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Concern Solving Not Problem Solving

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Abstract

The object of this study is problem solving. The authors believe that considerable advantage can be gained from designers talking about clients' concerns, rather than their problems. Using Mitroff and Linstone's (1993) division of the knowing world into objective, subject and personal, the authors are suggesting need for a more personal perspective. Further, their and Checkland's [1999] call for perspectives thinking can be used to very usefully separate the problem into object-like and subjective-like elements. The thing being studied is separated from the client's concerns about that thing (treated as an object). The evidence to support this conclusion includes the multiple perspectives literature, and the first author's many years of experiences in problem solving both is IS and in research design. A simple graphical tool is presented that the author has found useful to assist group discussion about separating the object under consideration from the client's concerns.

Keywords

Information Systems Development; Management; Problem Solving

> *"Some make the deep seated error of considering the physical conditions of a country as the most important for its inhabitants; whereas it cannot, I think, be disputed that the nature of the other inhabitants with which each has to compare is generally a far more important element of success"*
>
> *(Charles Darwin, On the Origin of Species, 1859)*

INTRODUCTION

Mitroff and Linstone (1993) divide the knowing world into objective, subjective and personal. To talk of 'problem' solving presents an 'object' only perspective on problems. This suggests that the 'problem' should be solved as if it were a physical thing, out there separate from people. Solutions then involve mathematics, measurements, one correct solution all will agree upon. The subjective side of the problem, the fact that there needs to be a human present for a problem to exist is ignored. However, this paper is not suggesting that 'problem' solving be seen as a totally subjective exercise whereby 'problems' can be wished away. Rather that, in line with perspectives thinking, that a subject and objective separation exercise is undertaken. This introduces the subjective into an object world and more pragmatically helps with the identification of the client's concerns. This 'concerns solving' approach has been observed on many occasions to cause a genuine realignment of thinking towards the people involved and away from the technology. It focuses thinking on the disease not the symptoms; on listening, not informing.

This paper will argue for 'problem' solving in Information Systems to be thought of as 'concern solving' because this introduces the subjective. Apart from discussing 'concerns', the paper will provide a series of illustrations and a simple graphical method used to focus 'problem' solver on 'concern' solving.

Before starting it may be worth providing a simple example. Assume I say that I have a problem with the cup on my desk. If I focus on my concerns then the next question is, 'What is it about the cup that concerns you?' There are several perspectives or concerns I can now express. One maybe that its empty, another that it is leaking, another is in the wrong place. The cup can be treated as an object or thing and the subjective is introduced through my particular concern. This concern is very subjective because it is very much about me. If someone else said the cup was a problem, then typically it would be a very different 'problem'.

CONCERNS

Wilson (1983) defines concern as "a readiness to exert influence: a readiness to act". A failure to be able to act often heightens concern. Use of the word "concerns" does come up in the IS literature. Baskerville and Wood-Harper (1998) use it frequently in their explanation of research, in particular action research, as "Area of Concern". This, they argue, needs to be determined up-front in any investigative process. This fits in well with what is being argued here, in that a problem is defined by first noting people's (area of) concerns. Keen (2000)

also talks about exploring communities' concerns rather than "topics" when looking for research agenda. Dewey (as cited in Argyris & Schon, 1996) uses the term "doubts" as the driver for human inquiry. This must be a similar concept to concerns as must Habermas' cognitive interests (Ulrich, 1983).

Landry (1995) and Metcalfe and Powell (1995) argue that it is people's concerns (real interests) that people use to interpret the millions of messages they constantly receive from the environment. The authors believe that these 'concerns' are the primary lens for processing information. The idea being that, if you are concerned about something, then this 'determines' your priorities to these messages. For primal survival concerns, language is not paramount. Small children instinctively know to stay away from rows of sharp teeth. Concerns over being burnt can result from either touching a fire or from observing the panic-like actions of parents. More complex concerns, such as promotion at work, are socially constructed through dialogue.

