

TOWARDS A DYNAMIC THEORY OF STRATEGIC INFORMATION SYSTEMS PLANNING

Neil McBride, De Montfort University

ABSTRACT

Strategic Information Systems Planning (SISP) has been defined as ‘the means of identifying application systems which support and enhance organisational strategy. It also provides a framework for the effective implementation of these systems’. This paper explores the underlying classical assumptions which support such a definition. Critical analysis of the classical approach to SISP leads to the conclusion that such formal-rational approaches are inadequate for organisations in the late nineties which are subjected to continuous change. Alternative schools of thought from strategic management literature are outlined and their relevance to SISP is examined. It is concluded that a more dynamic approach to SISP is required. The characteristics of a dynamic approach are outlined which leads to the identification of some alternative research hypotheses. Finally a dynamic approach to SISP is defined as ‘the continuous review of computer technology, applications and management structure to ensure that the current and anticipated information and process needs of the organisation are met in a way that provides an acceptable return on investment, is sensitive to the dynamic politics and culture of the organisation and is aware of the sociological environment within which the organisation exists.’

1. INTRODUCTION

Strategic Information Systems Planning (SISP) is the process of identifying the information systems (IS) requirements of an organisation at a high level. It has been defined variously as: ‘the process of identifying a portfolio of computer-based applications that will assist an organisation executing its business plans and realising its business goals.’ (Lederer & Gardiner, 1992); ‘the means of identifying application systems which support and enhance organisational strategy. It also provides a framework for the effective implementation of these systems.’ (Fidler & Rogerson, 1996); and ‘ [a means of bringing] together the business aims of the company, an understanding of the information needed to support those aims and the implementation of computer systems to provide that information, [resulting in] a plan for the development of systems towards some future vision of the role of IS in the organisation’ (Wilson, 1989). It is essentially the strategic management of IS.

The exercise of SISP has focused on the identification of suitable IS for the organisation, investment appraisal and implementation planning with the overall aim of aligning IS strategy with business strategy (Baets, W,1992; Burn, 1993; Dutta & Doz, 1995; Earl, 1989; Sillince & Frost, 1995). Most textbooks (Robson, 1997; Fidler & Rogerson, 1996; Ward and Griffiths, 1996) and many researchers (Lederer & Salmela, 1996; Elliot & Melhuish, 1995) have interpreted SISP as a formal, rational

exercise in which a series of logical steps are undertaken resulting in outputs which define IS requirements and identify a long-term strategy. Indeed, methods such as Business Systems Planning, Method/1 and, Information Engineering involve an intensive study at a particular point in time which applies some form of scientific analysis to identify specific IS support for business goals.

As such, SISP adopts a classical view of strategic management which focuses on an attachment to rational analysis, the separation of strategy formulation and execution and a commitment to profit maximisation (Egan, 1995). In IT terms, this can be seen in the commitment to logicalisation and the identification of logical models, the separation of operational systems and strategic systems and a focus on return on investment and cost benefit analysis.

The adoption of this classical view of strategy depends on there being a clear business strategy, a clear and identifiable link between IT implementation and business results and a future which can be predicted and responded to through rational planning. The case for rational SISP is stated as an antidote to non-rational planning, piecemeal planning, and so-called muddling through. Such irrational processes, although more practised than formal approaches are seen as inhibitors to effective and aligned use of IS (Lederer and Samela, 1996).

Consideration of SISP as a formal system consisting of input, processes and outputs enables us to identify factors that will result in success (Fitzgerald, 1993) and propose theoretical links between the planning of IS and the successful implementation of IS resulting in benefits to the organisation. Thus Lederer and Samela (1996) are able to formulate a series of hypotheses based on direct links between the environment and resources, the process, the plan, the implementation and alignment.

The formal SISP approach requires a static, stable environment in which a stable business and its strategy can be analysed and the technology is reliable and stable enough for plans to be developed and implemented over a period of time. It assumes that IS plans can be implemented without intervening changes in business environment and technology and that, because there are contingent links between technology and business, expected outcomes can be managed and delivered.

Lederer and Samela (1996) consider that formal SISP planning is a sign of technological maturity, that organisations will evolve towards a formal approach, itself a sign of IT coming of age, and will leave behind the primitive intuitive approaches to IS planning.

