SUCCESSFUL IMPLEMENTATION OF STRATEGIC PLANNING SYSTEMS: A PATH-ANALYTIC MODEL

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Comments and Criticisms Appreciated

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Successful Implementation of Strategic Planning Systems:
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Abstract

In an effort to overcome the conceptual and methodological limitations of most previous research on the effectiveness of Strategic Planning Systems, this study develops and tests a multi-level model of effective implementation of strategic planning. The theoretical model proposes a sequence of linkages originating in the organizational context of planning and ultimately leading to the fulfillment of key planning objectives, viewed as the effectiveness criteria for assessing implementation success. Specifically, it is argued that the organizational context influences the orientation of the planning system (i.e., functional coverage, emphasis on techniques, and attention to internal and external facets). These in turn are posited to determine the improvement in the capability of the system to support the overall strategic management process. The general model and most of its underlying propositions and hypotheses are tested using a path-analytic framework and data collected from 202 strategic planning units. The capability of the system to support the strategy process, the organizational context within which planning is carried out, and the degree of coverage to internal and external facets emerged as important determinants of planning system success. Implications of these results and directions for future research are also noted.

Key Words: Strategic Planning Systems, Strategic Management, Implementation of Strategic Planning, Path-Analytic Model.
Strategic planning systems occupy a central role in the emerging field of strategic management (Schendel and Hofer, 1979). The role accorded to these systems is rather pervasive. It extends from the identification of the strategic problem, through the formulation and evaluation of strategies to the implementation of strategies (King and Cleland, 1978; Lorange and Vancil, 1977; Steiner, 1979).

In spite of the prominent and pervasive role according to strategic planning, the extant research on this topic is largely limited to empirical examinations of the relationship between planning activities, on the one hand, and organizational performance on the other (see Armstrong, 1982, and Lorange, 1979 for reviews of this stream of research). Even within this somewhat narrow research stream, results have generally been inconsistent and confusing. For instance, Thune and House (1970), Herold (1972), and Karger and Malik (1975) established that "formal planners" significantly outperformed "informal planners," but the results of studies by Rue (1973), Grinyer and Norburn (1974), Sheehan (1975), and Kudla (1980) raise questions as to the impact of planning on ultimate financial performance.

Although the inconclusive results from the above set of studies led researchers to view planning within the context of organizational processes which lead to the achievement of a broader set of objectives, a major shortcoming has been the absence of attempts at developing "theoretical models of strategic planning effectiveness." While individual research studies have examined theoretical relationships between specific aspects of the planning process such as managerial participation and effectiveness (e.g., Dyson and
Foster, 1982) or the impact of the environment on the nature of planning (Lindsay and Rue, 1980), no systematic attempt has yet been made to develop and test a generic theoretical model of the effectiveness of strategic planning. This paper describes a study aimed at understanding the key relationships underlying successful implementation of strategic planning. Specifically, the study's two major objectives are:

(a) to develop a theoretical model of the factors influencing successful implementation of strategic planning systems; and

(b) to employ the model to empirically examine the nature of the relationship (i.e., direct versus indirect) among the above factors within a path-analytic framework.

This paper has five sections. The first section discusses a set of issues derived from prior research which underly the development of the proposed model. The second section develops the theoretical model. In that section, the key dimensions of the model are described and theoretical propositions and hypotheses relating these dimensions are derived. The third section describes the research method employed for testing the model and its constituent hypotheses. The fourth section presents the results while the fifth section discusses the implications of the results for theory, methodology, and practice. The study's limitations and directions for extending this research are also noted.

Key Issues in Previous Research

The model developed in this study builds on and extends previous research on strategic planning effectiveness. The motivation of this study is to overcome some of the major limitations of the earlier studies. Four issues
which have received inadequate attention in extant research form the basis for the development of the theoretical model. These relate to: (a) the need to enlarge the conceptualization of planning beyond the simple "planner" versus "non-planner" classification; (b) the need to explicitly consider the organizational context within which planning activities are carried out; (c) the conceptualization and operationalization of the dependent variable—"planning success"; and (d) the adoption of an explanatory (as opposed to a predictive) research framework as a first step towards the development of a theory of strategic planning effectiveness. These issues are elaborated in the following paragraphs.

Conceptualization of Planning: Beyond the "Planner" vs. "Non-planner" Dichotomy"

Most studies in this stream of research have employed a dichotomous classification such as "planner" versus "non-planner" (e.g., Thune and House, 1970; Karger and Malik, 1975) or "programmed" versus "impoverished planner" (Fulmer and Rue, 1974). Such an approach is useful only for discerning overall differences between the two categories (i.e., "between-group" differences) and does not reflect the degree of variation in the planning practices within a particular category (i.e., "within-group" differences). Dissatisfied with such crude, dichotomous classification of firms, Wood and LaForge (1979; 1981) developed a seven-level Guttman-type scale of planning comprehensiveness which ranged from zero (non-planners) to six (comprehensive planners). Although such a refinement in the conceptualization of planning is certainly useful, it still assumes that planning can be captured along a single dimension.

The conceptual literature on strategic planning, on the other hand, describes planning as a multifaceted management system (Hax and Majluf, 1984;
King and Cleland, 1978; Lorange and Vancil, 1977; Steiner, 1979). These authors would not only caution against dichotomous classifications but also would question any undimensional characterization of planning. Unfortunately, there appears to be no widely accepted set of dimensions for characterizing a planning system. Thus a major task of this study was to develop a comprehensive set of important dimensions of planning systems.

Importance of the Organizational Context

Another major shortcoming of previous empirical research studies on planning has been their general failure to recognize the broader organizational context within which planning systems function. Any attempt at directly relating planning practices (either degree of formality or comprehensiveness of coverage) to the organization's financial health is questionable since it does not incorporate the broader set of factors which impact organizational performance. In addition, such a "black box" approach does not provide insights into the complex process by which formalized approaches to planning lead to better performance (King, 1983). If an effective strategic planning is one that is "inextricably interwoven into the entire fabric of management" (Steiner, 1979; p. 3), then any research model of the effectiveness of strategic planning systems should formally recognize relevant organizational characteristics.

Conceptualization and Operationalization of "Planning Effectiveness"

Research in this area has been stymied by the inadequate attention provided to conceptualizing and operationalizing planning system effectiveness. Most studies have been solely preoccupied with the financial pay-offs from planning. Typically, the focus has been on identifying the degree of association between planning and accounting-based indicators such as return on investment and return on equity (Thune and House, 1970), although market-based
measures such as abnormal returns have been used in recent work (Kudla, 1980). While financial indicators of performance are generally accepted as appropriate measures of organizational performance using a goal model of effectiveness, there are increasing concerns that an exclusive reliance on financial benefits provides only a limited perspective on the role of planning within an organization (Camillus, 1975; King and Cleland, 1978; Lorange, 1980; Steiner, 1979). If we view planning system effectiveness as a subset of the overall concept of organizational effectiveness, a multi-dimensional view of the benefits of planning appears to be more appropriate (e.g., Campbell, 1977; Steers, 1977). Thus, the conceptualization and measurement of planning effectiveness emerges as a key issue in the development of the research model.

The Adoption of an Explanatory Framework

Most previous studies have adopted a "predictive" research framework, where the focus is on predicting a dependent variable (say, organizational performance) using single or multiple independent variables (say, planning activities) chosen based on their potential to enhance prediction. In such instances the aim has been to obtain a high level of $R^2$ using multiple individual variables representing planning practices. In an explanatory framework, on the other hand, the choice of independent variables is guided by theoretical considerations, and interest centers on the ability of the model to enhance our understanding the phenomenon of interest. Since explanation and prediction are both necessary in the sense that an ideal explanation is probably one that allows best prediction (Kaplan, 1964), there are significant benefits in adopting an explanatory perspective. This is achieved by rooting the research model in a causal-modeling framework with the use of path-analytic techniques to decompose the correlation coefficients into direct, indirect, and
spurious effects. Such an approach enables us to improve our understanding of the nature of the effect better than we can with the use of only correlation coefficients (Duncan, 1971; Kenny, 1979).

A theoretical model rooted in the above four issues is developed in the next section.

