Reflections On Information Systems, Qualitative Research And Business Intelligence[1]

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Abstract:
For my keynote address I have been asked to reflect on my academic career in information systems, highlight my research, in particular using qualitative approaches (such as action research, hermeneutics, conversation analysis and case study) to address information systems issues, especially information systems development. I then relate this to the important topic of the conference, that of business intelligence and the knowledge economy. For me, the third of these is much more difficult because on that topic 'the tables are turned' – you the audience are the experts, not me. Nevertheless I will try to illustrate in that third part how qualitative approaches to researching business intelligence (that is, your research now and in the future) might well make a significant contribution to information systems research and practice. I have entitled my talk 'Reflections on Information Systems, Qualitative Research and Business Intelligence' because I hope that lessons that I learnt in my career might also be relevant to yours though it does mean that my talk is rather egocentric and I apologize in advance for that. However, for each of my lessons and reflections, I suggest how they might apply to you. You are, of course, entitled to say things like 'that does not apply in my university or my situation' but I hope my reflections on my life in academia do have some resonance for you. I hope also that when you are listening to the presentations at the conference to come, you ask yourselves: 'what is the contribution of the research?', 'why did the researcher choose the particular qualitative or quantitative method used?' and 'what might have been gained (and lost) if the research had been done following a different approach?'.

Introduction:
Since graduating in the social sciences, I took various roles in data processing (as information systems was called then) for a food processing company, an oil company and a property company (amongst others). My entry into this profession was rather haphazard. Having taken various tests I was told I had the 'aptitude' to do computer programming. In truth, the salary offered was the highest compared to being a trainee accountant and a trainee in marketing (this was the late 1960's) and I thought, for whatever reason, that 'computers' were an exciting field. I found training to be a computer programmer quite difficult as the logic involved was very different to my academic courses in economics, history, politics, sociology, and so on. It took me some time to be anything like competent as a computer programmer, though once I was I had a period of enjoyment using Cobol, Fortran, Assembler and other languages, and became a chief programmer at one stage. But boredom did set in and my career changed to have more orientation towards people and the business and I was promoted to systems analyst and project leader during this time. I was surprised that I was able to use some of the lessons learnt in my social sciences degree in practice. I will not dwell too much here on this experience, but what surprised me most was the haphazard way systems were developed and the lack of methodology at that time.
I wanted a year off and decided to do a Masters course in computing in the early 1970s and a fellow student of the course was Guy Fitzgerald with whom I have been writing and researching ever since. Once gaining our MSc. awards, both of us left commercial computing for the academic life. This is the start of my 'story' as an academic which I describe in this paper. It discusses my focus of interest in the discipline for both teaching and research, that of information systems development. But it also looks at my interests outside of teaching and research, especially to two important groups, at least to me, the IFIP Working Group 8.2 and the Association for Information Systems. In research, I emphasize qualitative approaches, such as action research, hermeneutics, conversation analysis and case study. Finally I draw links with and make observations about business intelligence research.

My focus on information systems development:
Both Guy Fitzgerald and I were asked to teach a course on information systems development at different polytechnics (now universities). As the world of work was so haphazard, despite the importance of information systems development, we asked ourselves 'what should we teach?' IS development is clearly one of the main themes of information systems in teaching and practice and yet we were not sure what was important and what was not. There was no agreed syllabus and no book. It was at this time that we set about our taxonomy of information systems methodologies, techniques and tools that we have published in numerous articles and a series of books (for example, Avison and Fitzgerald 1988; 2003; 2006; and 2009). Initially, our concern was more about finding a solid version of the IS development life cycle, but later it was more about finding our way through the plethora of information systems development methodologies – which ones should we teach and propose as best practice?
For us, it was important not to suggest that there was only one way to develop information systems, a lot depended on the particular circumstances – the system to be developed, the experience the IT

specialists and users already had, the culture of the organization, and so on. For that reason we discussed many techniques, tools as well as methodologies in the book.

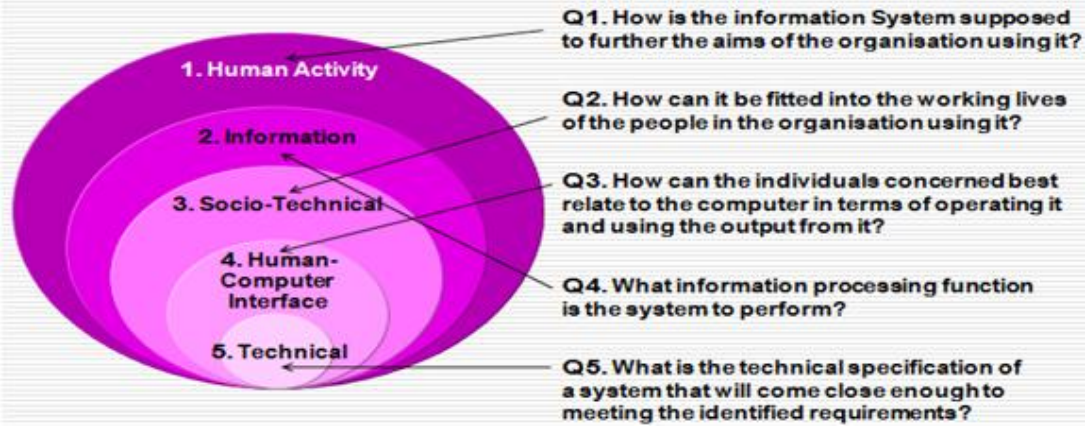

Figure 1: The Multiview framework (mode 1)