But what if the business environment is not rationally predictable? What if internal and environmental forces are chaotic and constantly changing? (Stacey, 1993). What if the future does not match forecasting models? What if organisational dynamics are the result of political and cultural processes that cannot be rationally modelled? What if strategies are absent or if present are socially constructed and subject to the vagaries of irrational and emotional managers? What if, far from being rational, strategy formulation in the business and in IS is an unpredictable process where the use of managerial intuition is likely to be more effective? What if intuition and evolved strategy represents a higher state of managerial evolution and maturity than formal

strategy? Where does this leave the hypotheses that Lederer and Salmela formulate as part of their theory? The next section critically reviews these hypothesis.

2. CRITIQUE OF THE CLASSICAL SISP APPROACH

Classical strategic management has been the basis of most current initiatives in SISP. The dominant perspective is that of senior IT managers leading the strategic exercise, identifying IT requirements in a rational, detached and sequential manner, and making strategic choices. Such an approach strengthens the IT manager’s position as the strategic expert, ensures the need for a professional presence and reduces complex social, political and cultural problems to a set of simply-stated technical specifications.

The development of classical strategies may give the IT manager a sense of security and worth, and satisfy corporate managers, but it is unlikely to reflect the complexities of the organisational situation, nor to have long term value. Classical SISP is based on the premise of the rational, economic man (Whittington, 1993), making strategic decisions based on scientific analysis of the situation.

Lederer and Samela (1996) adopt a classical approach in identifying a sequential approach to SISP as a basis for their theory, typified by Method/1, in which internal and external environment and resources influence the planning process, the planning process affects the SISP plan, the information plan determines implementation and the efficiency of implementation effects alignment. The theory enables the postulation of hypotheses describing direct predictable links between constructs (Table 1).

External Environment	H1	A more stable external environment produces a more effective and efficient planning process
Internal Environment	H2	A simpler internal environment produces a more effective and efficient planning process
Planning Resources	H3	More extensive and higher quality planning resources produce a more effective and efficient planning process
Planning Process	H4	A more comprehensive planning process produces a more useful information plan.
Information Plan	H5	A more useful information plan produces greater plan implementation
Plan Implementation	H5	Greater plan implementation produces better alignment.

Table 1: Constructs and Hypothesis for a classical SISP Theory (Lederer and Salmela, 1996)

There are some underlying premises or assumptions behind the representation of SISP as a linear procedure in which inputs are transformed to outputs as a result of processes and in which the outputs of one process feed into the next. Firstly it suggests that the process of SISP is linear and there is no feedback. Does the

implementation plan affect the information plan? Is it likely that a dynamic process of learning takes place such that earlier steps are revisited and deliverables altered? Secondly it suggests that increased planning and control results in increased maturity of an organisation. The evolution of an organisation is then accompanied by increased formalism and bureaucracy. It could be suggested that increased formalism in planning leads to stagnation and reduced ability to adapt. Thirdly it suggests that the primary goal of planning is alignment between business goals and IT strategy. Is it possible that conflict and tension between the technology and the business may lead to new strategies as business responds to the technological challenge and technology is forced to evolve in response to the challenges provided by the business environment? Fourthly it elevates the value of fixed plans. The goal of classical SISP, as suggested from H5 is to implement as much of the plan as possible. Is it possible that dynamic evolving plans may be more valuable in meeting business needs and enabling adaptability?

Study of H1 and H2 suggests, if they are proved to be correct, that the value of classical SISP is limited to firms operating in stable environments with little change. Stable external environment and simple internal environment are presented as factors which may lead to successful SISP implementation - success being judged in terms of alignment. The rarity of such conditions suggests a limited use for classical SISP. Or are Lederer and Samela suggesting that, since formal SISP is an attainment of a technologically mature organisation, then external stability and internal simplicity are also properties of such an organisation?

In H3, Lederer and Samela identify effectiveness and efficiency as attributes of a successful SISP exercise. Such attributes reflect the classical pedigree of this SISP approach. Classical strategy focuses on profit maximisation above all else. SISP plans must be comprehensive and useful according to H4; although Lederer and Samela make little attempt to define comprehensiveness and usefulness. Could not partial strategies be equally valid, perhaps concentrating on specific issues and limiting the amount of information needing to be processed and understood by managers? If usefulness equates to relevance, it can be suggested that relevance is a pre-requisite for the delivery of any IS. Finally, it can be suggested that greater implementation will *not* lead to better alignment (H5). More does not indicate better, particularly if the systems being implemented as a result of the SISP exercise lack cultural fit, or are of diminished relevance as a result of strategic and environmental changes occurring between planning and implementation.

