

A Model for Colleges of Engineering  
to Select a Strategic Planning Methodology  
and  
Implement a Strategic Planning Process

by

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(ABSTRACT)

This research operationalizes the theory and recommendations from academic and business strategic planning sources. The desired research outcome is to improve academic strategic planning for colleges of engineering.

My contribution to the academic planning body of knowledge is a model to select a strategic planning methodology and implement a planning process for colleges of engineering. The model's design is based on the logical conclusion that choice of planning methodology should be matched to desired planning outcomes.

The model uses a preplanning instrument, a planning template, and a Gantt

Chart. I designed the preplanning instrument based on six success/fail criteria identified from the research, desired outcomes and outputs of the planning process, and selected planning steps from the Virginia Productivity Center (VPC) Planning Methodology. Answers to questions on the preplanning instrument are then summarized on the planning template. The template requires the planner to consider the sequence of the selected planning steps and prepare an agenda to accomplish them. Finally, the model requires the scheduling of this agenda on a Gantt Chart. The Gantt Chart becomes a timetable for a plan to plan for the college of engineering.

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was my desktop publisher. She took my novice skill at word processing and fashioned a professional format for this thesis. In addition to her professional skill, I needed her sense of humor and can-do attitude to get me through the last few trying weeks.

I dedicate this work to my mother, , who will not understand it but will be proud of me anyway. She has shown me the way to live life with dignity and grace in spite of what appears to be insurmountable odds. I only hope I can do the same for my loved ones.

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## List of Definitions

I will use terms like planning methodology and planning process throughout this thesis. The key terms relating to strategic planning in this research are defined as follows:

**Strategic Planning:** planning with the primary focus on enhancing institutional adaptation to the external environment. Strategic planning involves 1) scanning the external environment for threats and opportunities, 2) assessing internal strengths and weaknesses, 3) analyzing the external and internal information, and 4) identifying major directions that will promote health and viability (Schmidtlein and Milton, 1988).

**Planning System:** all planning and planning related activities of an organization working together, including strategic, performance improvement, financial, department, program, and project plans (Coleman, 1988).

**Planning Process:** the agenda and timetable that moves the planning unit through the plan to plan, the planning methodology, and other steps such as training and social events.

**Planning Methodology:** a sequence of planning steps and techniques to achieve a desired outcome for a planning unit.

**Planning Step:** an effort by a person or a group to accomplish a planning objective or an output of a planning methodology.

**Planning Technique:** discussion, memorandum, Nominal Group Technique, Delphi Technique, or any means for determining consensus, or any mechanical means to reach a well-defined end during a portion or all of one planning step (Acar, 1985, Kurstedt, 1989).

**Model:** a pictorial description used to visualize a system of related activities that cannot be directly observed.

**Success/fail Criteria:** a standard on which a judgment or decision may be based to predict success or failure.

# Introduction

## *Desired Outcomes of Research*

This research attempts to improve the strategic planning processes for colleges of engineering. Improvements can be affected by appropriate selection of strategic planning methodologies and effective implementation of strategic planning processes. Effectiveness, efficiency, quality, and timeliness of producing a planning document and in successfully implementing the goals of that document is defined as successful strategic planning.

## *Problem Statement*

Leedy (1985) recommends that problem statements for research should be questions which the research will resolve. In this research, the main problem to resolve is — How can colleges of engineering improve the probabilities of achieving their desired planning outcomes through a strategic planning process? Subproblems are:

1. What are the reasons for initiating strategic planning in colleges of engineering?
2. What are typical desired outcomes for strategic planning in colleges of engineering?
3. What planning methodologies are used for strategic planning at colleges of engineering?
4. What steps comprise the planning methodology for an effective college of engineering strategic plan?
  - a. What is the optimum schedule and cycle for an initial strategic planning process?
  - b. How and when should the faculty participate in the strategic planning process?
5. How can the academic planner conduct an initial design session to prepare for a strategic planning process?

## *Outputs of Research*

The theoretical concepts of strategic planning are reviewed and integrated into a model which assists the planner in evaluating the planning environment and selecting an appropriate planning methodology to achieve a desired planning outcome. The model is a diagram for the academic planner, defining a starting point for the strategic planning process, alternate destinations, and various routes to get to the selected destination.

The model includes:

1. a preplanning instrument for measuring the available resources of the college: time, people, and money, and identifying the desired outcomes and outputs of the planning process,
2. a template to combine the results of the preplanning instrument and the appropriate steps of the VPC Planning Methodology and thus produce a scheduled agenda for the planning process,
3. a table listing possible desired outcomes of planning for colleges of engineering.
4. The steps in the VPC planning methodology from which to select for the planning process.

An additional output of this study is advice for Virginia Tech's College of Engineering for future planning.

### *Type of Research*

My research includes a descriptive model based on experience reported in the literature, my observations, and interviews. This research is qualitative, not quantitative. My model is slightly prescriptive in that once you choose a

desired outcome for the strategic plan, it prescribes what criteria you must meet and what planning methodologies to use. My model is also slightly predictive in that it predicts failure if you don't have adequate resources or if you use the wrong planning methodology to achieve your desired outcome. Success is achieving the desired outcome, failure is not achieving it after using a planning methodology.

For my research, I conducted descriptive, exploratory studies. Descriptive research observes situations firsthand and interprets or draws implications from those observations. Sometimes, exploratory research designs and/or develops new things such as a preplanning instrument. These designs and developments from exploratory research are usually not confirmed for validity in the initial research. Descriptive, exploratory research does not usually involve statistical analyses or null hypotheses (Leedy, 1985). The observation of the Virginia Tech College of Engineering planning process was action research in that I was part of the experience I was observing.

In this study, exploratory research accomplishes the following: 1) identify theoretical concepts (from literature search) and document empirical bases (from interviews and observation) for design of a model to assist academic planners in selecting and implementing a successful strategic planning process. 2) analyze and generalize criteria to identify key resources required for evaluating the planning environment through a preplanning instrument, and 3) develop standards and format for design of a template to organize the planning process. I used the research results to design the preplanning

instrument and template of the model as effective planning tools. I neither confirmed the validity nor reliability of the instrument and template. I did not statistically evaluate repeated use of the instrument or template over a range of applications. I recommend those confirmations and evaluations for future research.

The research was ex post facto in that the implications of some data were drawn against the observations. Observations generated data and the data were interpreted to yield implications. The design of the model and its components was completed after the data were observed and analyzed.

For proactive, experimental design (a design completed before the data are gathered), a researcher can construct null hypotheses because they expect a result they want to confirm. Then the data are interpreted against the hypotheses. For after-the-fact, ex post facto, design, the hypotheses tend to be qualitative supposition or proposition. In exploratory research, such as mine, researchers tend toward ex post facto because they're searching for a cause given the effect, without any expectation of what the cause will be. For example, medical research is often ex post facto research. On the other hand, in confirmatory research, researchers are confirming their expectations of an effect from a specific cause or hypothesis. (Leedy, 1985). Ex post facto research methodology isn't as **efficient** as confirmatory research methodology, but, in fact, it may be more **effective**.

I did no formative or summative studies with my model. Therefore, I can't



comment on the completeness, repeatability, reliability, and validity of either. This research generated a qualitative, conceptual model. Others can check validity. Therefore, the predictive and prescriptive aspects of the model aren't substantiated, they're implied.

### *Importance of this Study*

In the past three years, the Southern Association of Colleges and Schools has required university planning as a criterion for accreditation. To retain their accreditation, universities must have a plan which includes a vision for the university in addition to budgets, facilities, and programs. This university-level requirement, in some form, should cause the colleges or schools of engineering to prepare their own strategic plan. So, the colleges need to think about how they would proceed in planning. The result of my research is a model to support colleges of engineering as they plan to plan. This model describes the related activities comprising the design and development of a plan for the strategic planning process.

If academicians want measurable results from a strategic plan, then they must consider their campus environment (culture, history, constraints, opportunities) and their desired planning outcomes before selecting a planning methodology. The need to match planning methodology to a desired planning outcome is documented in the literature (Chaffee, 1985; Mortimer, and Tierney, 1985; Peterson, 1980; Schmidlein and Milton, 1988).

Properly approached and conducted, strategic planning can enhance performance for colleges of engineering, especially in times of projected enrollment decline and/or financial constraints. Peterson (1980) argues for different kinds of planning to match different kinds of situations. Early empirical work of Mortimer and Tierney (1985) on strategic effectiveness suggests the key to success in strategic planning is realistic expectations. Both of these authors imply that successful planning requires preplanning activities for-matching the planning methodology to desired planning outcomes.

Colleges can't improve their planning if they don't understand the cause-effect relationship between the effect of their campus and external environment and the selected methodology for strategic planning. Chaffee (1985) points out that "—very few higher education studies have specified independent and dependent variables so they cannot examine the causal structures underlying strategies." She goes on to say, "Questions for research in higher education include: How does strategy move from the idea stage to implementation? Does implemented strategy bear any resemblance to intended strategy?" This last question refers to selecting an appropriate methodology to achieve the desired outcome of the planning process. Chaffee's landmark paper on higher education strategy also states "Writers in higher education have not looked deeply and widely into their own experience for a model that is inherent to their setting." My observation of Virginia Tech's College of Engineering planning process is an effort to look deeply into a planning experience. The model developed from this research is an attempt to provide a

strategic planning model applicable to colleges of engineering.

The literature suggests that bad planning experiences in higher education come from incongruities and inconsistencies between planning assumptions and operational realities of academic institutions (Schmidtlein and Milton, 1988). Example operational realities are the administrative hierarchy, budget constraints, and faculty independence. Academic institutions are conducting more planning than ever; and the need to customize the planning approach to the specific institution at least will save many dollars in wasted effort.

Wiseman (1979) and Tack and Resau (1982) also found that when colleges tried to apply available recommended planning models, they did not have sufficient time and resources and/or they encountered skepticism and resistance from various campus constituencies. The need for commitment of resources to the planning process is a common theme throughout the literature.

