

# Using Strategic Choice To Make Information Systems Decisions Quickly

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## ABSTRACT

This paper reports on an action research study that used the Strategic Choice method. The method was used to support the prioritisation of information systems with respect to enhancing these systems within a public sector Health Department. Such decisions are notoriously complex, fuzzy, time consuming and political for stakeholders. The results of this study indicate that the Strategic Choice method offers the potential to reduce time commitment for stakeholders yet do so in a satisfactory manner.

## INTRODUCTION

There are many occasions currently in which budget and constraints on personnel dictate that only a limited amount of development or systems enhancement is possible. This is becoming a more common problem as legacy systems and their ongoing need for maintenance continue to represent a growing proportion of an IT department's budget. In addition, the nature of the relationships between information systems is complex and often subtle in terms of their strategic contribution to the organisation. Worse still, there is no single methodological approach which has been recognised as ideal for making this kind of decision (Gregory 1995, Sikora et al. 1998), especially so when such decisions are often required to be made under severe time limitations.

The method used in this study was the Strategic Choice approach (Friend & Hickling 1987). The approach is empirical rather than intellectual and explicitly recognises some of the ways in which people, faced with complex decision problems in practice, cope with dilemmas at an intuitive level. It has been used in other decision domains (Stromberg & Khakee 1993, Friend 1989) but not in information systems selection. A particularly attractive feature of Strategic Choice was the potential for minimal involvement of the stakeholders and so an action research study was set up to examine this question. As a consequence, only three two-hour sessions involving five stakeholders were required to arrive at a decision.

The study was set up on typical action research lines (Wood-Harper 1985, Elden and Chisholm 1993). All participants were qualified in terms of their agreement to participate in the research (Winter 1998) and in terms of the nature of the problem focus (Cook 1998) and what their role would be within that. The paper proceeds as follows. The next section provides a brief overview of the Strategic Choice method. This is followed by a section describing what actually occurred in each of the three sessions as well as some further detail of the method. The paper closes with an evaluation of Strategic Choice in terms of the study's aims.

## THE STRATEGIC CHOICE METHODOLOGY

Strategic Choice is best described as a framework involving four complementary phases (or modes) of decision-making activity. The bubbles in figure 1 outline the steps in this study, and are adapted from Friend & Hickling (1987, p22). Researcher involvement is primarily facilitative, describing the process and assisting the workshop participants to work through all steps (modes).

In the **shaping** mode, decision-makers address concerns about the structure of the set of decision problems which they face. They may debate the way in which problems should be formulated and whether links exist between decision options. They may consider whether their current focus should be enlarged, or conversely broken down into more manageable parts.

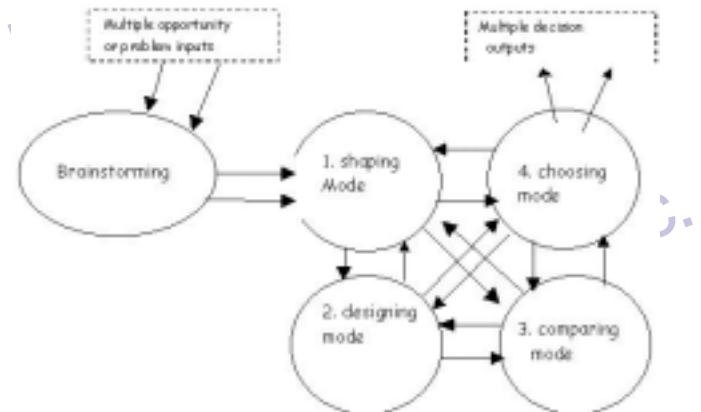
In the **designing** mode, decision-makers address concerns about what courses of action are possible in relation to their current view of

the problem shape. They may debate whether they have enough options in view, or whether design constraints of a technical or policy nature exist that restrict their ability to combine options to deal with different parts of the problem in a particular way.

In the **comparing** mode, decision-makers address concerns about the ways in which the consequences or other implications of different courses of action should be compared. Consequences based on economic, social and other criteria may be assessed.

In the **choosing** mode, decision-makers address concerns about incremental commitment to actions over time.

