Probing some theoretical aspects of practitioner-based inquiry research in Information Systems

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ABSTRACT

Information and Communication Technologies (ICT) practitioners are often located in the social sciences branch of Information Systems (IS). Practitioner research comprises of research that practitioners undertake with a view to the advancement of their practice. A question arises in respect of research conducted by ICT practitioners: does practitioner-based inquiry research have a theoretical base and does practitioner-based inquiry research challenge enlightenment presuppositions based upon an empiricist epistemology? The probing and discussion of this question is the objective of this paper.

In this paper, ICT practitioner-based inquiry research in organisations is discussed. Some philosophical underpinnings of practitioner-based inquiry research are probed and a reflection on practitioner-inquiry research is given. It is suggested that actively participating ICT practitioners in the IS research domain are a necessity in the workplace environment but their participation requires that the actual context in which IS practices are conducted, should be analysed. To ensure that such IS research is valid, an epistemological base is needed, for critical reflection and thoughtful action from which to draw.

Keywords

ICT practitioner, practitioner, practitioner-based inquiry, reflective practitioner.

1. INTRODUCTION

There are many definitions of science. "[P]hilosophers of science writing in the tradition of the physical or natural sciences are likely to see theory as providing **explanations** and **predictions** and as being **testable**" [17]. The concept of testable theory creates the perception that scientific endeavours are objective, but Einstein [14] suggests that "[s]cience is the attempt to make the chaotic diversity of our sense-experience correspond to a logically uniform system of thought". More recently, Gould [16] indicates that "[s]cience is not an objective, truth-directed machine, but a quintessentially human activity". Both these definitions suggest that "the process of carrying out research is highly subjective, depending on the intuition and the inspiration of the researcher" [27].

Science is traditionally regarded as having two major branches, natural sciences and human sciences. The natural (or physical) sciences that study subjects such as Chemistry and Physics use mainly empiricist methods[1]. Human sciences consist of the social sciences (such as Economics, Psychology and Information Systems (IS)) and the humanities (Arts, Language and Philosophy). Although empiricist methods are used in some human sciences, others in the humanities do not necessarily share this methodological approach. Most of the humanities use a rationalist approach that is not empiricist. In undertaking research, the keys of empiricism and theory should first be understood. Theories are social constructions. Thereafter matters related to positivism and phenomenology need to be clarified. Empiricism can be positivist or phenomenological [27]. However, while empiricism is the dominant theory in the natural sciences, positivism is its counterpart in the social sciences. Both these philosophies assume that knowledge is based on facts that can be determined through sensory perception. This is, in turn, based on assuming that the world is an objective reality. Alternatively, it is assumed by rationalism that knowledge is based on human thought constructs, where the scientist starts with an idea and works it out rationally. This is the basis for scientific knowledge. Interpretivism's point of departure is that realities are constructed and are known subjectively [cf. Oates [24]; Myers [23]].

Babbie and Mouton [3] indicate that scientists have to submit their "research decisions constantly to critical reflection (which

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[1] Empiricism is an approach based on the idea that scientific knowledge can only be valid if it is based on empirical observation and measurement.

theory to select; which indicators to use in measuring a phenomenon; which research design to choose …)". In the world of IS a considerable amount of IS research is conducted using the positivist research tradition [25]. Over the years, the study of IS has changed radically and these changes have resulted in the subject being pushed to a point where it is now very eclectic [6]. However, eclecticism has its price and, not surprisingly, the IS community of researchers have during recent years presented a variety of research methodological arguments for their research [25]. While there has been such a variety of research undertaken by academics (*e.g.* action research by Baskerville and Myers [5]; actor-network theory by Walsham [32]; critical realism by Pather and Remenyi [25]), a question arises in respect of research conducted by Information and Communication Technologies (ICT) practitioners. Does practitioner-based inquiry research have a theoretical base and does practitioner-based inquiry research challenge enlightenment presuppositions based upon an empiricist epistemology? The probing and discussion of this question is the objective of this paper.