Concerns can therefore be classified as from nature (instinctive) or nurture (communicated). Barnes and Bloor (1982) argue that humans not only have, like all species, instinctive concerns, but uniquely appear to have a concern anticipation and concern solving disposition. Humans do seem to have an environmental competitive advantage in our desire, supported by our language skills, to create and solve concerns of our own perception. For example, NASA scientists are mining for water (oxygen and hydrogen) on planets to allow the building of life support systems and for rocket fuel. Is there a problem here that "needs" to be solved? Extreme sports are another example, which involves solving the problem of how to get a safe thrill. However, if dealing with threats is seen as concern solving, the evolutionary advantage becomes clearer. Those humans who have avoided death by anticipating threats may have produced more off spring. Technological advancement itself can be seen as overcoming basic human concerns about controlling nature and food resources.

Wilson (1983) uses the term 'cognitive authority' to describe those people who influence our concerns. Influencing people's concerns may act to alter their information wants. Persuasion is really about altering people's concerns; a practice well versed in advertising. Managing an IS problem, from appreciation to solution, can be perceived as managing people's concerns. This will include appreciating those concerns, trying to clarify them, trying to satisfy them, and trying to alter them. Put another way, managers and specialists can act to alter the perceptions of those involved in the probem, which in turn affects their concerns, all of which makes 'peoples' problem solving' a communicative action.

The action research (eg Baskerville and Wood-Harper, 1998) which is based on the Soft Systems Methodology, strongly argues that project managers (and academic researchers) approach their 'inquiries' by first articulating their 'intellectual framework' (lens, conceptual scheme, filter, frame, world view, etc). This provides the 'lens' with which a system is being observed. While critical to good inquiry, this terminology is very hard for many managers to understand. Therefore, it has been found useful to use the word 'concerns' to assist in this process. Rather than ask, "With what conceptual scheme do you intend to study this system?" it has been more productive to ask, "What is it about the system that concerns you? From the answer it is possible to appreciate how the manager is 'seeing' the system. For example, if he or she says, "I am concerned about how the system aligns with the corporate purpose", then the lens with which the manager is seeing the system is 'alignment'.

Concern Resolution Loop

It is being argued that we are born with survival concerns. We learn others from our families, friends and tutors. Upon receiving an external message (stimuli) through the senses, such as the presence of someone or food, these concerns motivate our brains to make assertions (claims, decisions) from which we decide to try some action. In babies this action might cause a missed grab. In an IS manager it may be a successful click on a menu or the idea to build an ERP. This action may be just to move, to say something, or to build something. If the action is long enough, as in building something, then information will be sought to sustain that action. The action, regardless of whether it is successful or not, creates new knowledge (or perception) and will be followed by a period of reflection. The Argryis and Schon (1996) argument is that for complex tasks, this reflection should be explicit, sustained and collegiate to achieve maximum learning.

All stages of the concern resolution loop, when dealing with concerns, need information and are of interest to the IS manager. These include the management of concerns (cognitive authority), to the storage of any newly created knowledge through the provision of rapid and relevant information when a claim needs to be tested. The complex part of the concern resolution process, sketched out in Diagram 1, is appreciating the layers and iterations going on at the same time at macro and micro levels. It is so pervasive that it is hard to envision, but a person is going around this loop hundreds of times a day, sometimes dealing with trivia and sometimes working on an innovative complex task. Consider a simplified example: while designing a new piece of software, an IS manager may be talking through options at a meeting and scratching her nose. In that sentence there are at least three iterations.

First, the nose scratching started with a sensory input of an itch. Concerned over the presence of a bug on her skin, the manager uses her memory to quickly come up with a possible action; she rubs her nose. Information from her fingertips suggests there is no bug. The rubbing worked, there was learning through action. No external information was required and a moments reflection saves the experience in her memory.