I have already implied that personal friendships with colleagues have been really important to me. I met Trevor Wood-Harper only one year after meeting Guy, as Trevor and I started our academic career on the same day at the same institution. Multiview owes more to Trevor than to me! He was greatly influenced by Peter Checkland (for example, Checkland 1981) and the systemic view of Multiview reflects this. We were both greatly influenced also by Enid Mumford whose work is reflected in our emphasis on the socio-technical view and the people side of systems. Following her sad death in 2005, the Information Systems Journal (which Guy Fitzgerald and I are founding editors) produced a tribute issue (16, 4) devoted to her work and this included her last published paper (Mumford 2006). Multiview (Avison and Wood-Harper 1990) is an IS development framework which, as seen in figure 1, addressed five questions. Of course any emphasis on organizations and people is now seen as obvious, but in the early 1980's when Multiview was proposed, the emphasis was totally on the technical aspects. The other aspect of Multiview which is important is that it is a contingency approach – a framework rather than a prescriptive step-by-step methodology. Both these aspects were reflected in the approach and were original at the time. Researchers need to make an original contribution. Thanks to the excellent input of our many colleagues and research students (of more later), and Richard Vidgen in particular, The approach developed greatly in Multiview mode 2 (see Vidgen et al. 2002), seen as Figure 2, and afterwards.

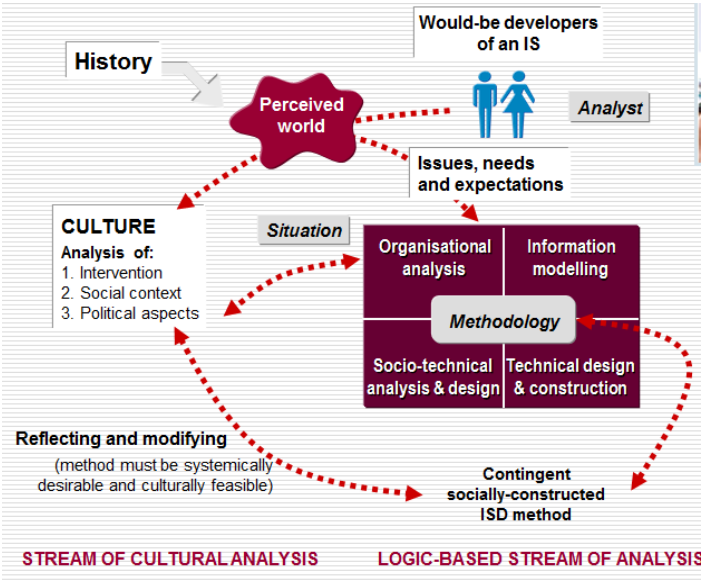

Figure 2: The Multiview framework (mode 2)

Other topics of my research:

Although the focus of my research has been on IS development, thanks to colleagues and research students I have researched in the area of flexibility and uncertainty with Hanifa Shah, Con Connell and Philip Powell amongst others; success and failure with Shirley Gregor and David Wilson amongst others; status and power of the IS/IT function with Christine Cuthbertson amongst others; strategy for IS/IT with Mutaz Al-Debei (who might be familiar to some of you), Philip Powell and David Wilson amongst others; Internet usage with Enas Al-Lozi Al-Debei (who may also be familiar to you), and Melissa Cole; IS and health with Paul Catchpole and Terry Young amongst others ; and offshoring relationships with Peter Banks. These are some of the collaborations amongst many others. Research approaches and techniques discussed in these papers include action research, case study research, ethnography, hermeneutics, and conversational analysis – all examples of qualitative research. Amongst these co-authors include the names of work colleagues, PhD. students, MSc. Students, and people I met on sabbatical and other visits. Of these the most influential have perhaps been my research students. It is particularly fulfilling for me that five of my PhD. Students, whom I often refer to as my 'children', became full professors. (Once a young woman present at a conference in Al Ain, United Arab Emirates said that 'she was my granddaughter'. This was a great surprise, if not a shock to me, until she explained that she gained her PhD under the supervision of one of my PhD students, Hanifa Shah!).

Reflections from the above include the following:

1. **Have a focus for your research:** Clearly it is important not only to have a focus but one which is sustainable over the longer term and is interesting to you. Several papers and books along with my PhD and HDR (a post-doctorate qualification in France) centered on aspects of information systems development. For you this may well mean a long term focus on business intelligence. This is surely an interesting topic as well as one having longevity. This topic is often a research stream itself in a general conference – a good sign! – (e.g. **Knowledge Management and Business Intelligence at PACIS Vietnam 2012; Decision Support, Data Management Systems, Knowledge Management and Business Intelligence** at AMCIS Seattle 2012); as well as the special interest conferences like BIKE itself.

2. **Take advantage of Opportunities:** Even if focused, don't be one-dimensional if research with others sounds interesting. You may have colleagues at your institution, research students (or ones you might jointly supervise), friends you meet at the BIKE conference that may have different ideas, research approaches, and topics within or even outside the business intelligence area with whom you may research. Joint work can lead to great things (don't forget that the 'total' might well be greater than the 'sum of the parts'!).

3. **Researching with others can make things easier and more enjoyable.** For me research on my own is much less fun and also much less constructive and I cannot emphasize enough my debt to my colleagues, friends and research students. For me, research must be fun, as it is hard work and not normally well paid (though maybe it is well paid in Jordan?). Research and the academic life must be fun for you as well, so researching with others provides that really important dimension (it may also lead to two or more jointly authored high quality papers which I think is better than one single-authored paper).

4. **Books and other outputs are also important.** It remains surprising and a source of regret to me that Deans say to their colleagues: "top journals are the only worthwhile output – don't bother with books". Yet I realize how important the book with Guy Fitzgerald was to my career. Books are also important to future academics. Again, getting that paper in a top journal is important but not the only potential achievement for you. In my view you should see it as one of many potential outputs for your work.