In sum, higher education planners often don't get what they expect from the planning processes they conduct. Planning authors and consultants suggest their planning methodologies for use in academia even though these methodologies are based on little or no systematic analysis of actual campus planning environments and experiences. To develop and implement more effective planning guidelines and recommendations, there is a need to better

understand planning contexts, purposes, and constraints in diverse academic settings (Schmidtlein and Milton, 1988). My research on academic planning concentrates on 1) analyzing the experiences reported in the literature and other sources, 2) generalizing recommendations to would-be planners, and 3) creating a planning model to help customize a strategic planning process for a college of engineering.

# The Search for Data and Information

## *Summary*

I found data using three different search methods. I observed a planning process at Virginia Tech's College of Engineering. The observation spanned three years, I read books, journal articles, and planning documents from other universities, and I interviewed university planners.

I reviewed four categories of planning literature: organizational theory; business planning practice; academic strategic planning case studies; and academic planning research. The organization theorists addressed the importance of planning. The recommendations from business planning consultants also addressed the importance of planning and suggested the importance of preparing to plan. The academic case studies provided more detail about the steps of academic strategic planning methodologies. The research journals suggested improvements for planning based on their conclusions drawn from recent studies of academic planning.

The literature review served two purposes. First, the literature supplied data for analysis to further my understanding of cause/effect relationships be-

tween success/fail criteria and desired planning outcomes. Second, the literature reported planning methodologies to compare with the VPC Planning Methodology used in the Virginia Tech observation and with methodologies identified from interviews with university planners.

The success/fail criteria I found in the case studies were in the form of lists of actions to take or not take; resources required or not required; techniques that worked or didn't work in academic strategic planning. I compared these results from the literature with the results from the observation and interviews. This comparison contributed to the model for strategic planning for colleges of engineering, the primary output of this research.

Sometimes I have a difficult time separating the background literature for this research from the results found in the literature. In this chapter, I have tried to report only the background literature for this study. In the Results Chapter I refer once again to the literature to report the results I found there.

### *Strategic Planning and Its Variations*

For thoroughness in investigating strategic planning, I reviewed literature sources on strategic planning, strategic management, and organizational change for both business and academia.

Peterson (1980) defines the differences among types of planning. He uses the

term strategic planning, tactical planning, and operational planning. He regards strategic and tactical as two levels of planning. Strategic planning deals with purpose and direction. It has an external focus and addresses the questions of what business are we in and where are we going. Tactical planning is oriented to internal issues. It deals with resource allocation and programs. It addresses the question, how do we get to the desired outcome of the strategic plan? Operational planning designs new procedures to carry out tactical plans. Examples of operational planning are new information or accounting systems. Operational planning also develops control mechanisms to measure the progress of meeting the desired outcome.

In the case studies, the term strategic planning is often used to indicate the intent to produce a planning document. The implementation of that planning document is sometimes called strategic management. Peterson would call implementation of the strategic plan tactical and operational planning. Some planning methodologies consider implementation of a strategic plan as a step in the strategic planning methodology. For example, the VPC Planning Methodology used at Virginia Tech combines the production of a strategic plan with the management of the plan's implementation. Step 5 of the VPC Planning Methodology addresses strategic management, or tactical and operational planning. Most methodologies do not address the implementation of a plan but stop at the production of a document listing goals.

For these reasons, the VPC Planning Methodology was found to be a comprehensive and detailed version of the planning methodologies found in the lit-

erature. The VPC Planning Methodology is a better defined methodology than others found in the search for data and information.

### *The Need for Strategic Planning*

While much is written about strategic planning, the question of why an institution plans is rarely answered. Schmidtlein and Milton (1988) found in their study of 256 universities that presidents often initiated planning not for any desired outcome but because they thought they “should be doing something” in the planning area. Typically, universities begin planning because of three factors: critical events, pressure from external groups, or a key personality with influence. These three factors will shape the desired outcomes of planning at the individual institution (Peterson, 1980).

The topic of strategic planning, strategic management, or organizational change is a common topic among the recognized masters of organizational theory: Barnard, Drucker, Kanter, and Thompson. These organizational theorists provided the basis for considering strategic planning as a research topic. In his landmark organizational theory book, Barnard says “choosing and monitoring strategic plans and implementation has been promoted as an important part of the executive function—” (Barnard, 1939).

The very practical Drucker admonishes both public and private institutions to plan strategically. “Any institution needs to think strategically what its business is doing and what it should be doing. This question is as important



for public service, not-for-profit institutions as it is for business.” (Drucker, 1980).

Kanter (1983) speaks not only about change as a result of planning in organizations but about participation of employees in all facets of the change process. She says masters of change are also masters of participation. Kanter is cautious about when participation is appropriate to include in planning change. “A common assumption by managers in debates about participation is that people want to be involved in the ‘big decisions’ about the overall management of their organization or other sweeping concerns.” She observes from a variety of evidence that most employees would rather be involved in local issues relating to their specific responsibilities. Kanter says participation is appropriate to develop and educate people and is appropriate for a range of other activities (Kanter, 1983). This last statement about participation may be a factor in deciding when and how to include faculty in academic strategic planning. The issue of training people in using planning methodologies is another common issue in the literature and relates to participation.

Thompson makes an important point about outcomes from planning. He says people's beliefs about cause and effect relations and their preferences regarding possible outcomes affect their decisions (Thompson, 1967). Since people's beliefs do not always reflect reality, academic planners must keep an open mind when developing their plan to plan.

So, Barnard and Drucker address the need for strategic planning. Kanter

considers the appropriateness of participation. Thompson reminds us to consider people's beliefs and preferences for outcomes. These four theorists have identified issues expanded in the literature by others.

### *Observation of Virginia Tech's College of Engineering Strategic Planning Process*

Virginia Tech's College of Engineering conducted a strategic planning process, April, 1985 - September, 1988. A six-member faculty committee appointed by the Dean chose to conduct a participative planning process involving the entire faculty. The committee chose improved performance for the College of Engineering as the desired planning outcome and used a planning methodology used by the Virginia Productivity Center (VPC). This methodology is shown in Figure 1, the 1986 VPC Planning Methodology. I observed the meetings and reviewed all planning documents and results of the planning process. Details on this lengthy and instructive observation are discussed in chapters on Methodology and on Results and in Appendix A. The observation yielded data to compare to the findings in the literature and interviews. The model generated from this research draws heavily on the conclusions from this observation.

### *Strategic Planning in Business*

After studying the works of the organizational theorists, I turned to the

Step 1	<b>Internal Strategic Audit</b> What internal factors (strengths, weaknesses, problems, needs, trends, etc.) should/must we consider as we develop the strategic plan?
Step 2	<b>External Strategic Audit</b> What external factors (trends, constraints, threats, opportunities) should/must we consider as we develop the strategic plan?
Step 3	<b>Planning Assumptions</b> Convert the data from Steps 1 and 2 into clearly stated planning assumptions that our strategic plan will be based upon.  Importance/certainty grid analysis
Step 4	<b>Strategic Planning</b> Development of consensus and prioritized strategic (2-5 years with an "eye" on the year 2000) goals and objectives.
Step 5	<b>Performance Measurement Criteria</b> Identification of performance measures or criteria against which the performance of the college over the next 1-5 years will be assessed. How will we know if we are accomplishing our goals and objectives and how well we are doing?
Step 6	<b>Action Planning</b> Development of consensus and prioritized action programs. What objectives will have to be budgeted for (time and/or money) during the next year in order for us to begin to move toward accomplishing our goals?
Step 7	<b>Action Team Assignment</b> Program/project planning, resource estimates, resource allocation, accountabilities, project management.
Step 8	<b>Implementation Evaluation</b>

**FIGURE 1**

**1986 VPC PLANNING METHODOLOGY**

business practitioners. These consultants provided little detail about the nuts and bolts of planning. Most of the articles by practitioners promote the idea of planning, "why we should plan," and augment that statement with the major pitfalls to avoid. They do not give specifics on how to choose, organize, conduct, and implement a strategic plan in business. Their lack of specifics may be due to their interest in guarding their expertise for consulting relationships.

The business consultants agreed on several criteria for successful strategic planning. Most agreed on the absolute need for a mission statement at the beginning of the strategic planning methodology and top executive leadership and commitment to planning (Goodstein, Pfeiffer, Nolan, 1985; Levitt, 1975, Gup, 1979; Fitzgerald, 1979).

Goodstein, Pfeiffer, and Nolan (1985) go on to say that most strategic planning processes are poorly conceptualized and poorly executed. Raichle (1980) suggests that good planning is well planned. Planners need to think through in advance what they want the new plan to include. Goodstein, Pfeiffer, and Nolan (1985) also include the plan to plan as a step in their strategic planning model, an important early step in achieving success in strategic planning.

Schwartz and Davis (1984) remind us that when culture and strategy do not match, the strategy may have to be abandoned or changed. This need for culture/strategy match is another hint at the importance of choosing an appropriate methodology for the strategic planning environment.

Chaffee (1985) discusses the differences between business and higher education which affect strategic planning. These three main difference are: higher education organizations have multiple, often conflicting goals, higher education chief executives lack power, and higher education strategic options are constrained.

### *Evolution of Academic Strategic Planning*

The volume of literature on academic strategic planning is extensive. However, a review of the history of academic planning provides a basis for evaluating new ideas. George Keller (1983) reviews the history of planning in academic institutions. He identifies the origin of strategic planning to the planning, programming, and budget system (PPBS) created in 1961 by Charles Hitch of the Department of Defense. For the first time, PPBS linked long-range objectives, specific programs, and budgets (Keller, 1983). Previous planning methods were reactive to circumstances. PPBS suggests shaping the future rather than reacting to forecasts and manipulating personal relationships.

