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REFLECTION, PRAGMATISM, CONCEPTS AND INTUITION

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ABSTRACT

While there have been many calls to use reflection in information systems (IS) research, the intent of those who linked the word to inquiry, the pragmatists, seems to be unclear. They suggested that sensory inputs (experiences) are reflected off specific concepts, either intuitively or explicitly. This paper argues that it may help to distinguish two types of reflection, 'intuitive reflection' and 'concept reflection'. The former involves reflection without an explicit and formal process of selecting and considering the concept (idea, stance) that is to be used to reflect on a past sensory experience. Explicit concept reflection involves selecting a specific concept against which to reflect. The reflection literature is revisited using this distinction. Without a clearer understanding of the pragmatic stance on thinking as re-viewing, the useful pluralist and emancipatory implications of using reflection are in danger of being missed.

THE PROBLEM STATEMENT

Numerous researchers call for reflection (Reynolds 1998; Kember et al 1999; Bjerknes 1992; Mathiassen and Puroo 2002) without making clear what is to be reflected against what. Are we to reflect our sensory input against an ideal or are we to reflect against various conceptions of the world? The latter is very much the pragmatic intent when advocating reflection. This specific meaning of reflection is often not made clear, which means the powerful pragmatic inquiry method is not being fully exploited. This paper aims to re-emphasise the pragmatic intent and use this to revisit the reflection literature. It will do this

by distinguishing between intuitive reflection and the explicit use of well defined concepts.

INTUITIVE AND EXPLICIT CONCEPTS

The pragmatist who wrote the most about reflection is Dewey (1910). He specifically argues that thinking starts with the reflection of sensory inputs (experiences) against some concept (ualisation); a comparison. Rigorous thinking starts with the reflection of sensory inputs against explicit concepts, self-consciously selected. Reflective thinking suggests a sequence of:

- The need to make a choice, and the selection of one option.

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- Recollection of experiences related to that option. These experiences are sensory inputs from past events, actions, or advice.
- Comparison of those experiences (intuitively or explicitly) against some concept.
- Consideration of the consequences of that option as highlighted by the particular concept used.

One of Dewey's examples involves choosing whether to take the train, bus or taxi to get to an appointment across town. He thinks of one option, say, the train, and selects the concept of 'timeliness' (arriving on time). He then reflects one against the other to highlight the consequences (logical sequence of events) of the option of taking the train. If that option is problematic he then goes through the sequence again with another option, say taking the bus. Interestingly, Polya, in his famous 'How To Solve It' (1945), suggests the same problem solving method. When stuck on a maths problem, look for concepts used to provide solutions to previous problems to see if any are useful with the new problem.

Notice there are at least two important elements of this pragmatic act that need to be mentioned in this paper. The first is having some experience, be it from everyday work or from a controlled experiment. The second is reflecting against a particular concept, intuitively or in an explicit self-conscious manner. Pierce (1878) seems to argue there will be one best concept through which to reflect, but James (1907/1910) opens up the idea that the reflection will be more informative if a comparison were made with a range of concepts rather than just seeking one ideal. Using Dewey's example of thinking about transport to get across town, past experiences might have been reflected upon using concepts like comfort, speed, fun, novelty or environmentally friendly. These concepts will suggest different choices of transport to get to his appointment.

Dewey has obviously had an impact on information systems through his influence on Herbert Simon's and Donald Schon's work. However, his specific use of the term 'reflection' to explain thinking may have been underestimated because it would appear that we can think without using explicit concepts against which to reflect. For example, we

CONTRIBUTION

The contribution this paper makes to the IS community includes:

- Providing a review of the reflection literature.
- Reiterating the pragmatic intent when using the word 'reflection'. Given the pragmatics were one of the main proponents of reflection, this seems appropriate.
- Assisting those undertaking action research to ensure their reflection uses an explicit concept.
- Providing supporting evidence to the argument that the classification of reflection into 'intuitive' and 'explicit use of concepts' is useful.

would appear to be able to think about, reflect on, a recent project without needing to first think about some concept to reflect against. Dewey's response would be that this is wrong. We intuitively use concepts (or parts thereof) to reflect off when thinking; even though we may not be aware we are doing it. In the case of Dewey's transport problem he may have 'intuitively' chosen the concept of 'timeliness' over status, comfort or environmental responsibility. The rigorous thinker is aware of which concepts he or she is using to reflect.