The lineage of the principle SISP methodologies and the theory delineated by Lederer and Samela (1996) can be traced to the classical strategic management theories of Sloan, Chandler, Drucker and others. The attraction lies in the formalism and pseudo-scientific nature of the methods and the resulting outcomes. Messy outcomes are avoided and clear cut decisions can be made which validate the power of corporate and IT managers. Policy is separated from operations and problems are logicalised to a point where the fuzziness of social, cultural and political issues is removed. Furthermore, the underlying assumptions of SISP methodologies is rarely explained. The techno-functionalist paradigm is not questioned. The complexity of the business world requires more variety in approaches to SISP. An expanded theoretical base is required (Introna, 1997).

I would suggest that current SISP methods are out-of-tune with trends in strategic management and with the practical problems and environmental changes facing organisations today. While classical approaches may suit the preference of information systems practitioners for formal methods and non-messy problems. The use of strategic approaches whose key period was in the 1960s (Whittington, 1993) is hardly appropriate in the chaotic, dynamic and post-modernist environment of the late 1990s. SISP thinking and approaches to IS planning needs a radical overhaul, if IT is to not only support organisations but become embedded in organisational structures. A more dynamic approach to SISP practice and theory is required which is socially sensitive, adaptable and evolving. The search for alternative approaches to SISP may be helped by studying trends and ideas in strategic management. The following section considers three alternative schools of thought that challenge the classical approach and may provide new directions for strategic information systems planning.

3. ALTERNATIVES TO CLASSICAL THEORY

Whittington (1993) identifies three alternative, generic approaches to classical strategy: evolutionary, processual and systemic. This section discusses each of these, particularly identifying features of relevance to IS strategy. It is through awareness of the elements of alternative approaches and the attenuation of the classical approach rather than its wholesale rejection, that a new approach to IS strategy may be developed.

3.1 EVOLUTIONARY THEORY OF IS STRATEGY

The evolutionary approach, while seeing profit maximisation, i.e. return on investment, as the final arbiter of organisational fitness, does not consider that organisational fitness can be rationally planned for in a sequential manner. Rather, the organisation is viewed as being subject to the selection pressures of the market which determine its survival. Organisations survive by adapting to the market environment. Fitness involves a combination of efficient business processes, leanness and the occupying of distinctive niches. Such environmental fit may be a result of chance. However, managers can examine the current environment and seek the best possible fit. Organisations are viewed as complex adaptive systems, and a strategy of continuous adaptation is pursued. Competitive advantage must be sought, but there is the ever-present threat of the Red Queen effect in which competitors are locked in an arms race from which they obtain no benefit to their profits (Beinhocker, 1997). Chaos theory has some application here, since organisations, as complex, dynamic, non-linear systems do not evolve in a steady, predictable way. Small disturbances multiply, long-term planning is impossible, stable equilibrium are not reached and dramatic change can occur unexpectedly (Stacey, 1994, 1996; Levy, 1994)

Strategists with an evolutionary perspective consider it important to allow for variation and selection. A number of initiatives are attempted with the hope that, there being a large enough population with sufficient variety, some will succeed in increasing organisational fitness and adaptation to the environment. Strategic spaces are searched for possible options, and organisational learning play a key role in adaptation (Barnett and Burgelman, 1996).

An IS strategy must contain sufficient variety to meet the selective pressures of the business and technical environment. Over-reliance on single technologies, applications and methods may lead to an inability to cope with adaptive forces inside and outside the organisation. Information systems flourish in an amenable organisational environment. However, small changes in the environment may have significant effects on the IS.

Too much variety will result in inadequate resources, a diluted skills base and non-optimal IS solutions to business problems. A delicate balance is required, in which sufficient variety is cultivated to match the technological and business variety in the surrounding environment, although chaos theory would suggest that the variety will never be sufficient since changes in the internal and external environment will be unpredictable.