Keller (1983) and Lindquist (1978) agree that portions of specific planning methodologies are effective in different situations at different times of the

planning process (Lindquist, 1978). Keller (1983) says successful academic strategic planning is distinguished by the following six features:

1. Academic strategic decision making means that a college, school, or university and its leaders are active rather than passive about their position in history.
2. Strategic planning looks outward and is focused on keeping the institution in step with the changing environment.
3. Academic strategy making is competitive, recognizing that higher education is subject to economic market conditions and to increasingly strong competition.
4. Strategic planning concentrates on decisions, not on documented plans, analyses, forecasts, and goals.
5. Strategy making is a blend of rational and economic analysis, political maneuvering, and psychological interplay. It is therefore participatory and highly tolerant of controversy.
6. Strategic planning concentrates on the fate of the institution above everything else (Keller, 1983).

These features for successful academic planning are often referred to and expanded in the literature.

## *Strategic Planning Case Studies in Higher Education*

Academic planning was well documented in the mid-seventies. Several grants from the Kellogg Foundation supported planning efforts at universities and colleges of diverse missions in 1973. Out of these grants came several published case studies. All but one of the case studies presented the institutional effort. The exception described a planning process for a college within a university.

This research concentrated on case studies describing research universities since their missions are broad and similar to the mission of the College of Engineering at Virginia Tech. For thoroughness, three case studies of small liberal arts colleges were reviewed. Small colleges have fewer conflicting needs and enjoy a straightforward mission. These attributes might be similar to a college of engineering within a large university. Also, a college of engineering, although a unit of the larger university, often acts autonomously in academic as well as some budget areas. In this regard, the college of engineering administratively resembled a small liberal arts college in faculty and student size.

Case studies for the following colleges and universities were reviewed:

West Virginia University, Western Washington University, Villa Maria College, The University of Akron, Furman University, The Wichita State University, University of South Carolina, Hood College, Barat College, Teachers

College of Columbia University, Carnegie Mellon University, University of Minnesota, Rensselaer Polytechnic Institute (Keller, 1983, Kieft, 1978).

These longitudinal case studies were often four to five years and reported successes, weaknesses, dilemmas, and some results of the planning effort. Review of these cases helped put Virginia Tech's College of Engineering planning process in perspective with other universities' experiences. This comparison suggested using different combinations of the steps in the VPC Planning Methodology to meet a college's desired strategic planning outcome.

The conclusions reported by the editors of those case studies say change, or consensus on strategic change, was much easier to obtain at small colleges, where the mission of the institution was clear and shared by all faculty. For example, Villa Maria is a small catholic women's liberal arts college whose planning process is less cumbersome and is directly related to budgeting. Their size keeps the number of planning committees and levels of decision making to a minimum.

These case studies also told how other colleges plan. They described what forms to use, what timetable to consider, and how to include the faculty. Often, the case studies were not examples of strategic planning. They were just a more structured approach to preparing the annual budget. Although called strategic plans, no new strategic changes were recommended within the budget. Rather, the departments now had to identify how the budget served the mission of the department and ultimately the university. While



not reaching the scope of a strategic plan, a structured approach to routine budget preparation and resource allocation may be a first step in training faculty how to plan and in illustrating to them the importance of planning.

The academic literature strongly agreed with the business practitioners regarding the need for a champion. More efforts at improvement and better planning collapse because of the lack of consistent advocacy by the top leadership and persistent monitoring of divisional plans than for any other reason (Keller, 1983).

Another area of agreement seemed to be in the area of strategic planning staff expertise and/or training. Consultants, courses, workshops, and training programs available for campus executives help improve planning quality (Keller, 1983).

Two academicians recommended patience in strategic planning. Educational planning is new. Planning needs to find its way as it goes along (Adams, 1983). Academic strategies require time to investigate possibilities. Likening the commitment of time for planning to time for athletic practice, "it is well known that long hours of practice in a controlled process is the sole approach to sound performance when an urgent situation arises." (Haas, 1983).

Fitting planning meetings to the schedules of the faculty (within the academic calendar) is also an issue to consider. In case studies, participants in one or two hour a week meetings would say that each meeting restarted the

same debates all over again. Participants in extended meetings (one to three day retreats) usually were elated that so much progress had been made. In fact, participants in retreats actually began to enjoy each other and the task (Lindquist, 1978). These comments highlighted the success/fail criteria of time availability and scheduling.

### *Generalized Approach to Strategic Planning in Academic Case Studies*

The formal-rational model, Figure 2, is the most referenced model for academic planning found in this research. The sequence of planning steps includes formulation of institutional mission based on appraisal of the environment, development of goals and objectives, establishment of broad program and resources strategies, selection and design of action programs, implementation, and review. The progress of the plan is based on a rational assumption that mission and objectives can be clearly formulated and will guide the other steps. The overall planning process should depend on institutional traditions, governance patterns, and the desired planning outcomes (Peterson, 1980). Winstead (1982), also recommends the formal-rational model and encourages participation for those with program responsibility. Winstead recommends the use of information systems to supply data for the planning model. While these authors and several case studies followed the formal-rational model, little detail is given in the model for conducting the steps.

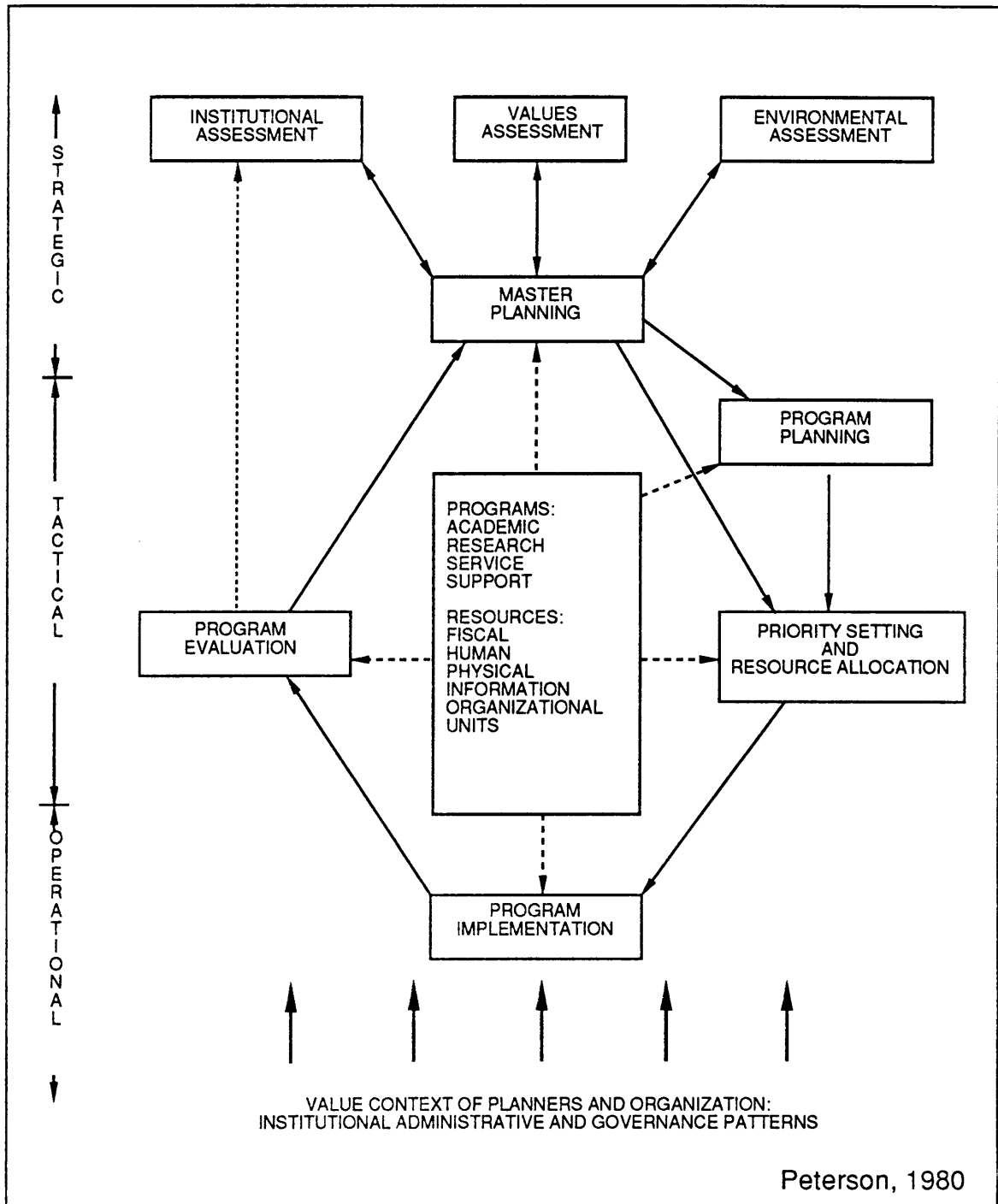


FIGURE 2

## THE FORMAL-RATIONAL PLANNING CYCLE

Several cases used the term "strategic planning" when they really meant tactical or operational planning. The tactical and operational planning often addressed budget changes and/or new systems to prepare the budget. These cases were still valuable because many universities today consider strategic planning a catch-all phrase for these other kinds of planning. This research considered the misuse of the term strategic planning and included tactical and operational planning in development of a model. The 1989 VPC Planning Methodology provides a base for strategic, tactical, and operational planning in line with the formal-rational planning model. The comprehensive nature of the sequence and details of the seven steps of the 1989 VPC methodology was the primary reason for using it in the model generated by this research.

