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THE CONTRIBUTION OF FORMAL PLANNING TO DECISIONS

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This paper presents results from a study of the contribution of formal strategic planning to 1087 decisions made by 129 of the Fortune *500 companies during the years 1982–86. Multivariate analysis of covariance revealed that the characteristics of decisions account for over 15 percent of the variance in data and should therefore be regarded as important determinants of the contribution planning makes to decision-making. The planning systems studied contributed more to decisions that were considered important and risky, and also to those that were either global in nature or related to divestments.*

Strategic planning has evolved through years. Critical issues have accordingly changed: from emphasis on tools and techniques to implementation, technology (Friar and Horwitch, 1986), and global orientation (Ghoshal, 1987). This shifting concern, however, is not reflected in research on effectiveness of planning, which is still largely concerned with 'does planning pay?' (Ramanujam and Venkatraman, 1987). Armstrong, for instance (1982: 206), reports:

> In general, formal planning was useful: improved performance was noted in 10 of 15 comparisons, with five of these improvements statistically significant at the 0.05 level. Three comparisons showed no difference.

But business performance is affected by market share, investment intensity, product quality (Schoeffler *et al.*, 1974), R&D and advertising expenses, and a host of other factors. Moreover, many decisions affecting firm's performance are made outside the formal planning process (King, 1983). How much of firm's performance then could reasonably be attributed to formal planning?

In this paper we conceptualize effectiveness of planning in terms of the intensity of usage of the planning system by the decision-makers (Ein-Dor and Segev, 1981). We consider the decision rather than the firm as the unit of analysis, and measure effectiveness of planning by the contribution planning made to the making of global decisions, technology decisions, and the like.

THE OBJECTIVES OF PLANNING

According to social scientists working on program evaluation, a necessary condition for measurement of effectiveness of a program is that the objectives of the program and those of the evaluation be defined as precisely as possible (Patton, 1978; Brewer, 1983). Because each program will have some idiosyncratic goals, the difficulties of defining objectives multiply in any large sample evaluation study. The studies of effectiveness of planning fall in this category.

Past studies of the effectiveness of formal planning typically used a large sample of firms and a variety of economic and non-economic goals of planning. Each of these goals could have been among the objectives of planning for some firms but, as we will discuss below, none could be treated as the objective of planning in a large

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sample of companies. Our study differs from the previous approaches in that we conceive of formal planning as a system whose objective, like that of other business systems, is to contribute to decision-making.

The economic objectives of planning

Most of the early empirical studies on effectiveness of planning sought to measure business performance (ROI, growth, stock price, and the like) as a surrogate for performance of planning. Using this approach many studies found a positive relationship between planning and economic performance (Ansoff *et al.*, 1970; Herold, 1972; Karger and Malik, 1975; Thune and House, 1970), several others found none (Grinyer and Norburn 1975; Kudla, 1980; Leontiades and Tezel, 1980; Wood and LaForge, 1979), while a few managed to find a negative association between the two (Rue and Fulmer, 1973; Fulmer and Rue, 1974).

There is nothing inherently wrong with the use of economic objectives for evaluation of planning. The literature on program evaluation is full of examples of the use of indirect economic measures. The objective of evaluation in such studies was to help the decision-makers decide whether to continue funding a social program (Scriven, 1967: 40–43). In the early years of the discipline of planning the question of whether to continue planning or not could indeed have been an issue, and the perceived impact of planning on economic performance might have been an influence in favor of planning for several firms. The early studies on the effectiveness of planning perhaps served this purpose.

But now that the continuation of planning is no longer an issue, there is little justification for the use of the economic objectives of a firm for the evaluation of planning. First, because strategic planning could be viewed as an innovation. Those who introduced it early reaped benefits in the beginning. Hence the positive results of the early studies on effectiveness of planning (Ansoff *et al.*, 1970; Thune and House, 1970). But others soon realized the importance of planning and those who could benefit from it adopted it. Hence the mixed and inconclusive results in recent studies. According to King (1983) and Hogarth and Makridakis (1981), it may now be extremely difficult to observe differences in economic performance attributable to planning.

Second, even if such an approach using a large-sample before–after study with a reference group controlling for size, industry, market power, and the like, were to discover an association between planning and performance, we would caution against a causal interpretation. Those hypothesizing a causal link between planning and performance assume that all decisions affecting economic performance come out of the planning system. But King (1983) points out that this need not be the case. If so, then even if one could observe differences between economic performance of businesses which do and of those which do not plan, one could hardly attribute it to planning. Cyert and March (1963) suggest that planning could be part of the slack profitable firms create whose resources could easily be cut back during times of austerity. If this is true then profitable firms might be seen doing planning—because they are profitable!