3.2 PROCESSUAL THEORY OF IS STRATEGY

The processual approach to strategy views success as being a result of opportunism and foresight as well as luck. It is less pessimistic than the evolutionary approach in considering what manipulative effect managers can have on the surrounding environment. Strategy is seen as a pattern in a stream of actions and decisions. It emerges and may only be clearly articulated after the event. There is an absence of well-defined, prior intents, although there may be consistency (Araujo and Easton, 1996). There is no division between formulation and implementation. Strategy is born out of action in response to current and anticipated events.

Processual theorists may focus on the context and process within the organisation. Strategy results from interactions between cultural and political issues (Walsham, 1993; Walsham and Waema, 1994). The use and distribution of power (Hardy and Redivo, 1994) is of key importance. Sources of sustainable advantage lie within the organisation. Core competencies must be developed in a manner that gives sustainable advantage (Hamel and Prahalad, 1994). These core competencies are obtained by the distinctive use of assets including reputation, skills, and knowledge (Andreu and Ciborra, 1996).

IS strategy influenced by a processual view should take into account issues of context, culture and process. Adjustments may be incremental and are made in a manner which is sensitive to the organisational environment. Alignment results from internal shared culture, rather from specific applications or uses of technology. Aligned IS emerges from an understanding of organisational influences. Historical context is important, as are the internal and external contexts.

The processual view recognises that, although each organisation and its IS is distinctive, general patterns can emerge. The interplay of cultural, political and economic process needs to be considered by the IT strategist who should be aware of her own motivations in influencing the process (Rouhonen, 1991).

3.3 SYSTEMIC THEORY OF IS STRATEGY

If the viewpoint of the processual theorist is one of inside the organisation. looking outwards, the viewpoint of the systemic theorist is outside the organisation looking

inwards. The systemic approach to strategy highlights the importance of the social and economic systems within which organisations are embedded. Managers' cultural and social backgrounds influence their approach to strategy. Ideas and norms are perpetuated through class systems and education systems. Different cultures produce different organisational structures which yield different strategic approaches. The surrounding context of class and professions, nations and states, family and gender influence the structure and strategy of the organisation. Strategy is culturally determined. Professional managerial groups develop skills and strategic approaches which legitimise their profession, social status and earning ability. The development of a technical-functionalist approach to strategy ensures that only professional managers can carry the strategic process through.

In IS terms, the use of a formal methodology may validate the professional role of the IT manager. The role of IS and the influence of the IS manager may be influenced by the organisational structure, and its diversification and divisionalization. This in turn may be culturally determined. Patterns of diversification are different in Japan from those in the US. The short-term, profit related perspective of Anglo-Saxon countries differs from long-term and goal-oriented perspectives in, for example, Germany and Japan. A long-term investment in IS may be difficult to justify, let alone plan for, if the organisational strategy is one of short-term profit maximisation.

4. PARADOXES IN DEVELOPING APPROACHES TO IS STRATEGY

Taking a classical approach to SISP may be of limited effectiveness and only work for certain organisations where change is minimised. An effective approach to SISP must match the rate of change within the organisation. This creates a paradox. An approach is required which creates a stable technical platform since constantly changing technology will weaken IS and create resource and skills stresses within the organisation. However, an ideal SISP approach must create strategy which is dynamic and can respond rapidly to business changes - the need for new products, new business relationships, and new services at short notice. We need short-term, rapid response and long-term stability. We are looking for long-term stability in an environment where both the technology and the business are changing faster than we can implement information systems.

There is a further paradox in that a strategy needs to routinise and optimise IT systems, for example, by centralisation of transaction systems and the creation of data warehouses. At the same time it needs to create diversity such that new applications are available to meet new business needs and changing information requirements. I would suggest that IT strategies have tended towards the routinisation of work and have discouraged the diversity necessary for encouraging creative ideas. Routinisation and optimisation lead to greater control and larger systems which in turn increase the power and role of the IT profession within an organisation.

5. PROPERTIES OF A DYNAMIC APPROACH TO STRATEGIC INFORMATION SYSTEMS PLANNING

Having suggested that the classical approach to SISP is inadequate for organisations, we need to ask what could replace it. A dynamic approach to SISP will have certain characteristics drawn from the alternative strategic paradigms.

