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ABSTRACT

One of the reasons that we conduct research is to provide a body of research findings and theories that can inform practitioners (Williamson 2000). This article highlights research approaches that are typically used to bridge the gap between two well-known communities of practice, the academic community and the practitioner community. It examines how knowledge may be transferred between the two communities and then discusses two research approaches, action research and case studies that can be used to bridge the gap.

1. INTRODUCTION

In 2005, one of the authors was involved in editing a special edition of the Journal of Information Technology, Theory and Applications that considered the relationship between information systems (IS) research and its subsequent practical outcomes in industry. The preface to that special edition (Wenn and Burgess 2005) considered the notion of identifiable academic and practitioner communities of practice and considered some of the ways in which knowledge might be transferred between them. At the time, a diagram was used (see Figure 1 below) to represent how knowledge might be transferred between the two groups. In the diagram, the straight arrows represent boundary objects that exist or can be created to support that knowledge transfer. We conduct research in order to do one of the following (Leedy 1997:5):

- Provide an answer to a question

- Resolve a problem

- Develop greater understanding of something.

Research is the systematic approach to achieving one of these goals. Research in the business field is often performed so that its results can be used in the decision making process, with an emphasis on moving decision makers from intuitive information gathering to a more systematic and objective approach (Zikmund 2000). Zikmund (2000:5) defines business research as "the systematic and objective approach of gathering, recording, and analyzing data for aid in business decisions". Williamson et al (2002: 12), discussing research in the information management and information systems fields, lists a number of reasons as to why research should play a part in professional practice. Included in these reasons are the following:

- To assist in understanding problems and issues which arise in the workplace.

- To add to knowledge in the field and/or provide solutions to problems.

- To provide a body of research findings and theory to inform practitioners.

- Information systems researchers draw problems for investigation from practice and the results of their studies usually generate theories, which need to be applied and tested by practitioners in the context of the real world information systems. Information systems researchers are very conscious about the usefulness of their research results to industry as well as the rigour of their approaches and their contribution to the core knowledge of the information systems field.
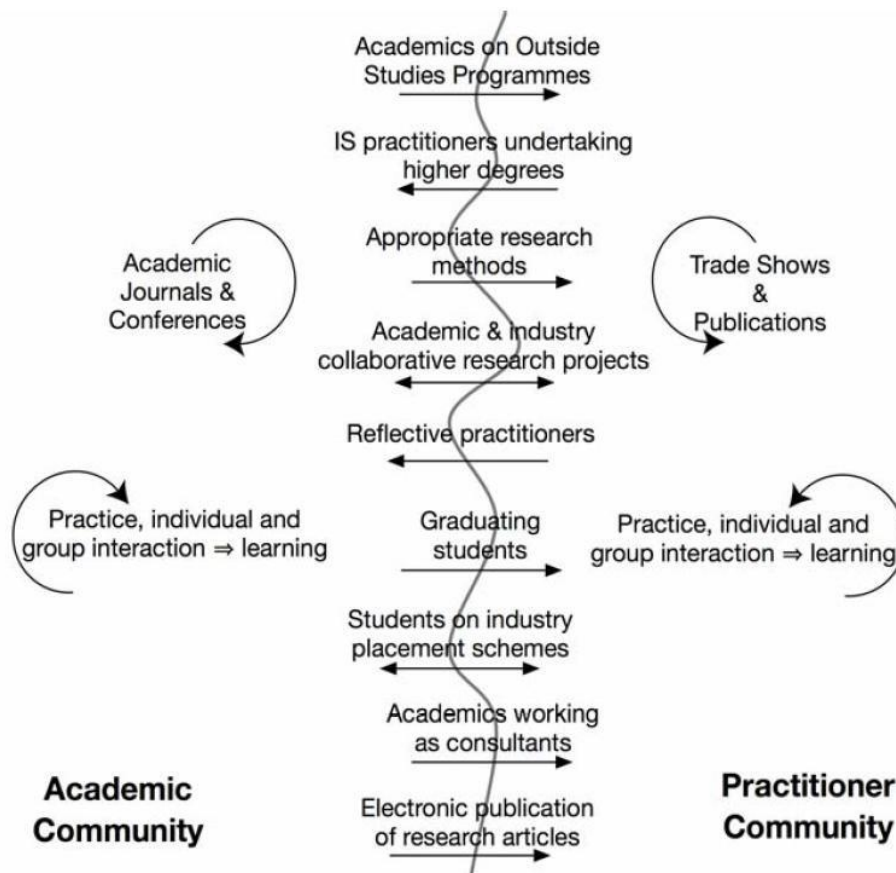
(Williamson et al, 2002: 17-18)

Figure 1: Communities of Practice and the means to enhance knowledge transfer (Source: Wenn and Burgess (2005:27))

We conduct research to expand the limits of our knowledge in some way. In the case of pure research, we are generally testing or verifying acceptability of some given theory. In the case of applied research we are often attempting to answer a specific problem or address a specific situation, often to make decisions about a particular course of action or to frame policy (Zikmund 2000). To help us conduct research, we design a research methodology that enables us to control the acquisition of research data and to analyse and interpret that data in a meaningful manner (Leedy 1997).