A Theoretical Model

The proposed model consisting of four stages of implementation of strategic planning is developed. The first stage captures the organizational context of planning, while the second stage reflects the planning system's design characteristics, termed collectively as "planning orientation". The next two stages are designed to capture two distinct aspects of planning system effectiveness, with the third stage reflecting the improvements in the system's capabilities and the fourth indicating the degree of achievement of key planning goals. Each stage of the model is posited to influence the levels below it. The skeletal model is shown in Figure 1. In the following paragraphs, each stage of the model is described with its constituent dimensions and theoretical justification for their inclusion.

The Organizational Context of Planning

This is the first stage of the model and reflects the broader organizational context in which planning systems are embedded. A variety of factors characterizing the organizational context has been suggested in the planning literature. Key contextual factors include: the organization's size (Lorange and Vancil, 1977), the organization's diversity of businesses
(Leontiades, 1983), the overall predisposition towards planning indicated by the lack of anti-planning biases (Steiner, 1979; Steiner and Schollhammer, 1975) and the extent of involvement of the chief executive and top management teams (Lorange, 1980; Steiner, 1979). Synthesizing the various organizational factors argued to be important for successful implementation of strategic planning, two important theoretical dimensions were included in the model. One is the extent of resources provided to the planning function (RESOURCES), and the other is the extent of organizational resistance to planning (RESISTANCE). These are described below:

**Resources Provided to the Planning Function (RESOURCES):** A fundamental requirement for any activity to succeed is the allocation of a level of resources commensurate with the objectives set for that activity. In discussing the factors contributing to successful implementation of strategic planning, Lorange argued that "A (final) requirement for successful implementation deals with the realistic assessment of resource needs. The firm must be willing to allocate the necessary resources, make the necessary staff support available, provide the necessary budgets for training, meetings..." (1980; p. 10). These resources may be in the form of allocation of management personnel to the planning function, involvement of line managers in the planning process (Lorange, 1980), and the time spent by the chief executive officer and other top management personnel in planning activities (Lorange, 1980; Steiner, 1979). The chief executive's involvement and the allocation of adequate resources to planning reflect an organizational commitment to the planning philosophy (Eastlack and McDonald, 1970), which is a necessary ingredient for success (Ringbakk, 1971). In fact, Lorange specifically argues that top management must be the true sponsor for planning activities to be successful (1980; pp. 134-138), and Haspeslagh (1982) found that the CEO's commitment was important for deriving benefits from portfolio planning.
Organizational Resistance to Planning (RESISTANCE): The management literature highlights the need to foresee and preclude organizational resistance to an activity if it is to succeed (see for instance, Schultz and Slevin, 1975 for a discussion of this issue in the related context of implementing OR/MS models). A high level of organizational resistance to planning is indicative of an unfavorable organizational context and is likely to hinder the successful implementation of planning (Ansoff, 1984; Steiner and Schollhammer, 1975).

A high degree of resistance to planning may manifest in dysfunctional managerial behavior such as not accepting the outputs of the planning exercise, and lack of involvement of line managers in the planning process. If strategic planning systems are to serve as an integral part of the management activities of an organization, they must be viewed as the fundamental activity of the organization from which its other activities are derived (Lorange, 1980). Consequently, any level of resistance to the very idea of planning is likely to have a negative influence on the effectiveness of the planning system.

The Planning Orientation

This is the second stage of the model and is conceptualized as the general pattern of emphasis provided to four key design characteristics of planning systems — (a) the breadth of coverage to various functional areas (FUNCTIONS); (b) the extent of attention given to internal facets (INTERNAL); (c) the extent of attention given to external facets (EXTERNAL); and (d) the extent of use of planning techniques (TECHUSE). A brief discussion of each follows.
**Functional Coverage in Planning (FUNCTIONS).** Most discussions on strategy development highlight the need to integrate functional areas to arrive at an internally consistent plan (see for instance, Camillus and Venkatraman 1984; Grant and King, 1982, Hax and Majluf, 1984; and Lorange, 1980). By providing emphasis on various important functional areas, the planning system can conceivably improve its ability to exploit the organization's critical strengths.

A premise of this study is that uniform emphasis on all functions and a broad general management perspective is critical for successful strategies (Andrews, 1971) and strategic planning. Although it has been implied that the relative emphasis on different functions may vary over time, it was felt that overall, planning systems are likely to be more effective when they place more emphasis on all functions. There is some empirical support to this position. Snow and Hrebiniak concluded that "all three (Miles and Snow's) strategies require strength in general and financial management" (1980; p. 334). In a similar vein, Hitt, Ireland, and Palia found general management and financial management to be the most important distinctive competencies on an overall basis (1982; p. 290).

**Attention to Internal Facets (INTERNAL) and External Facets (EXTERNAL).** It is a generally accepted axiom the strategic planning literature that a formal approach to planning begins with an assessment of the organization's recent history and current situation. From such an appraisal, an organization can begin to form assessments of its strengths and weaknesses (INTERNAL). A comprehensive analysis of internal capabilities (Ansoff, 1965), past performance positions (Steiner, 1979) and reasons for past failure ensures that the plans developed reflect the organizational capabilities for implementing them. Often plans fail because of an inadequate or incorrect assessment of
internal aspects (King and Cleland, 1978). Thus, attention to internal facets is treated in this study as an important characteristic of an organization's planning orientation.

Similarly, attention to external aspects (EXTERNAL) is another important dimension of a planning system, since identification of opportunities and threats is a major element of planning (Andrews, 1971). In addition, it is well argued in the impressive body of literature on environmental scanning that analysis of external events and trends in the economic, political, social, regulatory, technological, as well as competitive sectors should be the first step in the formulation and evaluation of strategic alternatives.

There is no need to belabor the importance of these two dimensions. Normative strategy literature generally underscores the need to consider both external and internal facets while developing a strategic plan (see for instance, Camillus and Venkatraman, 1984; Grant and King, 1982; Hax and Majluf, 1984; King and Cleland, 1978; Lorange and Vancil, 1977). Indeed, the concept of strategy as expostulated by most researchers and scholars involves the alignment or matching the firm's strengths and weaknesses and the environmental opportunities and threats that confront it (e.g., Andrews, 1971; Learned, Christensen, Andrews, and Guth, 1965; Schendel and Hofer, 1979; Venkatraman and Camillus, 1984.)

**Use of Planning Techniques (TECHUSE).** Planning practices often entail the use of a variety of techniques such as portfolio approaches, financial models, and environmental scanning. Managers generally choose from a "tool kit" of decision-structuring devices which range from simple heuristics to more complex models for evaluating alternate courses of action. The use of such techniques has been stressed as a critical component of formalized approaches to strategy formulation (see for instance, Grant and King, 1979; Hofer and Schendel, 1978). The underlying logic is that techniques provide a systematic
basis to consider and evaluate various alternatives, and are expected to result in superior decision choices. For instance, the use of BOG approach to portfolio planning (Hedley, 1977; Henderson, 1979) is expected to result in "optimum" allocation of resources to balance cash-flow and profitability. The "PAR" model of PIMS program is argued to be a source of learning based on the experiences of "similar" businesses and a reference point for strategy development (Schoeffler, 1983). The extent of use of these techniques is perhaps an indication of the formalization of planning as well as the comprehensiveness of the decision-making process.

At this juncture, the relationships between the first two stages of the theoretical model can be formulated. We specify these relationships as a set of propositions. Hypotheses in a testable form are derived from these propositions later when an operational model is developed from the theoretical model.

**PI:** The organizational context of planning has a significant effect on the planning orientation of the system.

Proposition PI contends that the resources provided for planning, are of the dimensions of the organizational context, exerts a strong influence in shaping the planning orientation. While we can see the logic for linkage between resources and each of the design elements, strong theoretical reasoning could not be developed for the link between resistance and the design elements. The resistance dimension, however, has important linkages with the other two stages, discussed later.