Intuitive concepts are thought to be similar to schemas, patterns, mental models, or automatic thinking as discussed in the psychological literature (Allport 1954) and perhaps like a priori as discussed in the philosophical literature. This subconscious application of a concept is thought to be so practised, that we do it without being aware. However, it is thought possible to make one aware of one's subconscious choice. Our concerns, such as food, status, safety and friendship, may well provide some *intuitive* concepts. Others can be explicitly learnt like 'environmentally-friendly', morality or 'project-management'. Language allows us to be encouraged to use alternative concepts.

As an exercise, may we ask you to reflect on 'organisations'. Intuitively you might think about the experience of your present place of employment and reflect on it using concepts of 'status', 'power' or

'change'. Morgan, in 'Images Of Organization' (1986), used a range of explicit concepts that he, Pepper (1942) and Lakoff (1993) call conceptual metaphors. These include reflecting on organisations through the concepts of 'machinery', 'adaptive organism', 'systems' and others. Their argument is that using these explicit concepts to reflect opens many more ideas about organisations. The wider management literature has used many other concepts such as core competency, competitive advantage, irony and strategy, to reflect on organisations.

Importantly, pragmatic reflection has a particular understanding of how decisions are made (Dewey 1910, chp.6) which differs significantly from that which might be called the 'traditional' one associated with Herbert Simon (Newell and Simon 1972; Metcalfe 2005; Gilbert 1991). The traditional one being that we observe a problem, remain neutral while collecting evidence in support of numerous alternative solutions and then we choose a solution. This would suggest for explicit concepts reflection, the task becomes one of appreciating a problem and then thinking about it using a range of different concepts until a useful one is found and using that to make a choice. Rather, Dewey's reflective thinking means that, when we encounter a problem, our intuitive concepts will immediately suggest a solution. For example, when told users are not happy with a particular application, the intuitive concept of user training may be enacted and the intuitive solution generated of increased user training. Rigorous reflection then becomes one of using a range of explicit concepts to reflect on this intuitive solution. If this intuitive solution becomes untenable, then another intuitive solution will need to take its place and then the explicit concepts reflection process starts again. This pragmatic approach to decision making therefore makes maximum use of participants' past experiences as these generate the intuitive solutions.

To emphasise the distinctive approach of reflection in pragmatism, it may be useful to compare it to the alternative of Aristotle's Causes. He suggests the system of questions which some readers will associate with Kipling's six serving men (Hookins 2005).

Cause of the Act

- (a) Why did it happen?
- (b) What (instruments) made it happen?
- (c) Who made it happen?
- (d) With what instruments?

Circumstances of the Act

- (e) When did it happen?
- (f) Where did it happen?
- (g) How did it happen, in what manner?

Result of the Act

- (h) What Happened?

These are picked up in the modern reflection literature by Mezirow (1991). He reduces them down to three groupings which he renames as content reflection (what we did), process reflection (how we did it and how well we did it) and premise reflection (why we did it and the consequences).

It could be said that Aristotle's questions are calling for reflection. However, there is a significant difference in emphasis compared to Dewey's point about reflecting off concepts. For example when asking 'What happened', there is no suggestion of what concept might be used to think about this question. So using the example of the failure of the various Ambulance emergency services computerised systems (Flowers 1996), to ask the ambulance drivers what happen will get a different answer from asking the patients, the hospital administrators and the IT developers who will give intuitive reflections perhaps based on their professional training. Each different answer may well be 'true' in its own right. Further, setting up a research project asking the same question using the concepts of leadership, systems evaluation, criminal activity and compassion will get different responses again. The same is true of all Aristotle's questions. A pragmatist when asked, "What happened?" should respond, "I have an intuitive response (reflection) to that question but what concepts do you want me to use to reflect further?"