Most of the reported case studies in the literature used a pyramidal planning methodology, flowing from one administrative level to the next, first top-down and then bottom-up. The planning methodologies followed closely the format of the formal-rational model. The methodologies began with statements of mission and internal and external analysis of opportunities and threats compiled by the president's office. This preliminary information was sent to deans and department heads. The deans and department heads responded to the president with operational budgets accompanied by narratives of how the budget would meet the mission of the university and take advantage of the opportunities defined. Budget allocations were tied to these plans as well as the reward system for administrators (Keller, 1983; Kieft, 1978)

The preliminary information from the president's office was usually sent to all departments with planning forms. Each department completed the planning form and sent it to the dean's office. Each department chose its own method for completing the form. Some chose total participation, some chose task forces, others allowed the department head to complete the form. The dean's office then reviewed all the department plans and extracted the most promising to include in the college's plan. The deans' reports were reviewed and compiled by the provost and submitted along with other vice-presidents to the president for review. The president's office extracted and funded the most promising new ideas and based operational budgeting on the information contained in the plans. The final budgeting decisions were downloaded at the college level which then appropriated departmental budgets within the given constraints (Kieft, 1978, LeHigh, 1988)

### *Interviews with Academic Planners*

Often, the case studies did not discuss details of the tactical and operational planning but only the preparation of the strategic plan and the outputs and outcomes of the plan. The VPC Planning Methodology includes strategic management (tactical and operational planning) as well as the production of the strategic planning report. To compare the tactical and operational planning steps of the VPC Planning Methodology to other planning methodologies, this research needed to review current efforts of other colleges to produce strategic plans and implement tactical and operational plans. Col-

leagues at Virginia Tech sent me strategic planning reports received through their contacts (Lehigh, University of Wisconsin) and mentioned other universities known to be conducting strategic plans. I called The Ohio State University, North Carolina State University, and Lehigh to discuss details of their planning process. I also reviewed their worksheets and final reports.

Final reports of these four universities were reviewed. Each university executed the preparation of the plan differently, but all followed the formal-rational model. The highlights from each plan are discussed in Appendix B.

### *Research in Academic Planning*

University planning organizations, such as Society of College and University Planners (SCUP), have existed for the past 20 years. Originally, university planners were architects concerned with facility planning. In 1989, planning organizations and journals in academia include academic strategic planning as well as facilities planning. The planning research journals give insight into ways to improve planning since they often report research on recent university planning efforts. This section reviews current findings about academic strategic planning.

Stuart (1987) completed a project on academic planning which evaluated questionnaires from 150 university presidents and provosts. One of her conclusions was that planning processes should be directed at defining goals

and objectives. These goals and objectives should be tied to specific measures which permit their institutions to assess whether desired outcomes were being attained. Stuart also finds agreement from presidents and provosts on integrating goals and objectives from planning with budgeting and resource allocations. This agreement points to the general applicability of the formal-rational model and specifically, to the 1989 VPC Planning Methodology.

Stuart's study found that chief academic officers included faculty governance and participation in planning. The top administrators believed that both ad hoc groups as well as formal standing committees should be used for study and planning. A research study of 256 campuses by Schmidtlein and Milton (1988), also addressed faculty governance as a criterion for successful planning and implementation. They judged planning processes that integrated traditional decision makers and governance bodies more satisfactory than those using broadly based committees. Chan (1987) states that while strategic planning is legitimate and right for faculty participation, actual desire by most faculty to shape policy is low. This speaks to Kanter's assertion that participation must be appropriate for the situation at hand. Faculty participation should include those interested in overall campus decision making but would not necessarily require total faculty participation.

Dill and Helms (1989) address faculty participation in planning. They recommend including faculty in planning processes which address 1) definition, creation, design, and discontinuation of programs, departments, and research centers; 2) budgeting priorities; and 3) design of central academic support systems, such as libraries and computers.

Schmidtlein and Milton (1988) and Keto and Helms (1989) agreed on relating budgets to planning. They state that strategic planning much in advance of budget formulation does not appear useful and that comprehensive planning processes should cross reference budget development to provide the needed link between educational goals and budget.

Chan (1987) regards assertive presidential leadership and common understanding of mission as relevant to successful strategic planning. Again, mission statement and champion appear as two criteria for effective planning.

Stuart (1987) found in her study that the planning process should be conducted by one administrative officer centrally responsible for study and planning. Stuart refers to the need for staff expertise.

Schmidtlein and Milton (1988) asked the 256 top administrators their views on perceived outcomes of planning activities, reasons for problems encountered, and suggestions for improving planning. The majority of those interviewed seemed to be quite dissatisfied with their outcomes. However, the administrators agreed the process benefits of planning were usually greater than any substantive benefits. Process benefits are improved communication among faculty, increased awareness of campus strengths and weaknesses, and development of younger faculty. Substantive benefits are tangible results addressing the goals identified during early planning steps.

Schmidtlein and Milton's research study concluded that a blend of both "top down" and "bottom up" approaches to planning appear necessary and depend-



ent on the kinds of initiatives under consideration. Top down requires direction from the dean; bottom up requires implementation by the faculty. This conclusion again points to a need to match desired outcome to planning methodology for greater effectiveness.

The need to match desired planning outcomes to selected planning methodologies was summarized also by Chaffee (1985). She indicates that choice of a planning methodology may depend on so many contingencies that each university will select a different methodology to suit their desired planning outcomes.

After completing data collection from the three sources, literature, observation, and interviews, six success/fail criteria (see list of definitions) for reaching the desired planning outcome seemed evident at this point. These success/fail criteria will be clarified in the Results Chapter. Success/fail implies that evidence of these criteria are necessary to reach the desired planning outcome.

1. clear and agreed upon mission statement,
2. staff expertise to carry out the process and/or outside facilitators to train the faculty/staff in the chosen strategic planning methodology,
3. reallocation of resources tied to any program or organizational change,

4. a committed and powerful champion,
5. faculty governance maturity and/or desired faculty participation, and
6. time availability and scheduling.

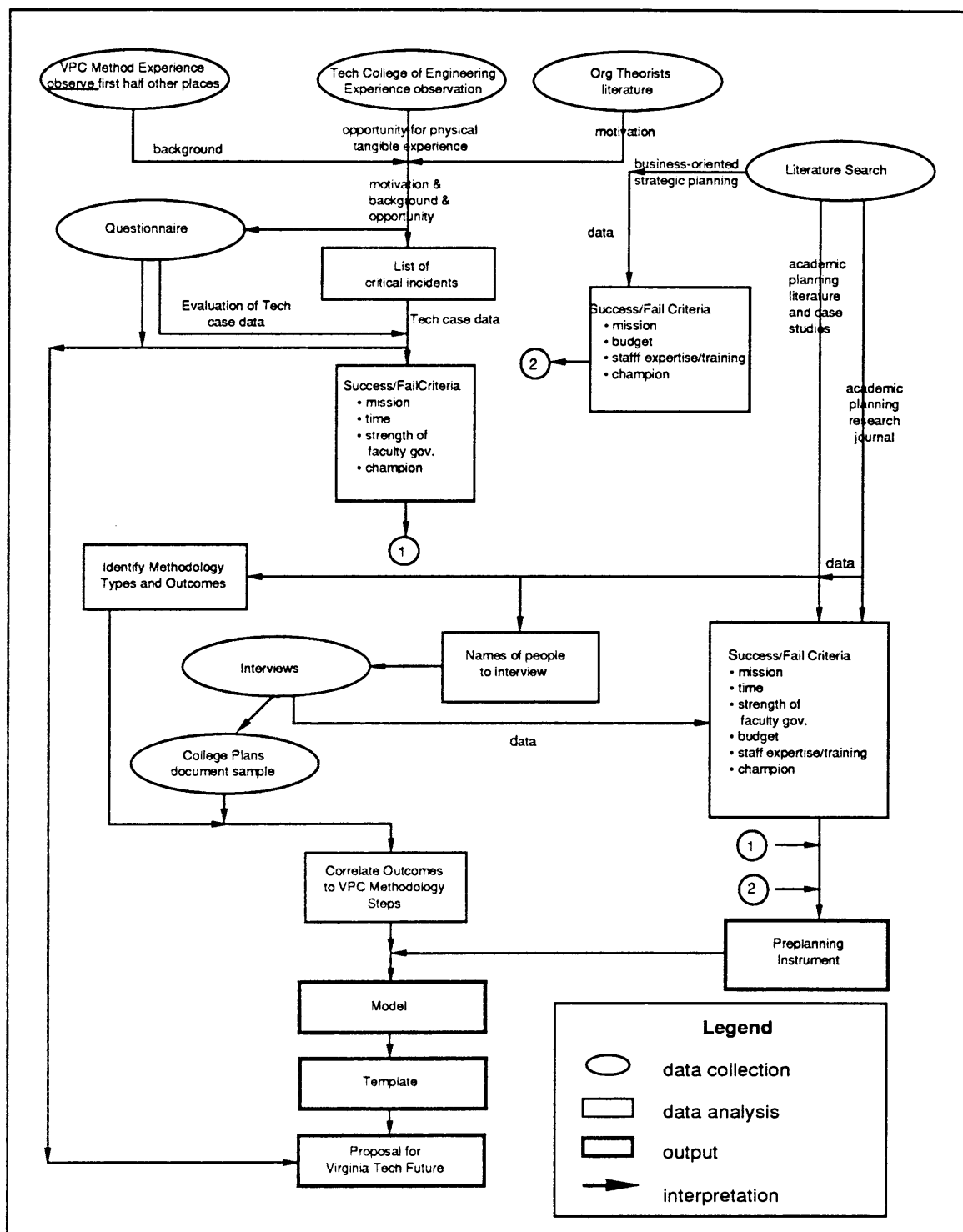
The Results Chapter expands on these six success/fail criteria for effective academic planning. The Conclusions Chapter incorporates them into the planning model developed from this research.

# Research Methodology

## *Summary*

I began this study motivated by the organizational change literature I reviewed in graduate classes. I participated in or observed the first four steps of the VPC Planning Methodology in class and in other meetings on campus. When Virginia Tech's College of Engineering initiated a strategic planning process, it offered an observation opportunity of gathering data for an application of the VPC Planning Methodology. Through observations of that planning process and more literature review, I generated research questions. Figure 3 summarizes the path I followed for this exploratory, descriptive research methodology.

With the motivation from class, the background from previous participation in part of VPC Planning Methodology and the opportunity to observe the Virginia Tech experience long-term, I began my work in earnest. After the 12 departmental planning meetings at Virginia Tech's College of Engineering, I constructed, distributed, and analyzed the results of a questionnaire for all faculty participating in the first four steps of the VPC Planning Methodology. I delved into the business-strategic planning literature. I interpreted two



lists of success/fail criteria for achieving a desired planning outcome— one from the Virginia Tech observation and questionnaire and one from the business planning literature. These two lists had some overlap but resulted in the final six success/fail criteria.

