

On the Nature of Information Systems Strategy Development*

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Most large organisations have developed one or more IS strategies in the past decade. A great variety of approaches have been tried. The paper addresses the choice of approach at the outset of an IS strategy development exercise. Based on his experience of developing strategies, the author suggests there are two key choices: whether the strategy development process should be conventional or participative and whether the method should be data or decision orientated. The contextual factors that should be considered when making these choices are identified and a five stage learning model for IS strategy development is proposed.

1. Introduction

A number of approaches to Information Systems (IS) strategy development are available in the literature (eg Cash et al, 1992; Checkland & Scholes, 1990; Earl, 1989; Lincoln, 1990; Ward et al, 1990; Wetherbe et al, 1988; Wilson, 1990). Ward et al comprehensively addressed the relationship between IT and business strategy. Lincoln contains practical advice on managing the process of IS strategy development based on the experiences of IBM consultants. Earl draws some useful distinctions and inter alia suggests the conditions which would lead to the adoption of one approach rather than another. Checkland, Scholes and Wilson describe the practical use of systems concepts in general and Soft Systems Methodology (SSM) in particular. The purpose of this paper is to revisit the question of which approach to adopt in different circumstances in the light of the author's experience of developing strategies in a variety of organisations.

At the outset of an information system strategy development exercise, a *process* has to be designed

and *methods* chosen to meet the exercise objectives in terms of scope and deliverables, within the specific organisational *context*. The paper is concerned with the interplay between process, methods and context of the strategy development exercise as illustrated in Figure 1. It is important to recognise that, although it is natural to think of context determining process leading to the choice of an appropriate method in a linear fashion, in practice process may well be influenced by the methods available and in the longer term, the methods and process chosen, feed back into the context.

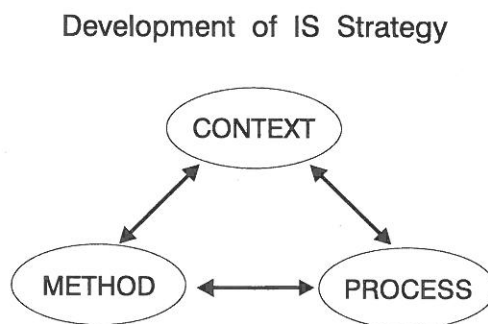


Fig. 1.

Unfortunately there is no generally agreed use of the terms IS strategy, IT strategy etc. Ward (1990), building on Wiseman (1985), distinguishes between DP, MIS and SIS (strategic information systems), referring to SISP (strategic information systems planning) exercises. Earl (1989) distinguishes between IS strategy, IT strategy and IM strategy. The convention

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adopted here is use Earl's distinction between IS, IT and IM strategies. Earl's definitions are:

- *Information Systems (IS) strategy*, which determines what is to be done with IT in terms of applications; a long term directional plan concerned with aligning IS development with business needs and with seeking strategic advantage from IT
- *Information Technology (IT) strategy*, which determines the how it is done, in terms of technology policies; a technology framework or architecture which drives, shapes and controls the IT infrastructure
- *Information Management (IM) strategy*, which puts the management into IT in terms of policies, procedures and aims; the management framework which guides how the organisation should run its IS/IT activities.

The paper addresses the choice of process and method within a particular context when an IS strategy is required. If an IT or IM strategy is required other considerations will affect the choices. The paper is also limited to IS strategy for a single SBU. Ward et al argue that the SBU should be the focus of IS strategy analysis, although they recognise that synergistic benefits should be sought across SBU s in multi-business enterprises. Developing IS strategies for multiple SBU s deserves separate treatment.

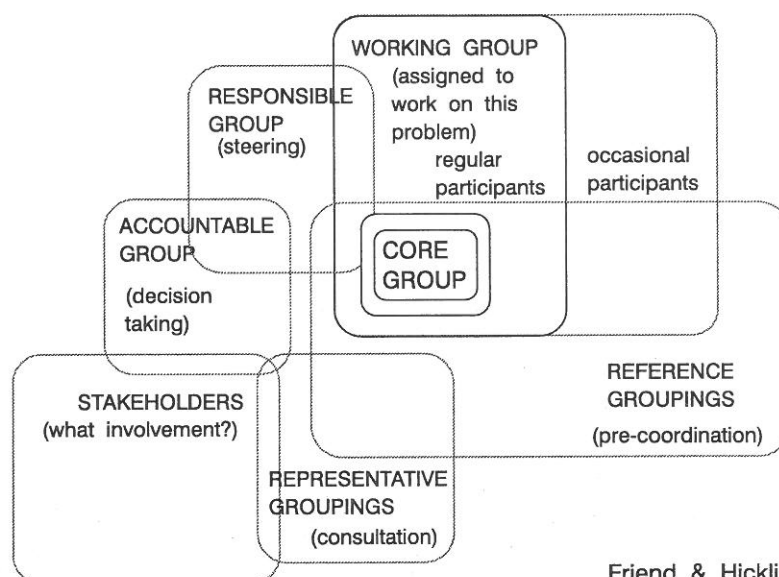
The first section of the paper will consider the key choices that have to be made in deciding on the process to adopt. The second will consider the methods that might be chosen for the strategy exercise and how they might influence the choice of process. The third will discuss the contextual factors that may influence both the choice of process and the method.