ICT practitioners are often located in the social sciences branch of IS. Practitioner research is seen as research that is done by (ICT) practitioners to advance their practice [21]. Practitioners' involvement in research and general inquiry that is small-scale, local, grounded and carried out by ICT professionals who directly deliver ICT services, is an essential ingredient of good practice in the business world workplace environment.

This paper is organised as follows: first, background to the research is given. Practitioner-based inquiry research in organisations is then discussed. Some philosophical underpinnings of practitioner-based inquiry research are then probed. Thereafter we reflect on practitioner-inquiry research. The paper ends with some concluding remarks.

2. BACKGROUND

A non-empiricist point of departure for research is applicable when phenomena are studied which cannot be proven by hard, concrete facts and empirical observation. Cilliers [8] pleads for alternative scientific methodologies regarding complex systems, which are modest and provisional, acknowledging that our understanding is limited and changing. Restricting the term *research* to empiricism is anachronistic, given the contemporary insight that knowledge is never final and beyond dispute. Modest claims about knowledge, however, invite knowledge workers and practitioners to persevere in an ongoing research for meaning and generation of understanding. These 'softer' research goals are the unique foci of especially the humanities. Remenyi *et al.* [27] indicate that the dominant paradigm in research into business and management is empirical research.

While empiricism is the scientific theory that rejects any research that is not based on observed facts, empirical research is a methodology used both in empiricism and rationalism (including interpretivism). Although IS, like other social sciences, often uses empirical methods, it may yet be classified as interpretive (not empiricist) since it also makes use of qualitative approaches to get a rich understanding of the research results.

Although it is tempting to view ICT as 'the epitome of rational expression', empiricist methods of research are appropriate only when related engineering and algorithmic issues are studied. Therefore, the study of ICT is divided into three branches [cf. Oates [24]]:

- Computer Science, including software engineering, information technology, computer games and animation (the natural science branch);
- Information Science, including web development and multimedia (the humanities branch); and
- Information Systems[2], including business computing, management information systems and human-computer interaction (the social sciences branch).

However, while this division may seem neat, many phenomena often require a mixture of these perspectives for comprehensive research. For example, Information Systems[2] (IS) is primarily regarded as a social science, because it investigates socially constructed issues such as the influence of ICT on organisations. Many ICT practitioners are found in the workplace environment of organisations. But IS also sometimes studies harder (only factual) phenomena, typical of the natural sciences, such as computer programming techniques and algorithms, in order to build efficient software solutions for organisations and industry. Furthermore, IS also has links with the humanities when focusing on the use and application of ICT in education, health care as well as other humanistic[3] focus areas.

IS should, therefore, be regarded as an interdisciplinary or trans-disciplinary science. IS should not only aim to add value to other disciplines but also borrow from other contributing ICT (and non-ICT) disciplines in order to strengthen their alliances. "The *power* and not the weakness of IS research models is precisely that they situate IS constructs within constructs that other disciplines study" [1]. For example, in one of the research foci of IS, namely Human Computer Interaction, there are elements of all three branches of ICT:

- it studies the behaviour of computer system users;
- the use of professional algorithms to produce human-oriented output; and
- friendly design of interfaces by means of inputs from graphical design and multimedia.

As a science with strong links to the human sciences, it is increasingly accepted in IS that empiricist research is not the only valid scientific methodology that could be used to produce good research. Roode [29], for example, has criticised IS researchers for being too positivistic in their leanings, and for being unaware of an array of methodological choices. Avgerou [2] argues for critical research using interpretive methods in IS to complement empirical and formal cognitive methods. She regards critical research as a process that aims to make sense of the investigated scenario, a radical procedure in which researchers' human capacities such as tacit knowledge and moral values are involved. "I see research as the art of putting together research questions with a critical content, multiple theories and epistemological awareness to develop claims of truth. This art cannot place confidence for producing valid knowledge on adhering to a testable theory or research practice" [2]. Although the knowledge claims contributed by interpretive case studies should be regarded as soft facts, they are still valid and should be generalised in clear formulations aimed at identified target audiences [4].