Originally, the diagram was used to represent, at a macro level, how such knowledge transfer may occur. Other articles in the special edition then highlighted different techniques that were used to help bridge the gap between the two communities of practice. Some of the techniques employed were exploratory case studies, actor-network theory and even diaries, with an emphasis in each instance on how the research actually affected practice. On reflection, it appears that the selection of appropriate research methods is vital for the creation of many of the boundary objects that are apparent in Figure 1 (except perhaps for students on industry placement schemes and possibly academics working as consultants).

A key issue is 'appropriate for what and to whom'? Often the research methods adopted by students undertaking doctoral research projects are influenced by the dominant research paradigm subscribed to by the doctoral supervisor, Department, School, University, or external funding body. In the past the pursuit of rigour has been emphasised often at the expense of relevance (Benbasat & Zmud, 1999). However King & Applegate (1997) have argued that an increasing move from government to corporate funding may be changing the balance of emphasis towards relevance.

The primary purpose of much of this research is to serve a research 'apprenticeship' and to qualify as an independent post-doctoral researcher. Being skilled at communicating the findings of such research to a variety of stakeholder groups is not seen as a high priority. On the contrary, newly qualified researchers are most often seeking to establish themselves in an academic career with 'tenure' seen as 'the holy grail'. To this end the incentive is much more heavily weighted towards successful

communication of findings to one's peers in the academic community, specifically in highly ranked academic journals. In addition, promotion and tenure decisions are still heavily influenced by 'theory based empirical research' (Benbasat & Zmud, 1999).

The editors of this special edition of the International Journal of Computers, Systems and Signals would like to use the rest of this article to examine some of the research techniques that are more suited to bridging the gap between academic and practitioner communities of practice, as well as introducing the excellent papers in this special issue.

2. RESEARCH APPROACHES TO 'BRIDGE THE GAP'

In continuing the theme of investigating means by which researchers can bridge the gap between academic and practitioner communities of practice, we will examine some of the research approaches commonly used to effectively bridge the gap between academic and practitioner communities of practice. One of the most obvious is action research.

3. ACTION RESEARCH

Action research is a research strategy within which a variety of research methods may be used, as felt appropriate to the specific context, e.g. case study, interviews, or participant observation. The term 'action research' originated with Kurt Lewin (1946) who viewed the process of enquiry in cyclical terms through: planning; acting; observing and reflecting (Collis & Hussey (2003). Lewin argued that one could only understand something when one tried to change it (Argyris, 1993).

It has been argued that action research evolved from a sense of dissatisfaction with more traditional 'scientific' research approaches, and that any reduction in academic rigour was compensated for through the more problem centred 'real world' approaches inherent to action research (Lancaster, 2005). Action research is unique in that it attempts to expand knowledge whilst at the same time causing some type of (usually organisational) change. One of the differences in action research from other research methods is that the research is concerned with actually making changes in the environment being studied. Often the researcher is actually immersed in that environment. This obviously means that there needs to be close collaboration between the researcher and those within the environment being researched (Baskerville and Myers 2004; Oosthuizen 2002; Templeton, Lee and Snyder 2006).

Baskerville and Wood-Harper (1998) believe that the IS discipline is very appropriate for the use of action research methods as it highly applied and almost vocational in nature. In 2004, MIS Quarterly hosted a special edition on action research in information systems. At the time, the editors of the special edition suggested that there was no reason why action research should "not be accepted in the field of information systems" (Baskerville and Myers 2004:329). Baskerville and Myers (2004) suggest that the essence of action research is a two stage approach:

- *Diagnostic stage:* a joint analysis of the social situation by the researcher and those within the environment being researched.

- *Therapeutic stage:* which involves the collaborative change.

Gill and Johnson (1997: 72) suggest that,

> "action researchers intend not only to contribute to existing knowledge but also to help resolve some of the practical concerns of the people, or clients who are trying to deal with a problematic situation". This is echoed by Oosthuizen (2002) who suggests that action research is meant to *bring about change of practice* but also involves the creation of knowledge at the same time. Oosthuizen also suggests that action research is carried out in discrete cycles of *action* and *reflection.* Later cycles are used to test and refine the results from previous cycles. These would occur within the *therapeutic stage* as identified by Baskerville and Myers.