The non-economic objectives of planning

After a series of studies with inconclusive results on the link between planning and performance, the current trend has been to use the non-economic objectives of planning. Dyson and Foster (1982) and Greenley (1983) justify these objectives by suggesting that the benefits from planning are of a process nature rather than economic. Ramanujam and Venkatraman (1987) found that process benefits accounted for the major part of variance in their data.

The use of non-economic objectives for the evaluation of planning is conceptually sound. But there are problems with the way previous researchers using this approach defined the objectives of planning. Dyson and Foster (1982) and Greenley (1983) make several normative assumptions about the objectives of planning that may not be appropriate in all contexts. Greenley (1983) includes 'clear statement of objectives' and 'quantification of goals' as attributes of effective planning systems. Yet Quinn (1980: 66) found that 'successful executives "announced" relatively few goals to their organizations. These few were frequently broad and general, and only rarely were they quantitative and measurably precise'. Dyson and Foster (1982) consider it desirable to

have a planning system with a feedback mechanism leading to modification of plans in times of change. Ramanujam and Venkatraman (1985: 23–24), on the other hand, claim that 'planning systems need to be more rigid than conventional wisdom currently advocates . . . a plan cannot succeed unless its finality is accepted. Concrete is not such a bad material to cast a plan—compared to clay or putty.' Ramanujam and Venkatraman (1987), and Venkatraman and Ramanujam (1987), who distilled the objectives of planning from previous research on organizational effectiveness (for instance, from Cameron, 1986), make no distinction among the objectives of the organization and those of planning. Apparently they too assume that planning is responsible for everything that an organization does.

A MODEL OF PLANNING SYSTEM EFFECTIVENESS

To operationalize what we view as the objective of formal planning we used a model of planning system effectiveness shown in Figure 1. It is a schematic representation of King's (1983) hypothesis that formal planning systems are not the sole channel through which strategic decisions are made. Decisions can be, and often are, made outside the formal strategic planning (FSP) system—by the CEO and by other high officials of the firm.

The model shown in Figure 1 differs from the prevalent approaches to measuring effectiveness of planning in that it recognizes the possibility of the existence of two separate links between decision-makers and strategic decisions. Link 1 in

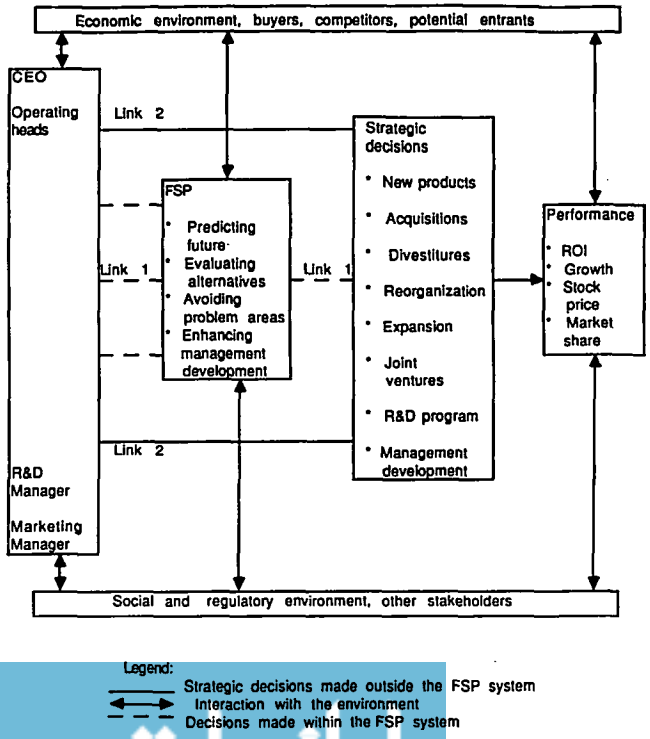

Figure 1. A schematic model of the contribution of strategic planning to decisions

Figure 1 is the only link considered in the traditional approaches which generally assume that the FSP system is responsible for the whole of firm's output. But, as King points out, the possibility of the existence of link 2 is very real, in which the FSP system is bypassed by the decision-makers.

In this model it is possible to have a planning system, and high profits, and the two may not be related if the profitable decisions were made outside the FSP system. If the FSP system is effective, executives will use it more intensively. On the other hand, if the FSP system is not effective, executives may circumvent it in making important decisions. Thus one measure of the effectiveness of an FSP system would be its COntribution to DEcisions (CODE) or choices made by the firm. In case of an effective FSP system fewer significant decisions would be made outside the formal planning system.

