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ALIGNING
INFORMATION SYSTEM UNITS
WITH
COMPETITIVE STRATEGIES

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ABSTRACT

This study explores the relationship between the Information System unit and the wider organization in 12 Fortune 1000 companies. Key variables include the environment, the firm's strategic planning system, and the IS planning system. Firms successful in deploying the appropriate strategic IS systems are closely aligned with both their IS unit and the environment.
ALIGNING INFORMATION SYSTEM UNITS WITH ORGANIZATIONAL
COMPETITIVE STRATEGIES

Information technology (IT) is a major design variable in organizations. Decentralization, centralization, departmental computing, networking, user groups, enterprise analysis (Maglitta, 1992; Kalbacker, 1986) are among many ways organizations are responding to changes in IT. Information System (IS) units within organizations have had to reflect these changes as well. Many IS units were historically centralized units. They face the dilemma of adapting to the uncertainties of the decentralized, networked, organizations from the relative certainty of centralized IS units.

Management faces the same dilemma. They are coming from an era in which IS was a centralized unit that had well conceived transactions responsibilities. This has evolved into an era where the technology has opened many possibilities for supplier relationships, customer responses, product design, and internal coordination. These possibilities, reinforced by marketplace realities, are unraveling most of the traditional organizational assumptions.

The strategic planning (SP) system helps an organization adapt to rapid environmental changes. It focusses the organization on the trends affecting the industry and discerns opportunities and threats. With a firm grasp on these happenings, the planning system assesses the ability of the organization to successfully deal with them. The weaknesses and strengths of the organization evolve during this assessment. With this knowledge, resources can be allocated to support strengths and correct weaknesses. These resource allocations are the strategy statements that feed the planning infrastructure and result in organizational, business, and tactical strategies, objectives statements, and budgets (Hofer & Schendel, 1978). The planning
infrastructure reflects the competitiveness of the firm. It maps the key competitive elements and their relationships (Henderson & Sifonis, 1988: 187).

A formalized IS methodology helps guide the planning process in many firms. For example, IBM suggests a global systems planning model (IBM, 1984). The global context disciplines the strategic IS plan. The Critical-Success-Factor logic is another approach. It suggests looking at the behaviors that will result in successful goal accomplishment. Once that is in mind, then the information requirements are devised that support the desired behaviors. (Rockart and Morton, 1984). Porter’s value-chain concept and Wiseman’s theory of strategic thrusts concept are additional methodologies used to conceive strategic IS strategies (Porter, 1985; Wiseman, 1987; and Bergeron, Bateau, and Raymond, 1991: 90).

There is great potential for information technology to enhance the competitive position of the organization (Henderson and Sifonis, 1988: 187; Cash and Konsynski, 1985). Others have pointed to the importance of IS as an integral part of the organization’s strategy (Gerstein, 1992: 26-9; Johnston and Vitale, 1988). For example, effective communications is a necessary condition to successful organizing. IT enhances communications and decentralization through networking and E-Mail applications. Linkage between global strategic business units and to customers and suppliers by telecommunications are a burgeoning requirement of IS units. Finally, knowledge-enhancement through artificial intelligence is increasingly helping organizations learn from rapidly changing environments. These issues constitute the substance of IS plans.

Although the potential is evident, the ability to track the impact of information technology on a firm’s performance is low. Crowston and Treacy suggest "it is very difficult to trace and
measure the effects of information technology through a web of intermediate impacts upon the enterprise level performance" (Crowston and Treacy, 1986: 299).

A continuing issue in the literature is how the information system strategy is tied through the organization strategy to the demands of the competitive environment (Cash, McFarlan and McKenney, 1983: 70; Hayward, 1987: 100). In the mid-1980s there were few companies that had integrated IS into their strategic planning (SP) process. One study suggested 85 percent of the Fortune 500 focussed on the applications backlog of the IS unit but didn’t include the unit in strategic planning. (Diebold, 1985). A study of 30 large European firms saw only 5 had a long-term strategy for IS in place (DeLong, 1983). A study by Cresap, McCormick and Paget noted the variety of successful IS planning systems it had uncovered. They found one common thread among those successful systems. "In summary, it appears that the will to achieve linkage between information systems and business objectives outweighs all other factors" (Johnson, 1984).

The difficulties faced by firms in aligning the key organizational elements is outlined by Lawrence. "The environment presents many opportunities, but no results will flow in terms of value-adding behavior until a matching organizational capability has been put in place... Creating the right organizational capability means fitting together all the separate elements of organizations... into a cohesive whole...." (Lawrence, 1992: 51). Behavioral concepts are also important to successful alignment. Henderson and Sinfonis, for example, highlight the need for cooperative behavior in the planning process (1988: 190). If a unit’s planning system is integrated into the organization strategic planning process it will mirror the strategic planning process. Hayward said "A planning model for information systems should not only include a
systematic review of the technology, the applications and the management of information systems, but should provide a mechanism and procedures to help overcome the communication gap between top management and Data Processing (1987:100)." Perceptual differences between IS and executive management play a key role in how successful the organization is in using IT as a strategic factor (Singleton, McLean, and Altman, 1988).