Second, assume at the meeting someone boldly states, "Lets take that section out of the program altogether". The manager's concerns make the thought (claim) jump into her mind that, if this is done, her group may be adversely affected. She thinks about it for a while (information from her memory), asks for a point of clarification (confirming information from outside), then agrees, maybe asking for it to be put in writing (creating explicit knowledge). The whole meeting agrees and the manager reflects, maybe even making a note, on who said what, and why. She thinks that more information should really have been called upon before the idea was verbalised, but it was a good solution, one she might use herself sometime, in some form or another in the future.
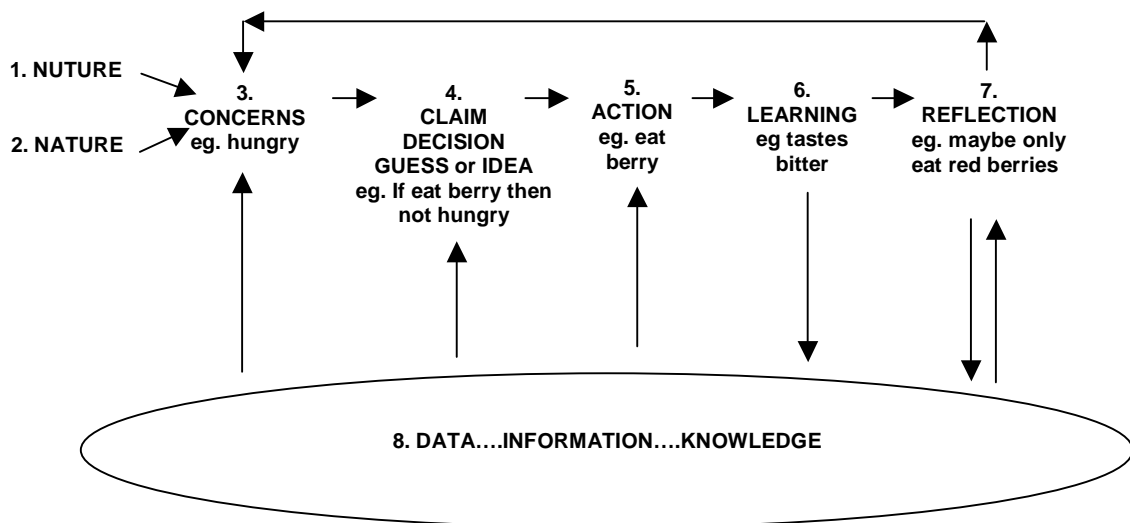

Diagram 1: Concern Resolution Loop

Third, the meeting mentioned above was part of the three monthly review of progress on a project the manager was working on. It involved designing a new piece of software. The project was the result of complaints about the old way of doing things. She had felt the need for something different. She started thinking about how best to do the changes, calling on some colleagues and reading the manual for a few suggestions. While not finished yet, she had learnt a lot and was reflecting on what she had learned and could be useful in the future.

In all three cases the manager is going through the 'concern resolution loop'. The main difference was the need for external information, beyond her memory, for the more complex tasks. The more complex the task, the more iterations were taken as the task was broken down into smaller concerns and 'claims'. Further, the more complex the task, the more formal the reflective process needed to become to reinforce the storage of memories.

The implication of the 'concern resolution loop' is that it alters the IS design process. Design, under this perspective, starts with finding out people's concerns, or in a hierarchical organisation, determining what they should be concerned about in return for their remuneration. Satisfactory solutions occur when the stakeholders say their concerns have (for now) been alleviated.

It is being suggested that communicative action, in response to people's concerns, creates knowledge and determines information needs. Some empirical evidence is presented below that shows how many organisational 'problems' are really 'people's concerns' problems. An attempt is then made to show how this determines information needs.

An Illustration

The opportunity arose to undertake a full time, two and half year study of "problem solving in an executive strategic management setting", when one of the authors was offered a job as adviser to the Deputy Premier of South Australia. The Minister was also the Treasurer, Minister for Mines and Energy, and the Minister for IT. It seemed an excellent chance to study problem solving.

The Minister's Office is made up of the Minister, his appointments secretary, a liaison officer to ensure the smooth and timely flow of paperwork, a 'Chief of Staff' in this case a ex-political journalist who was very much a political adviser, a media (or PR) adviser who was also an ex journalist, and the lead author who helped with 'commercial advice'. For example, the lead author's role included reading commercial contracts prior to the Minister signing them, informing the Minister of any delays or problems in the progress of projects, and interpreting the Minister's policy when public servants sought clarification to the progress of projects. In some cases this reached the point of joining the public servants as a negotiator on behalf of the Minister.

