The Wicked Relationship Between Organisations and Information Technology

Gill Mallalieu, Clare Harvey and Colin Hardy
University of Sunderland

The concept of the “wicked problem” is useful in coming to terms with any studies, which involve people, organisations and information technology. It helps to define the shortcomings of traditional positivist approaches in areas which display social complexity. This paper describes how the relationship between an organisation’s business processes and its legacy IT systems is considered under the RAMESES project as a wicked problem. The way in which this conceptualisation has led the authors to adopt the grounded theory methodology is discussed. The particular, detailed method undertaken within this framework is outlined; some results presented and conclusions about the success of the approach are drawn.

The relationships between people, organisations and IT (information technology) present a complex range of factors to be disentangled. Our approach has been to find a way to conceptualise this complexity which would give us a way of defining our problem and formulating a solution. The concept of the “wicked problem” (Churchman, 1967) has been particularly helpful to us and is further described in Section 2. It provides a mechanism by which the relationship between people, organisations and IT can be unravelled. The concept of the “wicked problem” does not lead the researcher to attempt to reduce the problem to isolated variables, and a series of steps to be followed sequentially. Instead, it advocates a pragmatic oscillation between problem and solution, so that our understanding of each of them evolves concurrently.

The project in which this conceptualisation was tested out was the RAMESES project (further described in Section 3). The overall objective of this project is “to provide a strategic model for the risk assessment of legacy software systems within SMEs (Small-to-Medium Enterprises) considering business process change.” Thus the relationship between the organisation, the way its staff carried out its processes and their legacy IT systems was at the centre of our concerns.

In order to allow our problem definition and our solution to evolve together, we chose grounded theory (Strauss & Corbin, 1997) as our methodology and populated that with a method which helped us to focus on both the problem area and solutions at the same time. This paper describes how the broad conceptualisation of the problem led to a detailed method to address it and the results available to date.

The Problem of Organisations

Wicked Problems

The term wicked problem was used by Rittel and Webber (1984) in a design context and Budgen (1993) picked out the four characteristics most relevant to the process of software design. These are also those most relevant to the more general study of information systems in organisations and are as follows:

• There is no definitive formulation of a wicked problem. A wicked problem cannot be reduced to a series of steps that need to be followed in order to reach a solution. Any series of steps so designed will address only part of the problem. By following a series of steps one may not even arrive at a partial solution, the process may
actually make the problem worse.

- **Wicked problems have no stopping rule.** Wicked problems are dynamic. One may derive a solution, which appears to solve the problem at one point in time, but that solution will in itself affect the problem. People will react to the solution that they are given and the problem will evolve in new and unexpected ways. Often the scenario, which is nominally designated as the solution, is only acknowledged as such because time and/or money have run out on the problem. Concepts such as “structuration” (Giddens, 1984) are important for tackling wicked problems. They acknowledge that the way in which people interact with the structures within which they operate acts upon the structures themselves to change them.

- **Solutions to wicked problems are not true or false, but good or bad.** Because the way to tackle the problem is not reducible to a series of steps the solution will never be a neat fit. The notion of a good or bad solution has a subjective tenor to it. That is because it is subjective. A solution can only be evaluated in the light of what one wished to achieve, not in any absolute sense.

- **Every wicked problem can be considered to be a symptom of another problem.** Because of the interconnectedness of things, one’s investigation into a wicked problem might reveal deeper underlying causes, or simply other factors at the same level, which are embedded in different issues. What is a “good solution” to the problem must be judged entirely on the basis of what the researcher was expected and empowered to achieve, not on the basis of completeness or finality.

**‘Solving’ Wicked Problems**

Both Conklin & Weil (1998) and Budgen (1993) refer to the waterfall model of software design (Royce, 1970) as having some elements which are useful in the solution of wicked problems and some elements which are not. The fact that the waterfall model implies a simple progression from one stage to the next in the process of designing software is unrealistic in the case of wicked problems. It is highly unlikely that a wicked problem could be grasped or understood from the start in order to allow a simple progression to the design of a solution. Concessions to the complexity of real life (and to what Budgen (1993) calls “the wickedness of problems”) are the multiple feedback loops that move back up the waterfall. They introduce the notion of going back and reformulating the problem.

Conklin & Weil, (1998) describe the behaviour of designers in the MCC Elevator study. Their study showed that designers did not, in fact work in a linear progression from analysis of the problem to formulation of a solution. These processes were not two sequential stages, but were different activities between which the designer oscillated. Analysis was carried out in order to assess the feasibility of possible solutions. The solutions that were available to some extent guided the analysis that was possible.

In terms of the traditional waterfall model, this manner of oscillating between analysis and design might be considered at best pragmatic, and at worst disorganised. However, in light of the characteristics of wicked problems (described above), this is the only sensible approach. Therefore, a method that insisted that analysis be complete before work may start on the design of a solution would be doomed in the arena of wicked problems. Such a problem needs to be scoped in terms of the time and budget allowed for its solution, the kind of solution expected, and the subject or area which is to be addressed by the solution (e.g. communication, over-competitive behaviour, or competition culture). Therefore, the problem space will be determined by the solution space. In the words of Conklin & Weil (1998): “You don’t understand the problem until you have developed a solution.”

**Why organisations are wicked**

Organisations are “wicked” in a number of different ways. Positivist science tends to look at an area of study, identify variables, isolate them and study each in isolation, and then model the way in which these act together. In this way, hypotheses are accumulated and are articulated as a theory. In the study of organisations, it is possible to identify the variables that bear upon a particular situation, and often to have some feel for their relative importance, but to isolate them is not meaningful. To decontextualise a process or an operator in order to study them, is to take away their meaning or raison d’être. Positivist scientists feel that an experiment should be “controlled”: i.e. all extraneous factors should be removed, in order to better observe the working of the variable under study. By contrast, many interpretivists believe that there is no such thing as an extraneous factor. If you try to remove some of the factors that operate on a situation, then you are removing context and meaning. It can be seen then that any problem with a social element will ramify greatly (Shurville et al., 1997) thus making it wicked. Just as the interconnection of variables is endless, so are the implications of any change or posited solution.

If you isolate a variable, you remove it from its context. For instance, during the RAMESES project (see section 3), the authors have been studying the relationship between an organisation’s legacy systems and its business processes to see whether the fit was good or whether there were areas of risk. It is possible to isolate this relationship in the following way. One could model the way in which the process works according to the appropriate manager, and then using the same technique, show the way in which the software related to that business process works, and then compare the two mappings. This would allow an analysis of fit or lack of it, however many important factors have been excluded. Both managers and the staff who operate the computer system may have different expectations of it from those that it was designed to deliver. A study of the business process and the computer system as they operate will reveal a different pattern from the ideal ones modelled above. Such a study will reveal shortcuts, extra activities, and clever solutions to problems, even abuses. Both the way in which the business