It should be continuous and emerging rather than episodic and fixed. If formal exercises are carried out they will be only small episodes in a continuous stream of strategic planning.

It should be difficult to differentiate between strategic and operational. There will be no artificial barrier. Strategy should be developed from consideration of operational issues and will have an immediate effect on IS operations. Strategic themes will emerge as a result of business needs (Earl, 1993).

The strategic process should explicitly address political and cultural issues. The strategist will have an awareness of the context of IS within the organisation, the history of IS usage and the political and cultural structure of the organisation. Political reasons for SISP and political factors, for example, the involvement of consultants, should be noted.

The SISP process should be sociologically sensitive. Planning should take into account the cultural conditions within which the organisation exists.

The SISP process should build on previous work. Where previous patterns of success or failure emerged, these should be taken into account, although they should not drive the strategy. However, it should be recognised that the SISP process may be initiated in order to replace previous work. When new organisational management arrives, there is a tendency to wipe the slate clean, attribute all problems and difficulties to previous practice and to start again.

The resulting strategy should be adaptive. Business 'hotspots' should be identified where significant adaptation is taking place due to market forces. IS strategy should be directed towards themes concerning areas of adaptation.

The outcomes of the SISP exercise may include changes in power relationships, the development of new technical support and IT structures within the organisation, learning and training, and policies or frameworks in addition to, or even instead of, the traditional portfolio of computer applications.

The rate of change in IS within the organisation should match the rate of change within the organisation, and with the minimum of lag. When the organisation is subject to constant change, the SISP approach should be one of rapid response and technological adaptation. Where change is frequent but not continuous, the SISP approach should be one of setting policies and directions rather than defining precise applications. Where the organisation is stable and subject to little change, the SISP approach may be one of long-term planning.

The SISP exercise should define management and political structure before defining technological structure.

The SISP exercise should consider current technology carefully. The current position should be used as a starting point for the evolution of strategy. The strategist should be aware of the historical and political factors that have led to the current situation and endeavour to explore the underlying cultural platform

6. TOWARDS A DYNAMIC THEORY OF SISP

A theory will consist of a series of statements that describe a situation and may attribute cause and effect, together with resulting hypotheses that enable the statements to be tested. Lederer and Salmela (1996) propose an overarching theory which would apply to all SISP episodes. This is the classical or positivist view. Processualists may argue that it is fruitless to propose an overarching theory of SISP. Post-modernists would argue that there is no grand narrative of SISP. I would support the latter view. It is unlikely that a grand theory of SISP exists. Each situation and organisation is different. However, protagonists of the interpretive approach would argue that some generalisation is possible. Supporters of chaos theory would argue that, in the short term at least, patterns do exist, although their appearance is never exactly the same. A dynamic theory of SISP will assume the form of guidelines and practically applicable principles rather than rigid formulas.

A dynamic theory of SISP cannot assume that the SISP exercise is carried out sequentially, that its success is predictable or determinable or that there are direct links between concepts or constructs and causal relationships. Furthermore, stability may not be a prerequisite for SISP implementation. SISP requires change, which may be easier to obtain in a complex, unstable environment where external and internal forces threaten organisational structure and dynamics.

A dynamic theory of SISP would need to aid the identification of reasons for a SISP exercise. The motivation behind SISP exercises may determine the outcomes and the way those outcomes are interpreted and implemented. The theory would need to address issues of change since a key purpose of SISP is to facilitate organisational change through the medium of IS. SISP often arises from change - in the external environment, in internal politics, in leadership and management, in technology - and itself causes change. An understanding of the state of change of the organisation is important in order to generalise on the outcomes of SISP.

Furthermore, the theory will have to account for the small, incremental changes resulting from a dynamic approach to SISP, where formal exercises mostly do not occur, and where they do they are minor episodes in the emerging information systems strategy. The dynamic theory of SISP will need to account for the influence of organisational structures on the SISP process and the consequent restructuring which emerges as a result of the SISP process. A dynamic theory of SISP would also need to examine power, within and without the organisation. It would need to explain how power is distributed, why certain managers may support a SISP initiative and how particular solutions to problems gain credence.