The first two stages of the model influence the third stage both directly and indirectly as shown in Figure 1. The third stage represents the capabilities of the system (SYSTEM-CAPAB) which is described next.
Capabilities of the Planning System (SYSTEM-CAPAB)

An effective planning system provides support not only in relation to the identification and formulation of strategies but also for translation of strategy into implementable action plans (Camillus and Venkatraman, 1984). Thus, a critical determinant of planning system success is the capability of the system to effectively and efficiently support the ongoing management tasks of formulating and implementing organizational strategies. In line with Lorange's (1979) arguments that a system's capabilities be treated as a measure of planning success, we treat this dimension as an intermediate state in the modeling of strategic planning effectiveness. To quote Lorange: "many of the measures [of effectiveness] were based on some general surrogate variable, when it probably would have been more relevant to measure effectiveness as a function of how well the formal planning system's capabilities were able to meet the specific planning needs" (1979; p. 230; emphasis added).

Ideally, in designing a system, the required capabilities should be specified in relation to the specific contextual requirements. However, for the purpose of a comparative cross-sectional research study, key generic capabilities of planning systems can be identified based on normative and descriptive writings on strategic planning. Our view is that such capabilities are required of all formal administrative systems.

Based on an exhaustive review of the literature on strategic planning, 13 important capabilities were identified. These include: the system's ability to anticipate surprises and crises (Ansoff, 1975), its flexibility to adapt to a dynamic environment (Thompson, 1967), its capability to facilitate effective management control (Anthony, and Dearden 1976; Lorange and Vancil, 1977), its role in the identification of new business opportunities (Hax and Majluf, 1984; Steiner, 1979), and its ability to enhance creativity and innovation (Camillus, 1975; Shank, Niblock, and Sandalls, 1973; Taylor and Hussey, 1982). This
dimension, which reflects a composite of such capabilities, is conceptualized as the "extent of improvement in the capability of the system to effectively support the overall strategic management process" and is viewed in terms of capabilities realized over a period of time.

As stated earlier, the first two stages of the model have strong influences on this stage. Such influences can be formally stated as a set of two propositions as follows:

P2: The organizational context of planning has a significant effect on the system's capability.

P3: The planning orientation has a significant effect on the system's capability.

These three stages strongly influence the final stage of the theoretical model, i.e., planning system effectiveness, which being analogous to organizational effectiveness spans a wide domain. It was therefore necessary to circumscribe the domain of this concept for the purpose of present research. Restricting our attention to the goal-model of organizational effectiveness, we conceptualize this dimension as "the extent of fulfillment of key planning objectives," which is treated as a measure of the perceived implementation success of planning (IMPL-SUCCESS). A brief description of this dimension follows.

Perceived Implementation Success of Planning (IMPL-SUCCESS)

This is the final stage of the theoretical model and is captured using one dimension — the degree of perceived success in achieving the key objectives of formal planning. In line with Steers' (1975) call for adopting a multiple-criteria model of effectiveness, a list of six indicators reflecting both financial and non-financial criteria (Camillus, 1975; King, 1983; King and Cleland, 1978; Lorange, 1980) was considered.
This dimension is conceptualized with reference to operative goals pursued by organizations (Steers, 1975). Accordingly, the following major objectives of planning were considered: financial benefits such as improvement in short-term and long-term economic performance (King and Cleland, 1978; Lorange and Vancil, 1977; Steiner, 1979), predicting future trends (Amara, 1981; Ansoff, 1975; King and Cleland, 1978; Paul, Donovan and Taylor, 1978), evaluation of alternatives (Camillus, 1975; Lorange, 1980), avoiding problem areas (Lorange and Vancil, 1977), enhancing management development (Hax and Majluf, 1984; King and Cleland, 1978).

The theoretical model (Figure 1) proposes linkages between each of the three previous stages and this stage. Such linkages are formally specified using a set of three propositions:

P4: The organizational context of planning has a significant effect on perceived implementation success.

P5: The planning orientation has a significant effect on perceived implementation success.

P6: The system's capability has a significant effect on perceived implementation success.

The Central Role of System Capability

An important premise of the theoretical model is that the system's capability occupies a central role and exerts a positive and significant effect on the effective implementation of strategic planning systems. The underlying logic is that the quality of strategic decisions is considerably enhanced if the system is capable of meeting the various requirements of strategy formulation, evaluation, and implementation (Hax and Majluf, 1984; Lorange, 1979; Thompson, 1967).

In addition, a careful analysis of the theoretical model and the propositions derived thus far would indicate that the impact of the dimensions
representing the first two stages of the model on IMPL-SUCCESS is both direct and indirect (acting through the third stage represented by SYSTEM-CAPAB). If the theoretical argument that system capability occupies a central role in the overall strategic management process is to be tested, then the direct effects of the organizational context and the planning orientation on IMPL-SUCCESS will be weaker than their corresponding indirect effects through SYSTEM-CAPAB. Stated differently, the indirect (i.e., combinatorial) effects of each of the dimensions (of the first two stages) acting through SYSTEM-CAPAB will be stronger than their corresponding direct effects on IMPL-SUCCESS. The explanatory research framework provides the opportunity to test such relatively complex relationships focusing on the directionality of influences. Thus,

P7: The indirect effects of the organizational context and the planning orientation through the system's capability will be stronger than their corresponding direct effects on the perceived implementation success of planning.

Table 1 provides a summary of the eight dimensions discussed above. Figure 2 is a representation of the detailed operational model with specific hypotheses linking these dimensions. The hypotheses with corresponding theoretical propositions are presented in Table 2 and are self-explanatory.

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INSERT FIGURE 2 AND TABLES 1 AND 2 ABOUT HERE

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Research Method

This section describes the research method adopted and focuses on four main issues. These are: (a) the data collection procedure; (b) the operationalization of the various theoretical constructs of the model; (c) the assessment of measurement properties such as reliability and validity; and (d)
the analytical procedure employed for testing the hypotheses proposed in the previous section.

Data Collection Procedure

Data for this study were collected between February and April 1984 by means of a mail survey using self-administered questionnaire for a research project aimed at documenting the changes in the strategic planning practices of leading North American companies. The Total Design Method (TDM) for the conduct of mail surveys, recommended by Dillman (1978) was closely followed in the design and administration of the data collection instrument.

The target sample was randomly chosen from the Fortune 500 list of manufacturing, and Fortune 500 list of service organizations. Senior managers were requested to indicate the trends and changes in various aspects of their strategic planning over the last five years. This was achieved by using anchors such as less emphasis/more emphasis, or much improvement/much deterioration, etc. for most questions. Details are provided in the Appendix. The focus on the trend over a period of time as opposed to current practice was deliberate. It enabled the identification of a pattern of emphasis on the strategic planning practices of respondent firms. A total of 202 planning units (out of a target of 600) comprised the sample for this study, representing about a third of the planning units invited to participate in the project. This level of response from a list of predominantly Fortune 1000 firms is considered higher than is usual for mail surveys of this population (Gaedeke and Tootelian, 1976). The characteristics of the sample are shown in Table 3.

INSERT TABLE 3 ABOUT HERE
The sample is biased in favor of larger firms, with sales level for 61.4% of the sample exceeding $1 billion. Similarly planning executives (69.2%) responsible for corporate-level planning (81%) constitute a dominant part of the sample. Since the planning practices do not significantly differ between large and small firms (Robinson and Pearce, 1984), the size bias in favor of larger firms is not believed to be serious for generalizing the results. Similarly, a comparison of the responses of operating executives and planning executives using t-tests indicated that the two groups taken as a whole did not differ in their assessments. [Details are available on request]. However, since data were obtained from a single respondent per planning unit in an organization, the extent of potential functional bias within an organization could not be assessed. Given that our respondents were senior managers (senior vice presidents of planning or functional heads), one can argue that they would be knowledgeable about their planning practices and generally unbiased. In addition, some validity assessments with external data were carried out to rule out such biases as described below.

Operationalization of Theoretical Constructs

The operational model (Figure 2) is represented in terms of abstract theoretical constructs with relationships specified between these constructs. These need to be operationalized such that the empirical measures reflect the theoretical constructs. Since inadequate attention to operationalization and measurement issues undermines the confidence that can be placed on the research results, attention to measurement issues is required prior to testing the relationships hypothesized in Table 2 and Figure 2.