2. Choice of Process

To understand the process of developing strategy, reference can be made to pioneering work initially conducted at the Institute for Operational Research, a unit of the Tavistock Institute of Human Relations in London. The research resulted in the Strategic Choice approach described in Friend and Jessop (1977) and Friend and Hickling (1987) and an approach to managing strategic projects described in Breure and Hickling (1990). The research identified the importance of designing the roles of different groups of people in the decision process of a strategy development exercise. As well as the **working group**, formed to carry out the task, five prototypical roles in relational to the decision-making process were identified:

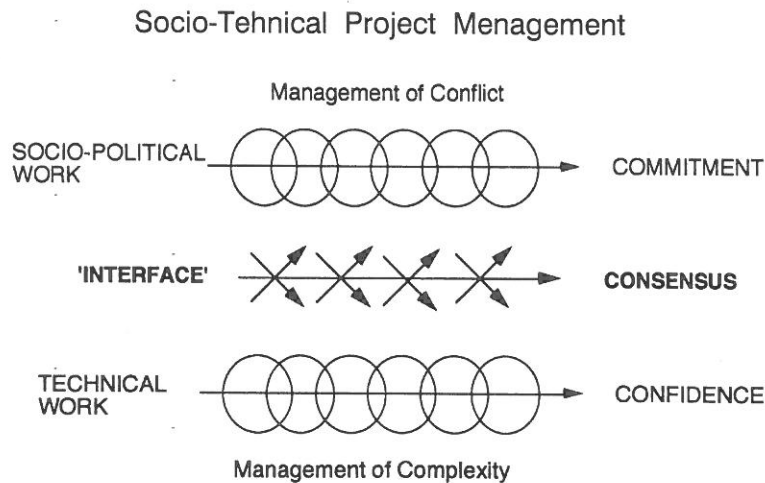
- those who are *accountable* for the decisions to be taken in a broadly political way

Organisational Responsibilities in Strategic Choice



Friend & Hickling, 1987

Fig. 2.



Breure & Hickling, 1990

Fig. 3.

- those who are directly *responsible* for guiding the conduct of the decision — making process, at a managerial or senior professional level
- those to whom periodic *reference* should be made because they have roles in other fields of decision-making which are instrumental in this case
- those who fill a *representative* role in relation to specific interests which may be affected by the decision
- those who are the *stakeholders* in the sense that they will be directly impacted by the decision.

The relationship between these groups is shown in Figure 2.

Any strategy development exercise consists of work taking place in a social context. Breure and Hickling (1990) point out that such projects need (i) to deal with the social systems context through the effective management of conflict and (ii) to secure a high level of commitment to the results, particular by those who are accountable and the stakeholder. To achieve these aims sociopolitical work to secure commitment has to be carried out in parallel with the technical work, the aim of which is to achieve confidence that the proposed solution is a good one. These two parallel process need to interact through reports and meetings described by Breure and Hickling as the Interface shown in Figure 3.

This much will be common to all strategy development exercises.

In carrying out the technical work two styles have emerged:

– in the *Conventional Process* one or more analysts (members of the working group) carry out interviews (including interviews with members of the the other groups in Figure 2) , analyse the results and report back findings, options and suggestions to the political, decision making level

– in the *Participative Process* members of the stakeholders and other groups themselves form the working group and conduct the technical work with the core group providing the methods and facilitating the process.

The development of Sainsbury s IS strategy (Jacobs and Ormerod, 1989) is an example of the *Participative Process* approach. At Sainsbury s the working group, referred to as the Task Force, consisted of senior line managers drawn from the various departments. In addition, the senior managers of the DP Department were formed into an Advisory Group. The Task Force and the Advisory Group carried out the investigation and analysis. The Steering Group (consisting of the two managing directors and one director) and other board members were also involved as participants in the process.