Starting from the premises of Lederer and Salmela (1996) the following outlines some possible elements of a dynamic theory of SISP, presented as statements with supporting hypothesis. This is neither comprehensive nor complete. Given that there is unlikely to be an overarching theory of SISP, a dynamic approach will by nature be fuzzy, informal and subject to growth and change. The point of these statements is to illustrate some of the types of guidelines, principles or patterns such a theory will hold together with the observable phenomenon which may follow. Its value is in sensitising researchers and practitioners to the issues involved in the continuous development of IS strategy.

Statement 1 :Strategic patterns will usually reflect the interpretation, theory of action and culture of those within the organisation with the greatest power.

Therefore:

The success of the SISP process will depend on the extent to which powerful organisational actors are enrolled.

SISP will be perceived to have been a success when it reflects the expectations and ambitions of the powerful within the organisation.

The extent of implementation of a SISP exercise will depend on the closeness of the relationship between the IT manager and the organisational power brokers.

Statement 2: Effective and fruitful IS strategy is born out of instability.

Therefore:

The less stable the external environment the more likely it is that some plans will be implemented.

The greater the conflict within the organisation and the greater the political pressure the more likely that a SISP exercise will result in effective change and improvement in the organisational IS.

The larger and more stable the existing IS platform, the less change will occur as a result of a SISP process.

Statement 3: Effective and implemented IS strategy emerges from incremental steps and not a grand design:

Therefore:

The allocation of greater planning resources to SISP will not produce better outcomes.

The more comprehensive the planning process the less likely that the resulting plan will be implemented.

A short planning cycle will produce greater alignment than a long planning cycle.

Good application definitions arise from small planning exercises, limited in time and scope, rather than a grand, organisation-wide exercise.

Formal SISP exercise, carried out as major, intensive studies will result in little implementation except where the results are treated as incremental, emergent strategy.

Statement 4 : Organisations are complex, dynamic, non-linear systems: they will never settle down long enough for a formal SISP exercise to be effective.

Therefore

The outcome of an effective SISP is more likely to be policies rather than application definitions.

External and internal forces will always intervene to invalidate any long-term strategic exercise.

It will be impossible to directly attribute 'success' to any specific SISP approach.

7. CONCLUSION

The classical approaches such as Method/1, Earl's multiple methodology and Information engineering are too simple and rigid to meet the SISP needs of changing organisations. More complex internal processual issues and external, systemic issues must be considered. IS strategy is often emergent. Where formal plans are produced they run the risk of being invalidated by the dynamic and chaotic changes occurring within the organisation. Rapid and dynamic approaches to SISP are required. Such approaches will incorporate developing ideas in strategic management where there is a move away from classical planning towards emergent strategy involving learning and step by step progression rather than grand plans and great leaps forward. Evolutionary responses which involve searching for a number of strategic answers to selective forces within the organisational environment, processual approaches which involve sensitivity to internal politics and culture, and systemic approaches which take into account the culture and society within which the organisation exists are all gaining currency. There is a growing realisation that strategy is messy: the rational, objective, long-term plan was always mythological anyway.

A dynamic approach to SISP is required which incorporates elements of evolutionary, processual and systemic approaches without losing the order and logic which a classical approach brings. I would suggest that a redefinition of SISP is required which takes into account the dynamic nature of organisations and the need for strategies which adapt. I propose the following definition:

SISP is the continuous review of computer technology, applications and management structure to ensure that the current and anticipated information and process needs of the organisation are met in a way that provides an acceptable return on investment, is sensitive to the dynamic politics and culture of the organisation and is aware of the sociological environment within which the organisation exists.

Such a process should result in emerging outcomes in terms of advanced technological platforms, flexible and responsive applications and appropriately trained staff. It should focus on learning within the organisation. It should identify the importance of knowledge and the transmission and support of knowledge through IS (Nonaka, 1991; Tenkasi & Boland, 1996; Spender, 1996). It should encourage the interpretation of organisational culture and the sociological awareness of the influence of state, culture and education (Whittington, 1993).

However despite the need for dynamic, interpretive and sociological approaches to SISP, managers will continue to cling to classical SISP because the execution of a classical SISP exercise gives IT managers a feeling of security, although the results may not be implemented and may be overtaken by subsequent events. It will take lots of persuasion and gentle encouragement before IT managers begin to develop approaches to SISP that are flexible, focus on learning and meet the changing, dynamic demands of the organisational environment.

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