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2 Information Systems is primarily regarded as a social science focusing on the human context of information technology [24].

3 The term *humanistic* is used here as an adjective of the noun *humanities*. It does not refer to the philosophy of Humanism.

Bondarouk and Ruël [7] argue for the use of discourse analysis to enable a hermeneutic approach to analysing information systems documents. Discourse analysis is another non-empiricist scientific method. It is essentially interpretive and constructivist. It tries to "give meaning to a text within a framework of the interpreter's experience, knowledge, time, epoch, culture, and history". It believes that understanding is an open, continuous process and that there is no final, authoritative interpretation – this is especially relevant to IS PhD candidates. What is important is that to "hold a PhD individuals should have their own philosophical stance towards their research clear in their minds" [27].

Some other non-empiricist, qualitative approaches (including theories, strategies and methodologies) in IS are [cf. Myers [23]]:

- action research (the researcher collaborates with members of the organisation to experiment with possible solutions to a problem);[4]
- actor network theory (the researcher studies the technical and social aspects of ICT as a unity, as well as the interplay between these elements [22]);
- critical realism and adaptive theory (the researcher attempts to combine and synthesise empiricism and interpretivism);
- ethnography (the researcher participates in activities of the organisation that is studied);
- grounded theory (the researcher derives theory by means of qualitative data analysis);
- structuration theory (the researcher regards human agency and social structure as an inseparable duality); and
- practitioner-based inquiry (the researcher tries to close the rift between theory and practice). As stated by Cochran-Smith and Lytle [9], the unique features which prompt research "is that they emanate from neither theory nor practice alone but from critical reflection on the intersection of the two".

From this discussion, it should be apparent that it has become acceptable to use other, non-empiricist and interpretive methods in IS research. Practitioner-based inquiry research may be another methodology that could introduce a 'softer' view and use of computers in organisations that would be more applicable in the human sciences than the 'harder' approaches that are typical of the natural sciences. Practitioner-based inquiry research suggests an open view to any appropriate methodology which may inform the ICT practitioner in the workplace in an organisation. A practitioner is a professionally employed person who is gainfully employed in a selected discipline [such as ICT] and is concurrently carrying out a systematic inquiry relevant to the job [28]. Some ICT practitioners are also IS PhD candidates.

3.   PRACTITIONER-BASED INQUIRY RESEARCH IN ORGANISATIONS

Practitioner researchers very often apply exemplars and theories to their own experiences and situations in their jobs in organisational settings. Practitioner-research can be described as "a systematic form of enquiry that is collective, collaborative, self-reflective, critical and undertaken by the participants of the inquiry" [20]. Individual enquiry is strongly encouraged in a practitioner-research culture. One underlying question of the practitioner researcher is on the continued ICT technical change

in the workplace, how can the practitioner researcher improve on what is happening in a specific workplace environment? Schön's book, *The Reflective Practitioner* (1983), challenges practitioners in their selected discipline to reconsider the role of technical knowledge when developing professional excellence.

In many practice-led research projects, research and development are often found in social and work-based organisational communities located in real life; this differs significantly from hypothetical scenarios. These practice-led research projects then give tangible meaning [10]. Since the focus is on real-life research and reflects on real-life practical as well as pragmatic activities, this results in work being meaningful to practitioner researchers. Gray [18] indicates that this meaningfulness coupled with the associated understanding of the organisational context should be seen as the starting points for practitioner researchers to theorise and reflect more on their practice to enable an outcome. One such suggested outcome is an emerging improvement on what is taking place in a specific workplace environment. It entails the practitioner building new understandings of the emerging and developing workplace situation. Schön [30] suggests that the practitioner reflects on what is unfolding before him, and also on the prior understandings that are present in his behaviour.