Figure 1: The strategic choice framework, after Friend and Hickling (1987)



## DESCRIPTION OF ACTION RESEARCH STUDY

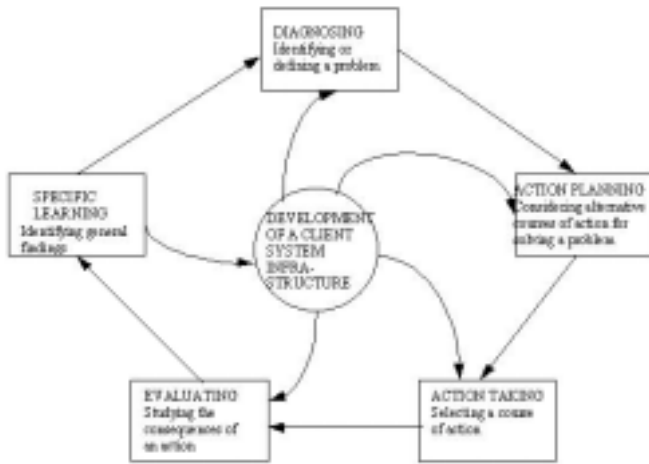
The facilitator was an experienced business analyst who had worked for a number of years in a large Health Department in Australia. He was familiar with the systems and participants involved with this study. The need to make this decision had been identified as an important real-life decision. At the same time the facilitator had been completing a masters degree and was looking for a topic in which to undertake his final project. He approached the senior management of the Health Department and obtained their approval to perform this study as part of his masters degree. His supervisor was an experienced action researcher and agreed to act as methods advisor to this project provided there was a possible opportunity for later publication.

A standard and well recognised approach to action research was followed using the model outlined by Susman and Evered (1978) in figure 2. In the centre of figure 2, is a task entitled the development of a client system infrastructure. This involved the facilitator negotiating the terms of the project with the client organisation, briefing all

participants about the goals and aims of the academic side of the study and ensuring that they were comfortable with this and specifying the outcomes and deliverables of the study both in terms of the organisation as well as the facilitator. As will be seen in figure 2, the client system infrastructure needs to be maintained throughout the life of the study and therefore may need to be reinforced in later phases e.g. re-assuring or reminding participants of the initial agreement or goals.

The **diagnosing** step at the top of figure 2 had to some extent already be completed in the sense that the organisations and more specifically had already identified the need to make a decision on information systems selection and that this decision had to be taken quickly. Previously the organisation and indeed some of the participants had had exposure to the soft systems approach (Checkland 1981, Checkland and Scholes 1990). While this approach was recognised as a powerful tool for facilitating decision-making was considerable concern that the time available would clearly not allow this approach to be used.

Figure 2: The Sociotechnical Action Research Cycle, after Susman and Evered (1978)



At the outset it was not clear just how many meetings would be required to meet the objective. However, at the **action planning** phase, a meeting was set for each of the four phases or modes of Strategic Choice i.e. four meetings were planned. These were set up on the basis of allowing some time (roughly one week) between each meeting to allow for reflection and other tasks or information gathering that may have been found necessary.

The **action taking** phase was of course the running of the actual meetings themselves. These were run by the facilitator who led the group through the Strategic Choice method. Between each meeting, a meeting was held between the facilitator and methods advisor to discuss the success of the previous meeting and to amend if necessary any preparations for the next meeting. This constituted the **evaluation** phase. At the outset this was seen as reflecting on the success or otherwise of following the Strategic Choice method, but as discussed in the next section, this turned out to be more complex than anticipated. The last phase of the cycle i.e. the **specific learning** phase, was carried out after the project was completed and was an opportunity to evaluate the whole action research study.

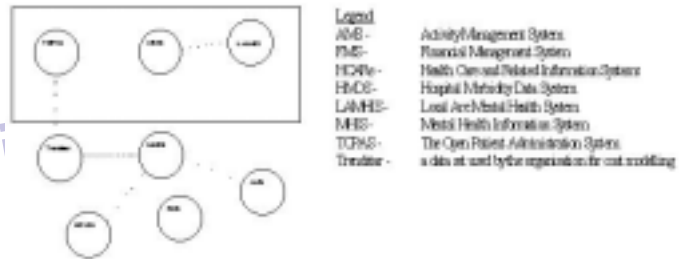
In total a series of only three workshops of about two hours each was necessary to resolve a real world prioritisation problem. Five (middle and senior) managers attended these sessions in addition to the facilitator and methods advisor.

