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## 1. INTRODUCTION

Strategic Information Systems Planning (SISP) has been reported to be the critical concern of IS Executives in large organizations. Several authors have suggested what SISP should comprise, how it should be done and what problems are typical. Researchers have begun to investigate the practice of SISP (Sullivan 1985; Lederer and Sethi 1988; Galliers 1987) and examine how firms can gain strategic advantage from information technology (Runge 1985; Ives and Vitale 1987).

A synthesis of these works would suggest that SISP is concerned with at least the following:

* aligning investment in IS with business goals
* exploiting IT for competitive advantage
* efficiently and effectively managing IS resources
* developing technology policies and architectures

In United Kingdom companies, these were the principal objectives recorded in interviews done for the study reported here (Earl 1989b). Lederer and Sethi (1988, p. 445) offered a definition of SISP, namely, "the process of deciding the objectives for organizational computing and identifying potential computer applications which the organization should implement." This is what Earl (1989a) distinguishes as Information Systems (as opposed to Information Technology or Information Management) strategy formulation and is the topic which the rest of this paper addresses.

## 2. METHODOLOGY

In 1988 and 1989 a two stage survey was done of large UK companies. First, case histories were conducted on the experience of six companies previously researched by the author. Second, 21 additional United Kingdom companies were investigated through field studies. All were large companies whose turnover ranged from £55bn to £100m, and they were either headquartered in the United Kingdom or possessed national or regional IS functions within MNCs headquartered elsewhere. They were drawn from the banking, insurance, transport, retailing, electronics, IT, automobile, aerospace, oil, chemical, services and food and drink sectors. Their experience of SISP ranged from one year to twenty years. The field survey, the stage reported here, comprised in-depth interviews with three "stakeholders" in each organization, 63 interviews in total. The IS Director or IS Strategic Planner was interviewed first, followed by the CEO or a general manager, and finally a senior line or user manager. All prior surveys on SISP known to the author questioned IS executives only, yet most authorities stress that SISP has to involve all three stakeholder sets. Other research has shown how user views and attitudes differ from those of IS specialists (Hedberg and Mumford 1975). Interviews were conducted from questionnaires to ensure completeness and replicability, but a mix of unstructured, semi-structured and structured interrogation was employed.

## 3. OUTCOMES OF SISP

All respondents reported organizational benefits from SISP and were able to select confidently from a structured list. Alignment of IS with business needs stood out as the primary benefit, 49 percent ranking it first and 78 percent ranking it in the top five benefits. Top management support, better priority setting, competitive advantage applications and top management involvement were the other prime benefits reported.

Respondents were also asked to evaluate their firm's *success* in SISP using a self-reporting scale from 1 (low) to 5 (high). They were given narrative translations of the scoring scale to assist them and to limit any tendency to self-report around the mean. Of the firms surveyed 9.5 percent claimed that their SISP had been "highly successful" deserving a score of 5, 58.7 percent reported that it had been "successful but there was room for improvement," scoring 4, and 28.6 percent said "it had been better than not doing it," scoring 3. Sixty eight percent of all respondents rated SISP worthwhile (scores 3 to 5) and 32 percent not so (scores 1 to 2). On this test, there were differences between stakeholder set; whereas 76 percent of IS Directors gave a score above 3, only 67 percent of general managers and 57 percent of user managers were so content. Alternatively, as the mean score by company was 3.73, and the modal company score 4, the typical experience can be described as worthwhile but with some room for improvement.

However, a complementary question revealed a different picture. Interviewees were asked in what ways SISP had been *unsuccessful*. Sixty five different types of unsuccess were recorded, but in such a long list none were dominant. Nevertheless, Table 1 summarizes the five most quoted reasons for dissatisfaction.

**Table 1: Unsuccessful Features of SISP**

| Rank Order | Unsuccessful Feature |
|---|---|
| 1 | Resource Constraints |
| 2 | Not Implemented Fully |
| 3 | Lack of Top Management Acceptance |
| 4 | Length of Time Involved |
| 5 | Poor User-IS Relationships |

It is apparent that concerns extend beyond the method of SISP. First, *implementation* was a cause of concern: IS strategies were not always implemented or fully achieved. They could be inadequately resourced or they hit organizational constraints. Whereas Lederer and Sethi (1988) found that most actual IS developments were not to be found on the IS strategic plan, there was interview evidence that much of what was proposed by SISP was not developed or implemented.