In Figure 1 the objective of the FSP system is to strengthen link 1 by contributing more to decision-making. The effectiveness of the FSP system is measured by the strength of link 1 as indicated by the intensity of usage. Unlike the objectives of planning used by Ramanujam and Venkatraman (1987) and Venkatraman and Ramanujam (1987), the objective of planning in our approach is distinct from the economic and non-economic objectives of the firm, and unlike the objectives used by Dyson and Foster (1982) and Greenley (1983), our objective is not dependent on the context.

Our conceptualization of effectiveness of FSP system in terms of the intensity of usage follows a convention established in MIS research (Powers and Dickson, 1973; Garrity, 1963). Ein-Dor and Segev (1981: 6), for instance, define a successful MIS as one that is 'profitably applied to an area of major concern to the organization, is widely used by one or more satisfied managers, and improves the quality of their performance.' Of these Ein-Dor and Segev (1981: 7) believe that 'use is the most important since a manager will use a system intensively only if it meets the other criteria.'

THE EMPIRICAL STUDY

We used the above approach to study the effectiveness of formal planning among the *Fortune* 500 companies. The data for this study were collected in three phases. In the first phase we interviewed planning executives of 17 companies in Massachusetts, 12 of which ultimately participated in the study. Prior to the interviews the Vice-President (or Director) of Corporate Planning in each of these companies received a different questionnaire tailored around 10 specific decisions—new product introductions, acquisitions, divestments, and the like—his company had made during the past 5 (1982–86) years. These decisions were obtained from the annual reports of the companies.

We asked the respondents about the contribution the FSP system had made to these decisions. Treating decision as the unit of analysis, if a firm never made such a decision before it introduced formal planning, and/or could not have made the decision in the absence of FSP, then the contribution of FSP to that decision was regarded as high. On the other hand, if the firm had a history of making such decisions in the past, even before it had introduced FSP, and/or could have as easily made the decision without FSP, then the contribution of FSP to that decision was not so high. Finally, if a decision was made outside the FSP system then the contribution of the FSP system to that decision surely was nil. We constructed a five-point interval scale around these anchor points.

Based on discussions with executives in the first phase, we expanded and mailed similar specially tailored questionnaires to 179 of the *Fortune* 500 companies not covered during the first phase who had named a Vice-President of Corporate Planning (or equivalent position) in the 1987 annual report.

Including the data from interviews, we received responses on 1290 decisions made by 129 of the *Fortune* 500 companies. This represents a response rate of 65 percent, which is substantially above the response rate of less than 30 percent typically achieved in mail surveys in this stream of research (Ramanujam and Venkatraman, 1987). All respondents were corporate-level planning executives—Vice-Presidents, Directors, and Managers of Planning. Table 1 shows the characteristics of the sample. The participating firms are more or less uniformly distributed across the *Fortune* 500, though with 26 and 49 percent of the respondents coming from the top 100 and top 200 firms respectively, there is a small bias

Table 1. Characteristics of the sample (n = 129)

A: By Fortune *rank*

Fortune rank, 1987	Sales in 1986 ($ billion)	No. of respondents
Between 1 and 50	> 7.2	19
51–100	> 3.74	14
101–200	> 1.78	31
201–300	> 0.985	22
301–400	> 0.641	27
401–500	> 0.346	16

B: By primary industry

Primary industry	No. of respondents
Chemicals and pharmaceuticals	22
Mining, crude oil, petroleum refining, and rubber	13
Aerospace, electronics, and computers	22
Food and beverages	15
Motor vehicles, parts, industrial and farm equipment	15
Metals and metal products	10
Other resource-based industries	11
Publishing	8
Other consumer goods	7
Other industrial goods	6

towards larger firms. This was not unexpected because small firms do not undertake formal planning to any significant extent (Robinson and Pearce, 1983).

In the third phase of data collection we interviewed the respondents over the telephone to cross-check the accuracy of the responses. This also gave us rich contextual material on how formal planning contributes to specific decisions.

Validity assessment

To assess the validity of our constructs we used between methods triangulation with the help of responses from multiple informants in a subset of our sample. Planning executives in eight companies interviewed during the first phase of the study had agreed to allow another executive outside planning to participate in it. So we received responses from two informants on 80 decisions. The inter-informant correlation for all items was high, positive, and significant. In particular, responses from the two executives on the contribution of planning to the decisions correlated at 0.6 ($p < 0.001$). The pattern of correlations broadly fulfilled the criteria required for construct validation (Campbell and Fiske, 1959) and an analysis of variance revealed that there was no statistically significant difference at the $p = 0.01$ level between the contributions of planning reported by the two executives.

Analysis of data and results

The data come from the responses of corporate-level planning executives in 129 of the *Fortune* 500 companies to five questions on 1290 decisions made by them during the years 1982–86. Listwise deletion of missing cases reduced the case base to 1087 decisions but there were no substantial changes in the distribution of variables or in their covariance matrices.