ALTERNATIVE CLASSIFICATIONS OF REFLECTION

It is being suggested here that it is useful to distinguish intuitive from explicit concept reflection to underline the pragmatic intent when calling for reflection. This includes Dewey's view of thinking where all

thinking involves reflection between our sensory input (experiences) and some concept. If the concept is not explicitly appreciated by the thinker then, if understanding takes place, an intuitive one from past experiences must have been provided by our brains. This seems to assume differing levels of reflective competence. Some people seem competent enough to select the concept against which they reflect, while others reflect against concepts unawares. This differing ability is assumed to exist only until people are made aware that they can select alternative concepts against which to reflect.

The human cognitive development researchers, like Piaget (1973) and Bateson (1973) have studied the development of our thinking skills during childhood. Their research, and other mentioned below, seems to suggest that intuitive reflection may be present in children but explicit concepts reflection comes later in life, taking some years and effort to develop.

The ability to see some event from someone else's view apparently does not start until aged about seven or eight years. Arguably, this means the ability to use a range of concepts through which to reflect takes much longer for our brain to achieve. The necessity to lecture on double loop learning in University courses, and the observation of a lack of explicit concepts reflection in some middle aged people, support the argument that concepts reflection not only needs considerable cognitive skill, but it also needs explicit practice. Personal experience of undergraduates' responses when asked to compare how different professions might respond to a complex social problem reinforced this. The same is true of getting undergraduates to apply Morgan's organisation metaphors to case studies. It can take some students a while to confine their reflections to one metaphor. An even more testing example comes from the experience of using the 'random word' brainstorming technique. With this, people are given a random word and asked to use it to reflect on some problem. For example, someone could be asked to use the randomly generated word 'elephant' to reflect on the problem of designing an information system. Elephants in the context of IT make me think of long memory, cumbersome, family protection of

the young, evaluation by being approached by numerous 'blind' people, destroying environments and being able to communicate over long distances outside the human audible range. The concept 'elephant' does seem to encourage a particular reflective stance.

King and Kitchener (1994) seem to provide support for the intuitive/explicit pragmatic divide being argued for in this paper. They talk in terms of cognitive competence providing three main stages which they call

- pre-reflective,
- quasi-reflective and
- reflective judgement.

The quasi reflective stage would appear to be thinking that includes being able to see something from other people's point of view, to use metaphors and methods like random word brainstorming. The latter, reflective judgement stage, is the ability to use explicitly a series of different concepts to interpret the same world events. While many people may achieve this final stage, there is expected to be a considerable range in people's skills to perform these mental tasks. While lining up with the intent of pragmatic reflection, it does not emphasise the idea that a mentally developed person will be reflecting off concepts (even if only intuitively).

Hatton and Smith (1995) contend that there are five developmental classifications of reflection, technical, descriptive, dialogic and critical, each with its own purpose and characteristics.

Smyth (1986) describes *technical reflection* as being:

characterised by the application or implementation of existing knowledge to the attainment of given ends. This is reflection of a technical-rational kind that culminates in instrumental action. (p. 18)

It does not examine the social context, in fact, it takes the context for granted (Kemmis 1985). Technical reflection involves auditing the existing competencies and skills to assess their adequacy, in efficient completion of a given task using a set of given criteria for success. Hatton and Smith (1995) maintain that technical reflection is a crucial aspect for young professionals' development and foundation for other forms of reflection.

Recognition that there are alternative (re)actions or paths possible to achieve some goal, and being able to justify the choice of one constitutes *descriptive reflection* (Hatton and Smith 1995). It is called 'describing' because of the ability to describe the process of deciding which action to take. Hatton and Smith (1995) report that descriptive reflection is often used by individuals to describe the context of the situation and the reasons, based on personal judgement, for taking that action. It is then used to build the next form of reflection.

Dialogic reflection involves retrospective analysis of a situation or action, comparing the action taken with available alternatives and viewing the action from different frames. Pee et al (2002, p. 578) describe it as 'a form of discourse with one's self, mulling over reasons and exploring alternatives.' Hatton and Smith (1995, pp. 49) assert that 'such reflection is analytical or/and integrative of factors and perspectives and may recognise inconsistencies in attempting to provide rationales and critique'.