THE STUDY

This study explores the relationship between the Information System unit and the wider organization. Several variables are investigated: a) the nature of the IS unit; b) the environment being faced by the organization; c) the nature of the organizational SP system (SP); d) the nature of the IS planning system.

The study's logic is in a successful firm the organizational SP is closely linked with the IS planning system and reflects the nature of the environment facing the organization. The organizational planning systems are good surrogates for determining the organization's ability to respond to a changing environment. The degree to which an organization has its act together is a function of a) whether internal units are integrated with a powerful SP system and b) whether they each have consonant views on how the SP system works and understand the organization's overall strategy. Modern-day organizations increasingly use information technology to gain competitive advantage (Cash and Konsynski, 1985; McFarlan, 1984). It is logical to infer a strong relationship between the firm’s strategic planning system and the IS unit's system.

The investigation uses the Cash, McFarlan and McKenney model (1983) to illustrate four typical organizational responses to the environment. The planning system model is made up of elements of a WOTS-up analysis and selected infrastructure factors.
IS Unit Model

Cash, McFarlan, and McKenney suggest a paradigm for categorizing information system units (Cash, et al, 1983: pp.26-28). Two key variables focus on the strategic nature of the operating systems and the size of the strategic applications development portfolio. The matrix in Figure 1, categorizes firms according to these two variables.

FIGURE 1
Categories of Strategic Relevance

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Insert Figure 1 about here
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The Strategic profile and the Support profile are at the opposite ends of a continua. The strategic unit manages both operational strategic systems and a high impact applications development portfolio. The support unit has neither responsibility. It might have a responsibility for many non-strategic information systems, however. The Factory unit is focussed on tactical systems that are strategic in nature. The market environment demands a tactical focus versus a longer term emphasis resulting in a minimal strategic applications backlog. The Turnaround unit is reflective of a changing environment for the organization. It has a burgeoning strategic applications development portfolio. The likelihood is that it is on a journey to mirror either the Factory or Strategic unit. Strategic applications from the portfolio are soon implemented and require administration as strategic operating systems. This changes the nature of the unit to
either Strategic or Factory if it is to be successful. Turnaround portfolio, then is reflective of a changing environment for which the organization was ill-prepared.

Cash, et al. devised this framework to reflect the different ways IS unit’s organize. To the extent the IS unit mirrors the demands made on the wider organization, the caricature also fits the wider organization. A strategic IS unit reflects its part of the environmental demands being made on the organization. A situation requiring rapid change in an IS unit is reflective of abrupt changes going on in the wider organization. There are leads and lags. For example an organization might achieve a strategic profile and be dragging a recalcitrant Factory IS unit. Or, perhaps an ambitious IS unit achieves a Turnaround status ahead of a recalcitrant Support-type executive management.

The Environment

Porter’s model is being used to analyze the environment (Porter, 1981). He posits three generic strategies which characterize most strategies undertaken in organization. They are: low cost, differentiation, and focus. He analyzes the environment facing the firm by asking 5 basic questions. From the answers to these questions, a logical generic strategy can be derived. The five questions assess the: Rivalry among existing firms; Bargaining power of Suppliers; Bargaining power of buyers; Threat of new entrants; Threat of substitute products or services.

Planning System

The planning system variables include the infrastructure questions relating to the nature of the planning process, the linkage with the wider SP system, and the depth of the WOTS-UP components. A list of variables on the questionnaire is listed in Appendix I. The appendix also lists the questionnaire items presented to executive management and to the CIO.
Integration of the Variables

Table 1 is a matrix arraying the respondents observations of the planning systems against the four unit profiles describes the study. The cells contain a summary statement that reflects the character of the respective profile. By reading an entire column the reader will get a sense of the unit that behaves like that profile.

TABLE 1

McFarlan’s Categories and the Questionnaire sections.

Verbal Descriptions

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Insert Table 1 about here

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The sample

Twelve Fortune 1000 firms were selected for this study. There were six service firms, 5 manufacturing firms and one utility. They are listed as Service 1 through Service 6 and Manufacturing 1 through Manufacturing 5. The utility is designated Utility 1. Eight locations were at corporate headquarters and the other four were large strategic business units.