Practice-led research projects often involve a fusing of intellectual and practical capabilities – they depend significantly on the community of practice where the research practitioner is involved [10]. For practitioner-based inquiry research, the practitioner should therefore make a synthesis of the theoretical and empirical knowledge for the selected research approach. Researchers implicitly or explicitly make certain assumptions in their research and such assumptions are applicable to practitioner-based inquiry research.

4.   SOME PHILOSOPHICAL UNDERPINNINGS OF PRACTITIONER-BASED INQUIRY RESEARCH

Positivism, as well as interpretive social science, provides insight into the nexus of theory and practice. In positivism the application of theory subscribes to technical control, i.e. the ICT specialist's theoretical work informs the practitioner by supplying technical information. Such technical information may comprise top-down solutions for application in specific contexts in the organisation – the practitioner receives specialised knowledge. Social science, with the interpretive approach, wants to explain the perspectives of subjects phenomenologically. In this interpretation, the researcher is viewed as a participant and also as an observer. Whereas 'behaviour' is described objectively in positivism, interpretive social science wants to establish what 'actions' mean within the socio-cultural context where subjects may appear. Interpretive social science does not try to explain human life causally, but to deepen and extend our understanding of the uniqueness of social life (Carr and Kemmis cited in Demetrion [13]).

The focal point of practitioner-based inquiry IS research is the identification of IS problems in organisations, i.e. the discrepancy that exists between the practice of IS practice and the expectations associated with the practice. It is now argued that the viability of the theoretical analysis becomes clear because expectations for an (IS) practice implies some prior beliefs and assumptions, where these expectations are explained and justified (Carr and Kemmis cited in Demetrion [13]). When relationships among IS practices and beliefs (or theories)

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[4]   Although action research may have a positivist underpinning, most studies are either interpretive or critical [24].

underlying them are probed, in relation to problems and quests for resolution, then ideological critique, based upon the precepts of critical social science, becomes possible [13]. Demetrion [13] indicates that "[p]ractitioners, who may or may not possess extensive academic training in the social sciences, need to express any ideological critique in an idiom authentic to their experience and knowledge bases". IS practitioners would do this in a different (though possibly related) idiom that implies directly that the theory is almost always moderated by the self-moderation of practice. "Unfortunately, much of the research published in academic business journals is often seen as being too theoretical and of little practical relevance to business professionals" [23]. Active participation by practitioners in the IS research realm in organisations is a required necessity but also demands an analysis of the real context within which IS practices function. The validity of IS research requires an alternative epistemological foundation that synthesises but goes beyond both the scientific-positivistic and interpretive social science paradigms [13].

Donald Schön (1930-1997) was a very influential theorist who developed reflective professional learning theoretically and practically. Central to Schön's [30] work are the concepts of reflection-in-action and reflection-on-action. Reflection needs space in the present as well as the promise of space in the future [31]. Reflective practice is therefore enacted. When addressing issues in the practice of organisational settings, practitioner researchers must combine reflection and practice. According to Price [26], there are three aims for reflecting:

- understanding one-self, one's perceptions, motives, values, attitudes and feelings. Since practitioners understand themselves, they become more open to understand the different perceptions of others;

- the constructions of meanings form the basis of reflective practice (although some of these may be misguided); and
- reflecting on the consequences that may follow from one's actions.

Schön [30] centres the concept of 'reflection' to understand what professionals do in organisational settings. In the epistemology of practice, "the knowledge inherent in practice is to be understood as artful doing" [30]. Furthermore, IS research is certainly a fertile ground for the practice of reflection [25]. Given the purpose of reflection and the associated characteristics of reflective practice, one may argue that they can collectively be seen as an approach to encourage practitioner learning and practice development in workplaces of organisational settings.

Even though philosophical ideas are implicit in all research, we argue that they continue to influence research practice too and require articulation. When utilising a philosophical view (i.e. philosophical position) in research, the question that needs to be asked, is: what lies behind the methodology? According to Cresswell [11] there are three questions central to research design:

- What are the *knowledge claims* made by the researcher?
- What are the *strategies of inquiry* that inform the procedures?
- What are the *methods of data collection and analysis* to be used?