This work situation was unusual for organisational studies because it involved the policy function for large public service departments. The entire resources of the public service are at the Minister's control to turn his policy into practice. The Minister made use of all forms of knowledge: explicit, tacit, calculative, opinion, hearsay, experience, and scientific detail, to make large impact, complex decisions in a politically charged, hostile atmosphere. The lead author's job included identifying problems, from the Minister's perspective, and to solve them to the Minister's satisfaction, that is, to address his concerns.

Being a politician is very much about being in tune with peoples' concerns. As a manager of a totally social process, success was defined by those involved. This contrasts with purely engineering tasks where some outcomes can be demonstrated objectively enough. With 'political solutions' the Minister had to define success depending on whether those with influence over him felt it was a satisfactory outcome. Saying that politicians are concerned with other peoples' concerns is not being a bit utopian. What is being suggested is that their advancement depends on the feelings of a select group of people, typically the collective electorate, party members, or in case of a Minister, the Premier (Chief or Prime Minister). These 'colleagues' decide whether the MP has been successful. However, this may well be true for most, if not all, careers.

It is possible to underline the subjective view of problem solving by being a bit ironic about Vicker's appreciative systems. Vickers (1984) was referring to a manager's own appreciation of the world being altered, which is very much aligned with the concept of addressing 'concerns'. However, the Ministers dealt with in this study had a very acute sense that their role was to do things that *other people* appreciated. For example, the sale of public assets was not decided upon by following some pseudo-mathematical analysis. Rather, it was undertaken because the right people would be appreciative of the sale.

The first general observation about working in the office was the 'queen bee' nature of the job. The day was filled with meetings, and the evenings with signing off correspondence from the public service agencies. The Minister did not have a computer; those with computers used them to write speeches, letters or policy documents. There were no databases, no spreadsheets and no internet. Email, faxes, the telephone and yet more meetings filled the day. The job was about communication, in and out, not about calculations. Information came from experts' written or verbal reports. All discussions were aimed at minimising controversy and in addressing someone's concerns. If the Premier was concerned about something, that took priority. The Minister had concerns, as did the public, public servants and industry representatives.

Company representatives would arrange to meet with the Minister so they could outline their concerns or lack of them. Concerns had to be communicated and balanced. Stories carrying concerns were told by people claiming to represent large numbers of people. The more credible the story, which was rarely formally confirmed, and the greater number of people it claimed to involve, determined the priority given to the story. People's apparent accuracy, sincerity, past reputation and general level headedness was also important in making the stories have influence.

The Emergency Services Communications Problem

This is an example of the typical problem handled by the Minister's Office. The police, ambulance and fire brigade were looking to upgrade and integrate their communication systems to digital, for more reliable coverage and to carry a lot more traffic, such as graphics files. (That was the object under consideration). The State had a mishmash of different systems, managed by a range of public service departments, including fisheries and the utilities. It was an innovative IT project which had the risk of blowing its budget. Moreover, attempts in London and Melbourne had been a disaster with their new systems simply not being clever enough to replace human operators. The State had a recent history of IT project blow-outs and of emergency services communications failures leading to death.

The concerns involved were about value for money, whether integration would rob the smaller departments of their autonomy, about a failure during an emergency and about the Minister loosing financial control because of the technical nature twelf the project. In previous cases, one suspects public servants had received Cabinet permission for projects, knowing the budget estimates were too low, but relying on the Government becoming publically committed to a project that further requests for funds were reluctantly approved. As so many Government agencies and commercial consulting companies were involved, the task of keeping all parties

involved was massive. This included first create concerns about the complexity of this project in stakeholder's minds and then to work through solving them. The project did go to large cost blow-outs.