Contributions outside of research and teaching:

I now turn to the role of the Association for Information Systems (AIS) as I think that it has much potential to help in further establishing the discipline. Of course this does not obviate the necessity for each of you to get involved in one or more IS activities, such as contributing to conferences, working on a journal or indeed becoming a volunteer for a conference such as BIKE or another local or

international group or the AIS itself (for which I was president, so perhaps I am biased at giving this such prominence). The AIS website is found at www.AISnet.org. The AIS e-library, for example, is a marvelous resource for the AIS journals and proceedings from the AIS conferences (the Americas Conference in Information Systems (AMCIS) and the International Conference in Information Systems (ICIS)) but also many other international journals and proceedings. It has within its structure many special interest groups (SIGs) and regional groups (called chapters). The website gives a wealth of specialist information such as salary levels of IS academics, career placement services and a faculty directory (as with the e-library, all accessed free to members). There are links to websites relating to particular research and teaching topics and approaches. The AIS website can truly be seen as a 'one-stop-shop' for information on the discipline. You will also find information on how you can make a change to develop information systems and support the community by becoming a volunteer.
I have also been chair of the IFIP 8.2 Working Group on the Organizational and Social Aspects of Information Systems, the UK Academy of Information Systems, program, organizing and track chair of many conferences and co-editor of the Information Systems Journal. This also reflects my age and opportunism (if you would prefer to use negative words!) but performing these roles has added to my career and life. Thus I add another lesson to my list:

5. All academics should volunteer to support their colleagues, be it for a conference, journal or AIS itself, or its SIGs (is there a special interest group that you feel covers your topic?) and chapters (is there a chapter covering your part of the world?). So you might referee for a conference or journal, play a more demanding role such as an associate editor, support BIKE and other conferences, nationally and internationally ,or the AIS in an organizational or research capacity.

My emphasis on qualitative research:
As suggested above, most of my research has been qualitative. This was partly due to the influence of colleagues of IFIP working group 8.2 devoted to the social and organizational aspects of information technology. An edited book of readings (Myers and Avison 2002) includes such key qualitative research papers as those of Markus (1983), Orlikowski (1993), Boland (1991), Galliers and Land (1987), Hirschheim and Newman (1991), Lee (1989), Baskerville and Wood-Harper (1996) and Walsham (1995), all of whom have, amongst many others, been very influential to me. But I have also been influenced by people from other disciplines and friendships. David Silverman, for example, a professor of sociology and editor of the Sage series of texts in qualitative research, has been particularly influential (see for example, Silverman 2006a; 2006b; and 2010).
This inspires my sixth reflection for you:
6. Be inspired by your heroes. I am not ashamed to admit that many people have influenced me. For you it might be more experienced colleagues in your university and/or in business intelligence research and practice. We will look at some examples later.

More recent influences in my own qualitative research is that with colleagues including when using action research to understand information systems development at Dansk Bank (Avison and Pries-Heje 2008), using hermeneutics to understand purchasing behavior of individuals using the Internet (Cole and Avison 2007); using conversation analysis to understand aspects of IS offshoring for a pharmaceutical company (Avison and Banks 2008); and using a case study approach to understand how cultural differences impact on the success or failure of an IS project.

Action research

Action research was the approach associated with the development of Multiview (see also Avison et al. 1999). In action research, researchers test and refine principles, tools, techniques and methodologies to address real-world problems. Practitioners as well the researchers participate in the analysis, design and implementation processes and contribute to any decision-making. Following Susman and Evered (1978) the cycle of action research starts with diagnosing the situation, then action planning, action taking, evaluating, and specifying learning. At this point the process starts again with diagnosing. In the case of Multiview, the cycle above can be adapted to start with theory formation where a contingent approach from emerging themes (called Multiview) is prepared; testing the Multiview framework in an organization; reflecting on the Multiview framework in an organization and modifying the Multiview framework as appropriate. At this point the theory was redefined, tested and the Multiview framework changed again as appropriate, and so the cycle was used to teste the framework again in a number of different organizational circumstances.

As we see in Figure 3, the area of concern is information systems development, and with Guy Fitzgerald we developed a taxonomy (or classification) of IS development approaches. In the context of IS development in organizations, Trevor Wood-Harper and I developed a contingent framework called Multiview. But the theory needed to be tested and was done through a number of action research cycles in various organizations, reflecting on the results, modifying Multiview as appropriate and so on. More recently, I used action research in a project looking at information systems development at a Danish bank (Avison and Pries-Heje 2008).

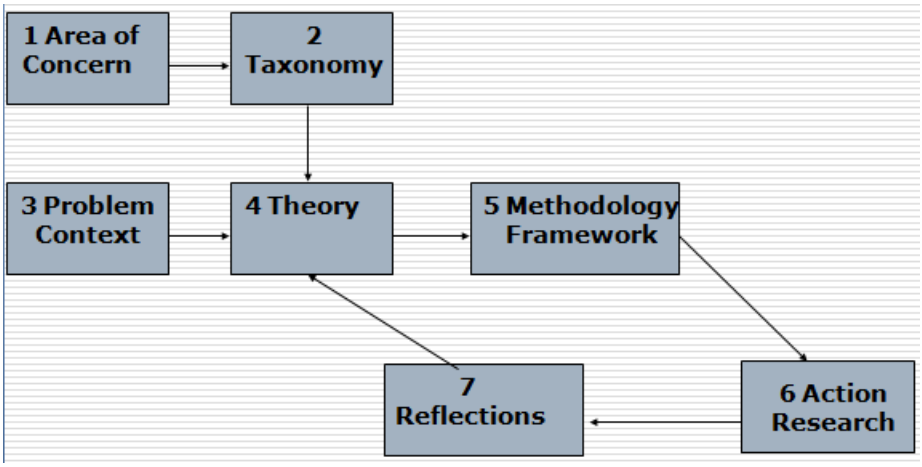

Figure 3: Action Research in Context

Hermeneutics

Hermeneutics is a theory of interpreting text, such as interview data, but is rarely used in IS research. Using the approach we follow cycles of reflection. These cycles include the actions of understanding, explanation, and interpreting as we attempt to make sense of the text (see Figure 4).

