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A "R"EVOLUTIONARY STAGED GROWTH MODEL OF INFORMATION SYSTEMS PLANNING

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ABSTRACT

The securing and maintaining of alignment between business strategies and Information Systems (IS) strategies is frequently cited as a critical concern of IS managers. Consequently it has been ranked as an important issue for IS research agendas over the last decade. Very few empirical studies have, however, been reported with the result that there is no firm evidence to support the need for alignment, far less the way that strategies might interact. This paper reports the results of a longitudinal study that examines both IS and business strategies using an external-internal alignment model. After four years of data collection and analysis, there is strong support for an alignment model that follows a lead-lag strategy. This implies that alignment is not a steady state but will reflect a dynamic and "r"evolutionary model of change. The alignment and change models are described and a future research agenda identified.

1. INTRODUCTION

The need to develop a "fit" between Information Systems (IS) strategies and business strategies has long been emphasized by researchers (Galliers 1987, 1991; Lederer and Mendelow 1987; Lederer and Sethi 1988, 1991; Henderson and Venkatraman 1992; Burn 1989; Luftman, Lewis and Oldach 1993) and reflects the belief that the use of IS evolves in an organization over time (Nolan 1979, 1984; Earl 1989; Galliers and Sutherland 1991) and can serve different strategic roles within different organizational contexts (McFarlan, McKenney and Pyburn 1983; Earl 1989; Boynton, Victor and Pine 1993). IS planning has become a crucial management activity that is recognized to be a dominant concern among organizations (Niederman, Brancheau and Wetherbe 1991; Lederer and Sethi 1992; Gilbert 1994). Growing appreciation of the changing role of IS has highlighted the need to focus on different approaches to IS planning which can more closely align the IS plans with the business plans (King 1988; Burn 1993a; Broadbent and Weill 1993). Traditionally, however, IS planning techniques have been viewed as being dependent on the business strategy which drives the organization (Henderson and Venkatraman 1992). Recent research has shown that IS have now become sufficiently powerful drivers to have become interdependent with business strategies and may, therefore, require planning approaches which support their role as leaders of business strategy (Scott-Morton 1990; Thurlby 1993).

Evaluating the alignment model between business strategies and IS strategies has become an important research question (Henderson 1990; Luftman, Lewis and Oldach 1993; Sambamurthy, Venkataraman and DeSanctis 1993); however, there are few empirical studies which evaluate this link. This is understandable given the longitudinal nature of research required to study strategies and the interaction of IS and organizational change. Only recently have there been some research studies which focus on the role which IS plays in an organization and the IS planning approach used (Zmud, Boynton and Jacobs 1987; Galliers and Sutherland 1991; Sambamurthy, Venkataraman and DeSanctis 1993; Premkumar and King 1992; Thurlby 1993; Burn 1993a; Chan and Huff 1993). As with research on organizational strategic planning (Mintzberg 1973, 1979; Miles and Snow 1978; Quinn 1980; Cowherd and Luchs 1988), these support the view that specific planning processes will impact in different ways on organizational performance.

This paper reports the results of a study designed to consider both the interaction of organizational and IS strategies and the impact on IS planning approaches. Specifically, the study examines

1. the strategic alignment model between IS and organizational strategies;
2. dynamic models of change impacting on the organization and the role of IS;

3. the lead-lag role of IS planning.

The study was initiated in 1989 and has collected data from 168 organizational studies over a four year period. The results from the first year of study were published earlier (Burn 1993a) and provided the basis for the development of a strategic alignment model. This paper updates the model and extends the analysis using longitudinal comparisons between the data sets from the different years of study. Specifically, the results suggest that there is a staged cycle of change that requires IS and business strategies to continually "revolve" between a leading or lagging role.

This paper reviews previous research into alignment theories, provides an overview of the research model, describes the strategic alignment model relating organizational strategies to IS strategies, and provides a detailed analysis of models of dynamic change that impact on IS planning approaches. A number of change models are described relating to the different views of the organization collected over time and supporting a revolutionary model of IS strategy formulation. The research is on-going and future areas are identified for closer investigation. Finally, the need for research using a similar approach but with different variables is emphasized and a number of suggestions made for the direction of such studies.

2. ALIGNMENT THEORIES

2.1 Interaction of Organizational Factors and Strategy Formulation

Strategic management has been defined as the process of general managers co-aligning their organizations to environmental opportunities and constraints (Schendel and Hofer 1979). Although much has been written in recent years about the desirability of creating a fit between organizational and business strategy, this work remains largely theoretical and descriptive. The concept of "fit" has been used to describe linkages in strategy structure (Chandler 1962; Mintzberg 1979), technology-structure (Woodward 1965), organization-environment (Thompson 1967; Miles and Snow 1978) strategy-organizational culture (Schwartz and Davis 1981; Mintzberg 1989, 1991) and competitive product life-cycle-business strategy (Porter 1980, 1985). Cowherd and Luchs (1988) suggest that two streams of research studies have emerged:

- Strategic studies which focus on competitive analysis, and market environment and other external concerns (typified by Porter 1980, 1985),
- Organizational studies which emphasis internal concerns such as organizational design, human resource

systems and culture (typified by Mintzberg 1983, 1989).

Very little empirical research supports or integrates these.