We used two items (contribution to FORMULATION and IMPLEMENTATION of decisions) to measure FSP's contribution to decisions on five-point scales. Since our unit of analysis was the decision, we asked respondents to indicate three characteristics of decisions—their RELATEDNESS to existing businesses, their IMPORTANCE from the point of view of

potential impact on long-term growth in profits, and their RISKINESS—on single-item five-point scales.

We also classified the 1087 decisions into nine non-exclusive categories. Two categories—global decisions (Ghoshal, 1987), and technology decisions (Friar and Horwitch, 1986) were selected for their growing importance. A decision relating to operations abroad, for instance, to the acquisition of a manufacturing facility in Japan, was coded as a GLOBAL decision. TECHNOLOGY decisions related to joint ventures, acquisitions, and investments in high-technology areas, R&D expenses and facilities, and licensing. The remaining seven categories *viz.* ACQUISITION decisions, DIVESTMENT decisions (including plant closures), CAPACITY EXPANSION decisions, NEW PRODUCT decisions, STRATEGIC ALLIANCE decisions (technology, manufacturing, and marketing alliances), ORGANIZATION decisions (comprising reorganization and formation of a new division or a new company) and OTHER decisions (relating to debt, dividend, share issue and repurchase, employee stock ownership, relocation, MIS, marketing channels, and the like) were obtained from cluster analysis of decisions. Marketing, manufacturing, and technology acquisitions, for instance, clustered together, while divestments and plant closures formed another cluster. Decisions that did not form any cluster were put together as OTHER decisions. The categories did overlap. For instance, an acquisition made abroad in a high-technology area was considered a global decision, a technology decision, and an acquisition decision.

Table 2 shows the descriptive statistics for the five variables. On scales of 1 to 5 the average FORMULATION and IMPLEMENTATION scores were 3.10 and 2.68 respectively, indicating modest overall contribution of FSP to decisions. Overall, the FSP systems were apparently being used by the decision-makers but they were far from being indispensable. The mean IMPORTANCE score for the decisions was 2.70, indicating that not many decisions were considered critically important by the respondents. The mean RISKINESS score at 1.92 was even smaller, indicating that most decisions were considered low in riskness.

Table 2 also presents Pearson's zero-order correlation matrix for the five variables. The signs of the correlations are in the expected directions. For instance, RELATEDNESS correlates negatively with RISKINESS, unrelated decisions generally being considered riskier. IMPORTANCE correlates highly with FORMULATION and IMPLEMENTATION, indicating that FSP systems made high contribution to decisions considered important. These correlations can be considered rough guides to the pattern of FSP's contribution to decisions, but interpretation in this vein is hazardous because of multicollinearity in the data.

Choice of analytic technique

Given our task to examine the relationship between the characteristics of decisions and the contribution of FSP systems to these decisions, three data analytic schemes suggest themselves:

1. Separate multiple regression analyses for each indicator of FSP's contribution to decisions, viz. FORMULATION and IMPLEMENTATION, with dummy variables indicating different types of decisions.
2. Analysis of covariance structure with structured means (Joreskog and Sorbom, 1984)
3. Multivariate analysis of covariance (MANCOVA).

Table 2. Pearson's zero-order correlation matrix and descriptive statistics (n = 1087)

	FORMULATION	IMPLEMENTATION	RELATEDNESS	IMPORTANCE	RISKINESS	Mean	SD
FORMULATION	1.000					3.099	1.254
IMPLEMENTATION	0.728*	1.000				2.679	1.278
RELATEDNESS	−0.001	0.044	1.000			4.083	1.274
IMPORTANCE	0.361*	0.319*	0.079	1.000		2.696	1.116
RISKINESS	0.220*	0.221*	−0.005	0.402*	1.000	1.917	.886

*p<0.001

Regression analysis makes the least demand on the quality of data in the form of assumptions of multivariate normality, and the like. But the regression technique is incapable of handling more than one criterion variable. The use of multiple regression then would have forced an unwanted separation between FSP's contribution to formulation and to implementation of decisions.

Since we have multivariance in both criterion and prediction variables, we preferred MANCOVA over multiple regression. Kahneman (1965) and Lord (1960) suggest that for the results from MANCOVA to be reliable the covariates be measured without error. Analysis of covariance structure with structured means, on the other hand, can handle data with measurement error (Joreskog and Sorbom, 1984). But, according to Overall and Woodward (1977), the assumption of no measurement error in covariates is not essential in MANCOVA so long as the assumption of random sampling from the population is satisfied. Though our sample is not random, our data comprising 1087 decisions made between the years 1982 and 1986 by two-thirds of all *Fortune* 500 companies who named a corporate-level planning executive in the 1987 annual report are represent ative of the population of decisions made by large companies who do formal planning.