Another set of doubts concerned *process*. Issues such as management acceptance or "buy-in," poor user-IS relationships, user awareness, and line management non-participation are examples. There were also concerns over *method*. Such doubts included lack of strategic thinking, excessive internal focus, too much or too little attention to architecture, amount of time and resource required and ineffective resource allocation mechanisms.

Accordingly, the "unsuccess" factors were classified into three clusters of method, process and implementation issues. The results presented, in Table 2, do not show equal frequencies of citation, nor is the distribution grossly asymmetrical. When analyzed by stakeholder, interesting differences emerge (Table 3). Implementation is the highest concern of IS Directors – perhaps because they are charged with delivery – followed by method. User Managers report most concerns, especially about process, perhaps because they seek more influence. General Managers emphasize method issues, perhaps because they find strategy-making far from easy.

**Table 2: Unsuccessful Features by Class**

| Concern Class | Frequency of Response | Percent |
|---|---|---|
| Method | 50 citations | 40 |
| Process | 41 citations | 32 |
| Implementation | 36 citations | 28 |

**Table 3: Stakeholder Views of Unsuccessful SIP Features**

| | IS Directors | | General Managers | | User Managers | |
|---|---|---|---|---|---|---|
| | Citations | % | Citations | % | Citations | % |
| Method | 14 | 36 | 18 | 44 | 13 | 28 |
| Process | 9 | 23 | 11 | 27 | 19 | 41 |
| Implementation | 16 | 41 | 12 | 29 | 14 | 31 |
| Total | 39 | 100 | 41 | 100 | 46 | 100 |

The data suggests that method, process and implementation are all necessary conditions for success in SISP. Indeed, when respondents volunteered success factors, based on their organization's experience, for SISP they conveyed such a multidimensional perspective (Table 4).The highest ranked factors of "top management involvement" and "top management support" can be seen as process factors, "available business strategy" and "study the business first" as more to do with method, and "good IS management" as at least partly related to implementation.

**Table 4: Success Factors in SISP**

| Rank Order | Success Factor | Respondents Selecting | Primary Frequency | Sum of Ranks | Mean Rank |
|---|---|---|---|---|---|
| 1 | Top Management Involvement | 42 | 15 | 160 | 2.54 |
| 2 | Top Management Support | 34 | 17 | 140 | 2.22 |
| 3 | Business Strategy Available | 26 | 9 | 99 | 1.57 |
| 4 | Study Business before Technology | 23 | 9 | 87 | 1.38 |
| 5 | Good IS Management | 17 | 1 | 41 | 0.65 |

Thus consultants, practitioners and researchers would seem well advised not to regard SISP as a matter of method alone. This is especially so if the impact of SISP methods is of interest, for typically it seems that firms use several methods over time. An average of 2.3 methods (both proprietary and in-house) had been employed by the 21 companies studied and nine of them had tried three or more. Any attempt to identify the effect of a method therefore becomes difficult. It also may be misleading because when asked to relate their firm's experience of SISP, respondents usually recounted a historiography of initiatives, events, crises, techniques, successes and failures all interwoven in a context of how IS resources had been managed.

Accordingly, this research shifted to an examination of SISP *approach*, that is of the interaction of method, process and implementation. The accounts of interviewees, the "untutored" responses to the semi-structured questions, the documents supplied and the tangents followed up by the interviewer all produced data on each company's approach. Once the salient features of SISP were compared across the 21 companies, five distinct approaches were identified. These seemingly could be used retrospectively to classify the experiences of the six case study firms.

## 4. SISP APPROACHES

The five approaches can be termed Business Led, Method Driven, Administrative, Technological, and Organizational and they are delineated as ideal types in Table 5.