Critical reflection 'involves an analysis of power and control and an examination of the taken-for-granted within which the task of problem is situated' (Reynolds 1998). Critical reflection, considered the highest form of reflection (Hatton and Smith 1995; Stein 2000; Knight 1996; Raelin 2001), requires recognition of events through cultural, social, political and historical frames. Hatton and Smith (1995, pp. 35) describe critical reflection as:

involving moral and ethical criteria, making judgements about whether professional activity is equitable, just and respectful of persons or not. In addition, critical reflection locates any analysis of personal action within wider socio-historical and politico-cultural contexts.

From the intent of pragmatic reflection, Hatton and Smith (1995) appear to be suggesting a development through the concepts being used to reflect. At first the concepts come from life's social experiences from our families and friends particularly when growing up. Fairness and compassion are examples. Then some concepts are provided from scientific or professional education like measurement, efficiency and

leadership. Then, in adult life, other concepts are appreciated like justice, equity, respect, loyalty and democracy. Exactly what order concepts become available to our minds would seem to depend on our upbringing and interest in engaging with the concerns of people different from ourselves.

Mezirow (1991) points out that the nature of critical reflection requires there to be a 'hiatus' during which the analysis of one's intuitive concepts takes place. Brookfield (1990) explains critical reflection is comprised of three stages: firstly, identification of one's intuitive concepts; secondly, examination of those for validity and accuracy; and thirdly, reforming the concepts, taking into account issues highlighted in the scrutiny.

Reynolds (1998, pp. 189) asserts that critical reflection has the following characteristics that differentiate it from the other forms of reflection:

- It is concerned with questioning intuitive concepts... a process of making evaluations, often moral ones, and not simply using concepts of a practical, or technical nature.
- Its focus is social rather than individual... the socially situated nature of intuitive concepts must be taken into account for reflection to have any meaning.
- It pays particular attention to the concept of 'power'. Perhaps the most notable distinction of critical reflection is in terms of the attention paid to questioning relations between power and knowledge and the way even a person's intuitive concepts is inevitably influenced by their position in hierarchies of power and privilege.
- It is concerned with the emancipation concept.

King and Kitchener (1994) argue that critical reflection is similar to, but not the same as, reflective judgment. They maintain that critical reflection requires a set of skills that can be learned from a limited set concepts such as power, ethics or emancipation, whereas reflective judgment requires creative development of a range of alternative and relevant concepts. They suggest it is necessary to work through the other stages of reflection before the concepts required for reflective judgment can be appreciated.

Although Stein (2000, pp. 1) claims that adults can learn to reflect using critical concepts if they are taught the processes: 'assumption analysis, contextual awareness, imaginative speculation and reflective scepticism', he concurs with Hatton and Smith (1995) that the incidence of critical reflection in students in their studies and studies of others is very rare. Hatton and Smith (1995) found that, despite the methods used to promote the critical concepts, the majority of students remain using technical concepts. Techniques such as action research projects and journal writing, incorporating questions to trigger thought processes, have been proven to be successful in facilitating the explicit use of these technical and other non critical concepts for reflection (Hatton and Smith 1994; Mathiassen and Puroo 2002). However, they argue that specialised skills in the educator and non-traditional educational processes are required if critical concepts are to be used with ease.

Reflection on all levels is recognised as a learning concept. Critical reflection, with its focus on cultural, political and historical concepts, is considered essential to any information systems education to encourage developers to adopt inclusive, ethical work practices (Reynolds 1998; Hatton and Smith 1995). However, the pragmatic intent does more than encourage use of critical concepts. It includes making people aware they can use alternative concepts to appreciate alternative truths. In this way they can improve the choices and so improve their lives. For example, the concept of 'systems' enlightened problem solvers locked into the 'cause and effect' concept.

REFLECTION AND DOUBLE LOOP LEARNING

The distinction between intuitive and explicit concepts reflection was made to overcome the feeling that reflection could be undertaken without using a concept against which to reflect. This clarification can now be used to re-interpret the double loop learning literature (Argyris and Schon 1996) to provide further explanation both of double loop learning and the pragmatic intent of reflection as always being against concepts.