The OASIS program (Organization and Strategy Information Service) was established in response to this need in 1984 and the results indicate that there are strong relationships between business strategy, organization and performance (Cowherd and Luchs 1988). Any research program that intends to study alignment models of IS and organizational strategy must attempt to take a number of organizational factors into consideration and integrate external and internal alignment theories.

2.2 Interaction of IS Strategy Formulation and Business Strategy

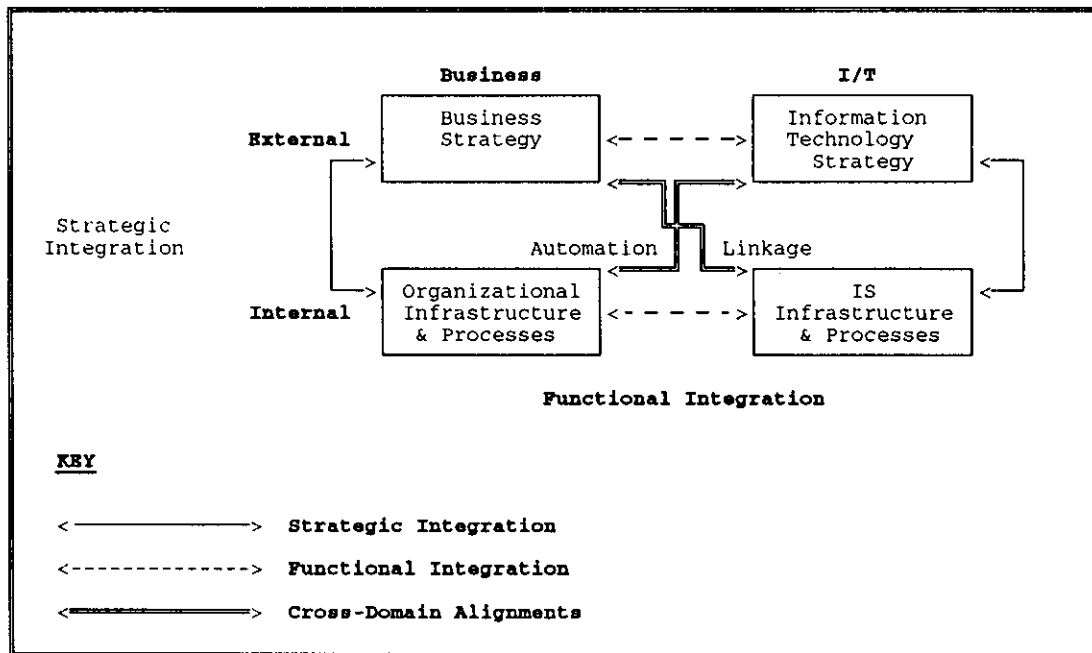
A major focus of the Management in the 1990s (MIT90s) program (Sloan School of Management) was to investigate the link between business strategy and Information Technology (IT). Of significance were the findings which concerned the future role of IT in the organization (Scott-Morton 1990):

1. IT does not provide sustainable competitive advantage by itself. It requires integration with the organization's processes and structure to achieve lasting advantage.
2. IT capability is now of sufficient influence to become a driver to change the organization, its processes, products and even its market.
3. Although IT is an agent of transformation, significant technical problems still exist and constrain effective deployment of IT in the business domain.

This implies that IS planning is no longer a sequential process but an iterative process with a number of possible start points and that IS planning spans four different domains: business strategy and organizational infrastructure and processes; IT strategy and IT infrastructure and processes.

This model specifically combines the traditional notion of functional integration with the concept of strategic fit. Strategic fit explicitly examines the relations between strategy formulation (choices that position a firm in a market) and strategy implementation (those that define the internal arrangements within the firm that are necessary to execute strategy) (Henderson and Venkatraman 1992). The dimensions of this model reflect an external-internal alignment fit that must be managed and supports the model used within this research study.

Figure 1. The Proposed Strategic Alignment Model (MIT90s)