*Business Led* approaches were adopted by four companies. The espoused emphasis is that the business will drive technology, not the reverse. This is seen initially as a simple matter whereby business plans or strategies are analyzed to identify where information systems are most required. Often this linkage is an annual endeavour and is the responsibility of the IS Director or IS strategic planner (or team). Eventually the IS strategic plan is presented to the board for questioning, approval and priority-setting.

| | BUSINESS LED | METHOD DRIVEN | ADMINISTRATIVE | TECHNOLOGICAL | ORGANIZATIONAL |
|---|---|---|---|---|---|
| EMPHASIS | the business | technique | resources | model | learning |
| BASIS | business support | best method | procedure | rigor | process |
| ENDS | plan | strategy | portfolio | architectures | themes |
| METHODS | ours | best | none | one way | anyway |
| NATURE | responsive | top down | bottom up | blueprints | interactive |
| INFLUENCER | IS planner | consultants | committees | method | teams |
| RELATION TO BUSINESS STRATEGY | fix points | derive | criteria | objectives | look at business |
| PRIORITIES | board | rational analysis | central committee | compromise | emerge |
| I.S. ROLE | driver | initiator | bureaucrat | architect | team member |
| METAPHOR | it's common sense | it's good for you | survival of the fittest | we nearly aborted it | partnership |

General managers see this approach as simple, being "business-like" and a matter of common sense. IS Executives may see it as their most critical task and welcome it as just what IS has needed for years. However, they can discover that business strategies are neither clear nor detailed enough for specification of IS needs, so that interpretation and further analysis become necessary. In seeking clarification from the business, IS planners can find that top executives may be more forceful in their views and expectations than others. It may be especially difficult to promote the notion that IT itself may offer some new strategic options. User Managers can perceive the exercise as remote, complaining of inadequate involvement. Because the IS strategy becomes the product of the IS function, commitment of resources and users is not guaranteed, potentially impairing implementation.

Some advantages can accrue from this approach. Information systems are seen as a strategic matter and the IS function receives greater legitimacy. If the business strategy is clearly presented, the IS strategy can be well aligned. Indeed, in one of the case study companies which also adopted this approach, a clear business plan for survival initiated IS developments which are admired by many industry watchers.

*Method Driven* approaches were present in two companies (and probably two of the case study firms). The IS Director may believe that management will not think about IS needs and opportunities without the use of a formal method, perhaps applied by consultants. Any method will not do. There is a search for the *best method*, generally one better than the last one they tried.

Methods first adopted may find again that business strategies are deficient for the purpose of SISP, but they do not provide a remedy. As formal methods usually are sponsored by the IS department, they may fail to win the

support and involvement of key managers. Thus, a second or third method may be attempted and perceptions of the "best" method emphasize the particular consultants as much as the technique. However, such consultancy exercises can be judged by user managers as "unreal" and "high level" and by top managers as "business strategy in disguise." A consequence is that the IS strategic plans lose credibility and may never be fully initiated.

Whether formal methods are bound to fail is not clear. A *succession* of methods achieved little in the two survey and two case study companies. Each method, however, was judged *ex post* to have been good in some unanticipated way for the business or the IS department, for example showing the need for business strategies or informing IS management about business imperatives.

The *Administrative approach*, which emphasizes resource planning, was found in five companies. Typically IS development proposals were submitted by business units or departments to committees or resource planners who examined project viability, common system possibilities and resource consequences. The outcome of the approach is a one-year or multi-year development portfolio of approved projects; typically no application is developed unless it is on the plan.

There were significant downsides to this approach freely discussed by respondents. It was commonly claimed that the outcome was not strategic. It was "bottom up" rather than "top down," ideas for radical change were not identified, strategic thinking was absent and enterprise level applications backgrounded. More emotional were the claims about conflicts, dramas and gamesplaying, perhaps inevitable in an essentially resource allocation procedure. The concern over resources led to a resource constrained outcome. Spending limits were applied *ex ante* (analogous with capital rationing in investment appraisal) and boards

and CEOs were accused of applying budget cuts as though only IS suffered.