A combination of these three elements of inquiry (i.e. what knowledge claims comprise of, what the strategies of inquiry are as well as the meaning of methods of data collection and analysis) make up different approaches to research – see Figure 1.
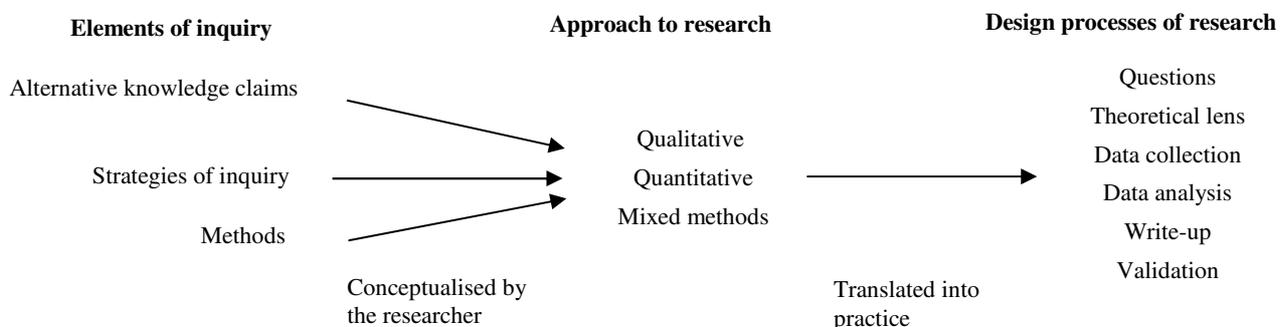

Figure 1: Claims to knowledge, inquiry strategies and data collection and analysis methods as well as the design processes of research (Adapted from Creswell [11])

From Figure 1, an ICT researcher can choose in their research between a quantitative, qualitative or mixed methods approach to an inquiry. Sometimes researchers may adopt a pluralistic approach by using multiple methodologies. Claims to knowledge, inquiry strategies and data collection analysis methods are now discussed:

4.1 Knowledge claims
The researcher begins with perspectives about the strategies and the objects of learning during the practitioner-based investigation. Cresswell [11] suggests four schools of thought about knowledge claims:

- Postpositivism[5] – deals with quantitative research or 'scientific methods' and reflects a deterministic philosophy;
- Constructivism – deals with interpretivism, i.e. addressing the 'process' of interaction among individuals while realising that their own background will shape their interpretation;
- Advocacy – deals with promoting a research agenda for helping marginalised people and that the inquiry be blended with a political agenda; and

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5 This term is more generally referred to as positivism. For a discussion of both terms, see Jackson and Søren [19].

- Pragmatism – deals with situations, actions and their consequences as opposed to antecedent conditions. There is a concern with effective applications and solutions to problems.

Cresswell [11] suggests that when inquirers engage in research, pragmatism provides a basis for qualitative and quantitative assumptions - researchers can choose from the available procedures, techniques and methods of research that may best meet their purposes and needs. Since both qualitative and quantitative research may use empirical methods [23], empirical studies may contribute to a better understanding of how practitioners act-in-practice by considering all the aspects of the research setting.

4.2   Strategies of inquiry

The strategies that are associated with mixed methods include combining field methods, *e.g.* interviews (qualitative data) and observations and with surveys (quantitative data). The ICT practitioner needs to engage with a situation in an organisational setting. Since it is acknowledged that all methods have their own limitations, researchers think that biased assumptions in any single method can render the biases of other methods neutral.

4.3   Data collection and analysis methods

For any approach to research, the methods specific to data collection and analysis must be identified. For example, for a mixed methods approach, Cresswell [11] suggests multiple forms of data that draws on all possibilities, questions that are open- as well as closed-ended, and analysis of statistical texts. For an approach of mixed methods, the ICT researcher usually tends to base claims on a pragmatic perspective, strategies of inquiries are employed involving the collection of data sequentially or simultaneously and the collection of data which relates to numeric and text information to best understand research problems [11].