2.3 Interplay of IS Role and Strategic Approach to IS

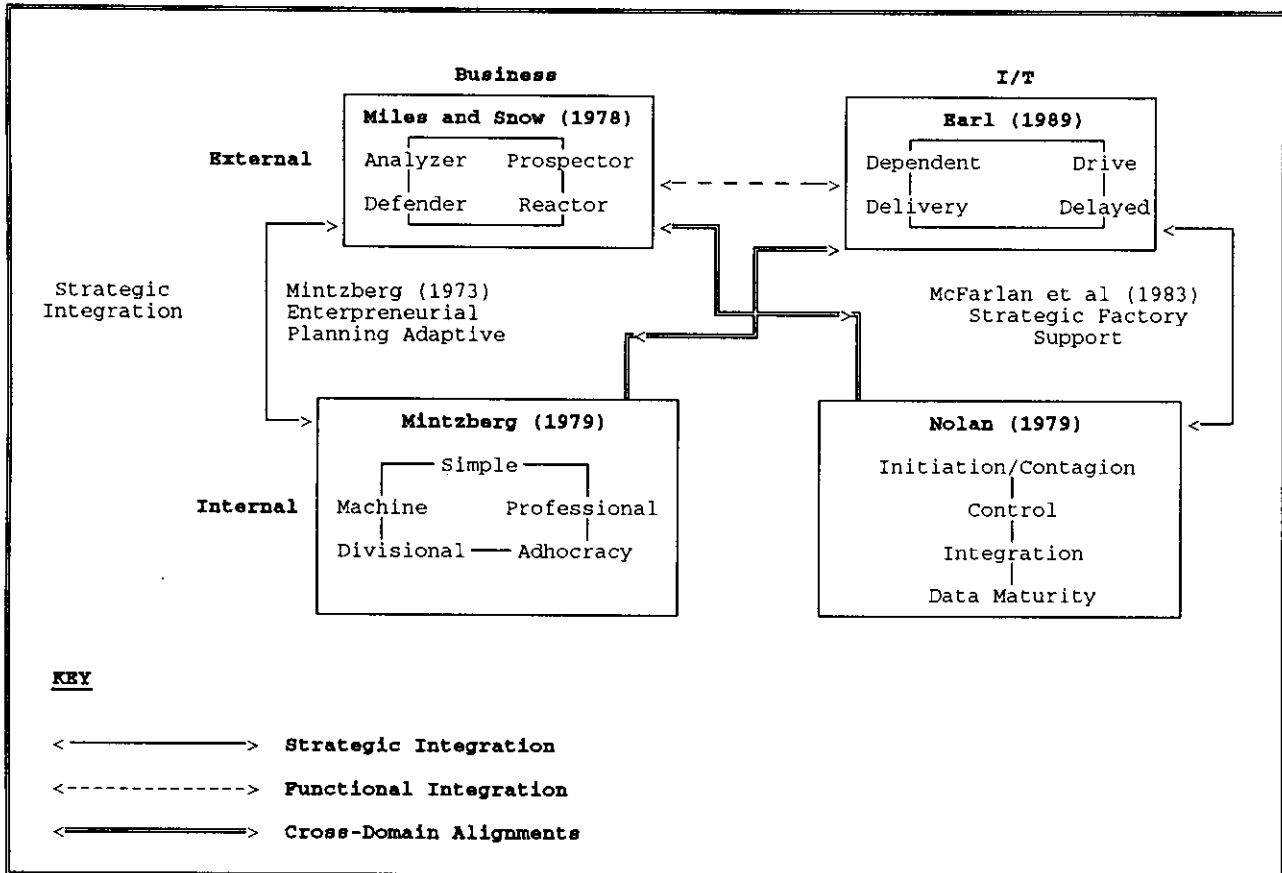
Only a small number of research studies have sought to explore the interrelationship between the IS role and the strategic IS approach used by the organization and little empirical evidence exists. Galliers and Sutherland developed a revised stages of growth model (Nolan 1979) to take into account the socio-technical view of IS planning and also to take account of the company's culture, staff, skills and organizational structure necessary to implement the chosen strategy. This model focuses on internal alignment but Galliers (1991) notes that too little attention has been paid to the choice of an appropriate IS strategy and related IS planning approach. He suggests the use of a strategic grid framework (McFarlan, McKenney and Pyburn 1983) to extend the model of alignment.

Premkumar and King use the McFarlan, McKenney and Pyburn strategic grid framework as the basis for an empirical study into IS planning related to the strategic role of IS in the organization. Three categories of variables were chosen to describe the various aspects of an IS planning system: planning characteristics, organizational support characteristics and planning performance characteristics. The results of their data analyses indicate that there are significant differences in planning, organizational support, and performance characteristics of IS planning among organizations with different roles for IS. The planning and support characteristics generally match the predictions

implicit in the strategic grid, thereby partially validating it. Significant relationships exist between two of the performance measures, planning effectiveness and IS's contribution to organizational performance, and the "fit" between the role of IS and the quality of the planning process. This study did not relate the IS variables to business strategy but Premkumar and King suggest that their work could be extended by examination of the relationship between the Miles and Snow typologies of organizations and the role of IS in an organization. This would allow researchers to examine the impact of "fit" between business strategy and the role of IS on organizational performance. Dov, Segev and Shenhar (1993) have found significant relationships between the success of strategic units classified under the Miles and Snow typologies and their use of IT.

Sambamurthy, Venkataraman and DeSanctis examine the design of IT planning systems for various organizational contexts from a theoretical standpoint. They identify the following organizational factors as affecting the conduct of the IT planning process: reliance on IT, market homogeneity, and the IT planning group's existing knowledge and experience as well as existing level of agreement on IT planning issues. While there is, as yet, no empirical support for their research propositions, they argue a very strong case for empirical research which can draw from the rich base of conceptual and empirical knowledge available in organization theory and strategic management. The use of longitudinal and cross-sectional studies is particularly advocated.

Figure 2. The OCA Framework



The study reported in this paper reflects the need to base alignment research on theories which relate to both organizational and IS strategies from an external and internal perspective. While it does not pretend to cover all organizational or IS variables which may impact on the strategic planning process, it does adopt a cross-sectional approach allowing consideration of a number of factors at external and internal policy levels. The results to-date strongly support the evolution of a "r"evolutionary model of IS planning.

3. THE RESEARCH STUDY

3.1 Research Overview

The framework used in the research study is shown in Figure 2. It combines theories related to organizational behavior with those related to IS strategies in a comprehensive methodology and is known as the "Organizational Cultural Audit" (OCA).

The analyst (a middle or senior manager in the organization) analyses the organizational strategy from an external

and internal alignment model. The theories of Miles and Snow are used to identify the business strategy approach while Mintzberg (1989) provides the basis for an infrastructure analysis. The overall planning style which is applied to align these is also examined using Mintzberg (1973). This analysis is repeated for an evaluation of IS strategies using Earl's dependency model for IS strategy analysis, Nolan's stage model (1979) for IS infrastructure examination, and the McFarlan (1984) portfolio model to review the IS planning approach. The results are then compared for co-alignment comparing all six cross-alignment relationships.