Historically most Information strategy exercises have been conducted using the *Conventional Process*. Obtaining commitment to the results has proved difficult and has often not been successful. In the author's experience *Participative Processes* are much more effective in gaining commitment but they can be very demanding of management time. The managers involved may also have a limited tolerance for analysis and documentation. The author has been conducting field trials in conjunction with RTZ Ltd., the international mining group, to speed up and simplify the process.

IBM have embraced the participative approach in their Process Quality Management (PQM) process methodology as described in Lincoln, 1990.

3. Choice of Methods

Earl (1989) reviews evaluative work (that) has sought to discover when, how and whether these (IS strategy formulation) methods work. He concludes that a firm's management has to tackle three issues:

- (a) clarification of the business needs and strategy in information terms;
- (b) evaluation of current information systems provision and use; and
- (c) innovation of new strategic opportunities afforded by IT.

He propose a three-pronged methodology to tackle each of these directly, to be used in combination. The prongs are Top-down, Bottom-up and Inside-out analysis:

Top-down — the essential ingredient of this approach is clarification. First business strategies have to be clarified and then the potential contribution of IT applications can be clarified, suggesting key directions. The Critical Success Factors approach is one such method. External analysis should focus on opportunities and threats.

Bottom-up — the coverage and value of existing systems and technical experience is evaluated through surveys. The surveys can point up gaps, suggest new departures and pinpoint exposures. External analysis should focus on strength and weakness appraisal.

Inside-out — the objective is to identify opportunities afforded by IT which may yield competitive advantage. The emphasis is on creativity rather than analysis or evaluation. External analysis should focus on exemplars and scenarios.

In addition Earl suggest that the strategy can be infrastructure led, business led or opportunity led depending on his classification of industry sector use of IT as Delivery, Dependent or Drive (terms that are described below). The appropriate leg would then be emphasised. He is thus suggesting a link between industry sector and method.

Ward et al (1990) use Earl's distinctions between analytical, evaluative and creative approaches but goes further in describing the methods available. Under analytical and evaluative methods he describes Information Analysis which includes entity models, activity decomposition diagrams, dataflow diagrams and matrix evaluations. Many organisations build their IS strategy development around such techniques. For example, when the author worked with the National Grid Company's team to develop their IS strategy for privatisation, both activity diagrams and activity-entity matrices were used.

When describing techniques to support the creative approach Ward et al concentrate on the tools and techniques of business strategic thinking and analysis which they believe will be more easily adopted by the business managers. Three groups of techniques are identified:

- (i) Business portfolio analysis
- (ii) Competitive strategy analysis
- (iii) Value chain analysis.

These approaches provide focus to the question, how can IS/IT help the business achieve its strategic aims. They point to the most important places to look and the type of improvement that should be sought. Having found where to look, opportunities to reduce costs, provide service and enhance the product can be envisaged.

Ackoff (1967) in his critical paper Management Misinformation Systems emphasised the importance of focussing on decision-making processes. This theme was picked up by McCosh et al (1981) when considering the problem of designing MIS systems. They identified four sets of relevant concepts:

- decision concepts
- computer concepts
- systems thinking
- process concepts.

In discussing decision concepts they draw attention to the definition of an information system suggested by Mason and Mitroff (1973):

“An information system consists of, at least, a *person* of a certain *psychological type* who faces a *problem* within some *organisational context* for which he needs evidence to arrive at a solution, where the *evidence* is made available through some *mode of presentation*”.

In discussing systems thinking they state:

“The critical task is to explicate the implicit models which exist throughout organisations in decision-makers’ minds, to construct a conceptual model and translate it into an operational device for specifying information requirements”.

This focus on problems and decision-making is quite distinct from the emphasis placed on activities and data contained in information analysis referred to above. The author believes this is the crucial choice when choosing the method for an IS strategy development exercise: should a data orientated approach or a decision orientated approach be used:

The *Data Orientated Approach* concentrates on identifying the data flows required (defined as high level entities) to support the business functions on a corporate basis. The result is a list of prioritised candidate systems and a data architecture. The approach treats data as phenomena emerging naturally from administrative and management activities. To improve business efficiency the data needs to be captured, stored, manipulated and distributed. This itself should be done efficiently, capturing data once only and managing it to ensure its validity, integrity and security. The IS strategy does not concern itself with how the data is used.