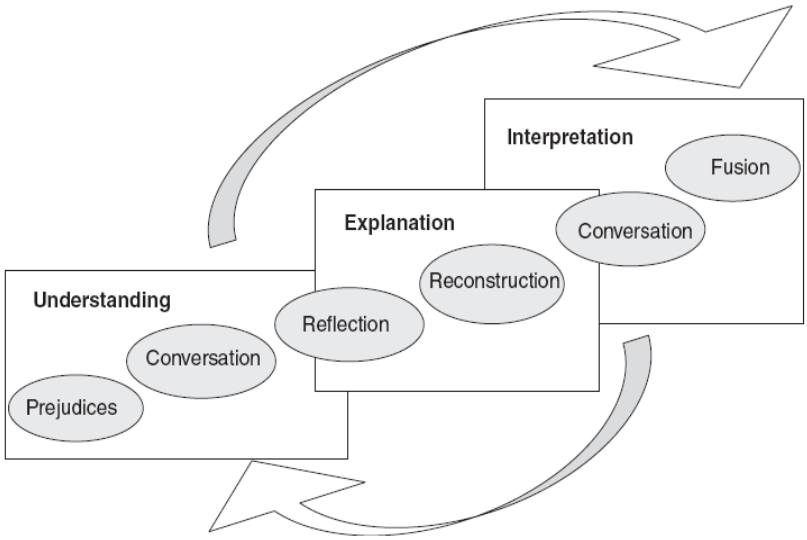

Figure 4: A hermeneutic framework for practical research

This framework of understanding, explanation and interpretation also shows the role of the researchers as they attempt to expose their own prejudices, reveal through conversations, reflect, reconstruct and eke out relevant interpretations of the text. The approach might also be seen as consisting of six stages which reflect and modify those in Figure 4:

i. **The explication of prejudices:** this involves clarifying one's presuppositions, the aim being to allow the researchers to understand their interpretive lens better prior to data collection and analysis.
ii. **Formulating lines of enquiry:** Developing reflections formulated in the previous stage should help the researcher create a richer appreciation of their interpretive position and thereby inform the lines of enquiry and drive the research while collecting data during active interviews.
iii. **Conducting the active interview:** This considers the interviewer and interviewee as equal partners in constructing meaning from the unstructured discussion. The aim is to delve beneath the surface of superficial responses to obtain true meanings that individuals assign to events, and the complexities of their attitudes, behaviors and experiences.
iv. **Analyzing a priori codes:** This includes displaying the data for the purpose of reflection and reconstruction. Shared meaning is interpreted anew, data is categorized and connections are identified as a means of explanation. The themes identified for organizing data collection can be re-used as codes for data analysis (see also Miles and Huberman 1994a and 1994b).
v. **Breakdown in prejudices:** Achieving a shared meaning requires exposure to alternative life-worlds on the part of the researchers and their participants. Expanding one's appreciation of different attitudes and behaviors may provoke a 'breakdown' in the researcher's unconscious understanding about a particular issue or theme. Ultimately the researcher attempts to construct a new (to them) explanation of the anomalous phenomenological elements ready for 'testing' through further conversation interviews.
vi. **Fusion of horizons:** The final stage of the framework is achieved when a consensus of shared meanings are distilled into an interpretation that is more informed and sophisticated than any predecessor meanings, including those of the researcher's initial assumptions.

Cole and Avison (2007) interviewed a number of consumers using the Internet and collected their interview notes as text data. In carrying out these interviews, we did not have a particular research question to address. Our aim was to collect data first and then see what emerged from the data that explored attitudes as people change from conventional purchasing to electronic purchasing (in this aspects there are resonances with grounded theory – see Glaser and Strauss (1967) and Strauss and Corbin (1998). Unlike other research methods, hermeneutics aims to transcend existing notions about some phenomena (in this instance the perceived convenience of online shopping) by actively challenging the perceptions of both interviewer and subject as they move towards a new, shared understanding (Walsham 1995).

Amongst many more predictable interpretations of behavior, analysis of the data highlighted a set of unaccountable behavior. This behavioral form specifically related to Internet browsing on behalf of others. The idea that a person will engage in various consumption-related purchase tasks when requested by others radically challenges the mental model (prejudice) that a direct relationship exists between the consumer and the Internet, that is, the person who is looking for a product online is the person who will be consuming that product. Again, it is not the purpose here to look in detail at the project, but analysis of what we call these 'surrogate' consumers (for example, a family member buying for a non-computer-literate relation or a secretary booking an airline ticket for his manager) shows very different consumer purchasing patterns in our data than that shown by consumers buying for themselves. Such behaviors included making purchases more quickly with less analysis, making purchases where the surrogate also benefitted to some extent, and so on.

These surrogate consumer behaviors are unlikely to have been exposed using other research approaches as they were totally unexpected and unlooked for. They were not part of our research question and yet the behaviors are interesting and were worth further analysis in our second 'turn' of the hermeneutic circle. We would also argue that the subjective nature of this approach would mean that another researcher, even using a hermeneutic approach, may not have discovered this issue of surrogacy (but may well have exposed other interesting phenomena).