The analyst can identify from this where misfits occur and the extent of their impact on the overall planning model. (A detailed review of this process can be found in Burn 1993a.)

In 1991, fifty-nine organizations were studied using this approach and the results of this study supported the existence of a staged growth model of IS development that could be related directly to the organizational infrastructure model. A further 109 analyses over three years have now been completed and include both organizations new to the

study and organizations that have been the basis for longitudinal study. (The sample is drawn from business managers attending courses in strategic planning for IT.) The data continues to support the strategic alignment model shown in Figure 3 but also provides the basis for the change models which are also discussed in the next section.

4. THE STRATEGIC ALIGNMENT MODELS

4.1 The Functional Integration

The main conclusion drawn from the earlier stage of analysis was that organizations do change their planning styles as they progress through stages of growth in their usage of IT and different organizational configurations show very different patterns of growth related to their organizational typology.

These patterns are shown in Figure 3. The strategic support level is identified as that level where organizational planning style and IS planning style are in alignment. This also appears to be the level at which the majority of organizations of a particular configuration find stability. As can be seen, 60% of organizations within the Machine Bureaucracy level are at stage 3 or 4 but only 20% of Professional Bureaucracies and Simple organizations reach this level. The cases of Divisional Bureaucracies (32 examples) and Adhocracies (eight examples) are still unverified since a number of the former represent sub-divisions rather than the whole group whereas in the latter case too few examples have yet been drawn from the population. The stronger pull toward stages 3 and 4 (65%) would, however, suggest a multiple stage model requiring multiple planning styles in support.

This model of alignment first suggested the lead-lag role of IS in developing IS and business strategy. The strategic support level is defined as the MINIMUM support level of IS stage growth which an organization would need to maintain to provide full support and alignment with business strategy.

In order to arrive at this stage, however, organizations must be prepared to adapt their approach to IS strategy in accordance with the IS stage model and to cycle in and out of each style. This also implies that they may have to change their organizational infrastructure model to attain satisfactory alignment.

Several examples from the longitudinal study support these propositions and are reviewed in the next section but first it is useful to look at some of the other alignment matches at the strategic rather than infrastructure level.

4.2 Strategic Integration

Organizations were classified at the strategic level using the Miles and Snow typologies as Defenders, Reactors, Analyzers or Prospectors. The results of the analysis over four years are shown in Table 1.

The table shows that there has been a substantial change of strategic approach across organizations and emphasizes the importance of analyzing IS strategies within the environmental context as well as individual organizational contexts and cultures. As can be seen there is a positive movement toward "Analyzer" strategies and away from "Defender" strategies. For a more detailed understanding of this context please refer to Burn 1993b.

This change in business strategy has been reflected by a similar change in IS strategies using Earl's Dependency models as shown in Table 2.

From less than 50% in the Delivery and Dependent strategies for IS there are now over 60% at this level of strategic use. This would be an expected pattern of growth in a society where the reliance on IS is evolving. (Time series analysis of both tables shows Drive for IS strategies and Analyzer and Prospector for business strategies being increasingly adopted by organizations.) The more interesting comparison, however, comes when we relate the business strategy models to the IS strategy and the IS planning and infrastructure models as shown in Tables 3, 4 and 5.

In Table 3, the most noticeable feature relates to the need to adopt an "Analyzer" strategy in order to move into a "Drive" stage of dependency for IS. This most typically marks a transition stage from Delayed to Dependent but can also characterize a move from Dependent to Delivery. This trend is also reflected in Table 4 when analyzing the business strategy against the IS planning approach.

Furthermore, the "Analyzer" mode would seem to be necessary to progress into "Strategic" usage of IS. In all cases of "Strategic" application, organizations have already progressed to stage 3 or stage 4 of IS infrastructure development as shown in Table 5.

These tables do not support exact matches but, rather, show that there may be patterns of change which can be more closely examined by looking at some of the individual cases for which there are multiple sets of data in the research study. Using chi-square analysis, there is a significant interdependency between IS strategies and business strategies, IS planning strategies and business strategies, and IS strategy and IS infrastructure.

Figure 3. The Strategic Alignment Mode

Stage of IS Growth		Strategic Alignment Support Levels				
IS PULL	Approach					
	Multiple	4	IS STRATEGY LEAD	1	5	6
	Top-down/ Bottom-up	3	5	6	35	20
	Bottom-up/ Top-down	2	8	17	18	7
	Bottom-up	1	12	13	8	7
			IS STRATEGY LAG			
Approach			Bottom-up/ Top-down	Bottom-up/ Bottom-up	Top-down	Multiple
Organizational Configuration			Simple (25)	Professional (37)	Machine (66)	Divisional/Adhocracy (40)

ORGANIZATIONAL PULL

Table 1. Strategic Typologies (Miles and Snow 1978)

	Defender	Reactor	Analyzer	Prospector
1991	32	7	17	3
1992	15	2	19	3
1993	9	2	22	2
1994	10	1	22	2
Total	66	12	80	10

Table 2. Strategic Typologies (Earl 1989)

	Delivery	Dependent	Drive	Delayed
1991	12	17	11	19
1992	10	16	4	5
1993	10	18	5	6
1994	8	12	6	9
Total	40	63	26	39