The data were collected by a combination of interviews and questionnaires during 1990. The questionnaires were distributed to the CIO (Chief Information Officer) in the IS unit and to the top planning officer in executive management. Appendix I identifies the questions each respondent answered. Executive management and the CIO were asked to evaluate the organizational SP system. The CIO was also asked to evaluate the IS unit planning process.
In order to increase comparability of the firm's responses the authors weighted the items on the questionnaire. All the planning variables were weighted 3, 2, or 1 (a variation of High, Medium, Low). The Porter environmental variables were evaluated using a scale of 5 to 1 (high impact to low impact). This process established the profile standards against which we later compared the respondents answers.

Table 1 represents a verbal surrogate of the weighted outcomes of this process. Using the scale for Porter's model, the authors evaluated each firm's competitive environment. Industry and investment literature was used to check the assessment of that firm's environment. A final scale evaluated the relative success of each firm. Using investment literature and annual reports a general ranking of each firm's success within their industry was established on a 3 point scale (Successful, Moderately Successful, Less Successful).

The data from interviews and questionnaires were scored with the same system used in establishing the standards. The scores of the CIO and Executive Management were then compared to the standards set for the profiles. The closest standards resulted in using that profile to describe the organizational unit.

Table 2 arrays the individual firms against the key organization units required for successful alignment with the environment. The cell value represents the actual organization of the firm as represented by a profile name. The profile name was derived from the answers given by firm members on the questionnaire. Successful firms are underlined. Referring to Table 1 as a guide to the meaning of a particular profile can augment its meaning.

**TABLE 2**

Alignment of Key Organization Variables
The data suggests the difficulty a firm has in aligning the IS unit, organization SP system and the environment it faces. Only Service 4 was aligned across the organization. It was in a Turnaround status suggesting high turbulence in the environment. Service 4, a travel-related service firm, was facing a recession. It also had large real estate holding in a particularly hostile environment. Eight other firms had consistency on two of the three profiles. Only three of those firms didn’t achieve any consistency across the profiles.

The last column describes the IS unit’s profile. The large number of Turnaround profiles indicates a high degree of change. It appears the tenor of the times involves IS units in most marketplace and organizational issues. The litany of strategic issues includes intense foreign competition, decentralized networking, telecommunications, increasing supplier and customer relationships, increasing user demands and large-scale organizational change. These changes reflect the firm’s increasingly demanding marketplace. The conflicts, inconsistencies, and "disconnects" evident in CIO-CEO relationshipships in recent years are apparent from observing the disparity in the wider organization’s profile and the IS unit’s profile.

There are always leads and lags associated with the profile of a unit. The interview data was collected in 1990. These profiles are a complex result of reflecting the firm’s past and anticipating the future. The authors have continued to study the organizations. The following comments about their consequent history add validity to the study’s findings.
1) The last three firms in Table 2 show no alignment between the units and the environment. Service 1 is a survivor, but without real prospects in the industry. Service 2 was merged into a larger organization. At the time of the study, Service 6 was approaching a crisis point when its survival was in question.

2) There appears to be a clear lead relationship in some cases. Manufacturing 1 had only moderate success during the 1980s. Two years prior to the study, they changed to a leadership which had a clear mandate to change the company. The study reflects the change with the Turnaround SP system and IS profiles. Since the study, Manufacturing 1 has dramatically increased market share, earnings, and stock price. They have become a world-wide competitor and increased the scope of their product offerings, changing the nature of the marketplace environment to reflect the strategic nature of their organization.

3) At the time of the study, Utility 1 had been under regulatory siege because of problems in a subsidiary. The Factory profiles in both the environment and SP system probably reflect this situation. IS planning was beginning to sense a let up in this pressure and preparing for change. In the ensuing 2 years, the earnings have increased and the stock has split.

4) The Turnaround environmental profile reflected a radically shifting marketplace for Manufacturing 4. The background was the end of the cold war and the decline in defense orders. The strategic planning profile was suitable to deal with it. IS was, perhaps belatedly, being brought up-to-speed to deal with the turmoil and prepare for peacetime efforts.

**DISCUSSION**

There are a number of limitations in the study. The small number of firms limited the generalization that can be made from the data. Additional respondents from each firm might give
more confidence about the validity of the company data. Data was collected from the chief planning officer instead of the CEO. The CEO and executive team might give a better reflection of the richness of the organization planning effort than the planning officer. Understanding the organization's use of technology didn't come through clearly in the study. Attributing a profile to an entire unit or organization is replete with problems. We studied a limited number of variables of a larger number of potentially more significant variables.

The study did open up several areas of inquiry. It suggested a way of analyzing the alignment of units to the demands of the environment. The Cash et al. model highlights important elements of the organization response. The use of the strategic planning system as a major lever in the adaptation to the environment has had limited empirical study. This study assigns the strategic planning system a key role in the alignment of the organization with the demands of the environment.