As well as being interesting esoterically, there are practical considerations for this discovery. For example, the design in the decision support tools might be adapted for surrogate users (such as recommendation agents based on user profiling and browsing patterns). This phenomenon might lead to the development of new models of consumer behavior in a networked economy. It also has implications relating to technology diffusion.

Hermeneutics used in our example provides a real means of engaging in interpreting the behavior of people and therefore is somewhat different to attempting to resolve the immediate practical concerns of systems designers, as was our action research example discussed previously. Perhaps the greatest benefit offered by hermeneutics is the freedom to pursue anomalous comments or findings. Rather than concentrating on the determination of textual meaning (as would be the case in semiotics and narrative stories), a researcher using the hermeneutic approach is able to put their interpretation on the data being

analyzed as a basis for further discussion and future understanding. As a result, new avenues of research can emerge and be immediately investigated in ways not possible using other research approaches. For example, in the research described here, the practice whereby people acted on behalf of other consumers was revealed unexpectedly and their behavior explored and potential actions suggested.

Conversation analysis

The offshoring of information systems (IS) work has seen phenomenal growth. This has resulted in IS professionals interacting with workers from vastly different cultural backgrounds in order to deliver IS project and support services. This cultural 'barrier' has been highlighted in the IS literature as a key challenge for offshoring. However, the attention given to research in the field has in the main been restricted to surveys or interviews, often reliant on reductionist national culture models. Avison and Banks (2008) use the ethnographic research technique of conversation analysis (CA) to study cross-cultural communications in offshoring relationships. Again, there have been no concerted research efforts to apply CA to IS research in general and to IS offshoring in particular. This research aimed to address that gap by analyzing naturally occurring recordings of telephone conferences between offshore vendor staff at two companies in India and employees in the UK and US offices of a major pharmaceutical company.

87		(0.1)
88		↓So it's done the wrong way around ↓and the process should be, if you get
89		it in a Remedy ticket and if needs to go into Request-First because it's going
90		to take longer than 2 hours to resolve you need to raise a Request-First
91		request to track it though on behalf of the customer and inform them that
92		that's what you've done.
93		(2.1)
94		does that make sense?
95	**Venu:**	↑Yes↑ Steve, I will take advice and I will do the ticket from there.
96		(0.1)
97	**Steve:**	↑Thank you very much↑ (0.2) I mean have you been doing that for other
98		customers?
99		(1.4)
100	**Venu:**	Yeh (.) most of the customers I ask to create, but it is confused when it's
101		like that, uh: I went by Instant Messenger - I sent a
102		message through IM, I left a message, but they came back if there
103		are issues-(.) like raising the Request-First request. I think I'm having some
104		IM chat windows I think I've saved (.) I can share with you later.
105	**Steve:**	Yeh, cause at the moment I can't see- quite see why you've not raised a
106		Request-First request at this stage, so if you can perhaps come back to me
107		and indicate why that hasn't happened. I just want to understand, the
108		process flow of what happened here so that we can be clear to Tammy and
109		John how we can handle it in the future
110	**Venu:**	Sure
111	**Steve:**	Does that seem ok?
112	**Venu:**	Yes

Figure 5: Part of a conversation for analysis

CA developed as a field of study in the 1960s through collaboration between Harvey Sacks, Emanuel Schegloff and Gail Jefferson (Goodwin and Heritage 1990). Key to CA is the detailed transcription of conversations observed in their natural environment. This 'make[s] what was said and how it was said available for analytic consideration, at first for the analyst who does the transcribing, and later for others, colleagues and audiences' (Ten-Have 1999). Figure 5 shows an extract of a conversation between people at the pharmaceutical company and one of the outsource suppliers and figure 6 shows a few of the symbols used to describe events in a conversation other than the words spoken. It is clear from a brief look at this particular conversation that the relationship does not appear to be one between equals!

Characteristics of speech production

word	Underscoring indicates some form of stress, via pitch and/or amplitude.
::	Colons indicate prolongation of the immediately prior sound. Multiple colons indicate a more prolonged sound.
-	A dash indicates a cut-off.
↓↑	Arrows indicate marked shifts into higher or lower pitch in the utterance part immediately following the arrow.
WORD	Upper case indicates especially loud sounds relative to the surrounding talk
°	Utterances or utterance parts bracketed by degree signs are relatively quieter than the surrounding talk.
〈 〉	Right/left carets bracketing an utterance or utterance-part indicate speeding up.
.hhh	A dot-prefixed row of hs indicates an inbreath. Without the dot, the hs indicate an outbreath.

Figure 6: Some transcription conventions for CA

Detailed analysis carried out at this company is found in the original paper. Of course conversation analysis is very time consuming and the process of transcribing and analyzing conversations is somewhat laborious. However, the research approach can yield results that can be more profound and useful than some research alternatives. Our analysis of the conversations led to a number of findings:

i. A clearly identifiable asymmetry of participation exists within onshore–offshore vendor meetings.
ii. A lack of shared understanding of expected responses results in an increase in asymmetry of participation between Indian vendor staff and UK/US client staff.
iii. A lack of cues and listener responses results in a disproportionately high occurrence of hyper-explanations within offshoring communications.
iv. A major factor in observed asymmetries of participation is perceived hierarchical differences between Indian vendor staff and UK/US client staff.
v. The rhetorical organization of turns during conflict/negotiation is culturally contexted and exhibits key contrasts between Indian vendor and UK/US client staff and commonality within these groups.
vi. Cultural differences in the rhetorical organization by many Indian vendor staff reduce the illocutionary force of their arguments with UK/US client staff.
vii. Misunderstandings within cross-cultural communications take longer and more effort to repair than would be expected within ‘single’ culture communication.