Mention of reflection to most readers will bring up thoughts of single-loop and double-loop learning (Jepsen, Mathiassen et al. 1989; Knight 1996; Brockbank and McGill 1998; Williamson and Iliopoulos 2001; Mathiassen 2002; Mathiassen and Puroo 2002; McGill and Brockbank, 2004). So what is the relationship between these and the previously discussed intuitive and concepts reflection? It is thought that single loop reflection maps onto intuitive reflection. For example, Argyris and Schon, (1996) report single-loop reflection in the management context to mean evaluating past experiences only in terms of increased efficiency to reach a short term profit objective. Management training makes consideration of efficiency and effectiveness intuitive in managers. Another example draws on Knight's (1996) explanation of single loop reflection using the question 'are we doing things right?'. If this is answered with no discussion about what is meant by 'right' then only single loop reflection is occurring. Again it is thought that answering without asking what is meant by 'right' would be an intuitive answer, using the intuitive concepts of the respondent. Dooley (1999) uses the example of a buggy whip manufacturer in the early 21st century improving his processes in order to make finer buggy whips. Single loop reflection is when the manufacturer does not look beyond his immediate task to take into account the strategic changes occurring in transport. After many years making whips, he does not think through the concept of strategic change, but rather uses only the intuitive reflection of whip design efficiencies. Brockbank and McGill (1998) describe single-loop reflection in the context of higher education where perhaps single loop is like trade school training rather than the critical thinking required in a university course. Trade school is expected to teach the students to reflect intuitively on efficiency and effectiveness, while a critical education is expected to get students to question which concepts they are thinking through.

There is a place for intuitive or single loop reflection. Knight (1996) argues that on occasions there is use for this type of reflection because of a need for 'developing and improving the realisation of relatively fixed goals and objectives' (Knight 1996, pp. 13). Courtney et al (1998) describe single loop as low-level reflection as it involves only keeping

to a set of rules and is simply error correction, but it is still viewed as valuable for day-to-day activities and is necessary for progress to be made within the established frameworks (Brockbank and McGill 1998).

Double loop reflection is described by Argyris and Schon (1996) and Courtney et al. (1998) as a different type of reflection from single-loop. It incorporates the first loop with a second loop. In the language of this paper, this second loop centres on the evaluation of an experience using explicit and varied concepts. It recognises that evaluation of past actions and the resulting consequences identified through intuitive concepts alone may not be valid or extensive enough. Above in Dewey's transport example, double loop reflection involved explicitly identifying concepts like 'comfort' and the 'environment' and using these to evaluate the transport alternatives. Using Flood and Romm's (1996) questions, double-loop learning would ask, 'Are we doing things right AND are we doing the right things'. This paper is arguing that, in order to answer the second question, we need to reflect through a variety of different concepts. Mathiasen and Puro (2002) emphasise that double-loop reflection questions assumptions and values. Mezirow (1991) and Weber (2003) maintain that double loop reflection necessitates taking into account one's assumptions, biases and political influences when considering current beliefs and being prepared to challenge them, thereby being in a position to critique or evaluate with an open mind. Both of these also suggest the need for a range of concepts to highlight the assumption inherent in any one concept. The example of double-loop learning that Dooley (1999) gives is the occasion in the 1980s when Royal Dutch Shell delayed its intuitive plans for the acquisition of new oil fields when it foresaw the drop in oil prices and the demise of the Soviet Union. Scenario planning can be seen as an explicit exercise in shifting intuitive concepts to alternative explicit ones.

Double loop learning would seem to suggest 'standing outside of yourself', or seeing the common place in a new light (Brockbank and McGill 1998). Using explicit concepts seems an obvious way of doing this systematically. Examples of explicit frames include the environment, global forces, and ethics. Put another way, we can switch from

single loop to double loop by setting up a series of concepts through which to reflect. The first move from professional training to critical education may be to know when and how to activate this switch from intuitive to concepts reflection or from single to double loop learning.