In general, strategic management researchers (including those researching strategic planning issues) have provided inadequate attention to construct measurement issues (Venkatraman and Grant, 1986). Thus, few rigorous
operationalizations of the theoretical dimensions included in the model (Figure 2) are available. Consequently, this study adopted the measurement paradigm suggested by Churchill (1979). Based on available theoretical support, each construct was defined as clearly as possible and multiple items purported to be related to each construct were identified. The items which were initially adopted to operationalize the eight constructs used in this study are listed in the Appendix. Those items marked with asterisk (*) were subsequently eliminated during measure development, and assessment of measurement properties as discussed below.

Assessment of Reliability and Validity

Reliability. The multi-item indicators of each construct were "purified" (Churchill, 1979; Nunnally, 1978) by eliminating those items which are "outliers" to the construct. Following Cronbach (1951) and Nunnally (1978), internal consistency was assessed using coefficient alpha as the criterion. Such an analysis enables the researcher to delete items which are not highly intercorrelated with other items believed to capture the underlying construct.

Based on the results of such analysis, items marked (*) in the Appendix were eliminated. The Cronbach alpha reliability coefficients and the zero-order Pearson's product-moment correlations (r) are shown in Table 4. The

| INSERT TABLE 4 ABOUT HERE |

Cronbach alpha values range from 0.540 to 0.871 with four values exceeding Nunnally's (1978) suggested threshold value of 0.70, and three values around 0.60. As an additional assessment, item-to-total scale correlations were obtained for the eight measures. All correlation coefficients were not only in the expected direction but also significant at p-levels better than 0.01
The Cronbach alpha values and the item-to-total scale correlation values taken together provide modest support for the internal consistency of measures developed here.

Validity Assessments. Three separate assessments were carried out to address a variety of construct validity issues. The first was an assessment of the association between the IMPL-SUCCESS measure and indicators of perceived organizational performance relative to competition. Since extant research has argued strongly that planning success and financial performance are related, one should expect positive and significant correlations between these constructs.

Four items representing organizational performance relative to competition (sales growth, net profit increases, market share changes, and return on investment) obtained as perceptual measures from the participating managers as a part of this study were each correlated with the six items representing the IMPL-SUCCESS construct. 18 out of the 24 correlations were significant at a level better than p < 0.05. Not unexpectedly, the non-significant correlations were those relating the "soft" aspects of IMPL-SUCCESS (e.g., avoiding problem areas) with the "hard" data on competitive performance. Further, the linear composite index of competitive performance made up of these four performance measures correlated with IMPL-SUCCESS at a level of \((r = 0.2838; p < 0.001)\) — thus providing support for convergent validity of the dependent variable, i.e., IMPL-SUCCESS.

However, such an analysis is still subjected to common method bias since data for both constructs were obtained from the same source. To enhance the confidence that can be placed on the data, objective performance data from secondary sources were assembled for a subsample of 86 organizations (approximately 40% of the study sample). The performance measures included sales growth, net profit growth, and return on investment relative to industry
(operationalized as the difference between the value for the focal organization and the value for its industry category). Data for this purpose were obtained from Standard & Poor's Compustat tapes as reported in Business Week magazine's Inflation Scorecard (Business Week, March 21, 1984). The second validity assessment focused on the degree of correspondence between these two sources of data. All three perceptual measures had strong, positive and significant correlations with the corresponding objective measures (for sales growth, \( r = 0.44; p < 0.01 \); for net-profit growth, \( r = 0.42; p < 0.01 \); and for ROI, \( r = 0.51; p < 0.01 \)). The above results of the second test further support our claim that the perceptual performance data used in this study are appropriate indicators, and are free for the large part from respondent bias.

The third test is intended to provide some support for the contention that the dimensions are independent. This issue is particularly critical to support our contention that SYSTEM-CAPAB and IMPL-SUCCESS are separate dimensions. Two types of analysis were conducted. In the first case, using Guttman-type and Likert-type scales as alternate methods, discriminant validity criteria of the MTMM matrix (Campbell and Fiske, 1959) were satisfied (details provided in Venkatraman, Ramanujam, and Camillus, 1984). Further corroboration was obtained for the independence of these two dimensions based on the principals of confirmatory factor analysis (Joreskog and Sorbom, 1978). Results strongly suggest that the two dimensions should not be combined. The analysis indicate that the specification of one composite factor (which combines the two dimensions) should be rejected in favor of an alternate model with the specification of SYSTEM-CAPAB's effect on IMPL-SUCCESS (Venkatraman and Ramanujam, 1985).

The results of the above tests taken together provide adequate support to our claim that the operationalizations are at least adequate for testing substantive relationships proposed in the model.
Analytical Procedure

The operational model (Figure 2) and the set of hypotheses are tested using a path-analytic framework. The objective in using path analysis was to identify the relative magnitude of direct and indirect effects (i.e., through SYSTEM-CAPAB) of various antecedent dimensions on IMPL-SUCCESS.

Path analysis has been employed in many social science disciplines including management research. It offers the potential for decomposing effects into their various components (see Alwin and Hauser, 1975; Duncan, 1971; and Kenny, 1979 for detailed discussions). Applications of path analysis in situations comparable to the present study include (i) Deshpande and Zaltman (1982), who tested the effects of a set of antecedent variables on the use of market research information; (ii) Prescott, Kohli, and Venkatraman (1984) who in a strategy research context estimated the degree of "spuriousness" in the relationship between market share and business profitability in different environmental contexts; and (iii) Ettlie, Bridges, and O'Keefe (1984) who used the technique to elaborate the differences in causal strategy-structure sequences between incremental and radical approaches to organizational innovation. The specific analytical steps of the present study are described in the following paragraphs.

In the first step, the purified items representing the various constructs were combined into composite Likert-type scales. Simple aggregation was adopted to develop the scales, since in most instances, the summation of raw scores in which each item is scored identically and contributes equally to the total score is appropriate (Nunnally, 1978). However, construction of Likert-type scales assumes that the scale items have equal means, the same true score variances, as well as same error variances. This assumption was tested using a maximum likelihood method of estimating the parameters (Kristof, 1963). All $\chi^2$ values were significant (details on request) indicating that
the additivity assumption is not violated, thus supporting the construction of Likert-type scales.

Another potentially serious problem in the construction of linear composite scales is that of "missing data". Researchers seldom explicitly discuss their treatment of missing data, which is inevitable in mail questionnaire-based data collection approaches. In this study a case was included in the analysis if complete data were available for at least 50% of the items which constitute the scale. For example, in a seven-item scale, if data were missing for 4 items, that case was deleted from consideration. On the other hand, if data were available for 5 of the 7 items, the average of the 5 items was taken as the scale value (cf: Nie, Hull, Jenkins, Steinbrenner, and Bent, 1975).

In the second step, a set of six ordinary least squares (OLS) regressions was estimated, in line with the model specified in Figure 2. The six equations are as follows:

\[
\text{IMPL-SUCCESS} = a_0 + \beta_1 \text{SYSTEM-CAPAB} + \beta_2 \text{TECHUSE} + \beta_3 \text{INTERNAL} + \beta_4 \text{EXTERNAL} \\
+ \beta_5 \text{FUNCTIONS} + \beta_6 \text{RESOURCES} + \beta_7 \text{RESISTANCE} + \epsilon_1 \tag{1}
\]

\[
\text{SYSTEM-CAPAB} = a_0 + \beta_1 \text{TECHUSE} + \beta_2 \text{INTERNAL} + \beta_3 \text{EXTERNAL} + \beta_4 \text{FUNCTIONS} + \\
\beta_5 \text{RESOURCES} + \beta_6 \text{RESISTANCE} + \epsilon_2 \tag{2}
\]

\[
\text{TECHUSE} = a_0 + \beta_1 \text{RESOURCES} + \epsilon_3 \tag{3}
\]

\[
\text{INTERNAL} = a_0 + \beta_1 \text{RESOURCES} + \epsilon_4 \tag{4}
\]

\[
\text{EXTERNAL} = a_0 + \beta_1 \text{RESOURCES} + \epsilon_5 \tag{5}
\]

\[
\text{FUNCTIONS} = a_0 + \beta_1 \text{RESOURCES} + \epsilon_6 \tag{6}
\]

The standardized beta values obtained from these equations represent the path coefficients (Wright, 1960). The path coefficient indicates the direct effect
of an antecedent variable on a dependent variable taken as effect (Kerlinger and Pedhazur, 1973).