**Session 1 (Shaping Mode)**

In this first session, all candidate information systems were identified. If two information systems were strongly coupled for example

where data from one is input to the other, this was shown by a line connecting the two (figure 3). The purpose of this was to show pictorially where systems have strong affinity with others and where they do not (Friend and Hickling, 1987).

Figure 3: Health information systems



While this took up a large part of session one there was no real disagreement concerning the systems or their coupling. The group were then asked to brainstorm issues, initiatives and pressures that they perceived to have an influence. These were listed and then summarised in terms into broad areas of interest. Three areas were found to be important, but there was no disagreement in the group about which area was the most important. Figure 2 was then updated with a rectangle to indicate which information systems were considered the most important. The group were then asked to consider this set of related information systems. They were asked to identify strengths and weaknesses in relation to what was good about any of these systems and where gaps or improvements could be seen. The completion of this task ended the first session. Much of the information had been captured on electronic whiteboard and so the facilitator agreed to record the outcomes of the session and distribute these to stakeholders prior to the next meeting.

**Session 2 (Designing and Comparing Mode)**

The first session was considered to have identified the basic shape and territory of the problem. In the designing mode, the nature and number of options that are available are reviewed. It was here that a problem arose. In order to compare options, it is best if options can be expressed in a binary ('yes/no') fashion. However, some of the options were felt to represent different levels of modification rather than distinct options in themselves. This caused the team to reconsider the set of weaknesses identified previously with a view to reclassifying them as distinct options. The end result was the introduction of another system (HCARE) into the decision matrix. The effect of this decision was that there were now four main binary modification options i.e. systems and thus 16 option permutations. However, seven of these were considered incompatible and so nine remained as viable (table 1).

The construction of this table ended the second session. It was considered that the designing mode step had been completed and that the comparing mode had been started in this session but not completed. Further, the facilitator agreed to prepare cost, benefit and time estimates for the next meeting by consulting relevant stakeholders during the interim.

**Session 3 (Comparing and Choosing Mode)**

Estimates of costs, benefits and approximate development time were presented in session three. High cost was indicated as \*\*\*\*\*, low cost as \*, high benefit as \*\*\*\*\* and low benefit as \*. For time estimates, a long development period was estimated as between 5 and 10 years, and a short development period as 1 to 2 years. Participants agreed to work with these measures as they were felt sufficient to differentiate the decision options being compared. Time and benefit estimates were assigned for all eight decision options (rows 1 to 8) but

Table 1: Viable modification options

| Row | MHIS | TOPAS | LAMHIS | HCARe |
|-----|------|-------|--------|-------|
| 1   | M    | M     | M      | M     |
| 2   | M    | M     | M      | N     |
| 3   | M    | M     | N      | N     |
| 4   | M    | N     | N      | N     |
| 5   | M    | N     | M      | N     |
| 6   | M    | M     | N      | M     |
| 7   | M    | N     | M      | M     |
| 8   | M    | N     | N      | M     |
| 9   | N    | N     | N      | N     |

Legend: M = modify; N = no change

due to time limitations there had been time only to agree cost estimates for decision options 1, 3 and 5 (table 2). The group were asked to indicate their preference from the nine available decision options. The ideal choice, if resources, funding and time were available, was agreed as decision option one i.e. make required changes to all four systems to provide timely, good quality information. However, given cost constraint and the desirability of achieving benefit in the shorter term, decision option five was considered the best option.