The severe requirements imposed by MANCOVA would rarely be met by real data. We therefore cross-checked the results of MANCOVA with multiple regression and analysis of covariance structure with structured means and found excellent agreement.[1] We are reporting results from MANCOVA because they are intuitively more appealing and insightful.

Analysis

We performed MANCOVA using the MANOVA procedure in SPSS^x on two dependent variables that indicate the contribution of formal planning to the FORMULATION and IMPLEMENTATION of decisions. Adjustments were made for three covariates—the three variables indicating RELATEDNESS, IMPORTANCE, and RISKINESS of decisions. GLOBAL decisions, TECHNOLOGY decisions, ACQUISITION decisions, DIVESTMENT decisions, CAPACITY EXPANSION decisions, NEW PRODUCT decisions, STRATEGIC ALLIANCE decisions, ORGANIZATION decisions, and OTHER decisions were nine main effect variables. Analysis of a full factorial model was not possible as two-thirds of the cells would have been empty. Overlaps between the decisions were too small to estimate the interaction terms with any degree of confidence. For these reasons we specified a MANCOVA model with only main effects.

Evaluation of assumptions

A critical assumption in MANCOVA is that the observations be independent (Bray and Maxwell, 1985). To a certain extent the selection of ten decisions for each company from the annual reports for the years 1982–86 ensured independence of decisions from one another.

Two other assumptions of MANCOVA relate to multivariate normal distribution of variables and homogeneity of covariance matrices across groups. Box's M statistic was significant, indicating presence of heteroscedasticity. Examination of the distribution of the variables revealed departure from normality in the case of RELATEDNESS. We performed the analysis with appropriate transformation that improved normality, but the results were similar.

However, Olson (1976) reports that non-normality has little effect on the results of MANOVA, and Ito (1970) concludes that MANOVA is robust against heteroscedasticity. Though Ito's conclusion was based on an equal number of observations in each cell—a condition not fulfilled by our data—we believe that the impact of unequal cell size on the results of our analysis was mitigated by the use of the method of weighted squares of means (or unique squares—default in SPSS^x), and because of the large sample size, the smallest n in a cell being 64.

Much of the controversy on the effect of heteroscedasticity in MANCOVA relates to the

[1] We performed analysis of covariance structure with structured means using LISREL with nine groups of decisions. The results were similar with one exception. Because RELATEDNESS does not correlate well with other variables in our study, its presence resulted in unacceptable parameter values, and we had to exclude it from our analysis with LISREL. But RELATEDNESS is an important variable for research in strategy—not only for research on diversification, but also for research on acquisitions, mergers, divestments, joint ventures, and the like. MANCOVA allowed us to perform the analysis while keeping the variable RELATEDNESS in the dataset.

choice of the statistic (Pillais' V, Hotelling's T^2, Wilks' Λ, and Roy's greatest common root) indicating overall association. The power of these tests depends upon whether differences among population mean vectors occur along one or more dimensions (Olson, 1976: 581). Roy's GCR is the most powerful for data with concentrated noncentrality structure such as ours (see Table 5, only one discriminant function was significant) because, unlike the other three criteria, it takes into account association along only the first dimension. Unfortunately, it also exhibits high probability of type I error in the presence of heteroscedasticity (Olson, 1976: 582). Olson (1976), therefore, recommends the use of Pillais' V to test multivariate hypothesis. Stevens (1979), on the other hand, prefers Hotelling's T^2, Wilks' Λ, and Roy's GCR to Pillais' V for data with concentrated noncentrality structure because of higher statistical power.

Olson (1973) had found that if the ratio of the degrees of freedom for error to the degrees of freedom for hypothesis was over 10 times the number of variables then any of the four criteria could be used. This condition is easily met by our study. Based on Olson (1973, 1976) and Stevens (1979), and for data with a concentrated noncentrality structure, Barcikowski (1983: 568) recommends the use of Hotelling's T^2 or Wilks' Λ if the assumptions of normality and/or homogeneity of covariance matrices are not seriously violated, and the use of Pillais' V if the assumption of homogeneity is violated seriously i.e. if one group's variances are more than 36 times those of another. In Table 3 the largest variance for any variable in a group is less than six times as large as the smallest in another group. We will therefore report values for all four statistics and significance levels for Pillais' V, Hotelling's T^2, and Wilks' Λ.

Results

Table 4 shows the overall multivariate test statistics relating to the combined covariates. Pillais' V, Hotelling's T^2, and Wilks' Λ are all significant at $p < 0.001$, indicating that the two dependent variables were significantly related to the three covariates. The latter, in fact, accounted for over 15 percent of the variance in the dependent variables ($1 - \Lambda = 0.152$ or 15 percent).