From the discussion in subsections 4.1-4.3, the research inquiry process makes a contribution to a practitioner's way of knowing since the ICT practitioner will

- have achieved knowledge and understanding of inquiry strategies, the power of framing questions, the process of designing an inquiry and the significance of evidence;
- have identified how new knowledge can shape their professional IS practice;
- be aware of the kind of knowledge that can be acquired through inquiry; and
- be able to acknowledge that the reflective practitioner-based research inquiry process allows the ICT practitioner to be conscious of the process of inquiry at a meta-cognitive level, i.e. how they know what they know.

5.   REFLECTING ON PRACTITIONER-INQUIRY RESEARCH

Practitioner-based inquiry opens up new possibilities in the ICT practitioner's workplace environment. The reflection and analysis it involves not only focuses the attention of a practitioner on aspects of 'usual' practice that are problematical in the workplace in an organisation, but also on the *deliberation* about developing and improving of practice in the workplace environment. The analysis identifies and diagnoses the problems in practice and generates *action-hypothesis* which could be used as a basis for future experimentation [12]. Action research may, therefore, especially be a useful research strategy

for practitioner researchers, since it allows academics and practitioners to work together to uplift the standard and usefulness of such research. According to Myers [23], a qualitative research may ensure a good balance between rigour and relevance in this type of inquiry. Inquiry based on practice and reflective analysis has a dimension of deliberation and is oriented to the future [15]. Inquiry that is practice-based is therefore an essential tool for the ICT practitioner when undertaking research in his workplace environment. Knowledge becomes an integrated part of the ICT practitioner's professional research strategies through his active involvement in the generation of knowledge that is based on practice. Professional knowledge creation is knowledge which is derived from the systematic accumulation of evidence in the practitioner's workplace environment – it is developed from systematic forms of practitioner inquiry.

Engaging in practitioner-based inquiry research can thus contribute to the ICT practitioner's professional knowledge and his understanding of learning theory, although it is accepted that the links between theory and practice appear to be complex. Another component of ICT practitioner-based inquiry research is that the inquiry and outcomes can provide a direct link to the notion of 'reflective practice' and meta-cognitive process - but it is argued that ICT practitioner-based inquiry research and reflective practice are not the same. We argue that ICT practitioner-based inquiry research is distinguished (from reflective practice) by a deliberate, systematic and planned attempt to solve a particular problem (or set of problems) in an ICT practitioner's workplace environment. We contend that the assumption that reflection invariably leads to enhanced practice is significantly under-theorised; it is often taken for granted that all ICT practitioners can simply engage in reflection on their performance in (for example) the workplace environment and thus improve it. Two issues require further exploration:

- How can an ICT practitioner evaluate his own performance without feedback?
- How effective is reflection without any 'evidence' from practice in the workplace environment?

Perhaps future collaborative practitioner-based inquiry research can provide both feedback and evidence as well as the opportunity to engage in shared reflection which leads to changes in practice in the workplace environment.

6.   SOME CONCLUDING REMARKS

Since the issues that are identified originate from the views of ICT researchers, interpretive IS should be viewed as a sound alternative to positivism and as a valid form of IS research. In essence practitioner-based inquiry research is related to problems that are identified by ICT practitioners – it "keeps their appropriation of critical social science grounded within the dynamics of issues defined at the [IS] field level rather than by the canons of academic theory" [13].

The focal point for ICT practitioner-based inquiry research is therefore identifying IS problems as they are seen by ICT practitioners. Active participation by ICT practitioners in the IS research domain is a necessity in the workplace environment and also for IS PhD candidates, while both also require an analysed context in which IS practices operate. The validity of IS research as an interdisciplinary science requires an epistemological base to heal the chasm between positivism and interpretivism through critical reflection and considered action.

7. ACKNOWLEDGEMENTS

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