Action research is often concerned with a single group or company – in a similar manner to case studies. Thus, it may be difficult to test the general applicability of theories generated through action research (Oosthuizen 2002). However one of the key features of action research is the very context specific nature of the findings, and so, in good 'social constructivist' style it is the subjectivity which is seen as a benefit, that very subjectivity which is so mistrusted from the positivist or scientific paradigm. Baskerville and Wood-Harper (1998) suggest that action research can be carried out in various manners, but that each action research study is characterised by (p.92):

- Its multivariate social setting,

- Its highly interpretive assumptions about observations,

- Intervention by the researcher,

- Participatory observation, and

- The study of change in a social setting.

Recently, there have been a number of studies published involving the use of action research into information systems. These have traversed a number of areas, such as health (for instance, Davidson and Heslinga 2007 [adoption of electronic health records]; Braa, Monteiro and Sahay 2004 [health information systems in developing countries]) and information systems applications (Holsapple and Lee-Post 2006 [e-learning]; Champion, Stowell and O'Callaghan 2005; da Cunha and de Figueiredo 2006 [both information systems design]).

One thing that has emerged from the authors' own experiences in supervising research students involved in action research projects in the information systems field is the need for clear delineation of the role of the researcher in relation to: conducting the research project; being involved in the change that is occurring; and the ownership, or dissemination of results

There has been considerable academic debate as to the credibility of action research, which rehearsed many of the relevance versus rigour arguments highlighted in the MISQ Special Edition (Applegate, 1999). It has been likened to consultancy or even journalism (Gummesson, 1991). To counter many of these criticisms some prefer the term 'action science' which Gummesson describes as:

- always having two goals, solving a problem for the client and contributing to 'science' or subject knowledge

- the researcher and client learn from each other

- investigating the complex 'whole' while communicating to the differing stakeholders

- a co-operative project between researcher and client, involving regular communication and continuous adjustment to changing circumstances

- particularly applicable to understanding, planning and implementing change in social systems

- Not judged solely by criteria appropriate to 'scientific' research, but by criteria more appropriate to interpretivist study.

Several of these points go to the heart of this issue of knowledge transfer between communities of practice. Firstly identifying that there are different stakeholders, often with different objectives and measures of success, and secondly recognising the importance of communication between the interested parties.

4. CASE STUDIES

Darke et al. (1997) argue that "case study research is the most widely used qualitative research method used in information systems research" and they further contend that it is well suited to understanding the interaction between information technology and organizational contexts. As a research approach, case studies are well-accepted in the field of information systems research. Yin (2003) suggests that the decision to use a case study arises out of a need to understand complex social phenomena. One of the strengths of a case study strategy for research is the ability to cope with 'how' and 'why' type questions in situations that focus on contemporary events and where the researcher has little control over behavioural events. A case study…

investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident

(Yin, 1994)

Multiple sources of evidence are used, and Bell (1993) describes the case study as an umbrella term for a variety of research approaches focusing on a specific event. Case studies can be conducted using quantitative or qualitative methods and analysis.

We could usefully employ an analogy for the case method of gathering data. The analogy centres on trying to describe the interior of a large, structurally complex building, to a third party, who has never visited the site, but who has an interest in perhaps using the facilities. In order to accurately describe the building in these circumstances, one could argue that there are different methods of data gathering, in the same way as with academic research in case studies. For example, a single data gathering method such as a survey could be likened to conducting an external survey of the building, looking through windows to develop an inventory of rooms, facilities etc. This is reasonably effective if one wished to know the number of rooms, or the amount of equipment, but limited in only having a partial view of each room, and an inability to ascertain if there were some interior rooms without windows. So, the numeric data produced could give a false sense of confidence in the accuracy of the results.

The multiple forms of data gathering of the case study method could perhaps be likened to say, in the case of interviews, having a guided tour of the building with a member of staff, who could open doors to some rooms but not others, thus giving a much better insight into the facilities available, but still leaving gaps in the required knowledge. The gaps would vary depending on the level of authority of the guide, his/her willingness or ability to grant access to different rooms, knowledge of the purposes and availability of the rooms, the functionality of the equipment etc. Other data gathering may include checking maps, diagrams and blueprints of the site, as well as talking to other staff. Each form of data gathering would bring new insights, but each would have its own limitations. For example, constraints of authority of access, conflicting information, confidentiality or ignorance of information sought by the researcher. Each source of data therefore helps to build a more multi-dimensional and robust understanding of a complex issue. Sometimes there are conflicting, or overlapping 'truths', but this can encourage the researcher to pursue greater understanding in order to explain or resolve such conflicts.