Continued literature review, personal experience participating in and observing the continuation of the Virginia Tech strategic planning process, and personal interviews with other university planners led to the identification of the VPC Planning Methodology as a generalizable planning methodology for academic planning. The conclusion from this data collection linked using combinations of the seven steps of the VPC Planning Methodology to achieving desired planning outcomes and also substantiated the success/fail criteria. I used my understanding of the breadth and depth of the success/fail criteria to develop a preplanning instrument that is an output of this research.

After working with the preplanning instrument, I developed the template to prepare an agenda for selected planning steps from the VPC Planning Methodology to meet the desired planning outcomes. Added to a first step of analysis of the defined planning unit, I completed a model for supporting colleges of engineering in selecting and conducting strategic planning to meet a desired planning outcome. Given my experience with the VPC Planning Methodology, the model this research generated, and the Virginia Tech planning process and results of the faculty questionnaire, I proposed scenarios for using this model in academic settings. The following paragraphs relate the details of my research methodology.

## *Observation of the Virginia Tech College of Engineering Planning Process*

When the Dean of the Virginia Tech College of Engineering appointed a committee to develop a strategic plan, I recognized the situation as a case of organizational change based on strategic planning and an opportunity for a first-hand observation. I sat in on all strategic planning committee meetings. The committee decided the scope of the planning process would include participation by the entire 270 faculty and that the desired outcome was improved performance. I was present during those discussions to choose the 1986 VPC Planning Methodology as the structure for producing and implementing a strategic plan for the College of Engineering. That 1986 methodology is shown in Figure 1. The VPC Planning Methodology is a comprehensive and detailed version of the formal-rational planning model, Figure 2, page 24. Figure 12, pages 78 and 79, is the 1989 version of the VPC Planning Methodology. The differences between 1986 and 1989 are discussed in Appendix A. I attended the 12 departmental strategic planning sessions in the College of Engineering at Virginia Tech from 1985-1988, taking notes on techniques, steps, and critical incidents. I assisted in facilitating two department sessions. I assisted the committee in gathering planning documents from other parts of the University. I also helped collect reports and prepare information for the faculty during the three years. I surveyed the faculty (questionnaire) on their views of strategic planning in general and their particular experience in their departmental planning process. I gathered action team recommendation reports and summarized the recommendations made by the action

teams. I assisted the Interim Dean in documenting the progress made on recommendations and assisted in preparing a final report to the faculty. I became the archival librarian for all reports and materials pertaining to the three-year planning effort.

During the Virginia Tech planning experience, I took notes on what appeared to be critical incidents as they occurred in each meeting. Critical incidents were agreement/disagreement with the planning methodology steps, as well as agreement/disagreement over issues raised during the planning meetings and situations that were unexpected or unresolved. After several meetings, the areas of agreement and disagreement appeared to occur regardless of the department. I started looking for those incidents in other meetings and recorded them whenever I found them.

The results of these steps of my research methodology are a data base of the Virginia Tech experience and a list of critical incidents. The description of the planning agenda, the observations, and the College of Engineering planning results are discussed in Appendix A.

### *Business Planning Literature*

I reviewed the business strategic planning literature during the second and third year of the Virginia Tech planning experience. The VPC Planning Methodology had been used in a department and small college of engineering,

but most of the use of the methodology had been applied in business or government settings. Therefore, I felt I needed to review what was acceptable practice in business strategic planning to strengthen my understanding of the VPC Planning Methodology. I looked for descriptions of business planning methodologies. I found articles and books describing processes or techniques, but few references to an overall methodology for strategic planning in business.

### *Academic Case Studies and Academic Planning Research*

During the third year of the Virginia Tech planning experience, I located higher education planning books and handbooks. Finally, I reviewed the research journals for planning in higher education.

The higher education case studies did offer methodologies as well as steps, techniques, and standard forms. The higher education literature offered case studies of actual planning processes at universities and colleges. I reviewed 16 case studies that appeared to use planning methodologies based on steps of the formal-rational planning model (Peterson, 1980) and approximated steps of the VPC Planning Methodology. These case studies supported the six success/fail criteria identified earlier in this research. The consistent recommendation from the case studies associating desired outcome and success/fail criteria led me to conclude that planning methodology must be matched to success/fail criteria and planning outcome to achieve successful



results. I defined the variables that related to outputs and outcomes for academic strategic planning. The relationship between independent, (desired outcome), moderating, (success/fail criteria), and dependent variables, (planning methodology), can be traced to the literature's recommendations for successful planning.

The VPC Planning Methodology used at Virginia Tech was more comprehensive and detailed than the planning methodologies used in the case studies. See Appendix C for detailed description of the VPC Planning Methodology. Therefore, I identified the VPC Planning Methodology as the reference planning methodology for the model generated by this research. The results of these steps of my research methodology is a table listing desired planning outcomes for the case studies and the time required to complete one planning cycle.

### *Compilation of Success/Fail Criteria*

The literature and interviews surfaced many similarities to the observations of Virginia Tech's planning process. I constructed a chart of critical success/fail factors recommended by author and combined them with the observations at Virginia Tech. Table 2 in the Results Chapter summarizes this comparison.

## *Planning Documents from Other Colleges of Engineering*

Since the Virginia Tech College of Engineering planning process developed into a three-year effort, colleagues knew of my study and either sent other college's planning documents and reports to me or recommended people for me to call at other universities. By calling planning directors and task force members in higher education planning, I found other references and received personal comments about the effectiveness of college strategic plans or case studies I had read. I designed a standard interview form to ask questions and record answers from these experts. I designed the interview form to ascertain the presence of the success/fail criteria, the format of the plan as it was produced at the department, college, or university level, and the planner's evaluation of how well the desired planning outcomes were being achieved. As I asked these questions over the phone, I wrote the answers on the interview form. The answers reinforced the presence of the success/fail criteria identified in the literature review. These interviews confirmed my feeling about the need to recognize and allocate the resources identified in the success/fail criteria and to match the planning methodology to the desired planning outcome. I talked to planning directors and deans regarding strategic plans for three colleges of engineering. These were The Ohio State University; The North Carolina State University; and Lehigh University. I reviewed the planning report of The University of Wisconsin System, College of Engineering. The methodologies discussed in phone conversations or in the plans themselves were similar to the formal-rational planning model already

identified in the literature review and seemed to agree with the logic and popularity of using it in higher education. The result of this step of my research methodology was additional substantiation (through repeated appearance) of the list of six success/fail criteria and the use of the VPC Planning Methodology as a variation of the formal-rational planning model.

### *Instrument Formulation*

At this point, I began to formulate a preplanning instrument, a checklist of questions, that colleges should answer before initiating strategic planning meetings. By reviewing the list of six success/fail criteria, I developed questions that would assess the presence of these criteria. The result of this step of my research methodology is the preplanning instrument. The instrument is shown in Figure 7 in the Conclusions Chapter.

### *Developing the Model*

The preplanning instrument began to address choice of planning methodology but did not completely address the design for a planning process. A planning process was defined earlier as the path and timetable which moves the planning unit through the planning methodology and associated events. A model was needed which would incorporate the preplanning instrument and complete the plan to plan.

Based on the presence of the six success/fail criteria and from conclusions drawn from my readings, I identified eight desired planning outcomes for colleges of engineering. After thorough review of the literature, my observations at Virginia Tech, and my discussions with other colleges of engineering, I recognized that the 1989 VPC Planning Methodology was the most comprehensive and detailed approach engulfing other planning methodologies described in the literature. I chose to use the seven steps in the 1989 VPC Planning Methodology as planning steps that could be used independently or in combination to meet any of the eight desired planning outcomes.

Given the recommendations in the literature and my observations at Virginia Tech, I developed a model for colleges of engineering to assess their resources, desired outcomes, outputs, and faculty involvement; choose a methodology; and schedule the planning process agenda. The result of this step of my research methodology is the model, Figure 6 in the Conclusions Chapter. The model includes the preplanning instrument, a template for selecting planning methodology steps and agenda, and a Gantt chart to schedule the planning agenda. The preplanning instrument, template, and Gantt chart are shown in Figures 7, 11, and 17 in the Conclusions Chapter.

### *Applying the Model to Virginia Tech's College of Engineering*

After developing the model for general use, a specific application can be made to Virginia Tech's College of Engineering. Using the model's preplanning

instrument and template, I recommend a planning methodology for future use at Virginia Tech's College of Engineering based on discussions with the Dean and past Interim Dean's vision of a desired outcome. The result of this step is a recommendation for a methodology for planning in the College of Engineering at Virginia Tech and is discussed in the Conclusions Chapter.

## Results of Research Methodology

### *Summary*

The results of my research methodology generated data which were analyzed and used to develop a conceptual model for selecting strategic planning methodologies and implementing strategic planning processes at colleges of engineering. The model combines a set of six success/fail criteria and eight planning outcomes in a preplanning instrument. The 1989 VPC Planning Methodology is comprehensive and represents the commonly used formal-rational planning model. The planning steps in the VPC Planning Methodology can be chosen in different combinations to meet any of the eight desired planning outcomes. A planning template incorporates the VPC Planning Methodology steps with some of the planning instrument responses. A planner completes the template to organize the planning process. The process is then scheduled on a Gantt chart. The rationale for the design of the model, planning instrument, template, and schedule is discussed in this chapter.