It would be hard to present this 'issue' as an objective reality or being about the technical issues. It was about the concerns of all stakeholders. The police were concerned with being in control of the project as well as there not being any 'incidents' that put the police at the scene in any unnecessary danger. As 'owner' of the project, the Minister was also concerned about financial liability. The other emergency services wanted coordination of services but did not want to come under the direction of police. A lot of knowledge was sought alternative designs, and the experience of those who operated similar systems elsewhere. Each side had their own numbers to support their arguments, none of which seemed to impress the other side. A lot was learnt about how all the agencies involved operated. Had the Minister's Office concentrated on the efficiency of effectiveness of the basic technical system then no real progress would have been made.

There were many such issues that the Minister's Office had to deal with everyday. It left the lead author thinking there were very few techniques of tools available to help with the ongoing complex task of appreciating the myriad of concerns.

CONCERN DEFINITION METHOD

In the example above, like all the many issues faced by the Office, calculative or analysis techniques, like spreadsheets, databases, budgeting, DCF, critical path analysis, market chain analysis or whatever, would have been meaningless. The primary managerial task was to get from, or communicate to, stakeholders a clear understanding of concerns. In some cases this was to make stakeholders concerned and in others to alleviate those concerns. There were endless meetings but some process was required to ensure these lead to an improved definition of concerns. There was no guarantee that talking lead to a convergent rather than divergent process. After some meetings there was more confusion than before the meeting.

As a result of the above, the first author developed a concerns definition method (technique, tool, process) which is outlined below. It has been used in over 70 'problem' definition exercises from research proposals, to web design through drafting of land title agreements, planning writing and student industry placement exercises. While very simple, or maybe because of that, the lead author has found it very useful. It is somewhat 'tacit' in that it is easier said than done, like many group concern solving methods. 'Statistical' testing of the method was thought to be trivial, as the aim is to make problem solver re-focus of the client's concerns rather than objectify the problem. Therefore it is more a linguistic device, like talking of concern solving, not an overly formalised method, more a guideline and the application of a series of questions. The unique feature of the method is that it focuses on the stakeholder's concerns and yet also keeps the object of those concerns 'in the picture' ie the method disaggregates the object being concerned about from the concern. It is something that should be used upfront with a problem and re-used in near endless iterations during the attempts at solution being recorded in a weekly 'concerns diary'.
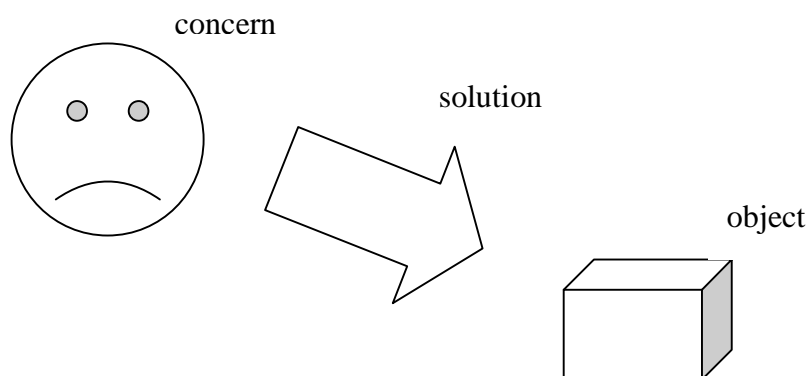

Diagram 2: The Concern/Object Diagram

Those familiar with Checkland and Scholes' (1999) FMA will recognise the Concerns/Object diagram as a derivation. The FMA is part of their soft systems toolbag, to be used to assist the "organised use of rational thought". The main change is the replacement of the Conceptual Frame (F) with the stakeholder's concerns. At one level this may be thought of as a semantic change. The authors believe that the stakeholders' concerns do determine their worldview or conceptual frame. Davidson (1994), a philosopher, argues that he cannot

understand what they are or how you can prove they exist. He feels it may simply be a linguistic device to articulate a perspective.

Given the argument that concerns can be explained from evolution theory and from social construction, it seems much more pragmatic to talk about a person's concerns driving their perceptions of an object. A person in front of an uncaged tiger sees the animal in terms of a physical threat. When watching tigers in front of the TV, the concern may be what is on the other channel or their extinction.