There were also some potential benefits. Users had the opportunity to submit proposals up the hierarchy. An analysis of competitive advantage applications in the 21 companies showed user requests were the most common source of ideas. Second, the emphasis on viability, approval and resource planning produced portfolios that were implemented and produced good returns. Finally, the approach can be a good fit with companies adopting a financial control management style.

The *Technological approach* was adopted by four companies and possibly two of the case study companies. Here the emphasis was on deriving architectures or blueprints for IT and IS and often information engineering terminology was used. Data, computing, communications and applications architectures, with perhaps "integrated" case tools, might exist. A proprietary method would have been used or adapted in an in-house style. Both IS Directors and General Managers would emphasize the objectives of rigorous analysis and building an infrastructure.

In effort or investment terms, this approach could be the most demanding and it was high profile. All stakeholders would comment on the length of time involved in the analysis and/or implementation. User managers commented negatively on the complexity and the tendency for technical dependencies to displace business priorities.

These characteristics could lead to user revolutions or declining top management support. Thus smaller exercises followed producing partial, not enterprise-wide or cross-functional, architectures. The benefits became perceived as long-term and in one company no applications had been delivered after three and a half years. However, IS Directors would claim development of sound infrastructures and/or valuable analyses or models.

The *Organizational approach* was in use in six companies and one of the case study companies. The approach was not without method, but methods were employed as required and to fit the purpose. However, process was emphasized, especially management understanding and involvement. Sometimes a major SISP method had been applied in the past, but in retrospect it was seen to have been as much a process-enabler as an analytical investigation. For example, executive teamwork and an understanding of IS and strategy had been left behind rather than specific recommendations for IS investment. Indeed, organizational learning was evident in at least three ways.

First, IS development concentrated on only one or two themes growing in scope over several years as the organization began to appreciate the potential benefits. Second, studies were important in SISP and it was often the assignment of multidisciplinary senior executive project teams or full-time taskforces to tackle a business problem

from which a major IS initiative emerged. The presence of an IS executive in the multidisciplinary team was felt to be important to the emergence of a strategic theme. Third, there was a focus on implementation, for example breaking themes down into identifiable and frequent delivery points and yet accepting occasional cost and time overruns to ensure eventual completion and incorporation of evolving ideas.

Disadvantages were also reported. IS Directors worried about how to regenerate themes, although one felt a theme would emerge in due course. They also perceived their IT infrastructures to be inferior due to incrementalism. Because this approach is essentially soft – there is no codified technique or procedure – a new CEO, management team or management style can erode it without the effect being apparent for some time. However, SISP had become a normal activity in these companies although it tended to be continuous and natural, not high profile and formal.

## 5. EVALUATION

The above descriptions are summarized as strengths and weaknesses in Table 6 and evaluated in Table 7 in terms of the three factors earlier suggested as necessary for success: method, process and implementation. In the Business Led approach, method scores low because there is none, process is rated low because it is commonly IS-dominated, but implementation is medium, because boards do approve some projects. In the Method Driven approach, method is high by definition, but process is largely ignored and implementation barely initiated. In the Administrative approach only a procedure exists as method, but its dependence on user submissions creates a medium process context. Because of its resource management emphasis, approved projects are implemented. The Technological approach is intensive of method, intolerant of process but usually leads to some implementation of infrastructure. The Organizational approach does not eschew method, invests in process and emphasizes implementation.

A more quantitative evaluation is an analysis of the propensity of each approach to generate competitive advantage applications. Respondents were asked to identify such applications and trace their histories. Although only 14 percent were identified as part of a formal SISP study, it is still interesting to compare achievement rates (Table 8). Possible reasons for this pattern are discussed elsewhere (Earl 1989b). Method Driven and Technological approaches are not promising, the former because little is ever initiated, the latter because competitiveness is not the focus. In the Administrative approach, user ideas receive a hearing; in the Business Led approach, some obvious necessities are actioned. In the Organizational approach, themes tend to be more radical and pursued for some time to give sustainable advantage.