Table 3. Business Strategy versus IS Strategy

	Defender	Reactor	Analyzer	Prospector
Delivery	18	-	20	2
Dependent	22	3	35	3
Drive	5	-	19	2
Delayed	21	9	6	3
Totals	66	12	80	10

Table 4. Business Strategy versus IS Planning

	Defender	Reactor	Analyzer	Prospector
Support	19	9	9	2
Turnaround	9	1	18	2
Factory	38	2	40	5
Strategic	-	-	13	1
Totals	66	12	80	10

Table 5. IS Strategy versus IS Infrastructure

	Strategic	Factory	Turnaround	Support
Stage 1	-	5	1	34
Stage 2	-	38	7	5
Stage 3	6	39	21	-
Stage 4	8	3	1	-
Totals	14	85	30	39

5. CHANGE MODELS

5.1 Government Sector

In the first year of study, a large Government division (>1000 employees) was analyzed overall as were the three separate sub-divisions. All were at stage 1 of IS growth with one sub-division operating as a Simple structure and

the other two as Professional Bureaucracies. The overall Divisional group was shown to be at a transition stage through an analysis of business strategy and planning, moving from a Defender to Analyzer mode and from an Adaptor to Planning style. In the second year of the study, the Division was analyzed as a Machine Bureaucracy in stage 2 of IS growth with Factory support. The planning style was still used but a Defender strategy reinforced

overall. The Division was seen to have moved rapidly into the stage when it must use IS for delivery of services and a need for even faster transition into stage 3 of IS growth. In the third year of the study, all sub-divisions are identified as Machine Bureaucracies at stage 2 of IS growth with Factory support systems and at Dependency level of IS support rather than Delivery. The overall organizational strategy has remained as "Defender" mode and planning has returned to an Adaptor model. Some explanations for this growth pattern from the studies are as follows:

- Change was needed but organizational change requires a "quantum" change which takes some time to stabilize and normally forces defensive, adaptive strategies in the period immediately following change.
- The IS strategy played a "leading" role in the transition stage and must now wait for organizational strategy to re-align (this is thought to be particularly true of government organizations where change is often viewed with suspicion).
- The move to an IS Dependency mode requires a significant "culture" change which takes time to develop both from an IS and business perspective.

An examination of the alignment of strategic planning during this period shows an initial alignment of bottom-up planning for both the organization and IS; an organizational shift to bottom-up/top-down leading the IS strategy of bottom-up; a top-down/bottom-up IS strategy now leading the organizational strategy.

The expected move would now be an organizational transition to top-down/bottom-up planning.

5.2 Private Sector

In the private sector, one of the large multi-group holdings was analyzed as a Machine Bureaucracy model, adopting a reactor strategy with adaptive planning and at a Delayed, Support stage use of IS with a stage 2 infrastructure. The organization operated as many different companies with bottom-up planning as a business focus and ad-hoc planning for IS. In the first year of the study, serious problems were diagnosed and the need to become more proactive in their use of IS apparent to all concerned. After two years, the organization remains at stage 2 infrastructure but has moved into the Dependent sector and turnaround mode. The overall business strategy has become that of Analyzer and Planning/Entrepreneur. The company has moved from a number of discrete Machine Bureaucracies to adopt the structure of a Divisional Bureaucracy and planning in all

areas is now clearly focussed on top-down. The organization intends to use this focus to direct the transition into stage 3/4 of IS growth.

This example is one where the organization, despite its size, is very much the creation of one entrepreneur and where support for IS expenditure will only be found if this can be shown to be directly aligned with the organizational (entrepreneur's) mission. The change model is always likely to find a "lag" model of IS.

5.3 Banking Sector

The third example described here relates to a large multinational bank which was one of the few examples found to be in the strategic use of IS in the first year of the study. The bank was a clear Divisional model acting as an Analyzer and Planner. Their reliance on IS was as a Delivery of goods and services with strategic use of IS at stage 4. Planning within the organization was effected top-down/bottom-up with multiple planning styles for IS and a declared need within the bank to move organizational configuration toward an Adhocracy and adopt multiple styles of planning. Two years later, the bank no longer finds itself comfortable with its strategic use of IS since technological changes have overtaken their IS development and the organization rates itself only at stage 3 of infrastructure supporting a Dependency reliance on IS. The bank indicates itself as being at Turnaround mode and all planning has now reverted to top-down/bottom-up in a formal controlled drive to regain a competitive edge from IS. The bank remains firmly in Divisional Bureaucracy model with a tendency to Machine Bureaucracy at control level.

In the three years of study, data from twelve banks has been collected and this particular group seem especially vulnerable to changes in technology which cause them to maintain a permanent balancing act between defending their positions and driving to regain strategic advantage. The lead-lag model is most noticeable here and can be seen over very short time periods. It would seem, however, to be a model which relates to all IS alignment with business strategy and to interact with a number of factors related to the strategic approach of the organization, specifically, organizational structure, strategy and planning approaches and IS reliance, strategy and stage of experience.