Table 2: Viable modification options with costs, benefits and times

| Row | MHIS | TOPAS | LAMHIS | HCARe | Cost  | Benefit | Time    |
|-----|------|-------|--------|-------|-------|---------|---------|
| 1   | M    | M     | M      | M     | ***** | *****   | 5-10yrs |
| 2   | M    | M     | M      | N     |       | ****    | 3-5yrs  |
| 3   | M    | M     | N      | N     | ***   | ***     | 1-2yrs  |
| 4   | M    | N     | N      | N     |       | ***     | 1-2yrs  |
| 5   | M    | N     | M      | N     | **    | ***     | 1-2yrs  |
| 6   | M    | M     | N      | M     |       | ****    | 3-5yrs  |
| 7   | M    | N     | M      | M     |       | ***     | 3-5yrs  |
| 8   | M    | N     | N      | M     |       | **      | 1-2yrs  |
| 9   | N    | N     | N      | N     |       |         |         |

## EVALUATION

This section evaluates the action research approach taken as well as Strategic Choice as a method and is essentially in two parts. In the first part, a review of how the Susman and Evered model fitted the reality of the study is discussed and then secondly the detail of what was learnt about information systems selection is summarised.

While the Susman and Evered model was a useful template for this study, in practical terms it was found that there were two places where learning took place. While the main formal evaluation took place at the completion of the study, surrounding each meeting there was effectively a mini-learning cycle. This involved **action planning** for the meeting, **action taking** (i.e. conducting the meeting) and **evaluation** of the meeting by the facilitator and methods advisor. Since the evaluation sometimes caused changes for the next meeting, this implied that the Susman and Evered template needed to be modified to show mini-learning cycles throughout the study. The kind of detail that was discussed during these mini-learning cycles and which was subsequently formalised in the specific learning phases is now summarised.

A key question in the **shaping** mode was to what extent the nature of information systems selection problem is similar to strategic decision-making in general. The stereotypical strategic decision model would allow related strategic options to be shown with cause-effect relationships as connections. In this study, related information systems were modelled and connections were added where (typically data) coupling existed. Clearly cause-effect relationships are not the same as data couples. On the other hand, participants were comfortable

with using the idea of coupling here and actively contributed to identifying connections between systems.

In the **designing** mode, the problem concerning binary ('yes/no') decisions was unanticipated and illustrated the flexibility of the approach. In both the design and maintenance of information systems there is typically a broad range of options available and many of these can be permuted with other options. At some point the complexity becomes too much to deal with especially in groups and under severe time constraint. The interesting observation is that the group sensed this also and were prepared to compromise in order to make progress by simplifying the decision options to a structure that was more workable.

In the **comparing** mode a departure from the method took place in terms of content. Strategic Choice did not require participants to identify cost, benefit and time estimates. That was a decision initiated by the facilitator in order to structure the comparing mode. In retrospect, since it is generally considered that the shape and nature of a problem should determine the tools used in its solution, the borrowing of standard thinking from IS in terms of costs, benefits, time estimates seemed a natural development, albeit that the group itself must have the power to make that final commitment to using those tools.

In reality the **choosing** mode step was not completed. The Strategic Choice method puts considerable emphasis on this step particularly in managing and monitoring the uncertainties identified. This was not done within the confines of this study, because it was seen as the responsibility of whomever assumed the role of project manager for the option selected to follow through on these issues.

Overall, the Strategic Choice method was considered to have been successful as far as the participants were concerned. In post-study interview, there was strong support for methods such as this which could facilitate group commitment to decisions under severe time constraints. However, there was recognition by participants that more in-depth study would often be necessary after initial selection was mandated (if only to confirm the decision) and that other information system selection decisions may not be as clear cut as this one. It was clear that this was a mature group in the sense that collectively that had skill, experience and understanding about decision-making processes generally - the role of facilitator and methods advisor might have been much tougher if this were not so.

Many tailoring and modification decisions were taken in applying the method as will be noted from the above discussion. However, that is not perceived to be a weakness of the method. Rather, one important strength of the approach was the ease by which appropriate deviations from the stereotype were able to be employed without losing sight of the goals. That said, more work is required in examining how the dynamics of these changes affect the suitability and efficacy of the method itself. Further work may also look at other kinds of problem where prioritisation is required. For example within a single project there is often proliferation of requirements or 'scope creep'. The steps and philosophy of Strategic Choice may be found useful here in the prioritisation of requirements.

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