Roy's GCR is based on the eigenvalue of the first canonical function (Table 5) for which χ^2 (d.f. = 9) was 178.17, significant at $p < 0.001$. The second function was statistically not significant.

In Table 6 therefore we report results of canonical analysis only for the first function. The

Table 3. Descriptive statistics of variables for nine types of decisions

		FORMULATION		IMPLEMENTATION		RELATEDNESS		IMPORTANCE		RISKINESS	
Decision	n	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
GLOBAL	200	3.36	1.16	2.96	1.21	4.57	0.96	2.65	1.02	1.85	0.74
TECHNOLOGY	162	3.27	1.22	2.77	1.23	3.94	1.45	2.85	1.06	2.12	0.89
ACQUISITION	275	3.21	1.26	2.84	1.28	3.78	1.37	2.82	1.10	2.04	0.81
DIVESTMENT	178	3.23	1.36	2.60	1.42	3.36	1.43	2.43	1.30	1.58	0.94
CAPACITY EXPANSION	133	3.19	1.18	2.72	1.32	4.83	0.61	2.86	1.05	2.02	0.80
NEW PRODUCT	197	2.80	1.34	2.54	1.11	4.31	1.03	2.70	1.03	2.02	0.93
STRATEGIC ALLIANCE	129	3.19	1.20	2.74	1.19	4.18	1.14	2.60	1.01	1.89	0.80
ORGANIZATION	94	3.28	1.22	2.73	1.25	4.34	1.21	2.83	1.10	1.87	0.87
OTHERS	64	2.64	1.28	2.31	1.30	4.41	1.05	2.59	1.02	1.88	0.92
TOTAL	1087	3.10	1.25	2.68	1.28	4.08	1.27	2.70	1.12	1.92	0.89

Table 4. Multivariate test criteria for combined covariates

Criteria	Statistic	Approximate F (degrees of freedom)
Pillais' V	0.153	28.95 (6,2100)*
Hotelling's T^2	0.179	31.31 (6,2096)*
Wilks' Λ	0.848	30.13 (6,2098)*
Roy's GCR	0.150	

*$p < 0.001$.

Table 5. Eigenvalue and canonical correlation of two extracted roots

Function no.	Eigenvalue	Percentage trace	Canonical correlation
1	0.176	98.44	0.387
2	0.003	1.56	0.053

Table 6. Canonical analysis of dependent variables and covariates

Variable	Correlation with first canonical variate*
Dependent variables	
FORMULATION	0.970
IMPLEMENTATION	0.872
Covariates	
RELATEDNESS	0.079
IMPORTANCE	0.956
RISKINESS	0.638

*Only one function was significant.

figures, also called loadings, are correlations of the dependent variables and covariates with the first function. Their interpretation is analogous to that of factor loadings in factor analysis.

Because both FORMULATION and IMPLEMENTATION load heavily on this function, it appears that the two items tap a common dimension. The canonical loading of RELATEDNESS is very small while the loadings of IMPORTANCE and RISKINESS are high, indicating that RELATEDNESS of a decision was of no consequence while IMPORTANCE and RISKINESS of a decision did matter in determining planning's contribution to it.

To investigate the power of covariates to adjust the dependent variables, we performed multiple regression on each dependent variable using the three covariates as predictors. The three covariates together accounted for 14 and 12 percent of the variances in FSP's contribution to the FORMULATION and IMPLEMENTATION of decisions (Table 7). Two covariates, IMPORTANCE and RISKINESS of decisions, provided significant ($p < 0.001$) prediction of the contribution of planning to both the FORMULATION and IMPLEMENTATION of decisions. The βs for RELATEDNESS were statistically not significant.

Table 8 shows summary multivariate test statistics for the main effects. After controlling for the covariates the planning systems in the sample contributed significantly more to the FORMULATION and IMPLEMENTATION of GLOBAL ($p < 0.01$) and DIVESTMENT ($p < 0.05$) decisions. The multivariate test statistics for the other seven types of decisions failed to reach significance.

Univariate F-tests shown in Table 9 confirm these results. But the step down F-statistics for IMPLEMENTATION were not significant for either GLOBAL or DIVESTMENT decisions. This test in effect uses four covariates, with FORMULATION added to the usual three covariates. So it appears that, given the high contribution of FSP systems to the FORMULATION of GLOBAL and DIVESTMENT decisions, their high contribution to the IMPLEMENTATION of these decisions was not unexpected.