6. THE LEAD-LAG MODEL

In their examination of the impact of managerial strategies on the IT penetration in organizations, Zmud, Boynton and

Figure 4. Organicity and Entrepreneurship
(Slevin and Covin 1990)

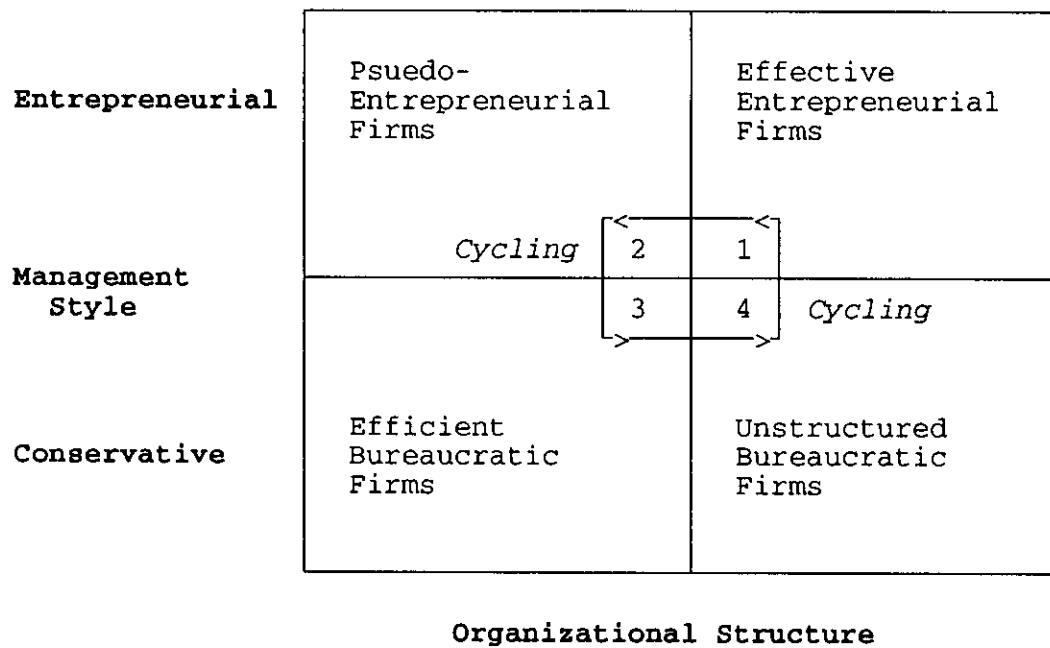
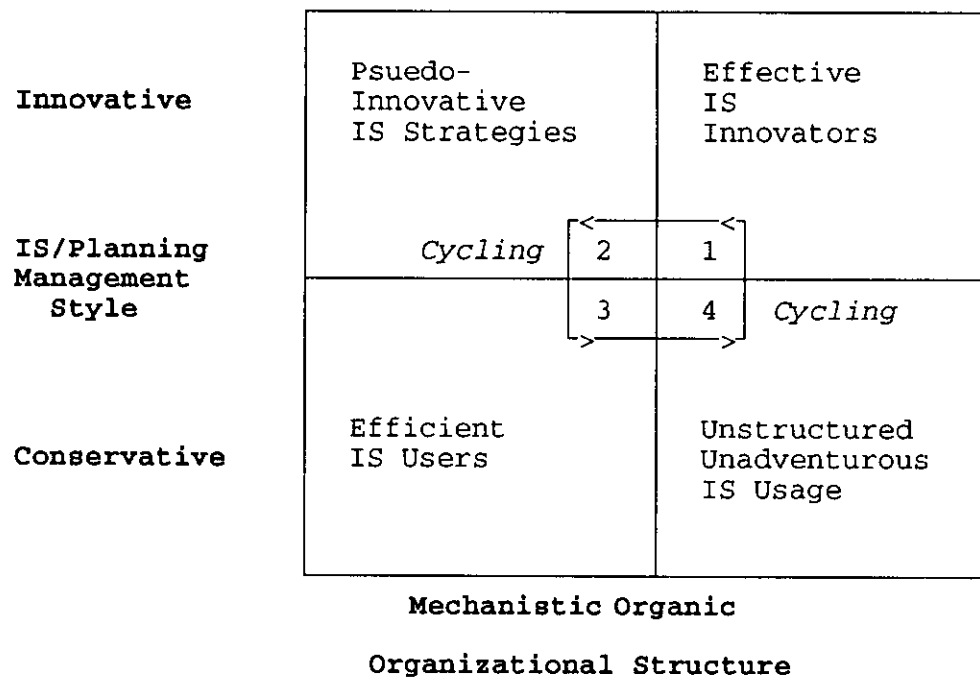


Figure 5. "R"Evolutionary Model of IS Planning



Jacobs found it useful to use a "push-pull" paradigm. Based on this theory, the extent of penetration would be a direct result of the extent of "push" that IT managers gave to IT products and services and the extent of "pull" from general managers requesting IT products and services. This theory can also be applied to the extent of change which the organization is prepared to undergo to effectively use IS and the extent to which IS can push the organization to change.

A similar model has been proposed by Slevin and Covin (1990) suggesting that a cyclical model applies within entrepreneurial organizations as shown in Figure 4.