Whereas other cultural studies (such as that of Nicholson and Sahay 2001) provide a useful comparison to our findings, they are at a much more general level, being about Indian culture as a whole and therefore somewhat reductionist, when compared to our study using CA. Thus, although a key limitation of CA is the difficulty to generalize findings and it was therefore not possible to assess convincingly the scale or impact of cultural differences on IS offshoring engagements in our study it was possible to demonstrate instances where it is believed cultural differences are impacting communication within offshoring. The arguments for CA are powerful, as Moerman (1988) puts it: ‘In every moment of talk, people are experiencing and producing their cultures, their roles, their personalities’.

One of the gains in analyzing conversations of practitioners is the differentiation of what is espoused and what is actually done. In other words what people say they do in interviews or written down in survey forms may well differ from the actual evidence of what they do that is found on sound cassette or video. Interviews inevitably show either what people ‘intended to do’ or suggest a sanitized biased version of events, which may hide or distort the true communications issues that are being experienced (Ten-Have 1999). Completed surveys are likely to be even less ‘honest’. Further, conversational analysis can pick out nuances in relationships and conversations (through, for example, pauses in the conversation or strength of voice) that would not be apparent in interview notes from an interview with each of the participants. In an interview, the actors may well have argued that their relationships and conversations are ones between equals. We showed in our research that analyzing conversations between the actors themselves suggest otherwise: they are much more asymmetric.

Case study

Thanks to privileged access into a Chinese joint-venture of a French multinational corporation we are collecting data using a case study approach to analyse ERP usage following implementation. As the case study methodology is much more understood and used in information systems research than the other three qualitative research approaches discussed above we will not describe the approach in detail here but rather its variant as we used it.

Avison and Malaurent (2007) highlights important misalignments between current Western IT solutions and the Chinese environment in terms of institutional structures, legal requirements, accounting rules and work practices. Developments since the time of the original study reveal a change from the subsidiary users refusing to implement the ERP because of a lack of culture-fit to making it fit by developing 'workaround' strategies. The local users now succeed to empower themselves through this strategy of enacting a single instance of the global ERP template in order to fit the local organizational and cultural context. From the headquarters' point-of-view, these are unexpected, unofficial and unwanted workaround strategies. However, our research suggests that they result in 'win-win' situations as the ERP is successfully implemented in the subsidiary through workarounds without compromising the requirements of head office.

In this case study research we follow a critical stream of contemporary social researchers who assert that information technology has allowed the deployment of panoptic structures invisibly throughout society. The panopticon concept, originally based on Bentham's (1791) work on prison architecture, refers to an architectural structure with a central tower for observation. This allows a guard to observe (opticon) all (pan) prisoners without the incarcerated being able to tell whether they are being watched. The panoptic gaze is thus continuous surveillance that is hierarchical (the prisoners can be seen by the observers who can themselves be observed by their superiors) and one-way (the prisoners cannot see the observer, cannot see each other and cannot know whether they are being observed).

When applying the panopticon concept to information technology, Zuboff (1988) named it ''information panopticon". She describes how computer technology makes work more visible to managers. Sia et al. (2002) suggested that the information panopticon lens might produce a better understanding of the impact of ERP use in organizations because ERP users are constantly monitored by the embedded tracking system. From our investigation at the company we also found some evidence demonstrating the will of the headquarters to settle a unique "information panopticon" to get visibility and consequently gain control over all their remote subsidiaries.

However, our later research (evidenced in Malaurent and Avison 2011) exposed these workarounds in which the subsidiary has developed practices which both conform to the basic headquarter requirements and yet enable adaptation for the local community. This idea is well described in Gasser (1986). Working around in this case means intentionally using the ERP in ways for which it was not designed or avoiding its use and relying on an alternative means of accomplishing work.

Through our investigation, we have discovered three forms of workarounds: data adjustment, procedural adjustment, and backup systems. An example of data adjustment occurs where users "cheat" the ERP system by entering data that they know is "inaccurate" or does not reflect the data codification expected by the system. They do this in order to get "usable" results. For example, the local accountants have designed their own data codification (adding 'miscellaneous' sub-categories) to track the expenses of the sales team.

An example of procedural adjustment occurs where users modify organizational procedures. Some procedures such as monthly closing are absolutely inflexible but others, such as the bidding process, led to adjustment. Here, the local users found ways to overcome the misfit by using empty fields for each screen and then design a parallel procedure which fitted their requirements. A third type of workaround is the use of alternative or backup systems, both manual and automated. Some backup systems are manual, involving duplicate records, local databases, spreadsheets, and handwritten notes. It can also be seen through the parallel use of legacy systems. We observed that for some procedures local users were obliged to enter similar data to the ERP and legacy systems in order to be able to fulfill local taxation requirements.

Although these are seen by head office as unexpected, unofficial and unwanted workaround strategies, they can in fact result in 'win-win' situations as the ERP is successfully implemented in the subsidiary without compromising head office requirements.

We argued in our introduction that we are not denigrating quantitative research. Clearly it has enhanced our knowledge of information systems greatly. On the other hand, the contextual, cultural and institutional aspects of this case study research implies complex intertwined aspects linking intercultural issues, headquarter-joint venture practice diffusion, competing institutional logics, and so

on. Qualitative case study research can be used in an attempt to understand this complexity as we interpret interview data. Most recently in our efforts to understand more about these workarounds, we have completed 18 interviews with 14 different organizational members. These include managers, project leaders and key users from production, sales, finance and accountancy. This leads on to many hours' analysis of the transcripts. We have more interviews planned at both the Chinese subsidiary and at the Paris head office. We have also collected screen-inputs and reports demonstrating such alternative practices. Qualitative research does not mean a lack of rigor!
Another example of case study work is that of Mutaz Al-Debei (found in Al-Debei and Avison 2010 and 2011) which explores using interviews and other methods of qualitative research the business models of telecommunication companies in the Middle East and Europe and develops a more general business model concept that we argue is comprehensive and appropriate to the complex nature of businesses today.