In the third step, the indirect effects were calculated as a simple multiplicative measure of the magnitude of the relevant path coefficients by using the Simon-Blalock technique (Simon, 1954; Duncan, 1971). With reference to Figure 2, as illustration, the indirect effect of RESISTANCE on IMPL-SUCCESS through SYSTEM-CAPAB is the value obtained by multiplying the path coefficient between SYSTEM-CAPAB and RESISTANCE by the path coefficient between IMPL-SUCCESS and SYSTEM-CAPAB.

In the fourth step, the ratio of the indirect effect (of each antecedent dimension through SYSTEM-CAPAB on IMPL-SUCCESS) to the direct effect (of each antecedent dimension on IMPL-SUCCESS) was calculated. This analysis provides the basis to examine the hypotheses H7a through H7f which posit that the indirecst effect through SYSTEM-CAPAB in each case will be stronger than the corresponding direct effects.

Results

Table 5 presents the summary results of the six regression equations.

As shown in Table 5 the R² values in all the six regression equations are significant at p-levels better than 0.001. The R² values for the first two equations — which are employed for testing most of the hypotheses — are 0.304 and 0.585 respectively. Although the purpose of path analysis is to determine the existence of hypothesized effects rather than to measure the explained variance, we can interpret the values of explained variance as an indication of the importance of the variables considered in the model (Deshpande and Zaltman,
1982). For the present purpose, however, it is more important to understand the statistical significance of the path coefficients and the relative strengths of indirect and direct effects.

Table 6 provides a summary of the path-analytic calculations and indicates that the indirect effects through SYSTEM–CAPAB are stronger than direct effects in five out of the six instances.

Confidence in the above results can be increased if rival explanations can be systematically ruled out. Two sets of additional analyses were carried out for this purpose. One involved the examination of the role of key contextual factors in moderating the relationships, and the other related to testing the robustness of the results in several sub-samples. These are discussed below.

Rejecting Rival Interpretations of Results

The first test focused on assessing the robustness of results across different contexts. As noted earlier, the sample of this study consisted of a somewhat heterogeneous cross-section of organizations that varied in sales level, business type, etc. (see Table 3). Unless we explicitly test for the possible confounding effects of these differences, alternative explanations for the research results cannot be ruled out. Consequently, the moderating effects of four variables—sales level, business type, respondent's position (operating manager versus staff planner) and organizational level (business versus corporate)—were examined. Equation #2, which is considered to be the central equation in the system of equations representing the model, was used for this additional analysis.
The test was performed using the procedure suggested by Arnold (1982). Since the relationship between an independent variable and the dependent variable may not remain the same with regard to both degree (i.e. strength of the correlation coefficient) and form (i.e. the beta value of regression) over a hypothesized moderating variable, it is necessary to test for both the degree and form while testing for the moderating effects. Testing for the first requires sub-group analysis while the test for the second is a moderated regression analysis.

The results of testing for moderating effects (degree and form) indicate that the impact of the moderators is not significant. For instance, all the four moderators, except for organizational level had no significant effect either in moderating the degree or the form of the relationship between the independent variables and the dependent variable in equation #2. Organizational level was found to moderate only the relationships between TECHUSE and SYSTEM–CAPAB and between RESOURCES and SYSTEM–CAPAB. The role of the other independent variables was invariant across contexts. The Fisher's \( Z \)-statistic for the difference in the degree of relationship between TECHUSE and SYSTEM–CAPAB across organizational levels was 3.00 (\( p < 0.05 \)), with a stronger relationship at the divisional level. In the case of the relationship between RESOURCES and SYSTEM–CAPAB, the degree was invariant across the levels, but the form varied (beta value of the interaction term, level \( X \) RESOURCES was 0.779 (\( t = 2.037, p < 0.05 \)). While space constraints prevent a detailed analyses of these findings, it is sufficient to note that the relationships obtained in this study are generally invariant across the four key moderators.

The second test sought to assess the stability of results in sub-samples. Again, equation #2 was used for the analysis. Four sub-samples containing 75\% of the sample were obtained by successively deleting 25\% of the sample four times. OLS regressions were performed on the four sub-samples. Results,
summarized in Table 7 indicate that the significance of the explanatory variables do not disappear in any of the sub-samples providing strong support to the stability of results.

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Discussion of Results

The study proposed and tested a theoretical model of successful implementation of strategic planning in organizations using data on planning practices of 202 planning units. Overall, the model and many of the underlying hypotheses are supported. Expectations regarding the central role of system capability received support based on its own strong direct effect on IMPL-SUCCESS as well as the relative dominance of indirect effects through the system capability over the corresponding direct effects of other dimensions in the model. In the following paragraphs, the discussion first revolves around the extent of support received for the various theoretical propositions developed in this paper. Subsequently the contributions of this study as well as the limitations and extensions for future research are noted.

The first proposition and its four derivative hypotheses (H1a to H1d) were supported indicating that the degree of resource commitment to planning plays a significant role in shaping the four design elements of the planning orientation. The implication is that planning requires an infusion of adequate resources which may be in the form of not only more managerial personnel allocated to the planning efforts but also in the form of more participation from operating managers and the chief executive. Thus, it appears that if planning can draw from a broader base of resources (both tangible and intangible), it can effectively provide the required support for the effectiveness of the overall strategic planning process.
The second proposition, which posited that the organizational context has a significant effect on the system capability, was only partially supported. Specifically, the contention that organizational resistance will have a significant negative effect on system's capability (H2a) was strongly supported (path coefficient = -0.479; p < .001). This provides empirical support to the conceptual arguments that overcoming organizational resistance and creating a favorable organizational climate is an essential prerequisite for any managerial activity (including planning) to succeed (Ansoff, 1984; Lorange, 1980; Lucas, 1978; Schultz and Slevin, 1975; Steiner and Schollhammer, 1975; Steiner, 1979).

The other hypothesis (H2b) derived from the second proposition, positing a positive effect of resource commitment on system capability, did not receive support (path coefficient = 0.112; ns). However, it is interesting that the correlation coefficient between SYSTEM-CAPAB and RESOURCES is positive and highly significant (r = 0.5815; p < .001). This implies that although the direct effect is weak, the impact of additional resources to planning is felt through other dimensions of planning orientation. This can be better understood through an examination of some of the later propositions.

For example, RESOURCES emerged as a key determinant of each of the four dimensions of the planning orientation. Beyond merely pointing out that increased resources positively affects the dimensions of planning orientation (which is perhaps a truism), the model can be used to examine the effect of alternative resource allocation patterns. An examination of the indirect effects of RESOURCES on SYSTEM-CAPAB through each of the four dimensions suggests that it is perhaps most beneficial to direct incremental resources to INTERNAL and EXTERNAL facets (see Table 6).

The third proposition was also partially supported. The level of attention given to both INTERNAL and EXTERNAL had a significant effect on
SYSTEM-CAPAB. The emergence of external and internal facets as key influences of the system capability lends further support to the arguments that an integration of internal and external facets lies at the core of effective strategy development. What is interesting and perhaps significant is that both these dimensions emerged as significant influences on the system capability. However, this study did not examine the impact, if any, of a trade-off between internal and external facets on the system capability. Future studies should examine this issue more systematically to develop normative guidelines for the design and implementation of planning systems.

It is interesting that TECHUSE did not have any strong effect either on SYSTEM-CAPAB or on IMPL-SUCCESS. The implication that can be readily drawn is that the planning process is not automatically improved by merely using more analytical techniques. Perhaps, it is more important to match techniques to the various problems addressed, and balance the use of analytical techniques with managerial intuition and judgements. Recent commentaries by academics and practitioners allege that the erosion of US competitiveness owes much to blind reliance on sophisticated management techniques and principles (Hayes and Abernathy, 1980; Kiechel, 1982). In a similar vein, our results perhaps reinforce the notion that the use of techniques is to be viewed more as a "means" towards certain desired "ends" (say, structuring complex problems or identifying relative merits/demerits of various alternatives) than ends in themselves.

