* of IS Practice to inform the concept of relevance, rather than for the application of an ecological research framework per se. The concept of an ecology is complex, and practical difficulties would undoubtedly arise from requiring research to be targeted and applied at multiple levels within a complex system.

The opportunity exists, however, for researchers to use an ecological perspective of IS Practice to inform their selection of topics, help frame their research questions, and consider how, and to whom, their research results could be communicated. In addition, an ecological view of practice could be used to underpin further analyses of the existing literature, identifying gaps and opportunities for research.

An obvious implication of the use of an Ecology of IS Practice perspective is that there may be multiple potential audiences for IS research. It is not within the scope of this article to undertake a thorough stakeholder analysis at each level, but this could be a valuable area for future consideration. A further implication of the ecological perspective is that it underlines the need for rich communication channels between the research community and the multiple 'communities of IS practice' that it represents. It is only through such rich communication, and recognition of the complexity of practice, that rich opportunities for relevant research will be identified.

By providing a multi-dimensional view, an *Ecology of IS Practice* perspective has the potential to help redress existing imbalances in the level of research, encouraging the consideration of higher units of relevance, and the inter-relationships between levels. It provides a counterbalance to the emphasis on the IT practitioner as the driver of the relevance agenda, providing a higher level, more holistic view of IS in Practice. This is a perspective that is in keeping with the rich vision for IS, as outlined by Weber. The ecological view of IS in Practice also highlights the potential of the IS field in terms of its social relevance and its potential for high level outcomes.

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