Multiple sources of evidence is one of the strengths of case study research, in that it provides a multi-dimensional view of the phenomenon in question. A common criticism of case study research is that it provides little in the way of generalization, and therefore by implication limits the usefulness of any findings. However, the success of case study research should not be judged against the statistical generalization which is commonly used in survey based research and often in experimental research, allowing inference from the sample to the wider population. Instead, one of the objectives of case study research is set in the context of analytical generalization. Here multiple cases should be viewed in the same way as multiple experiments or multiple surveys, from which the researcher aims to develop generalized theory. Multiple iterations of such case studies can lend greater credibility to the results. (Yin, 2003). This is in addition to addressing our earlier stated goals of business research (to help to inform decision making) and, more specifically, of applied research (to help to solve particular problems)

A useful framework which documents the process of theory building through case study research is proposed by Eisenhardt (1989), and is illustrated in

Table 1. It leads the researcher through the process of defining a research question, identifying cases, designing and conducting the research, analysing the results and building conclusions.

The process detailed by Eisenhardt is both rigorous and systematic and promotes validity and generalisability within the context of analytical generalisability. It is important to establish the credibility of the research findings through rigorous research design, data collection methods (often through data triangulation, or method triangulation), and data analysis. A clear 'audit trail' of evidence lends credibility through transparency of how conclusions have been reached (Darke et al., 1997).

Table 1: Process of Building Theory from Case Study Research (Source: Eisenhardt 1989)

Step	Activity	Reason
Getting Started	Definition of research question.	Focuses efforts.
	Possibly a priori constructs.	Provides better grounding of construct measures.
		Retains theoretical flexibility.
Selecting Cases	Specified population	Constrains extraneous variation and sharpens external validity.
	Theoretical not random sampling.	Focuses efforts on theoretically useful cases i.e. those that replicate or extend theory by filling conceptual categories.
Crafting Instruments and Protocols.	Multiple data collection methods	Strengthens grounding of theory by triangulation of evidence.
	Qualitative & quantitative data combined.	Synergistic view of evidence.
	Multiple investigators	Fosters divergent perspectives and strengthens grounding
Entering the Field	Overlap data collection and analysis, including field notes.	Speeds analysis and reveals helpful adjustments to data collection.
	Flexible and opportunistic data collection methods.	Allows investigators to take advantage of emergent themes and unique case features
Analysing Data	Within case analysis	Gains familiarity with data and preliminary theory generation
	Cross case pattern search using divergent techniques	Forces investigators to look beyond initial impressions and see evidence through multiple lenses.
Shaping Hypotheses	Iterative tabulation of evidence for each construct.	Sharpens construct definition, validity and measurability.
	Replication, not sampling logic across cases.	Confirms, extends and sharpens theory.
	Search evidence for 'why' behind relationships	Builds internal validity.
Enfolding Literature	Comparison with conflicting literature.	Builds internal validity, raises theoretical level and sharpens construct definitions.
	Comparison with similar literature.	Sharpens generalisability, improves construct definition and raises theoretical level.
Reaching Closure	Theoretical saturation when possible.	Ends process when marginal improvement becomes small.

CONCLUSION

It is important to match the research strategy with the type of research to be undertaken. (Yin, 2003). It is this point that returns us to the earlier issue raised, how do we choose appropriate research strategies:

- to satisfy the objectives of the researcher (qualification, promotion, funding, curiosity)

- to overcome the ignorance of the researcher (of alternative research perspectives, methods and analyses). To paraphrase Abraham Maslow, "if the only tool you have is a hammer, you tend to see every problem as a nail".

- to satisfy the objectives of other interested parties (academics, practitioners)

- that are achievable within the resource constraints of the research

Case study and action research are both research strategies that satisfy these criteria for 'appropriateness' in the context of knowledge transfer between the communities of practice of academe and IS practitioners.

One confounding factor in this debate concerns the broad church that is Information Systems, and the variety of areas that come together under the Information Systems banner. Allen & Wilson (1996) for example, incorporate information strategy, information management strategy, information technology strategy and change management or implementation strategy as forming the information systems strategy, which works within the business strategy. Thus there is a wide spread of issues under consideration, ranging from business, organizational and change issues, to highly scientific and technological issues. This, of its nature makes it difficult to communicate in language which is relevant or even understandable to users or practitioners in a related but often quite different area with information systems.

We must return once again to the issue of 'appropriateness'. There is a shared responsibility for the future health, relevance and rigour of our research. It is important that rigour remains a key driver of our research, whether from a 'scientific' or interpretivist perspective, and accepting that different perspectives will define rigour in different ways. However, it is the rigorous, systematic research design which underpins the credibility of our findings. Benbasat & Zmud (1999) suggest developing closer links with our practitioners; choosing research that is of interest and importance; that has sufficient longevity to remain of interest at the end of the research (and publication) process; to focus on the outputs of our research and how these may be exploited; and finally to present or communicate our findings in a manner which is intelligible and preferably of interest to targeted groups or communities of practice. In other words, as well as research being of a rigorous and sound design, and execution, it should also be: applicable, current, interesting and accessible (Benbasat & Zmud, 1999).

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