This shows four cell positions which an entrepreneurial firm may adopt as environmental forces change. Firms in cell 1, the Effective Entrepreneurial Firms, have the desired combination of entrepreneurial behavior as well as an organic structure to support and nurture that behavior. Their structures work because they enhance communication and minimize bureaucratization. These firms thrive in a highly competitive, often hostile environment. Firms in cell 2, the Pseudo-Entrepreneurial Firms, take risks and act in an entrepreneurial manner, but are stymied by a mechanistic, bureaucratic, rigid organizational structure. The emergence of this type of firm is often a response to an inherently uncertain environment where managers believe that tight controls and centralized decision making will increase predictability. Firms in cell 3, the Efficient Bureaucratic Firms, adopt a mechanistic structure with the emphasis on the accomplishment of routine or repetitive tasks with maximum efficiency. This type of firm is likely to be found in a stable, predictable environment. Firms in cell 4, the Unstructured Unadventurous Firms are organic, adaptable and conservative. They can respond quickly but do not and are likely to be inefficient at performing even the routine operational tasks. They are most often found in a benign or non-hostile environment.

The successful firm will cycle between cell 1 and cell 3 and this model can be adapted for organizations who wish to maximize their utilization of IS throughout the change cycle. Figure 5 shows a revised model which can be applied to IS innovation.

Cell 1 represents the external strategy lead model when organizations are risk taking and innovative in their application of IS and emphasize effectiveness. Cell 3 represents the internal infrastructure lead model when the organization is concerned with functional alignment of IS within the organization and emphasizes efficiency. In the change models examined previously, the first case, the government sector, is an example of an organization cycling from cell 2, through cell 1 to cell 3. The danger with this cycle is that it will return again to cell 2 and stifle innovation. The second case, the private sector, is representative of an organization cycling from cell 4 through cell 1 to cell 3

with the similar inherent danger that it will recycle into cell 4 and be unable to provide direction for technical innovation. The third case, banking, is an example where the organization appears to understand the need to cycle between cell 1 and cell 3 and has implemented this with some success.

This IS lead-lag model needs a full organizational support model. Organizations not prepared to adopt the cyclical change model for organization change are likely to fall into cells 2 and 4 where organizational over structure or lack of structure inhibits further advancement through the "r"evolutionary cycle of IS development.

7. CONCLUSION

This paper reviews the results of a four year, on-going study into the alignment of IS strategies with organizational strategies. A Strategic Alignment model has been shown to exist at the functional level (internal alignment) and a dynamic model of change at the strategic level (external alignment) which supports the need to adopt a lead-lag model of IS strategy. A cyclical model of IS innovation has been proposed which can assist the innovative organization to adapt effectively and efficiently to the impact of IS on organizational change. This model is proposed as a "r"evolutionary concept of IS planning.

Further research is needed to validate the model suggested in this paper but also to investigate the interaction of other organizational factors with effective IS planning. The work reported in this paper continues and will be extended with further variables related to the organizational structure of IS and the decision making locus within the organization.

8. ACKNOWLEDGEMENT AND NOTE

My thanks to H. K. Cheung for completing the statistical analysis on Tables 1 through 5. These tests were conducted on the advice of one of the reviewers to show whether positive correlations exist. The tests support this view; however, given the nature of the qualitative data collected and, as yet, the limited number of annual data sets, the full tables of results are not shown here since they are thought to be of limited value in a research study of this nature.

9. REFERENCES

Boynton A. C.; Victor B.; and Pine B. J. "New Competitive Strategies: Challenges to Organizations and Information Technology." *IBM Systems Journal*, Volume 32, Number 1, 1993, pp. 40-64.