Table 7. Univariate tests for covariates

	FORMULATION	IMPLEMENTATION
Multiple R	0.376	0.339
R^2	0.141	0.115
Adjusted R^2	0.139	0.112
F (d.f.)	57.58 (3,1050)*	45.39 (3,1050)*
Step-down F (d.f.)	57.58 (3,1050)*	4.57 (3,1049)**
β Coefficient (t-statistic) for		
RELATEDNESS	0.006 (0.20)	0.033 (1.12)
IMPORTANCE	0.319 (10.26)*	0.266 (8.43)*
RISKINESS	0.110 (3.55)*	0.127 (4.03)*

*$p < 0.001$; **$p < 0.01$.

Table 8. Multivariate test criteria for the effect of nine types of decisions

Decision	Pillais' V	Hotelling's T^2	Wilks' Λ	$F(2,1049)$	Roy's GCR
Global	0.011	0.011	0.989	5.82*	0.011
Technology	0.004	0.004	0.996	2.01	0.004
Acquisition	0.001	0.001	0.999	0.48	0.001
Divestment	0.007	0.007	0.993	3.80**	0.007
Capacity expansion	0.001	0.001	0.999	0.60	0.001
New product	0.002	0.002	0.998	1.21	0.002
Strategic alliance	0.000	0.000	0.999	0.09	0.000
Organization	0.002	0.002	0.998	0.91	0.002
Others	0.002	0.002	0.998	1.02	0.002

*$p < 0.01$; **$p < 0.05$.

Table 10 shows mean contributions of FSP systems to the FORMULATION and IMPLEMENTATION of nine types of decisions after adjusting for covariates. The mean scores are the highest for GLOBAL and DIVESTMENT decisions.

DISCUSSION OF RESULTS

In this paper we asked the question 'what are the characteristics of decisions to which planning contributes more?' The significant association between the characteristics of a decision and planning's contribution to it vindicates our approach to measuring planning system effectiveness. Planning systems are systematically selective in contributing to decisions. An appreciation of this pattern of selectivity of FSP systems is essential for understanding their functioning and for improving the practice of planning.

This is the first study to report the pattern of selectivity exercised by the FSP systems of the *Fortune* 500 companies. In our discussion below we first use this systematic selectivity to explode certain myths—popular misconceptions—about planning. We then offer some organizational and political rationales that could account for the pattern of selectivity observed in our data. Finally, we make a few suggestions for research in the future that could enhance the selectivity of the FSP systems along desired decision dimensions.

Table 9. Univariate tests for the effect of nine types of decisions

Decision	FORMULATION		IMPLEMENTATION	
	F(1,1050)	Step-down F(1,1050)	F(1,1050)	Step-down F(1,1049)
Global	8.30*	8.30*	10.96*	3.31
Technology	2.44	2.44	0.03	1.57
Acquisition	0.88	0.88	0.72	0.07
Divestment	6.03**	6.03**	0.61	1.56
Capacity expansion	0.13	0.13	0.25	1.07
New product	2.19	2.19	0.46	0.22
Strategic alliance	0.17	0.17	0.04	0.02
Organization	0.68	0.68	0.04	1.15
Others	1.85	1.85	1.44	0.20

*$p < 0.01$; **$p < 0.05$.

Table 10. Mean contribution of FSP systems to nine types of decisions after adjusting for covariates

Decision	FORMULATION	IMPLEMENTATION
Global	3.45	2.99
Technology	3.35	2.80
Acquisition	3.33	2.90
Divestment	3.64	2.93
Capacity expansion	3.24	2.67
New product	3.00	2.68
Strategic alliance	3.36	2.84
Organization	3.39	2.78
Others	2.71	2.37

Exploding certain myths about planning

The overall contributions of FSP systems to FORMULATION (3.1) and IMPLEMENTATION (2.68) of decisions in Table 2 are modest and appear to support much of the popular criticism of planning. Gluck (1985), for instance, had said that formal planning tended to be concerned more with administering a planning process rather than contributing to the decisions that determine success or failure for the firm. Hayes and Abernathy (1980: 71) had been critical of the 'analytical formulas of portfolio theory that push managers even further toward the extreme of caution.'

But the relatively high loadings of IMPORTANCE and RISKINESS in Table 6, and their statistically significant regression coefficients in Table 7, reveal that the FSP systems in our sample contributed highly to decisions considered important and risky. But decisions that have lasting impact on the future growth and profitability of firms or decisions that risk the future of the firm are not made every day, though when they are made planning contributes to them highly. The rarity of these occasions, however, could give rise to exactly the kind of criticism that came from Gluck, and from Hayes and Abernathy.

Another popular myth about planning is due to Kiechel (1982), who had argued that the use of portfolio models by corporate planners had led to a situation where too much attention was being focused on the existing (related) products and businesses in the firm's portfolio, but too little on the development of new products or new (unrelated) business ideas. The low positive correlation of RELATEDNESS in Table 6, and its statistically insignificant regression coefficients in Table 7, indicate that while FSP systems in our sample did indeed contribute more to decisions

in related areas, the difference between their contribution to decisions in related and unrelated areas was not high. Thus, our findings provide only small support for Kiechel's criticism. In view of the somewhat opposite recommendation by Peters and Waterman (1982) that firms should 'stick to their knittings,' it appears that the FSP systems of firms in our sample had achieved a balance between focus and attention to diversity.