The *Decision Orientated Approach* concentrates on critical tasks, key decisions of the business and its trading partners and opportunities to gain competitive advantage. The approach has appeared in different forms over time and has attracted a variety of labels from different practitioners. The analysis is concerned with

information for decision making but is not concerned with data per se.

A description of a decision orientated approach implemented at British Rail is given in Mainelli and Miller (1988). Some of the features of this approach are built into the RTZ field trials referred to above. The concept of critical decisions at the operational level is proving particularly helpful.

The trials also embody some aspects of Soft Systems Methodology (SSM) described in Checkland and Scholes (1990). SSM embodies systems thinking, providing a structured, yet relatively flexible, procedure for questioning the nature of business processes (referred to as human activity systems). This can either be used to debate and explore systems opportunities or the analysis can be developed to analyse the data flows (Wilson, 1990). SSM thus offers the possibility of being used in either a *Decision Orientated* or a *Data Orientated* mode.

4. The Influence of Context on Choice of Process and Method

In summary, there are two key questions that need to be resolved at the outset of an IS strategy exercise:

- should the **process** be *Conventional* or *Participative* and
- should the **method** chosen be *Data Orientated* or *Decision Orientated*.

Many more detailed questions will have to answered before the exercise can proceed but if these two fundamental questions can be settled the outlines of the exercise can be envisaged.

In the author’s view there is a natural affinity between a *Data Orientated* method and a *Conventional process*. The reason is that as the *Data Orientated* approach is not concerned with the decision-making process it does not necessarily need the close involvement of those who best understand the issues. Similarly a *Decision Orientated* approach is often associated with a *Participative* process because it is vital to include those who understand the subtleties of the decision-making process. Despite these affinities the other combinations are possible. IBM’s PQM approach is an example of combining a *Data Orientated* approach with a *Participative*

process and *Decision Orientated* approaches are frequently used without a high level of participation. What then are the factors that affect the choices of process and method?

Management Culture

The key determinant for deciding whether to use a *Conventional* or a *Participative* process is the current dynamic state of the management culture. There are three aspects to this:

– *prevailing style* which determines the way the organisation reaches decisions under normal, stable conditions, including the degree of consultation, time available for team work and the propensity to debate issues

– *cultural changes* that are in progress eg when developing an IS strategy with BP Oil in 1990 their management change programme, Project 1990, was a major influence. In these cases *Participative* processes with cross-functional team working may be welcomed as part of the new style

– *major upheavals* such as mergers and privatisation eg when developing an IS strategy to support a merger at Nicholas Laboratories in 1987, full participation would have been very difficult to achieve in the atmosphere that prevailed.

Information Intensity

As noted above Earl (1989) suggests that the approach should depend on whether the industry can be classified as *Delivery*, *Dependent* or *Drive*:

Delivery: IT is the means of delivering goods and services in the sector; computer-based transaction systems underpin business operations.

Dependent: Business strategies increasingly depend on IT for their implementation; business and functional strategies require a major automation, information or communication capability and are made possible by these technologies.

Drive: IT potentially provides new strategic opportunities; specific applications or technologies are exploited for developing business and changing ways of managing.

Clearly the more information intensive organisations in *Delivery* industries such as banking and insurance, will have a greater need to develop a comprehensive infrastructure. A *Data Orientated* approach will therefore be required at an early stage. The imperative for such an approach in the *Dependent* and *Drive* sectors is less apparent. However, in the age of the relational database, information analysis would

Planning In Stages

Earl, 1989

Timeframe/ factor	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Task	IS/IT mapping direction	Business planning	Detailed advantage	Competitive connection	IT-strategy
Objective	Management understanding	Agreeing priorities	Firming up the IS strategic plan	Finding IT opportunities	Integrating IS and business strategies
Direction Involvement	DP/IT lead	Senior management drive	Users and IS mainly	Executive management and users	Partnership of users, general management and IS
Methodological emphasis	Bottom-up survey	Top-down analysis	Matching top- down and bottom-up plus investigations and prototypes	Inside-out processes	Multiple methods accepted
Planning context	Inexperience/ unawareness	Inadequate business plans for the purpose	Complexity apparent	Impatience	Maturity

Fig. 4.

appear to be sensible thing to do whether part of a strategy exercise or not.