However, it is surprising that FUNCTIONS did not emerge as a significant influence on SYSTEM-CAPAB and IMPL-SUCCESS. Perhaps this is due to our emphasis on breadth of coverage of multiple functional areas rather than the nature of linkage among the functions. Future research efforts need to focus on the nature and degree of these linkages rather than merely the breadth of coverage.
The fourth and the fifth propositions specified the impact of the organizational context and planning orientation on the IMPL-SUCCESS respectively. Both the propositions were rejected although an examination of the correlation matrix (Table 4) indicates that the underlying correlations are statistically significant and in the expected directions. This again indicates that although the direct effects of the various dimensions on IMPL-SUCCESS are weak, the dimensions of both the organizational context and planning orientation exert strong indirect influences (see Table 6).

The sixth proposition that SYSTEM-CAPAB exerts a positive and significant effect on IMPL-SUCCESS was strongly supported. This confirms our central premise that system capability occupies an important role in the overall scheme of effective implementation of strategic planning. This finding is further augmented by the support received for the seventh proposition that the indirect effects through system capability will be stronger than the direct effects. As indicated in Table 6, the indirect effects of organizational context and planning orientation on IMPL-SUCCESS through SYSTEM-CAPAB were stronger than their corresponding direct effects in five of the six instances.

Thus, while planning orientation reflects four important design elements, SYSTEM-CAPAB is a characterization of the capability of the administrative system to provide support for strategic management. Hence, it is important to focus on those factors that improve SYSTEM-CAPAB. The three dimensions that have significant effects are INTERNAL, EXTERNAL, and RESISTANCE, and from a managerial perspective, they provide useful guidelines as to where specific attention needs to be directed to enhance the system's capability.

To summarize, the model proposed in this study received general support and established that all the four stages have important implications in the overall effectiveness of planning. The results indicate that merely directing additional resources to the various facets of planning orientation is unlikely
to result in implementation success. It is how the increased emphasis on various key dimensions of planning orientation gets translated into improvements in system capability that leads to implementation success. This assertion, which has been well emphasized in many normative contexts received support here in two ways: one, due to the importance of SYSTEM-CAPAB on IMPL-SUCCESS, and the other due to the relative dominance of indirect effects of organizational context and planning orientation over their corresponding direct effects. In addition, an organizational context supportive of planning that provides resources commensurate with the objectives and corresponding reduction in the level of resistance to planning are important determinants of planning effectiveness.

Contributions

This study makes modest contributions to the body of research literature on strategic planning systems. These are discussed under three categories — theoretical, methodological, and managerial.

Contributions to theory. An important contribution pertains to the shift away from simple "planner" versus "non-planner" categorization towards the recognition of multiple dimensions of planning systems in the research model. A related contribution is the formal representation of multiple "stages" in the model which emphasize not only the organizational context of planning but also the key dimensions of planning orientation. In addition to focusing on the multi-facetedness of planning systems, the model reflected the multi-dimensional nature of planning system success, through the development and use of the system capability dimension in conjunction with the more traditional goal-centered view of implementation success. The development of the theoretical model which formally recognizes the interdependence among these multiple dimensions should provide a basis for other research efforts aimed at refining and/or extending the model.
Contributions to methodology. Two important contributions are made to the methodological domain of strategic planning research. One relates to the development of multi-item operationalizations for the various dimensions of the model. Since inadequate attention to measurement issues weaken the theoretical implications of much of strategy research (Venkatraman and Grant, 1986), the use of reasonably reliable and valid measures here enhances the overall confidence that can be placed on the research results. More importantly, they serve as the basis for subsequent efforts at purification and improvement of operational measures for key characteristics of planning systems.

The second contribution relates to the use of path-modeling as the basis for adopting an explanatory perspective. Had the hypotheses been stated in terms of the strength and the direction of association between the various dimensions (and tested using the magnitude and the statistical significance of correlation coefficients) most hypotheses would be supported (see Table 3). However, this study went further to decompose the correlation into various theoretically-defensible effects (both direct and indirect) to provide further insights. Such an analysis enabled us to test the centrality of the SYSTEM'S-CAPAB dimension, which would not have been easily accomplished using only bi-variate correlational analysis. Strategy researchers are urged to examine the potential benefits of path analysis not only in relation to planning systems research but also to a broader set of strategy research questions.

Contributions to Practice. A few important pointers for enhancing general management practice can be made. Although not claimed to be "laws", these guidelines can be considered more valid than those suggested based on isolated case examples and anecdotal (and sometimes, tangential) evidence. In terms of the design elements, effective systems are likely to pay attention to
not only their internal capabilities and areas of strengths but also trends in
the broader external environment. Although this may appear to be a
corroboration of conventional wisdom, it is interesting that the breadth of
functional coverage and the extensive use of analytical models and techniques
did not lead to successful planning systems.

In relation to the organizational characteristics which facilitate
planning, the important requirements appear to be a willingness to commit the
required resources — both tangible and intangible, as well as efforts at
reducing the level of resistance to formalized planning approaches.
Involvement of line executives in planning and staff executives in translating
plans into budgets ensures that planning will lead to better results. Such a
result is in line with Business Week's recent claim that "the notion that an
effective strategy can be constructed by someone in ivory tower in totally
bankrupt" (1984; p. 62). In addition, the central role of enhancing system
capability to support the overall strategic management process has been
previously emphasized and need not be repeated here.

Limitations and Extensions

In developing and testing a theoretical model of successful
implementation of strategic planning systems, this study sought to identify and
overcome some of the major limitations of extant research in this stream.
However, no study is without limitations, and this study is no exception. The
major ones are noted in the hope of encouraging future research efforts in this
area.

First, despite the fact that this study paid particular attention to
measurement issues such as reliability and validity, it is necessary to
recognize that the data for these measures were obtained from a single
respondent per unit of observation. Although the respondents were senior
managers, the extent of individual biases could not be assessed. Since organizational-level constructs such as planning are best operationalized using multiple managers (Venkatraman and Grant, 1986), a possible line of extension would be to employ multiple managers representing different functions.

Second, checking for consensus among planners and operating managers within the same organization regarding the constructs of this study could open up new avenues for research. The use of two sets of respondents — planning executives ("designers") and operating managers ("users") — and an examination of the extent of consistency and areas of differences could provide more insights into the role of planning in the overall strategic management process.

The third limitation relates to the use of "retrospective" data on the trends over a five year period. The general belief is that the descriptions of historical events are unreliable due to loss of memory and recency effect (i.e., tendency to rationalize and distort accounts of past behavior in favor of recent accounts). On the other hand, some studies (e.g., Gutek, 1978; Ferber and Birnbaum, 1979) show that there is no significant difference in accuracy between recalling behavior which occurred ten or more years ago and that which occurred two or three months ago (Gutek, 1978). The issue, however, is not a simple one since strong arguments can be presented on both sides. Since the specific impact of the use of retrospective data in this study could not be assessed, it is necessary to acknowledge that the results are subject to this limitation.

Fourth, the organizational context of planning, now conceptualized using two dimensions (RESISTANCE and RESOURCES), can be enlarged to include a broader set of factors. A prominent candidate for consideration is the organization's strategy — which has been argued by some (Leontiades, 1983, Lorange, 1979) to be an important contingency on planning. Specifically, the relative importance of the various dimensions of the model can be examined for different types of
strategies to develop a richer understanding of the strategy–systems design linkage.

Summary

This study focused on an important topic in the area of strategic planning systems, i.e., the development and testing of a theoretical model of the implementation of strategic planning systems. In the process, it addressed some of the key conceptual and methodological limitations observed in previous research. The model, which sought to integrate the many factors presumed to influence effective implementation and use of strategic planning systems, was broadly supported. Specifically, each of the four stages of the model emerged as significant, although some of the constituent dimensions had a lesser role than envisaged. Analysis of the nature of the various relationships specified in the model indicated that the system capability dimension is central to conceptualizing and understanding the role of strategic planning in the broader context of the strategic management process.

We believe that research on strategic planning systems should move beyond conclusions based on isolated case studies, personal experiences of a few and piecemeal anecdotes devoid of the broader context within which planning takes place in an organization. This study will have served an important role if it stimulates further thinking about the complex nature of the organizational planning processes and initiate future studies aimed at examining many of the untested propositions on planning that we have today. Such efforts will go a long way in integrating research findings into an overall research framework and in developing "theories" of strategic planning.
References


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Kristof, W. The statistical theory of speed-up reliability coefficients when a test has been divided into several equal parts. Psychometrika, 1963, 28, 221-238.