- Broadbent M., and Weill P. "Improving Business and Information Strategy Alignment: Learning from the Banking Industry." *IBM Systems Journal*, Volume 32, Number 1, 1993, pp. 162-179.
- Burn J. M. "The Impact of Information Technology on Organizational Structures." *Information and Management*, Volume 16, 1989, pp. 1-10.
- Burn J. M. "Information Systems Strategies and the Management of Organizational Change: A Strategic Alignment Model." *Journal of Information Technology*, Volume 8, 1993a, pp. 127-136.
- Burn J. M. "IT's Impact on Organizational Change." *Proceedings of XII South East Asia Regional Computer Conference*, October 1993b.
- Chan Y. E., and Huff S. L. "Investigating Information Systems Strategic Alignment." In J. I. DeGross, R. P. Bostrom, and D. Robey (Editors), *Proceedings of Fourteenth International Conference on Information Systems*, Orlando, Florida, December 1993, pp. 345-365.
- Chandler A. D. *Strategy and Structure: Chapters in the History of American Enterprise*. Cambridge, Massachusetts: MIT Press, 1962.
- Cowherd D. M., and Luchs R. H. "Linking Organization Structures and Processes to Business Strategy." *Long Range Planning*, Volume 21, Number 5, 1988, pp. 47-53.
- Dov, D.; Segev, E.; and Shenhar, A. "Technology's Varying Impact on the Success of Strategic Business Units within the Miles and Snow Typology." *Strategic Management Journal*, Volume 14, 1993, pp. 155-162.
- Earl M. J. *Management Strategies for Information Technology*. Englewood Cliffs, New Jersey: Prentice Hall, 1989.
- Galliers R. D. "Information Systems and Technology Planning within a Competitive Strategy Framework." In P. Griffiths (Editor), *The Role of Information Management in Competitive Success*. Oxford: Pergamon Infotech, 1987.
- Galliers R. D. "Strategic Information Systems Planning: Myths, Reality and Guidelines for Successful Implementation." *European Journal of Information Systems*, Volume 1, Number 1, 1991, pp. 55-64.
- Galliers R. D., and Sutherland A. R. "Information Systems Management and Strategy Formulation: The Stages of Growth Model Revisited." *Journal of Information Systems*, Volume 1, Number 2, April 1991.
- Gilbert, A. L. "A New International Paradigm for Strategic I.T. Planning." *Proceedings of the PRIISM Conference*, Hawaii, 1994, pp. 90-100.
- Henderson J. C. "Plugging into Strategic Partnerships: The Critical IS Connection." *Sloan Management Review*, Spring 1990, pp. 7-18.
- Henderson J. C., and Venkatraman N. "Strategic Alignment: A Model for Organizational Transformation through Information Technology." In T. A. Kocham and M. Useem (Editors), *Transforming Organizations*. Oxford: Oxford University Press, 1992.
- King W. R. "How Effective is Your Information Systems Planning?" *Long Range Planning*, Volume 21, Number 5, 1988, pp. 103-112.
- Lederer, A. L., and Mendelow A. L. "Information Resource Planning: Overcoming Difficulties in Identifying Top Management's Objectives." *MIS Quarterly*, September 1987, pp. 389-399.
- Lederer A. L., and Sethi V. "Critical Dimensions of Strategic Information Systems Planning." *Decision Sciences*, Volume 22, Number 1, Winter 1991, pp. 104-119.
- Lederer A. L., and Sethi V. "The Implementation of Strategic Information Systems Planning Methodologies." *MIS Quarterly*, Volume 12, Number 3, September 1988, pp. 444-461.
- Lederer A. L., and Sethi V. "Root Causes of Strategic Information Systems Planning Implementation Problems." *Journal of Management Information Systems*, Volume 9, Number 1, Summer 1992, pp. 25-45.
- Luftman J. N.; Lewis P. R.; and Oldach S. H. "Transforming the Enterprise: The Alignment of Business and Information Technology Strategies." *IBM Systems Journal*, Volume 32, Number 1, 1993, pp. 198-221.
- McFarlan F. W. "Information Technology Changes the Way You Compete." *Harvard Business Review*, Volume 62, Number 3, 1984, pp. 98-103.
- McFarlan F. W.; McKenney J. L.; and Pyburn P. "Information Archipelago: Plotting a Course." *Harvard Business Review*, Volume 61, Number 1, 1983, pp. 145-156.
- Miles R., and Snow C. *Organizational Strategy, Structure and Process*. New York: McGraw-Hill, 1978.
- Mintzberg H. "The Effective Organization: Forces and Forms." *Sloan Management Review*, Volume 54, Winter 1991, pp. 54-69.

- Mintzberg H. *Mintzberg on Management: Inside Our Strange World of Organizations*. New York: The Free Press, 1989.
- Mintzberg H. "Patterns in Strategy Formation." *Management Science*, May 1979, pp. 934-948.
- Mintzberg H. "Strategy Making in Three Modes." *California Management Review*, Winter 1973, pp. 44-53.
- Mintzberg H. *The Structuring of Organizations*. Englewood Cliffs, New Jersey: Prentice Hall, 1983.
- Niederman F.; Brancheau J. C.; and Wetherbe J. C. "Information Systems Management Issues for the 1990s." *MIS Quarterly*, December 1991, pp. 474-499.
- Nolan R. L. "Managing the Advanced Stages of Computer Technology: Key Research Issues." In F. W. McFarlan (Editor), *The Information Systems Research Challenge*. Boston: Harvard University Press, 1984.
- Nolan R. L. "Managing the Crisis in Data Processing." *Harvard Business Review*, Volume 57, Number 2, 1979, pp. 115-126.
- Porter M. E. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: The Free Press, 1985.
- Porter M. E. *Competitive Strategy*. New York: The Free Press, 1980.
- Premkumar G., and King W. R. "An Empirical Assessment of Information Systems Planning and the Role of Information Systems in Organizations." *Journal of Management Information Systems*, Volume 9, Number 2, Fall 1992, pp. 99-125.
- Quinn J. B. *Strategies for Change: Logical Incrementalism*. Homewood, Illinois: Richard D Irwin, 1980.
- Sambamurthy, V.; Venkataraman, S.; and DeSanctis, G. "The Design of Information Technology Planning Systems for Varying Organizational Contexts." *European Journal of Information Systems*, Volume 2, Number 1, 1993, pp. 23-35.
- Schendel D., and Hofer C., Editors. *Strategic Management*. Boston: Little, Brown and Company, 1979.
- Schwartz, H., and Davis S. M. "Matching Corporate Culture and Business Strategy." *Organizational Dynamics*, Volume 10, Number 1, 1981, pp. 30-41.
- Scott-Morton, M. S., Editor. *The Corporation of the 1990's*. Oxford: Oxford University Press, 1990.
- Slevin, D. P., and Covin D. P. "Juggling Entrepreneurial Style and Organisational Structure: How to Get Your Act Together." *Sloan Management Review*, Volume 43, Winter 1990.
- Thompson J. D. *Organizations in Action*. New York: McGraw-Hill, 1967.
- Thurlby, R. "Strategic Information Systems Planning: A Process to Integrate IT and Business Strategies." *ICL Technical Journal*, May 1993, pp. 416-437.
- Woodward, J. *Industrial Organisations: Theory and Practice*. London: Oxford University Press, 1965.
- Zmud R. W.; Boynton A. C.; and Jacobs G. C. "An Examination of Managerial Strategies for Increasing Information Technology Penetration in Organizations." In J. I. DeGross and C. H. Kriebel (Editors), *Proceedings of Eighth International Conference on Information Systems*, Pittsburgh, 1987, pp. 29-44.