So, in summation, it appears that single and double loop reflection can be better explained by referring back to its pragmatic roots and the distinction between intuitive vs concepts reflection. The advantage of doing so is to be clearer about distinguishing the two loops which, given the number of translations from Argyris and Schon's original, suggests still causes problems with practitioners. Further, using the intuitive vs concepts language ties this reflection literature in with the pluralist and multiple perspective epistemologies and it also re-emphasises one of the principal intent of pragmatism, that of emancipating people world through useful concepts.

REFLECTION IN OR ON ACTION

At the start of this paper, it was suggested that there is a passage of time after a sensory experience before reflection and meaning is assigned. This passage of time may be a millisecond or many years. Intuitive reflection suggests a very small time period between the sensory experience (action) and the reflection to interpret the sensory input. It can be easily seen how evolution would select for this. There would be an advantage in being able to make a quick response to the sensory input of a predator. The threat would need to be very quickly reflected upon using the concept of predator. When there was some doubt, it would be better to use the predator concept intuitively, as the default. Reflection using explicit concepts seems like a luxury afforded only to those who can take some time over reflections. The reflection literature has long discussed this issue of timing, mentioning two or perhaps three different time bands. The mainstream thought is that there are two main time bands (eg. Schon 1995) called reflection-in-action and reflection-on-action. A third, prior, time band has been mentioned.

Reflection-in-action is when reflecting and action take place almost simultaneously. Raelin (2001) calls it contemporaneous reflection. Hatton and Smith (1995) and Lee

and Sabatino (1998) suggest this short time of reflection, which requires the practitioner to draw on their knowledge almost simultaneously while executing the action, as difficult if anything but intuitive reflection is to be used. Schon (1995) suggests that reflection-in-action is scheduled into work practices so that it is almost routine and taking place alongside the work experience. It is unstructured, spontaneous reflection that takes place in real time. It is analogous to tacit knowledge, and single loop learning.

However, when an unusual, unexpected or complex situation takes place, almost by definition, intuitive reflection no longer suffices; there is need to recognise the switch to using explicit concepts reflection, or reflection-on-action as Schon calls it. This necessarily comes distinctively after the action (Schon 1995; Mathiassen and Puroo 2002). Smyth (1986) argues that technical reflection, which involves evaluation of the adequacy of skills and capabilities used for a particular task, usually takes place immediately after the event when the consequences are known; higher levels of reflection take place later. Smith and Lovat (1995) advise continuing reflection over a prolonged period of time after the action to ensure alternatives to the action taken are fully investigated.

Reflection-on-action is often structured where actors are 'coached' through a series of activities (Seibert 1999) and learning and reflection are influenced by peers, supervisors or educators so that it 'takes on a social dimension' (Jarvinen et al. 2001, p. 288). Mezirow (1991, pp. 13) explains that this reflection requires a 'hiatus' between action and reflection 'to reassess one's meaning perspectives and, if necessary, to transform them.' It is easy to see how concepts reflections, perhaps using innovative concepts, could be systematically applied as reflection-on-action.

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Raelin (2001, pp. 19) argues for *anticipatory* reflection which occurs prior to the experience. This is analogous to reflecting on the future. Dahlborn and Mathiassen (1995) and Mathiassen (2002) seem to support this by calling for reflection coming before the action of developing a new human activity system. However, our reading of James (1907/1910) and Dewey (1910) is that it is impossible to reflect on something that has not been a past sensory experience. What will occur is the mind will assume a past sensory experience which is analogous to the future project and reflect on what it knows. This is reminiscent of the old adage that planning can only ever be like driving a car by looking through the mirror; trying to interpret the past so as to guess at the future. Reflecting on how analogous past projects are likely to be with the future, hopefully using a range of alternative concepts, does however seem useful.

SUMMATION

This paper has argued for the pragmatic intent of reflection. Pragmatism popularised reflection, but it has its own epistemology and ideology. This seems to have been repressed in much of the literature on reflection resulting in an exclusion of the pluralist dimension of reflecting so central to pragmatism. What is reflected off alters what is seen. Developing reflection skills becomes a matter of developing innovative concepts against which to reflect. Useful being defined as opening up alternative actions for people to take to improve their lives. For systems developers this means looking for concepts like systems thinking, critical social theory, e-commerce, knowledge management, self-organisation and mobility to think about the action of designing of useful information systems.

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