<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>DESCRIPTION</th>
<th>KEY SUPPORTING LITERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources provided for planning</td>
<td>The breadth of organizational resource support in the form of number of planners, involvement of top management in planning etc.</td>
<td>King &amp; Cleland (1978)</td>
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<tr>
<td>(RESOURCES)</td>
<td></td>
<td>Lorange (1980)</td>
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<tr>
<td></td>
<td></td>
<td>Steiner (1979)</td>
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<tr>
<td>Resistance to planning</td>
<td>The efforts at anticipating and overcoming resistance to planning and creating a favorable climate for effective planning.</td>
<td>Lorange (1980)</td>
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<td>(RESISTANCE)</td>
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<td>Steiner (1979)</td>
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<td>Steiner &amp; Schollhammer (1975)</td>
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<td></td>
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<td>Shultz &amp; Slevin (1976)</td>
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<tr>
<td>Use of techniques</td>
<td>The degree of emphasis is given to the use of planning techniques and analytical models to structure the unstructuredness of ill-defined, messy strategic problems.</td>
<td>Grant &amp; King (1979, 1982)</td>
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<td>(TECHUSE)</td>
<td></td>
<td>Hofer &amp; Schendel (1978)</td>
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<tr>
<td></td>
<td></td>
<td>Hax &amp; Majluf (1984)</td>
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<tr>
<td>Attention to internal facets</td>
<td>The degree of attention to internal (i.e., organizational) factors and past performance for analysis of strengths and weaknesses.</td>
<td>Camillus &amp; Venkatraman (1984)</td>
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<tr>
<td>(INTERNAL)</td>
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<td>Grant &amp; King (1982)</td>
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<td></td>
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<td>Lorange &amp; Vancil (1977)</td>
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<tr>
<td></td>
<td></td>
<td>Stevenson (1976)</td>
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<tr>
<td>Attention to external facets</td>
<td>The level of emphasis given to monitoring environmental trends.</td>
<td>Anquilar (1965)</td>
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<td>(EXTERNAL)</td>
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<td>Fahey &amp; King (1977)</td>
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<td>Kefalas &amp; Schoederbek (1973)</td>
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<td>Thomas (1980)</td>
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<td>Functional coverage</td>
<td>The breadth of coverage given to different functional areas with a view to integrate different functional requirements into a general management perspective.</td>
<td>Hitt, Ireland &amp; Palia (1982)</td>
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<td>(FUNCTIONS)</td>
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<td></td>
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<td>Lorange (1980)</td>
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<td></td>
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<td>Snow &amp; Hrebiniak (1980)</td>
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<tr>
<td>System's capability</td>
<td>The ability of the formal planning system to balance creativity and control; the adaptive capability of the system and its flexibility to support strategy formulation and implementation</td>
<td>Ansoff (1975; 1984)</td>
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<td>(SYSTEMS-CAPAB)</td>
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<td>King &amp; Cleland (1978)</td>
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<td></td>
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<td>Thompson (1967)</td>
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<tr>
<td>Perceived Implementation Success</td>
<td>The degree to which key planning goals are achieved</td>
<td>Camillus (1975)</td>
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<td>King &amp; Cleland (1978)</td>
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<td>PROPOSITION NUMBER</td>
<td>DESCRIPTION OF HYPOTHESES</td>
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<td>RESOURCES on INTERNAL (H1b)</td>
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<td>RESOURCES on EXTERNAL (H1c)</td>
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<td>RESOURCES on TECHUSE (H1d)</td>
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<td>RESOURCES on SYSTEM-CAPAB (H2b)</td>
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<td>Positive and significant effect of:</td>
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<td>FUNCTIONS on SYSTEM-CAPAB (H3a)</td>
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<td>INTERNAL on SYSTEM-CAPAB (H3b)</td>
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<td>RESOURCES on IMPL-SUCCESS (H4b)</td>
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<td>FUNCTIONS on IMPL-SUCCESS (H5a)</td>
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<td>TECHUSE on IMPL-SUCCESS (H5d)</td>
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<td>6</td>
<td>Positive and significant effect of:</td>
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<td>SYSTEM-CAPAB on IMPL-SUCCESS (H6a)</td>
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<td>7</td>
<td>Indirect effects on IMPL-SUCCESS will be stronger than corresponding direct effects in the case of:</td>
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<td>RESISTANCE (H7a)</td>
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<td>TECHUSE (H7f)</td>
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TABLE 3

Key Characteristics of the Study Sample\(^a\)
(n=202)

1. **Level of the Planning Unit**
   - Corporate level: 81%
   - Business level: 19%

2. **Title/Job Position of the Respondents**
   - Planning Responsibility: 69.2%
   - Line Responsibility: 30.8%

3. **Range of Sales of the Unit**
   - Less than $50 Million: 6.6%
   - $51-$100 Million: 4.6%
   - $101-$250 Million: 5.1%
   - $251-$500 Million: 10.2%
   - $501-$1 Billion: 12.2%
   - over $1 Billion: 61.4%

4. **Business Category**
   - Consumer Goods: 19.1%
   - Capital Goods: 19.1%
   - Raw or semi-finished materials: 13.1%
   - Components for finished goods: 9.0%
   - Service sector: 39.7%

\(^a\) Non-responses have been excluded.
TABLE 4

Zero-Order Correlations and Reliability (Cronbach α) Indices of the Measures Used in the Study

<table>
<thead>
<tr>
<th>RESOURCES</th>
<th>RESISTANCE</th>
<th>FUNCTIONS</th>
<th>INTERNAL</th>
<th>EXTERNAL</th>
<th>TECHUSE</th>
<th>SYSTEM-CAPAB</th>
<th>IMPL-SUCCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESOURCES</td>
<td>(0.597)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESISTANCE</td>
<td>-0.6404***</td>
<td>(0.614)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUNCTIONS</td>
<td>0.4586***</td>
<td>-0.4000***</td>
<td>(0.772)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERNAL</td>
<td>0.2868***</td>
<td>-0.2677***</td>
<td>0.3634***</td>
<td>(0.540)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXTERNAL</td>
<td>0.2983***</td>
<td>-0.3756***</td>
<td>0.4969***</td>
<td>0.2281**</td>
<td>(0.613)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECHUSE</td>
<td>0.4815***</td>
<td>-0.3589***</td>
<td>0.3058***</td>
<td>0.2946***</td>
<td>0.190**</td>
<td>(0.834)</td>
<td></td>
</tr>
<tr>
<td>SYSTEM-CAPAB</td>
<td>0.5815***</td>
<td>-0.6945***</td>
<td>0.4191***</td>
<td>0.4201***</td>
<td>0.4365***</td>
<td>0.409***</td>
<td>(0.874)</td>
</tr>
<tr>
<td>IMPL-SUCCESS</td>
<td>0.3127***</td>
<td>-0.3915***</td>
<td>0.1540*</td>
<td>0.2418***</td>
<td>0.2148**</td>
<td>0.2067**</td>
<td>0.5433***</td>
</tr>
</tbody>
</table>

NOTE: Cronbach α values are in the diagonal

* = P < .05
** = P < .01
*** = P < .001
Summary Results of the Six Regression Equations

<table>
<thead>
<tr>
<th>EQUATION NO.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td>IMPL-SUCCESS</td>
<td>SYSTEM-CAPAB</td>
<td>TECHUSE</td>
<td>INTERNAL</td>
<td>EXTERNAL</td>
<td>FUNCTIONS</td>
</tr>
<tr>
<td>SYSTEM-CAPAB</td>
<td>0.53312***</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>TECHUSE</td>
<td>-0.01644</td>
<td>0.09644</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>INTERNAL</td>
<td>0.04406</td>
<td>0.19702***</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>EXTERNAL</td>
<td>0.00555</td>
<td>0.14788*</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>FUNCTIONS</td>
<td>-0.10916</td>
<td>0.00139</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>0.01580</td>
<td>0.11213</td>
<td>0.48148***</td>
<td>0.2868***</td>
<td>0.3983***</td>
<td>0.45857***</td>
</tr>
<tr>
<td>RESISTANCE</td>
<td>-0.04683</td>
<td>-0.47922***</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

Summary Statistics:
- df: 7,165, 6,166, 1,175, 1,199, 1,199, 1,195
- R²: 0.304, 0.585, 0.232, 0.082, 0.1586, 0.21
- F: 10.322, 39.054, 52.812, 17.84, 37.523, 51.925
- P < : 0.001, 0.001, 0.001, 0.001, 0.001, 0.001

NOTE: The coefficients in the cells are standardized beta values.