I identified the six criteria from the observation of the Virginia Tech College of Engineering planning process, 1985—1988. Four criteria surfaced during

that observation and two surfaced in hindsight. The business literature yielded two criteria, the same two found in hindsight in the Virginia Tech observation. I found variations of the success/fail criteria in the academic case studies and the academic planning books and research journals. From the literature and interviews with academic planners, observation of Virginia Tech's planning effort, and document sampling of other universities' strategic plans, I identified eight desired planning outcomes. The planning methodologies used at other universities were variations of the formal-rational planning model (Peterson, 1980). Since the VPC Planning Methodology is a comprehensive formal-rational model, it can be used in part or whole to meet any of the eight planning outcomes. From interpretations of these results, I designed a preplanning instrument and a template to assist the planner in selecting strategic planning methodologies based on desired planning outcomes as predicted by the six success/fail criteria and scheduling the planning process. The model, preplanning instrument, and template generated from this research are discussed in the Conclusions Chapter.

### *Results from the Academic Case Studies*

The recommendations from the case studies verified the success/fail criteria identified from the Virginia Tech observation and from the business planning literature. All case studies reported in the literature had strong endorsement from the president's office. In most cases, the president initiated the planning process over the objection of the faculty. By tying budget allocations to

receipt of planning documents, presidents ensured compliance in completing planning documents and focused attention on the importance of implementing the plan (Keller, 1983; Kieft, 1978; Lehigh, 1988; OSU, 1989; and North Carolina State, 1989).

Most of the case studies began planning to deal with an external threat: reduced enrollment, reduced funding, perceived dissatisfaction with the university by faculty, students, and/or Boards of Trustees. A few programs were able to begin planning because of a grant from the Kellogg Foundation (Hipps, 1982)

In the cases reported by Kieft and in Lehigh's report, the actual planning forms were included in the case studies. These forms were compared to the workbooks used in Virginia Tech's departmental planning sessions. The forms used in the case studies were more specific than those at Virginia Tech and addressed details related to staffing and budgeting at those universities.

The National Center for Higher Education Management Systems Inc. of Boulder, Colorado undertook a project to help college and university administrators examine planning and management concerns at the various levels of program activity in 1973. They continued the project to investigate the process and procedural aspects of institutional planning in 1976.



These case studies led to prescriptive observations about academic planning.

These observations are:

1. Planning and allocation/reallocation of resources should be integrated.
2. Planning should be a process, not a project.
3. Planning is not limited to only quantifiable or measurable items.
4. Administrative allegiance to planning is essential.
5. Strict schedules and calendars are necessary for planning.
6. Planning requires staff expertise.
7. Planning requires information: internal and external.
8. Commitment of the CEO (president, provost, or dean) to planning is essential.
9. Processes including forms are mechanistic and consistent among departments.
10. Planning requires time and effort. (The first year will be revision and adjustment. An institution should expect to spend 2-3 years developing a process.)
11. Effective planning is comprehensive, including academic, student service, administrative support, and auxillary programs. Plans incorporate personnel support, equipment, space, and renovation.
12. Planning is both short and long range (Kieft, 1978).

Winstead (1982) suggested an eight-step model for systematic planning in academia. This model re-emphasizes needed resources for achieving desired

planning outcomes: allocations of essential resources and acceptance and support of key people. Other steps of Winstead's model mirror VPC Planning Methodology steps: identification and evaluation of problems and opportunities, determination of priorities, development and execution of program of action, and identification and monitoring of future developments that will have a major impact on performance or results. Winstead's model is another version of the formal-rational planning model and is described below.

1. Identification and evaluation of problems and opportunities.
2. Clarification and evaluation of problems and opportunities.
3. Determination of priorities.
4. Analysis and evaluation of capabilities.
5. Development and execution of program of action.
6. Identification and monitoring of future developments that will have a major impact on performance or results.
7. Allocation of essential resources.
8. Acceptance and support of key people who are involved or affected.

The recommendations from the case studies confirmed some of the recommendations from the business consultants and began to crystallize for me important success/fail criteria. Winstead's model, Kieft's prescriptive observations, and Keller's general features helped me recognize the need to develop a checklist of questions related to success/fail criteria which colleges of engineering would answer prior to the beginning of planning. At this point in the research, I thought this checklist would help ensure successful implementation of the strategic plan. With continued research, the checklist evolved

into the preplanning instrument of the academic strategic planning model generated from this research.

Additional literature review revealed eight common goals from the W.K.Kellog Foundation sponsored planning projects for Akron, Furman, and Wichita State universities (Hipps, 1982). Again these common goals supported the success/fail criteria and supported the use of planning steps from the 1989 VPC Planning Methodology. The eight common goals from the Kellog Foundation grant for planning are listed below.

1. All the institutions initiated their change programs by developing mission statements.
2. They had the unqualified support of top administrators, including presidents.
3. Because of the emphasis on participatory decision making, training was provided to participants prior to process implementation.
4. The change programs were comprehensive in nature with the recognition that change in one area affects many other areas.
5. Successful changes require the participation of all members of the academic community.
6. All emphasized the need for improved internal and external communication as a prerequisite to an effective change program.
7. The major emphasis was in developing a process to deal effectively with the changes occurring rapidly in higher education.

8. Raising the level of consciousness of the faculty, administration, and staff that individual goals must be merged with institutional goals.

### *Results of Virginia Tech's College of Engineering Planning Process*

In April, 1985, the Dean of Engineering appointed a six-member faculty committee to develop a strategic plan for the College of Engineering. The Dean expected the desired planning outcome to be a vision report recommending new directions for growth or opportunity for the College. The six-member committee decided to involve the entire faculty with the desired planning outcome to be performance improvement. This obvious difference in desired planning outcome for the college was not discussed by the Dean and the committee and remained unresolved and unnoticed. Appendix A details the events and observations of the Virginia Tech College of Engineering Planning process.

The College of Engineering conducted their planning process for more than three years, April, 1985 - August, 1988, to develop and implement a strategic plan. The attendees at the meetings on strategic planning ranged from the six-member committee to full faculty participation. Appendix A also provides a timetable of the progress of this planning process. The 1986 VPC Planning Methodology used at Virginia Tech resulted in 12 goals and objectives which

were assigned for action to 12 faculty action teams. The action teams met for one year and produced 66 recommendations for performance improvement. These recommendations were sorted on August 25, 1987, in categories addressing authority to implement. These sorted recommendations were reported to the faculty in September, 1987. Beginning in December, 1987, faculty action teams were formed to implement those recommendations under the authority of the faculty, department heads, or dean. The complete list of 12 goals and objectives and 66 recommendations can be found in Appendix A. Table 1 shows the sorted list of recommendation categories.

The 12 goals and objectives represented both strategic planning and tactical and operational planning. Because the goals represented these three levels of complexity and constituencies, the implementation of the objectives varied from not at all to a quick resolution.

### *Results of Virginia Tech Engineering Faculty Questionnaire*

The literature had revealed that perception of success or importance of planning as seen by the faculty is crucial to full implementation of goals and objectives. To pulse faculty attitudes in this regard, I administered a questionnaire in January, 1986, 4-6 weeks after all departments had concluded their strategic participative planning retreat. The questionnaire is shown in Figure 4. Of the 201 participants, 98 or 49% returned the questionnaire.

**TABLE 1**  
**ANALYSIS OF RECOMMENDATIONS FROM VIRGINIA TECH'S**  
**ENGINEERING STRATEGIC PLANNING EFFORT**

1. Completed changes.....	3 recommendations
2. Consensus needed before further action .....	10 recommendations
3. New policy needed, no faculty consensus required ..	9 recommendations
4. Recommendations to be considered and imple- mented by the larger university .....	27 recommendations
5. Budget reallocation required .....	8 recommendations
6. New committes recommended .....	4 recommendations
7. New assignements for existing offices .....	5 recommendations.

These recommendations and completed changes were published September, 1987,  
2-1/2 years after the beginning of the strategic planning effort.

Full professors accounted for 51% of the returned questionnaires, associate professors 28%, and assistant professors and instructors, 19%.

Ninety six percent of all respondents agreed the faculty should be involved in any planning process in the department.

Fifty-two percent agreed the process used for involving faculty was an appropriate use of time. Fifteen percent were neutral; 23% disagreed.

Fifty percent disagreed the departments should conduct the planning process or a similar one each year. Sixteen percent were neutral; 34% agreed.

General comments on the questionnaires were divided into two categories of responses related to 1) effectiveness and efficiency, and 2) expectations for implementation.

Forty-eight percent commented the methodology was not effective and/or efficient given the time used by their department. Comments were: "too many people, ideas too broad, Nominal Group Technique ranking not a true picture of departmental preferences, too rushed, and too drawn out.

Twenty-six percent responded that resources and leadership were essential for implementation. Most comments implied these resources and leadership were not expected and therefore planning effort was an "exercise in futility."

Professorial Rank _____	Department _____
No. of years at Va. Tech _____	For CY 1985 % 208 _____ % 230 _____ % 231 _____
No. of years of teaching engineering _____	
-----	
I believe the faculty should be involved in any planning process	
- in the department	_____ agree      _____ neutral      _____ disagree
- in the college	_____ agree      _____ neutral      _____ disagree
- in the university	_____ agree      _____ neutral      _____ disagree
I feel this process for involving the faculty in planning was an appropriate use of time.	_____ agree      _____ neutral      _____ disagree
I feel the results are meaningful to the future of my dept	_____ agree      _____ neutral      _____ disagree
I am committed to the goals and objectives identified and will assist with implementation	_____ agree      _____ neutral      _____ disagree
The time allocated for this planning process was:	_____ too short      _____ about right      _____ too long
I feel the dept. should execute steps 6 & 7 (i.e., develop action plans necessary to implement goals and objectives identified).	_____ agree      _____ neutral      _____ disagree
I feel the dept. should conduct this process or a similar process each year.	_____ agree      _____ neutral      _____ disagree
I have been involved in goal setting and planning sessions for my dept. prior to Nov. & Dec. 1985.	_____ yes      _____ no
If yes, is this most recent planning process conducted by the Strategic Planning Committee significantly better from previous planning in your dept.?	_____ yes      _____ no
What I liked best about the process _____	
_____	
What I liked least about the process _____	
_____	
Suggestions for improvement _____	
_____	
General comments _____	
_____	

FIGURE 4

# FACULTY THOUGHTS ON STRATEGIC PLANNING PROCESS FOR ENGINEERING



## *Results of Identifying Success/Fail Criteria from Virginia Tech Planning*

The following issues were concerns voiced by faculty participants throughout the planning effort.