The role of information technology in an organization is a primary issue of the 1990s. It is apparent that many organizations aren't using technology effectively in designing, producing, and delivering their products. Even those that deployed elaborate strategic information systems are sometimes less than successful. At a more basic level, though, only a few firms are so attuned to the marketplace and technological possibilities that they anticipate its needs. Most are reactive and wasteful in their use of technology. This research helps to pinpoint the reasons for these difficulties. A firm that is not aligned with its IS unit is unlikely to deploy technology in a timely way. It is possible, however, for a strategic IS unit to lead the organization to a brighter competitive future.
REFERENCES


APPENDIX I

Planning Characteristics- Responses

<table>
<thead>
<tr>
<th>Questionnaire Items</th>
<th>IS Personnel-IS</th>
<th>Executive Mgmt-EM</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATURE OF ORGANIZATION FRAMEWORK</td>
<td></td>
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<tr>
<td>Top down/Bottom up?</td>
<td>IS</td>
<td>IS</td>
</tr>
<tr>
<td>Degree of formality?</td>
<td>IS</td>
<td>IS</td>
</tr>
<tr>
<td>Links with SPs of other SBUs?</td>
<td>IS</td>
<td>EM</td>
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<tr>
<td>SUBSTANCE OF PLANNING PROCESS</td>
<td></td>
<td></td>
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<tr>
<td>Planning Horizon?</td>
<td>IS</td>
<td>IS</td>
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<tr>
<td>Assess future of marketplace?</td>
<td>IS</td>
<td>EM</td>
</tr>
<tr>
<td>Analysis of competitors?</td>
<td>IS</td>
<td>EM</td>
</tr>
<tr>
<td>S&amp;W of organization?</td>
<td>IS</td>
<td>EM</td>
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<tr>
<td>Overall Strategy- (Porter, 1985)?</td>
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<tr>
<td>ADDITIONAL CHARACTERISTICS OF PLANNING IN IS UNITS</td>
<td></td>
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<tr>
<td>Frequency of plan development?</td>
<td>IS</td>
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<td>Link with SP?</td>
<td>IS</td>
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<td>iterative process?</td>
<td>IS</td>
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<td>with bus unit personnel?</td>
<td>IS</td>
<td></td>
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<tr>
<td>Scope of plans?</td>
<td>IS</td>
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</table>
### FIGURE 1
Categories of Strategic Relevance

<table>
<thead>
<tr>
<th>Strategic impact of existing operating systems</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: Factory</td>
<td>I: Strategic</td>
<td></td>
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<tr>
<td>III: Support</td>
<td>IV: Turnaround</td>
<td></td>
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</tbody>
</table>

Low Strategic impact of applications
development portfolio

High
<table>
<thead>
<tr>
<th>Respondents</th>
<th>Factory</th>
<th>Strategic</th>
<th>Support</th>
<th>Turnaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS description of SP environment</td>
<td>SP formalized but IS is a minor player in process. Interaction with users in business units high.</td>
<td>Intimately involved with all aspects of a fast-paced SP process; with some political power. Complex responsibilities for operational strategic applications and strategic development applications.</td>
<td>Seldom consulted except at end of organizational process.</td>
<td>On the reactive end of an immature strategic planning system. IS place in planning system is incomplete.</td>
</tr>
<tr>
<td>IS description of IS planning environment</td>
<td>Tactical/maintenance oriented.. ROI and cost/benefit analyses drive unit.</td>
<td>Rather decentralized and fast-paced environment underpinned by sophisticated planning systems.</td>
<td>informal/not a sophisticated IS environment</td>
<td>Still reactive, but growing, credible planning process. Slowly developing formal methods and gaining control over development applications.</td>
</tr>
<tr>
<td>Management description of SP environment</td>
<td>Description of external environment</td>
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<td>------------------------------------------</td>
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<tr>
<td>Centralized and formal planning process. IS is important operationally but has only a moderate contribution in SP.</td>
<td>Moderately paced environment, with moderate value-chain threats.</td>
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<tr>
<td>Rather fast-paced SP process with a recognition of the strategic importance of IS.</td>
<td>Competitive rivalry is high in a relatively fast-paced environment. Strong value-chain position.</td>
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<tr>
<td>Rather slow-paced, centralized system, with little knowledge of IS.</td>
<td>A rather fast paced environment with high rivalry, potentially high bargaining power of buyers or suppliers.</td>
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<tr>
<td>Organization on the learning curve in developing a sophisticated SP growing awareness of IS.</td>
<td>A slow-paced environment with moderately low value-chain threats.</td>
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<td></td>
<td>Environment Profile</td>
<td>Strategic Planning Environment Profile</td>
<td>Information Systems Planning Profile</td>
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<td>Service 4</td>
<td>Turnaround</td>
<td>Turnaround</td>
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<td>Manufacturing 3</td>
<td>Strategic</td>
<td>Strategic</td>
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<td>Turnaround</td>
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<td>Service 3</td>
<td>Factory</td>
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<td>Utility 1</td>
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