* = P < .05
** = P < .01
<table>
<thead>
<tr>
<th>ANTECEDENT FACTOR</th>
<th>TOTAL ASSOCIATION WITH IMPL-SUCCESS (r)</th>
<th>DIRECT EFFECT ON IMPL-SUCCESS (PATHS COEFFICIENTS)</th>
<th>INDIRECT EFFECT THROUGH SYSTEM-CAPAB ON IMPL-SUCCESS</th>
<th>UNANALYZED EFFECTS (A-(B+C))</th>
<th>RATIO OF INDIRECT TO DIRECT EFFECTS C/B</th>
<th>OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESISTANCE</td>
<td>-0.3915</td>
<td>-0.04683</td>
<td>-0.25548</td>
<td>-0.08919</td>
<td>5.45</td>
<td>The indirect effect is in the expected direction and strong than the direct effect. (H7a)</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>0.3127</td>
<td>0.01580</td>
<td>0.146&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.1505</td>
<td>9.26</td>
<td>The indirect effect is in the expected direction and stronger than the direct effect. (H7b)</td>
</tr>
<tr>
<td>FUNCTIONS</td>
<td>0.154</td>
<td>-0.10916</td>
<td>0.00074</td>
<td>0.262</td>
<td>--</td>
<td>The indirect effect is in the expected direction but weaker than the direct effect. (H7c)</td>
</tr>
<tr>
<td>INTERNAL</td>
<td>0.2418</td>
<td>0.04406</td>
<td>0.1050</td>
<td>0.0927</td>
<td>2.38</td>
<td>The indirect effect is in the expected direction and stronger than the direct effect. (H7d)</td>
</tr>
<tr>
<td>EXTERNAL</td>
<td>0.2148</td>
<td>0.00555</td>
<td>0.0788</td>
<td>0.130</td>
<td>14.2</td>
<td>The indirect effect is in the expected direction and stronger than the direct effect. (H7e)</td>
</tr>
<tr>
<td>TECHUSE</td>
<td>0.2067</td>
<td>-0.01644</td>
<td>0.0514</td>
<td>0.1717</td>
<td>3.12</td>
<td>The indirect effect is in the expected direction and stronger than the direct effect. (H7f)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Indicates the number of corresponding hypotheses.
<table>
<thead>
<tr>
<th>Dependent Variable: DEPENDENT VARIABLE</th>
<th>SYSTEM-CAPAB Subsample 3</th>
<th>Subsample 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECHUSE</td>
<td>0.05902</td>
<td></td>
</tr>
<tr>
<td>INTERNAL</td>
<td>0.12243*</td>
<td>0.14116*</td>
</tr>
<tr>
<td>EXTERNAL</td>
<td>0.18837***</td>
<td>0.13676*</td>
</tr>
<tr>
<td>FUNCTIONS</td>
<td>-0.0281</td>
<td>0.048</td>
</tr>
<tr>
<td>RESOURCES</td>
<td>-0.4498***</td>
<td>-0.50871***</td>
</tr>
<tr>
<td>RESISTANCE</td>
<td>-0.4498***</td>
<td>-0.50871***</td>
</tr>
<tr>
<td>R²</td>
<td>0.585</td>
<td>0.511</td>
</tr>
</tbody>
</table>

* = P < .05
** = P < .01
*** = P < .001
APPENDIX

Operationalizations of the Constructs Used in the Study

1. IMPL-SUCCESS - it was operationalized by requesting executives to indicate the extent to which the following objectives of planning have been fulfilled, on a five-point interval scale, ranging from entirely fulfilled to unfulfilled:

   (i) Enhancing management development
   (ii) Predicting future trends
   (iii) Improvement in long-term performance
   (iv) Improvement in short-term performance
   (v) Evaluating alternatives based on more relevant information
   (vi) Avoiding problem areas

2. SYSTEM-CAPAB - operationalized by using a five-point interval scale ranging from much improvement to much deterioration on each of the following items:

   (i) Ability to anticipate surprises and crises
   (ii) Flexibility to adapt to unanticipated changes
   (iii) As a mechanism for identifying new business opportunities
   (iv) Role in identifying key problem areas
   (v) As a tool for managerial motivation
   (vi) Generation of new ideas
   (vii) Ability to communication top management's expectation down the line
   (viii) As a tool for management control
   (ix) As a means of fostering organizational learning
   (x) Ability to communicate line manager's concerns to top management
   (xi) As a mechanism for integrating diverse functions/operations
   (xii) As a basis for enhancing innovation

   In addition, the following thirteenth item scaled from strongly agree to strongly disagree was added.

   (xiii) Today's system emphasizes creativity among managers more than our previous system

3. TECHUSE - operationalized by using a five-point interval scale as the degree of change in the use of the following techniques in the planning activities:

   (i) Portfolio (e.g., BCG) approaches
   (ii) PIMS Model
   (iii) Financial model
   (iv) Zero-based budgeting
Appendix (continued)

(v) Financial-based measures, such as value-based planning
(vi) Project management techniques (e.g., PERT/CPM)
(vii) Stakeholder analysis
(viii) Scenario/Delphi techniques
(ix) Forecasting and trend analysis

4. INTERNAL - was operationalized by using a five-point interval scale ranging from significantly more emphasis to significantly less emphasis, for the following items:

(i) Internal capabilities
(ii) Past-performance
(iii) Reasons for past-failures

5. EXTERNAL - was operationalized by using a five-point interval scale ranging from significantly more emphasis to significantly less emphasis, for the following items:

(i) Competitive trends*
(ii) General economic and business trends
(iii) Regulatory issues
(iv) World-wide competition
(v) Supplier trends
(vi) Customer/End user preferences
(vii) Technological trends

6. FUNCTIONS - was operationalized by using a five-point interval scale ranging from significantly more emphasis to significantly less emphasis, on the following items:

(i) Marketing function
(ii) Operations/manufacturing function
(iii) Finance function
(iv) Personnel function
(v) Purchasing/Procurement function
(vi) Research and Development/technology function
(vii) Computers and MIS

7. RESOURCES - was operationalized by using a five-point interval scale ranging from significant decrease to significant increase, on the following items:

(i) Number of planners
(ii) Time spent by the chief executive in strategic planning
(iii) Involvement of the board of directors in strategic planning*
Appendix (continued)

(iv) Involvement of the staff managers in strategic planning
(v) Resources provided to strategic planning

8. RESISTANCE - was operationalized by using a five-point interval scale ranging from significant increase to significant decrease, on the following items:

(i) Overall emphasis to strategic planning - R
(ii) Involvement of the line managers in the strategic planning activities - R
(iii) Acceptance of outputs of strategic planning exercise by top management - R
(iv) Resistance to planning in general
(v) Threats to continuation of strategic planning

NOTES:

* = Removed during the "purification" stage
R = Reverse scored
FIGURE 1
A Theoretical Model of Sequential Influences on Strategic Planning Effectiveness

Stages

I  ORGANIZATIONAL CONTEXT OF PLANNING

II  PLANNING ORIENTATION

III  SYSTEM'S CAPABILITY

IV  IMPLEMENTATION SUCCESS (PLANNING EFFECTIVENESS)
FIGURE 2

The Operational Model of Effective Implementation of Planning Systems

1. One-directional arrows imply causal effects. (For details of the notation, please refer to Duncan (1971).)

2. All paths are hypothesized to be positive and significant (except those marked "**", which are hypothesized to be negative and significant).

3. Hypotheses 7 (a to f) are not drawn since they involve multiplicative effects. Please refer to Table 1 for details.