274

| | Business Led | Method Driven | Administrative | Technological | Organizational |
|---|---|---|---|---|---|
| Strengths | Simple | Method | System viability | Rigor | Becomes normal |
| | Business first | Plugs strategy gap | System synergies | Infrastructure | Implementation |
| | Raises IS status | Raises strategy profile | User input | Integration | IS-User partnership |
| Weaknesses | Ad hoc method | User involvement | Non-strategic | Management support | Regeneration |
| | Management commitment | f(Method) | Bureaucratic | Partial implementation | Soft methodology |
| | f(Business Strategy) | Follow-up | Resource constrained | Complexity | Architecture |

Table 7: SISP Approaches: Three Tests

| | Business Led | Method Driven | Administrative | Technological | Organizational |
|---|---|---|---|---|---|
| METHOD | Low | High | Low | High | Medium |
| PROCESS | Low | Low | Medium | Low | High |
| IMPLEMENTATION | Medium | Low | High | Medium | High |

Table 8: Competitive Advantage Analysis

| Approach | Competitive Advantage Application Frequency | |
|---|---|---|
| Business Led | 4 | applications per firm |
| Method Driven | 1.5 | applications per firm |
| Administrative | 3.6 | applications per firm |
| Technological | 2.5 | applications per firm |
| Organizational | 4.8 | applications per firm |

Another means of evaluation is to correlate success scores with approach. Mean scores by each stakeholder and overall are shown in Table 9. No approach differs widely from the mean score (3.73) across all companies. However, the most intensive approach in terms of technique earns the highest score, perhaps because it represents what respondents thought an IS planning methodology should look like. Conversely, the Business Led approach, which eschews formal methodologies, earns the lowest scores. An alternative evaluation is to analyze the unsuccessful features so freely reported, assuming each carries equal weight. Table 10 presents this data according to class of unsuccess, namely method, process and implementation. Overall the Organizational approach has the least unsuccesses attributed to it. Furthermore it is not perceived to be the worst (or close to) on any of three classes of unsuccess. Conversely, Business Led has high unsuccess on method and implementation. Method Driven is perceived to be unsuccessful on method and process but opinion is less harsh on implementation, perhaps because implementation experience itself is low. The Administrative approach, as might be predicted, is not well regarded on method. Perhaps surprisingly, the Organizational

approach raised doubts on process but the comments suggest a reflective self-critical perspective. This data is not widely divergent from the qualitative analysis in Table 7.

Table 9: Mean Success Scores by Approach

| 5 = high<br>1 = low | Business Led | Method Driven | Adminis-trative | Techno-logical | Organiza-tional |
|---|---|---|---|---|---|
| Total means | 3.25 | 3.83 | 3.6 | 4.0 | 3.94 |
| IS Directors | 3.5 | 4.5 | 3.6 | 4.25 | 4.0 |
| General Managers | 3.0 | 4.0 | 3.4 | 4.0 | 4.17 |
| Line Managers | 3.25 | 4.0 | 3.8 | 3.75 | 3.66 |

Table 10: Unsuccessful Features per Firm

| Approach<br>Class | Business Led | Method Driven | Adminis-trative | Techno-logical | Organiza-tional |
|---|---|---|---|---|---|
| Method | 2.75 | 2.5 | 2.8 | 1.75 | 1.33 |
| Process | 0.75 | 3.0 | 1.6 | 2.5 | 2.16 |
| Implementation | 2.75 | 1.0 | 1.6 | 3.0 | 1.83 |
| Total | 6.25 | 6.5 | 6.0 | 7.25 | 5.32 |

Finally, although objectivity and quantification may be imputed to interpretative data and small samples, Table 11 seeks to present a multidimensional ranking on three of the criteria just analyzed – competitive advantage applications, success scores and unsuccessful features – once again assuming equal weight for each criterion. The Organiza-

tional approach stands out clearly as the most promising approach, with the remainder varying by criterion but not distinctive overall.