Conclusions on qualitative research

We have discussed the potential of qualitative research in providing insights into the domain of information systems through a brief overview of some recent examples of action research, hermeneutics, conversation analysis, and case study. Although we are not denigrating quantitative research in any way, indeed we see many examples of research making important contributions to our knowledge of information systems where qualitative research would not be appropriate, we have argued that the examples of qualitative research discussed in this paper contribute to our knowledge in a way unlikely to be revealed through quantitative research without a loss of rigor. We would also argue – though readers will have to decide whether this is true for them – that these exemplars also illustrate the particularly interesting nature of qualitative research in information systems.
Reflections on the research method include:

7. Qualitative and quantitative research can both provide insights and are both valid in IS research if used appropriately. For you, if you are a qualitative researcher, open your minds to quantitative research. Can it add to your understanding of the topic that you are researching by providing other dimensions? If you are a qualitative researcher using one approach, like case study, will using another approach like action research add to your understanding? Similarly if you are a quantitative researcher, open your minds to qualitative research. Can it add to your understanding of the topic that you are researching by providing other dimensions? I hope also that when you are listening to the conference presentations that are to come you ask yourselves: 'what is the contribution of the research?', 'why did the researcher choose the particular qualitative or quantitative method used?' and 'what might have been gained (and lost) if the research had been done following a different approach?'.

overview: my life in IS research:

Before turning to issues related to business intelligence research itself, I provide an overview map of my 'life in information systems research'.

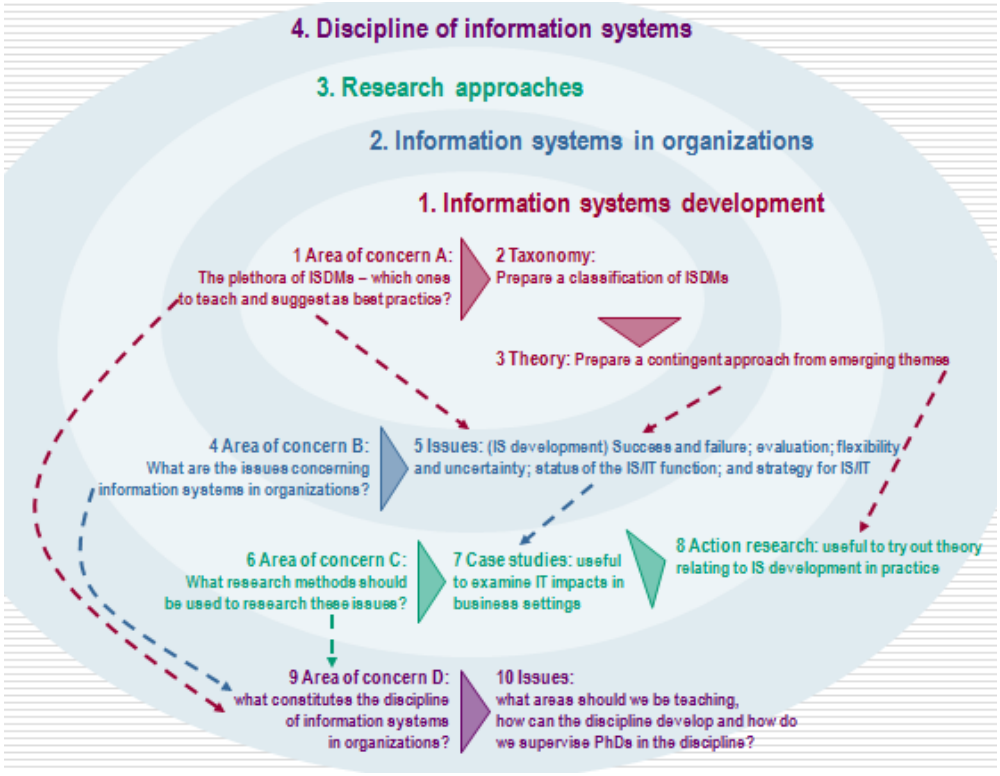

Figure 7: A life in IS research

Observations on Business Intelligence research:

In preparation for this final part of my talk on business intelligence research, I asked several people in the field to send me a list of their top and/or most interesting research papers in the field. This included a list provided by Enas Al-Lozi Al-Debei, Nicolas Prat (my specialist colleague at ESSEC), and several research students. The lists obtained varied between 5 and 15 articles and included papers spanning the period from 1980 to the present day. It had some articles cited more than twice, and I concentrate on looking at these in my 'book of more than 30 readings'. It will not be a surprise from what I said earlier that this was a most interesting experience and I have learnt a great deal. I have picked over half of the papers from this long list to comment briefly on them from my non-expert's eye and in relation to what I discussed above.

I start with an early paper recommended to me by Pawar and Sharda (1997). What it does so convincingly is to show the value of business intelligence, quoting firms that use it, and its potential in using information on the Internet. One of the things we have not been good at in information systems more generally is convincing the outside world of our value and importance. We must never research just for ourselves but see its potential for others. The paper of Brohman et al. (2000) followed a case study approach also to look at the potential value of business intelligence, in particular, data warehousing. Fifteen semi-structured interviews in six Canadian organizations were carried out. The short paper of Dobbs et al. (2002) develops this direction further through one case study which describes an example of a successful implementation of a business intelligence solution that supports customer relationship management for a retailer. Such use of business intelligence has become more and more important in the ten years since that was originally published. Research into business intelligence in different sectors, not necessarily profit-making organizations, is also valuable. For example, Spil et al. (2002) discuss the use of business intelligence tools in four organizations in the health sector, again using the case study approach.