Explaining the pattern of selectivity[2]

Our respondents were corporate-level planning executives, and their vantage-point explains much of the pattern of selectivity of the FSP systems in our sample. Planning in most companies today is highly decentralized. Even the largest companies have only a small corporate planning staff, which, to be effective, concentrates on the more important decisions. Hence the high contribution of FSP systems to IMPORTANT and RISKY decisions.

Given the importance accorded to global strategy by American corporations (Ghoshal, 1987), it came as no surprise that the FSP systems in our sample contributed more to global decisions. Interestingly, however, the planning managers did not consider global decisions as being either more important from the point of view of future growth and profitability of the firm, or riskier. Global decisions were often made in an area closely related to the existing businesses of the firm, and the size of acquisitions and investments abroad was typically much smaller than that of domestic acquisitions and investments. Why then should the planning managers be so concerned with global decisions?

Division executives in several companies have their own planning support and the corporate planning staff is not actively involved in most decisions relating to the businesses of a division. But very few companies in our sample had divisional executives in charge of global operations. The responsibility for coordinating across the various country businesses therefore fell on the corporate planning staff. Hence the high contribution of planning to even minor global decisions. If this explanation is true then we should expect the need for coordination of global operations by corporate planning staff to decline gradually as multinationals organizationally evolve into global business divisions.

Planning executives rated divestment decisions also as less risky and relatively unimportant from the point of view of long-term growth in profits. Planning contributed more to them, nevertheless. According to our respondents, the division (or group) executives in most companies enjoyed autonomy in making small and medium-sized acquisitions which had to be made by moving quickly when the opportunity arose. Divestment decisions, on the other hand, were made at a more relaxed pace and allowed the political dimension of strategic planning to come into full play. Divestment decisions had to be justified to directors, senior managers, employees, and other stakeholders. Routing a divestment proposal through the FSP system was the best way of demonstrating such justification. The seal of formal planning legitimized the decision. Moreover, the involvement of corporate-level planning staff helped smooth out the effects of divestments to the greatest possible extent.

Weaknesses of planning

Planning systems in our sample failed to contribute highly to TECHNOLOGY and NEW PRODUCT decisions. Most companies in our sample did not formally plan for technology and the Vice-Presidents of R&D were rarely active in formal planning. In Table 10 the adjusted means are the lowest for NEW PRODUCT and OTHER decisions. A possible reason for FSP's low contribution to NEW PRODUCT decisions could be that these decisions fell unambiguously within the territory of the marketing managers.

Limitations of the study and proposals for research

In this study we concentrated on the contribution of FSP to the realized and emergent strategies (Mintzberg and Waters, 1982) of firms that could be observed from the outside (announced in the annual reports). Some important decisions are not visible from the outside. Most firms report only the more glamorous new product introductions, and acquisitions. Changes in marketing channels and MIS: decisions that could have lasting impact on firm's profitability go unannounced. An extension of this research therefore

[2] We are grateful to an anonymous reviewer for several of the explanations offered in this section.

would be to prepare lists of such decisions with inside information or through focused study of published data for a small sample of companies.

According to March and Olsen (1976: 11) a choice process, among other things, provides an occasion for distributing glory or blame for what has happened in the organization. It is conceivable then that both the planning managers and the operating managers may attribute the success (or failure) of a decision to the FSP system merely because they have to distribute the glory (or blame), and that their responses may not have much to do with the real contribution of the FSP system to the decisions. Also, the incentive system in some firms rewards operating managers for using the FSP system. Both these factors, however, should affect the absolute values of FSP's contribution, not its relative contribution to different categories of decisions.

Future research should strive to find out which planning system characteristics and organizational factors (Ramanujam and Venkatraman, 1987) make planning effective along specific decision dimensions. If the impact of system characteristics is different on different types of decisions then it might be possible to strengthen a planning system along a desired decision dimension.

CONCLUSION

This paper presented results from an empirical study of the effectiveness of formal strategic planning (FSP) systems using a COntribution to DEcisions approach towards assessing the effectiveness of FSP systems. CODE is based on 'user perspective', and considers 'strategic decisions' as the unit of analysis. The characteristics of decisions are significant influences on planning system effectiveness that had been ignored by researchers in the past who had concentrated on an elusive link between planning and performance. Perhaps a more fruitful approach would be to study the characteristics of planning systems that make them effective along desired decision dimensions.

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