IS Planning Maturity

Another approach is to consider the maturity of the organisation in using IT generally (Nolan, 1979) or more specifically maturity in systems planning (Earl, 1989). Earl’s five stages shown in Figure 4 follows a plausible progression particularly for those organisations that were in the vanguard of the newly developing field in the 1980 s. With the alternatives now better understood it is not clear that organisations would or should follow such a progression in the 1990 s.

An alternative learning model could be based on the observation that those organisations that do not have a model of activities and data flows will probably want to build one using a *Data Orientated* approach; those that do have a model will want to move on to identify opportunities to add value using a *Decision Orientated* approach. Further one can postulate that organisations may wish to proceed to fundamentally review their scope in the light of the new skills and capabilities they (and their trading partners) have developed through the introduction of IT. If, as suggested by Earl, the first stage is to conduct surveys to establish the degree of computerisation and user requirements and following

convention, a final maturity stage is reached, a five stage IS strategy learning model is proposed:

- Stage 1 Coverage — Survey Approach
- Stage 2 Integration — Data Orientated Approach
- Stage 3 Value Added — Decision Orientated Approach
- Stage 4 Iconoclastic — Scope Redefinition Approach
- Stage 5 Maturity — Multiple Approaches

Figure 5 illustrates some of the methods that could be appropriate at each stage. These stages correspond quite closely to Venkatraman (1991) whose five levels of IT-reconfiguration are shown in Figure 6. Stage 3 above includes both Levels 3 and 4 of Venkatraman.

5. Conclusions

In the mid eighties Galliers (1987) conducted a survey of the maturity of IS/IT planning in major organisations in the UK and Australia. It confirmed what many senior executives had long felt, that there was widespread disagreement among the IS profession as to the objectives of IS planning, and how best to tackle it.

IS Strategy Development Learning Model

Timeframe/ factor	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Name	Coverage	Integration	Value Added	Iconoclastic	Maturity
Approach	Survey	Data Orientated	Decision Orientated	Buisness Strategy	Multiple
Direction Involvement	DP/IT lead	Senior management drive	Users and IS mainly	Executive management and users	Partnership of users, general management and IS
Methods	User Needs Grey Cells Wish Lists	Activity Models Entity Models Matrices SSM/Maltese Cross	Decision Analysis Value Chains RLCM SSM Technology Evaluation	Value Chains Competitor Analysis Strategic Options RLCM SSM Technology Evaluation	Various

SSM - Soft Systems Methodology
RLCM - Resource Life Cycle Model

Fig. 5.

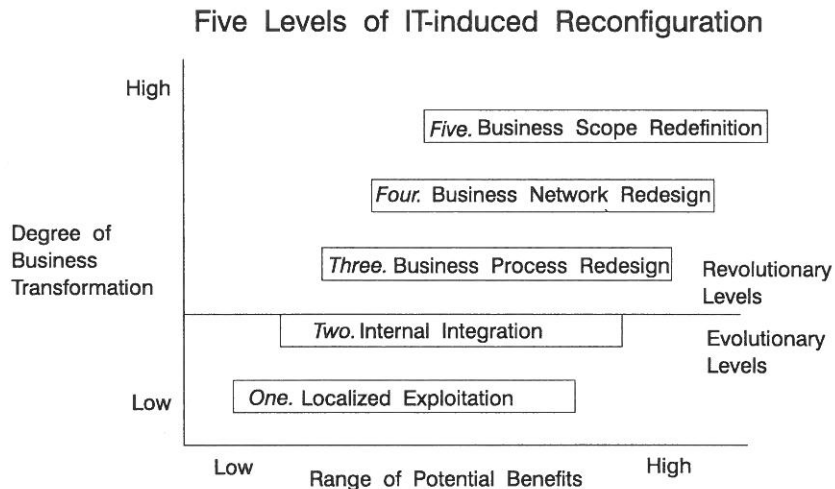


Fig. 6.

At that time many organisations had had only a few years of experience of IS planning.

Five years on, considerable experience has been gained both in the area of IS strategy itself and other related business strategy areas. The choices have become more complex as leading organisations have sought new, better ways of gaining the most from the new technology. Nevertheless there is a need for some simple guidelines for those choosing an approach at the start of a IS strategy development. In this paper it is suggested that the key choices for a single SBU are whether the process should be *Conventional* or *Participative* and whether the method should be *Data Orientated* or *Decision Orientated*.

It is suggested that the choice of process can be made in the light of the current dynamic state of management culture and that the choice of method can be guided by a five stage IS strategy learning model. These conclusions are based on the author's experience as a practitioner. The next stage is to validate these findings, particularly the learning model, by surveying a wider sample.

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