1. Mission Statement — Faculty often voiced frustration in their attempts to agree on goals and objectives for performance improvement because they did not agree on the mission of the College. Some faculty wanted teaching emphasized, others wanted research, and a small number wanted public service. The concern was so great, the college-level planning retreat identified the need for a mission statement as their number-one-priority goal.

2. Champion — Throughout the planning effort, faculty expressed doubt about implementation of results, since enthusiasm to complete the strategic plan was not exhibited by the Dean in the first two years of the effort. The strategic planning committee selected by the Dean was large enough that members could avoid leadership roles. The dean had assigned strategic planning to the committee. Since he did not intend to implement total faculty participation; he took a low profile during the process. Due to the lack of a champion, progress was slow, disagreements festered, and frustration was high, as evidenced by comments among the faculty.

3. Faculty governance/participation — The 270 faculty had not previously worked together to develop plans on any project. The Engineering Faculty Organization (EFO) was not active in proposing or implementing policies as a governance body or as consultants to the dean. Attendance at most EFO-called faculty meetings was less than 20% of the faculty. When recommendations were made during the planning effort which required faculty consensus, the process to tap faculty input had to be developed before the planning recommendation could be resolved.

4. Time Availability and Schedule — When he appointed a faculty committee on strategic planning, the Dean expected the entire planning process to take one year. Since the committee decided to involve the entire faculty, the process lengthened to more than three years. After 3-1/2 years, most issues, 58 of the 66 recommendations, were still unresolved. The planning methodology had diverged through many levels of committees and their subsequent recommendations. The control of implementation of recommendations was impossible at that point. A schedule had been published early in the planning process, but without a champion to lead it to the next step, and with an immature faculty governance system, adherence to the original schedule was impossible.

The Virginia Tech experience shows the power of inadequate resource availability in not reaching the desired outcome of the planning effort. The plan-

ning methodology may have been appropriate for improvement of college performance, although we can't definitely conclude its appropriateness since the implementation of planning recommendations was not completed. I observed the following roadblocks to successful preparation and execution of a strategic planning methodology at Virginia Tech:

1. The faculty was not skilled in planning.
2. The faculty was not skilled in teamwork.
3. The faculty was diversely opinionated about issues.
4. The faculty was skeptical about successful implementation of recommendations.
5. The faculty was diverted by other major university efforts — conversion to a semester calendar and a ten-year self study.
6. The Dean did not have the authority to implement some of the planning recommendations requiring increased budgets.
7. Lengthy planning effort eroded enthusiasm and commitment to implementation.
8. Lengthy planning effort overlapped personnel changes in decision makers.
9. The strategic planning committee's desired outcome, performance improvement, was forgotten along the way.

These observations again highlighted the need to prepare a planning schedule and to ensure appropriate resources were allocated to the planning process. The six-member committee could have acted as the decision and development team for the planning process. The design and development of the process should be done before involving all the faculty. An initial design session would identify key people for examining the feasibility of the proposed planning process (Monetta and Sink, 1989).

### *Results of Identifying Success/Fail Criteria from the Literature and Interviews*

Four success/fail criteria from the Virginia Tech planning process were evident throughout the literature search: mission statement, champion, faculty governance/participation, and time availability and schedule. Two additional criteria identified from the business literature and repeated in the academic planning literature are discussed below. In hindsight, these two criteria were also evident in the Virginia Tech process.

Budget allocation and accountability — Many business consultants and academic case studies prefaced budget planning with strategic planning or interwove the two. Meaningful plans for change usually require reallocation of budget lines or new infusions into the budget. In addition, someone must be held accountable to see that new or different budget allocations are carried out. Otherwise, the best intended plans may not be implemented.

Planning staff expertise and/or training of participants — Knowing techniques and steps in planning requires professional experience. If an academic organization does not have a full-time planning staff, then they should assign the planning functions to an administrative office and provide adequate support staff. Consultants, either outside or inside the academic organization can provide this expertise or training. Outside consultants can offer a map for procedures and help train insiders.

Table 2 lists the Success/Fail Criteria identified by author or source. I identified the following criteria from business-related literature: mission statement, planning staff expertise and/or training for participants, champion, and relationship to budget allocation. I identified the same four criteria in the academic planning case studies and academic planning research journals in addition to the following two criteria: time availability and schedule and strength of faculty governance/need for participation. I identified all six criteria from the Virginia Tech College of Engineering planning process.

Interviews with academic planning experts (directors of planning at other universities, or deans of engineering) supported these six success/fail criteria. The interviews did not surface any new criteria that were equally critical to ensure achieving the desired planning outcome through identification of an appropriate planning methodology.

**TABLE 2**

**Success/Fail Criteria Found Through Research by Source**

<u>Criteria</u>	<u>Author(s) or Source</u>
Mission Statement	Goodstein, Pfeiffer, Nolan; Levitt; Gup; Fitzgerald; Keller; Kieft; Hipps; Chan; Virginia Tech.
Time Allotted	Kieft; Haas; Adams; Helms; Sink; Schmidlein and Milton; Stuart; Virginia Tech.
Staff Expertise/ Training	Raichle; Goodstein, Pfeiffer, Nolan; Kieft; Winstead; Hipps; Helms; Sink; Virginia Tech.
Faculty governance/ participation	Kanter; Keller; Lindquist; Hipps; Dill and Helms; Likens; Glower; Schmidlein and Milton; Chan; Stuart; Virginia Tech.
Budget/ Reallocation of resources/ Account- ability	Keller; Kieft; Keto and Helms; Likens; Schmidlein and Milton; Stuart; Glower; Winstead; Sink; Virginia Tech.
Champion	Keller; Kieft; Goodstein; Pfeiffer, Nolan; Levitt; Gup; Fitzgerald; Helms; Likens; Glower; Winstead; Hipps; Sink; Chan; Virginia Tech.

Date \_\_\_\_\_ Name \_\_\_\_\_ University \_\_\_\_\_

1. How were participants in planning effort selected?
  - Participative (all faculty)
  - Participative (representative faculty)
  - Small Task Force (Specify positions)
  - Administrators (Specify positions)
  - Combination of any of the above (Specify)
2. Were budget allocations tied to goals and objectives identified in plan?
3. What time period constitutes a planning cycle?
4. What types of recommendations appeared in plan?
  - strategic, new directions
  - operational changes
5. How many recommendations were made?
  - less than 5
  - 6-15
  - 16+
6. How many recommendations were implemented within two years?
  - less than 3
  - 4-6
  - 7-10
  - 11+
7. Who was the champion?
  - President
  - Dean
  - Another administrator (please specify position)
8. Who was the director of the planning effort (specify position)
9. Who provided staff assistance? (specify position and office)
10. Who facilitated the planning meetings? (specify position and office)
11. Were consistent forms used throughout the university?
12. What was the reaction from Deans and senior administrators to the planning effort?
13. Who appreciates the planning effort?
14. What are your plans for future planning efforts?
15. What were the difficulties you encountered?
16. What techniques or processes worked well?
17. How did you disseminate information on the planning effort?

**FIGURE 5**

**Interview Format for  
University Planners**

**TABLE 3**  
**PLANNING OUTCOMES IDENTIFIED IN THE LITERATURE**

1. Preparedness for future planning
2. Communication among faculty
3. Analyze strengths and weaknesses
4. Improve faculty performance
5. Refine program directions and attendant budgets
6. Define new mission for the institution and reallocate resources to implement



**TABLE 4**  
**PLANNING OUTCOMES BY CASE STUDY SOURCE**

<u>OUTCOME</u>	<u>INSTITUTION</u>	<u>DURATION</u>
Preparedness for future; communication	Western Washington University	1 yr
	Wichita State University	2 yrs
	Villa Maria College	6 mos
Analyze strengths, weaknesses; improve facul- ty performance	University of Akron	2 yrs
	Furman University	3 yrs
	Virginia Tech	3 yrs
Refine pro- gram direc- tion and budgets	Kansas City Metro. Community College	1 yr
	University of Minnesota	2 yrs
	North Carolina State University	2 yrs
	West Virginia University	2 yrs
	Carnegie Mellon University	3 yrs
	Lehigh University	3 yrs
Define new mission and reallocate resources	Columbia Teachers College	6 mos
	Hood College	1 yr
	The Ohio State University	1 yr
	University of Wisconsin System	1 yr
	Renselaer Polytechnic Institute	2 yrs
	Barat College	2 yrs

## *Results of Identifying Methodologies and Desired Outcomes from Interviews with Academic Planners*

I developed an interview form, Figure 5, and used it with three academicians involved in planning at Lehigh, North Carolina State, and Ohio State. All used their strategic planning process in conjunction with the annual budget cycle.

These interviews reinforced the literature in the choice of the formal-rational planning model. The interviews also reinforced the desired planning outcomes identified from the other sources. These planning outcomes are shown in Table 3. The search for data and information revealed six planning outcomes. In the Conclusions chapter, these six outcomes are further delineated to become eight planning outcomes. For example, preparedness for future planning in Table 3 is better defined as create awareness of external environment (see Figure 9, page 74). In Table 3, analyze strengths and weaknesses was divided into two possible outcomes in figure 9: tap faculty thinking on important topics and identify options for future direction. The academic institutions and their desired planning outcomes are shown in Table 4, page 62.

The planning methodologies used at these four universities resembled the 1989 VPC Planning Methodology, a form of the formal-rational model (Peterson, 1980). The formal-rational model includes steps of formulation of institutional mission based on institutional appraisal, development of goals and

objectives, establishment of broad program and resource strategies, selection of design of action programs, implementation, and review. Lehigh and North Carolina State directed their planning through the president's office. The Ohio State University and the University of Wisconsin System directed their planning through the dean's office and a blue-ribbon task force respectively.