Hannula and Pirttimaki (2003) carried out an empirical study of 50 Finnish companies in their study. In fact they achieved this through telephone interviews. You may ask yourself whether a conventional questionnaire survey might have been more appropriate. What might have been different in the results? The telephone survey does enable follow-up questions based on an earlier response. On the other hand, it is not as deep as that which could be achieved from a conventional interview. Again, however, the latter is time consuming for both the researcher and researched. It is also becoming more difficult for researchers to gain access to companies, particularly in a project that may be carried out over a long period.

I wish to repeat that I am very comfortable with research being carried out with any research method, if appropriate for the question being asked by the researcher. Sometimes researchers follow a mixed approach. For example, the research may start using a survey questionnaire. This gives general trends and so on. But this may be followed up with one or more cases if the original survey exposed certain issues that might be explored in more depth. The opposite sequence might also be appropriate. A case study of one company might reveal an unexpected result, and the researcher follows this up with a questionnaire survey of many companies to see if this occurs more generally or not.

The papers of Pant and Menczer (2003) and Bernstein et al. (2004) use a more mathematical (formal) way of treating the topic. The former provides algorithms to measure the performance of four web crawlers and the latter looks at algorithms that assess the similarity of complex objects. In both these cases, the research method seems to me entirely appropriate to the topic investigated. I cannot see any reason to use qualitative research here! That may come later as we may use qualitative research to assess the user interfaces, to give one example. Chung et al. (2005) is a particularly good example of business intelligence research based on algorithms and readers like me can immediately see the potential value as the authors address the question of information overload in this context and they offer practical suggestions to search engine developers.

Negash (2004) is more a survey article of business intelligence papers but identifies those research avenues left unexplored (at least in 2004). Although sometimes criticized as not being 'proper research', such articles can be very useful to other researchers and can get large numbers of citations if done well (as I as one of the editors of the Information Systems Journal can testify!) Another reflection based from my years editing a journal relates to 'hot topics'. Remember that 'hot topics' cool down and that is when we receive a lot of papers on the same well-worn path. My advice is to research what you are passionate about and enjoy, and that is not necessarily the same as what everyone else is doing.

Interestingly in the context of the BIKE conference, Herschel and Jones (2005) show how its two constituents 'knowledge management' and 'business intelligence' can be related. In my brief review of research in this area, I have concentrated on business intelligence and indeed, if anything, have treated them as one research area. Watson and Wixom (2007) provide a later review of 'the current state of business intelligence' and the 2008 literature review of Jourdan et al. (2008) comments albeit briefly on 167 articles.

The later paper of Sircar (2009) proposes a business intelligence curriculum for business students. This paper can be downloaded free by AIS members (as can papers from leading journals, including MIS Quarterly) and there are a large number of conference proceedings on the site as well. These are otherwise very difficult to find even on the web. Of course curricula for computer science students will be very different compared to the business school one proposed here.

By virtue of it being published in MIS Quarterly means that the paper by Clark et al. (2007) commands our attention and respect. We are all victims and potential gainers of this elitist society (and our academic society is no less governed by prejudice and snobbery)! (At the time of writing I have two papers being reviewed by MIS Quarterly and by the time of the conference I may be able to say how much I appreciate or hate the system and how good or bad it is). I would expect everyone in the audience to know the paper of Clark et al. (2007), so I will not comment further on this.

By virtue of it being published in Communications of the ACM, Chaudhuri et al. (2011) will probably mean that it will reach the largest audience of the papers I have referred to. I have written many papers on action research, but by far the most referred to was published in Communications of the ACM (Avison et al. 1999), despite the fact that it was probably one of the most superficial and shortest. We as researchers need to think of impact and relevance of the paper (and that it is also interesting to the general educated reader) as well as rigor!

For me, the paper of Pinnington et al. (2007) is particularly interesting as in their case study they challenge the wisdom of technological determinism (that improved technology will lead to favorable outcomes) and address questions relating to empowerment, training, usage and other political and social issues. What I particularly liked about the paper is the authors' frequent use of citations from the interviews. The reader gets a real sense of the research questions in the context of the particular company looked at. It brings out the potential of doing this type of research.

Another paper that I liked is that of Petrini and Pozzebon (2009). This uses grounded theory (Glaser and Strauss 1967; Strauss and Corbin 1998) as the research approach. In grounded theory you are starting from scratch, without any prejudice, to see what emerges from analysis of the data. Although I see many grounded theory papers as editor of the Information Systems Journal, this is the first one that I have found in the business intelligence arena.

One of the contributions you can make is to use a different research approach to look at things many others are looking at. Effectively it was what I did when using action research in the 1980s. Few others were doing this at that time. It helped my career later, if not then (as my early failures applying for

university professorships will testify!) I also like this paper of Petrini and Pozzebon (2009) because it looks at the topic with an ethical lens. In fact it looks at sustainability in the context of business intelligence. I think the ethical dimension of what we do in research, as in everything else, should always be in the forefront.

Reflecting more generally on this review of research in business intelligence, I note the wide range of journals and conferences where these papers are published spanning the business, computer science, planning and systems sciences areas (as well as knowledge management explicitly), along with a majority being directed at the information systems community at large. I like this multi-disciplinary aspect and it falls in with my own views, but not with, for example, Benbasat and Zmud (2003). There are a number of interesting papers in King and Lyytinen (2006) on this topic. On this note of affinity with Business Intelligence I conclude my discussion.

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