The three parts of the diagram are the Object under consideration, the stakeholder's Concerns, and the solution. Of course the process of solution can alter the object and/or the concern as solution means to address some concern about an object, then the perception of the object can change, as can the concern. Using a well-known example, assume a web developer has been asked to draft a report on how best to develop a web presence. The web developer may well start by seeing the object to be the web page, with the concern being the user's attention span. As he or she collects information about attention spans, it may become clear that the design can considerably alter the attention span, but a complex design could take a long time to load. So the object may shift to design complexity and the concern to the being load-time. This indicates that, as the project is undertaken, the Object and Concerns may change.

The purpose of the Concerns/Object diagram is to deconstruct the concern from the object on those concerns. In this sense it can be said to provide project or concern definition. Typically, and still using the website development as an example, the diagram is used by first asking, "What exactly is the "Object" under consideration?" Let's say the client's answer is "The website's content". This can be drawn up on a white board as the box with "website conten'' alongside. The next question that is asked is "What is it that "Concerns" you about this (website's content)?" Let's say the stakeholder's answer is "Consistency across all pages". This can then be written up on the white board next to the smiley-face. This was a simple case but with more complex ones there will be some debate about these two parts; they may switch, or change noticeably. The dialogue around this is very important not only so the stakeholder takes some ownership of the two parts but also to help clarify the two parts as separate entities.

The use of this separation to aid project formulation and hence concern definition is aligned with the Multiple Perspectives (whole) approach of Mitroff and Linstone (1993). It contains both objective (technical), subjective (organisational) and person perspectives. The language of the questions aligns with the interpretive approach and it acknowledges the presence of a possible objective physical world. This identification of concerns is considered the first step in seeking a solution. If a group is involved, then, apart from group discussion about the primary concern, methods such as rich pictures can be used to identify all the concerns. Again, in line with multiple perspectives thinking, it is assume there is a 'project sponsor' so the exercise is in making their concerns explicit having revealed the other stakeholders concerns. Space does not permit the further discussion of the important issue of group problem solving methods.

Concerns Diary

Importantly, it is necessary to build into any project a way of dealing with changes as the stakeholders learn and interact. The "What do you see now as the thing we should be focused upon (object)?" and "What is it now that concerns you?" questions will need to be constantly re-asked. Therefore, some form of tracking of these concerns needs to be done to provide a project-by-project meta-learning about project design. Moreover, it may also help stakeholders reflect on their thinking during a project as well as helping to ensure some important and unresolved concerns don't get forgotten in the confusion of the job.

The keeping of diaries has a long tradition, especially in the biological sciences. Electronic versions are being used to coordinate manufacturing processes and IS managers are reporting that they find them useful for reflection. However, most inexperienced designers are unclear about what to include in a diary. While the answer to this must be "Whatever feels relevant", this is still not very specific. Therefore it was found to be useful to use the 'concerns' concept - a diary of the participant's concerns, recorded at weekly or fortnightly intervals, with a few notes about what they intend to do about these concerns in the near future. The diary can be extended to include the 'anticipated' concerns of the other stakeholders, and what they are likely to do about these concerns. This not only encourages the participant to think of problems from the other stakeholders' perspective, but it can also identify how well the communication process works between stakeholders. If these diaries are recorded using some central electronic standardised format, post project analysis and thus some learning is possible.

CONCLUSION

This paper has argued that ISD will benefit from considering it to be about 'concern solving' rather than be distracted by the technology. This is more than semantics; it correctly refocuses problem solving on the client and stakeholders; it makes the subjective central. It personalises the knowledge collection away from the objective. The risks of curing the symptoms rather than the disease are reduced.

Some attempt was made to explain the rational and evolutionary arguments for replacing conceptual schemes or theory with concerns. A simplified example from an analysts meeting was presented, as was a case from the lead author's experiences on a large IT project. This confirmed his previous academic work that concerns are central to how people view the world, and therefore projects. Last, a very simple but useful pragmatic, learning method for disaggregating concern solving into separate parts was presented.

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