Table 11: Multidimensional Ranking of SISP Approaches

| | Business Led | Method Driven | Adminis-trative | Techno-logical | Organiza-tional |
|---|---|---|---|---|---|
| Competitive advantage ranking | 2 | 5 | 3 | 4 | 1 |
| Success score ranking | 5 | 3 | 4 | 1 | 2 |
| Unsuccessful features ranking | 2 | 3 | 4 | 5 | 1 |
| Sum of ranks | 9 | 11 | 11 | 10 | 4 |

## 6. CONCLUSIONS

SISP in large organizations is a complex phenomenon and has been pursuing, it seems, several objectives using more than one method over time. Companies report benefits but are cautious in claiming success. They are articulate on the unsuccessful features of SISP and are as concerned about process and implementation as method. Accordingly, rather than talk of SISP methods alone, a more holistic term, "approach," might be preferred. This can be seen to comprise a wide set of activities including studies, events, methods, daily organizational interactions, partnerships between IS departments and users, and occasional traumas, crises and accidents. Certainly these are the dimensions recounted by those who have participated in setting directions for IS.

Qualitative analysis reveals five SISP approaches in 21 United Kingdom companies. The experiences of the six prior case studies seemingly can be described within this taxonomy. The data suggest that a Business Led approach can sometimes be effective, but a Method Driven approach is likely to disappoint. An Administrative approach can yield some benefits, as can a Technological approach, but not those most sought from SISP, particularly applications which are judged to be strategic and management support respectively. On a multi-criteria evaluation, an approach which is "Organizational" seems likely to be most effective.

A novel aspect of this study is the analysis of general manager and user manager attitudes and experiences as well as those of IS Managers. In reporting back the "results" to participating companies, an interesting reaction has occurred. When asked to select which approach best describes their experience, if only IS professionals and planners are present their conclusions often differ from the author's interpretative results. When all three stakeholders are present, a lively discussion ensues but eventually, unprompted, the group's view coincides with

the data and the author's interpretation. This suggests another test. Do differences in reported success score vary more by stakeholder set or by attributed approach? Analysis of variance tests suggest no significant association between either approach or stakeholder set and the fragile and perhaps irrelevant success score. Approach may be marginally more influential. The tests do suggest that approach has much the same effect on each stakeholder set are and the effects of each stakeholder set much the same for each approach.

Descriptively, however, differences in means and ends have been identified in each approach and the organizational approach looks most promising. This "result" does fit with some prior research. The thematic, emergent, interactive, both informal and formal, soft and in some ways – from the IS Manager's perspective – more political characteristics of the organizational approach are reminiscent of the more behavioral theories of organizational decision-making. In particular the dynamic is close to Mintzberg's (forthcoming) strategy as pattern or Quinn's (1980) incrementalist perspective on strategy-making. Indeed, both the strategies and the formulation process in the Organizational approach have a retrospective or rationalization character about them. The emphasis on implementation and distinct phases of benefit delivery is also reminiscent of Weick's (1984) strategic advance by small wins.

There is also some fit between the Organizational approach and the author's prior work on SISP methods (Earl 1987). The use of any method that helps at the right time may be consistent with earlier claims that multiple methods are required for IS strategic planning. However, the characteristics of the Organizational approach have no other obvious connections to prior SISP research. Furthermore, no contingent explanations are apparent for this approach or for the differences across all five. No significant association can be detected with organization structure, business size, business environment, IS intensity of sector or management style. Organizational approach firms did have several years' experience of SISP (a mean of 9.83 years) – which could suggest companies learn to plan by experience as suggested by Earl (1987) and corroborated by Galliers (1987) – but then so did other firms, especially those with an Administrative approach.

So what should practitioners conclude from this study? They could use the taxonomy of approaches as a diagnostic tool and consider how to remedy reported weaknesses and capitalize on claimed strengths of their particular approach. They could "mix and match" by adopting apparently desirable features of some approaches and avoiding obvious pitfalls of others. Alternatively, they could invest in the Organizational approach as that which seems best to cope with the three different challenges of strategic information systems planning discovered in this investigation.

276

For researchers, it is this multidimensional nature of SISP which is worthy of further study. Focussing on methods alone is not sufficient. Like strategy-making at large, SISP is a more complex phenomenon than simple technique and the characteristics of an effective approach may not fit easily with the certainty, rationality and structure often demanded by IS departments and their technologies.

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## 8. ENDNOTE

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