The analysis of the information found through this research confirmed the need to develop a model to assist academic planners in selecting, preparing for, and implementing a strategic planning process to produce a college's desired planning outcomes. Also, the results point to the need to include such activities as social events and outside consultant presentations into the agenda. An effective model must include all aspects of the planning process: methodology, agenda, and timetable. This model for selecting a planning methodology and implementing the planning process is discussed in the Conclusions Chapter.

## Conclusions

### *Summary*

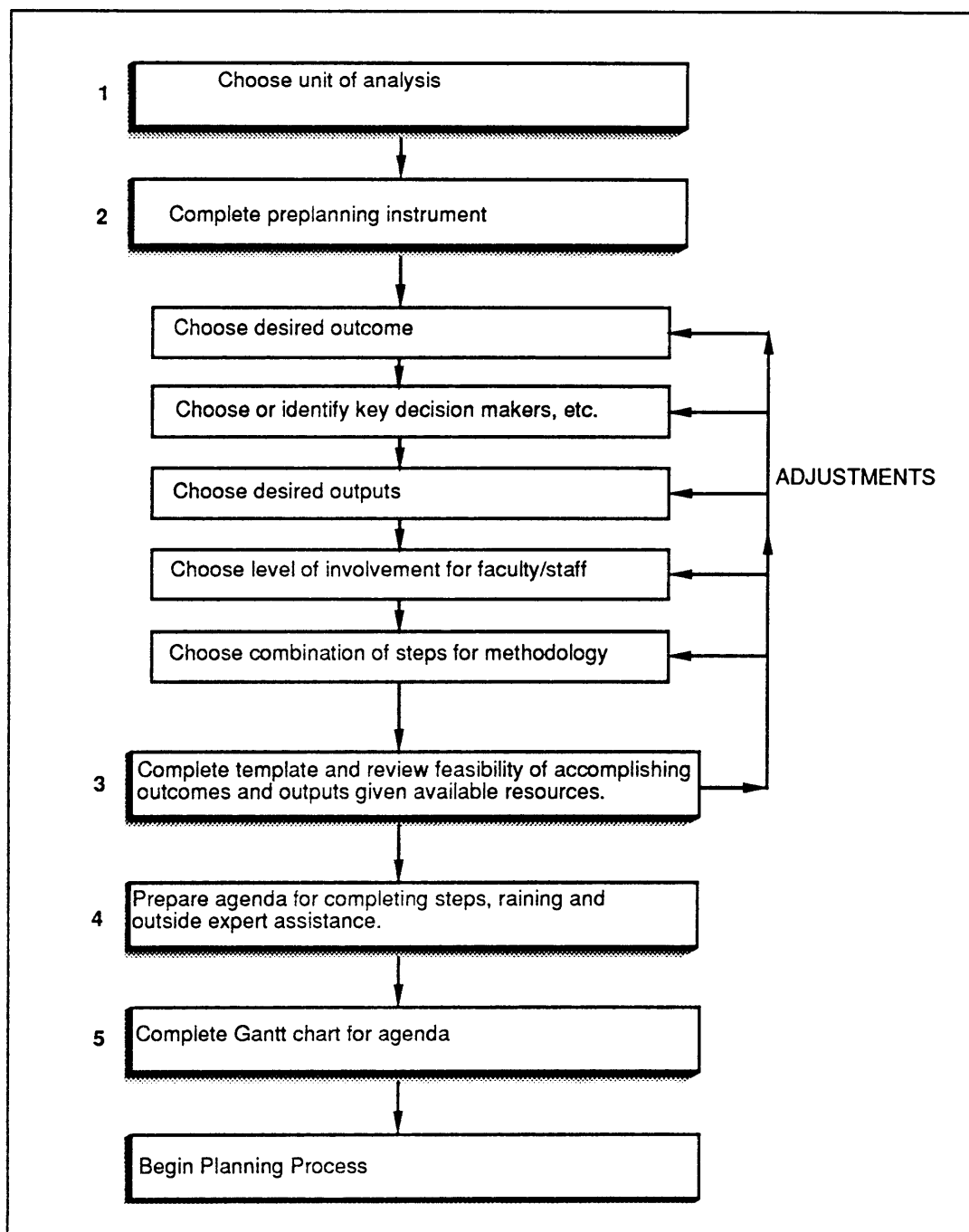
I identified the combination of six success/fail criteria and the final eight planning outcomes from the literature and the Virginia Tech observation. I incorporated the planning steps from the 1989 VPC Planning Methodology and designed a model for selecting a strategic planning methodology and implementing a planning process for colleges of engineering. The model can be used in two cases: the planning unit initiates the planning or a superior office requests a plan from the unit. I'll talk more about the unit of analysis later in this section, but briefly, the unit is the domain considering a planning effort. Incorporating the results of this research and the planning steps from the VPC Planning Methodology, the model leads the planner through an initial design and schedule for the strategic planning process. This model includes a preplanning instrument which is a list of questions. The answers to these questions will complete a template identifying a recommended planning methodology. The methodology is a combination of steps from the VPC Planning Methodology. These steps form a structured approach to meet the desired outcomes and outputs of the planning effort. The combination of desired outcomes, outputs, preference for faculty/staff involvement, selected

planning steps, and an agenda for the planning effort are the components of the template. The final step of the model is to schedule an agenda onto a Gantt chart.

### *Description of the Planning Model*

This section will describe the model and its components: the preplanning instrument, the template and the Gantt Chart, in that order. Before many people have invested time in planning meetings, the academic planner will need to organize and structure an agenda. The planner, alone or with or a small group of faculty/staff, also needs to think through the unit of analysis for planning, a list of desired outcomes (results achieved after three months or longer), outputs (results achieved immediately or within the next three months), and the preference for involving the faculty and/or staff at each stage of the planning.

The steps in the model for initial design of a planning process are: 1) Choose the unit of analysis for the planning methodology. 2) Complete the preplanning instrument by selecting the desired outcome, identify key decision makers and key players, choose desired outputs, choose level of involvement for faculty/staff in each output, and choose a combination of planning steps to form the methodology. 3) Complete the template. 4) Schedule the agenda for each planning step in the methodology including social and education events and 5) Complete Gantt chart. Figure 6 displays the model for selecting a



**FIGURE 6**

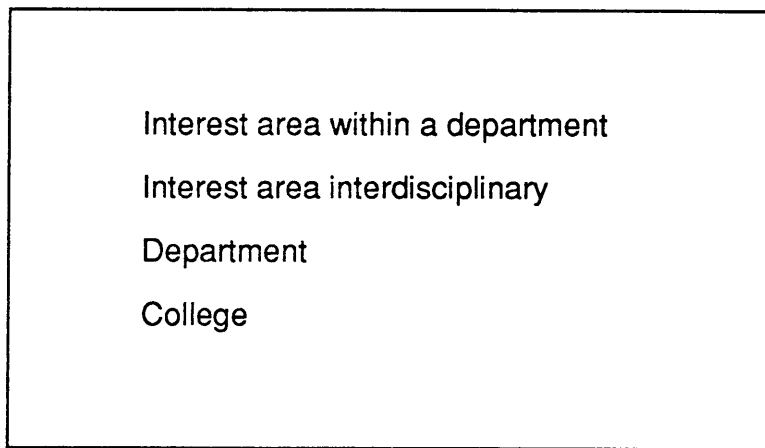
**MODEL FOR SELECTING AND IMPLEMENTING A STRATEGIC PLANNING  
PROCESS FOR COLLEGES OF ENGINEERING**

planning methodology and scheduling a planning process for a college of engineering.

### *Choosing the Unit of Analysis*

The unit of analysis refers to the organization which the strategic plan will consider. Four options exist: 1) a research or teaching area within a department; 2) an interdisciplinary interest area among departments; 3) a department; and 4) the college including all departments. Smaller units of analysis such as an interest area within a department, can accommodate more involvement of faculty and staff throughout the planning effort. Larger units may need to limit the extent of faculty involvement in some steps to facilitate completion of the process. In addition to size of unit and their involvement, unit of analysis also implies complexity of strategic and tactical objectives and interfaces with other units. A strategic plan for the college may be more complicated than that of a department because of the probable interfaces with other university units. Fusing these interfaces into a comprehensive plan will require negotiation and perhaps more time than a plan for a department. This model does not address interfaces outside the college of engineering but leaves that for another research study. Figure 7 displays the options for unit of analysis.

If the dean is initiating a planning process, then he may decide the unit of analysis. If the requirement to plan is issued by the president's office, then



**FIGURE 7**

**UNIT OF ANALYSIS FOR PLANNING**



the unit of analysis may be decided by the president's directive. If planning arises from top-down directives, selecting the unit of analysis is almost automatic. If planning arises from the faculty or bottom-up, discussion and agreement on the unit of analysis for planning will require more time. In most of the case studies in the literature search, the president's office asked for a college plan assuming departments would be consulted in some way. However, the president did not inspect each college plan for individual departmental plans. The dean was able to use his judgement in extracting objectives from the departments for developing the college plan. Sometimes each department completed a plan, sometimes the dean involved only the department heads, and sometimes the dean wrote the college plan himself. In the Virginia Tech College of Engineering planning process, each department's plan was reviewed and considered. The departments presented plans to the college which were incorporated into a college plan.

### *Completing the Preplanning Instrument*

The questions in the preplanning instrument, Figure 8, are designed to uncover any problems that might inhibit or impede reaching the desired outcome of the planning effort. Some problems can be resolved before planning begins. Other problems can only be recognized and adjusted for before planning begins. In any case, the objective is to be aware of and alert to the true situation.

1. Why are you planning?
  - a. respond to request from superior office
  - b. transition from one management style to another
  - c. transform unit to new area or level of performance
2. What approach do you think will be best suited to your reason for planning?
  - a. evolution
  - b. revolution
  - c. combination of evolution and revolution.
3. How much time do you have to commit to producing the plan?
  - a. 1-6 months
  - b. 6 months-1 year
  - c. 1-2 years
4. Can budget allocations be tied to planning recommendations?
  - a. no change in 1-2 year budget
  - b. some changes in 1-2 year budget
  - c. substantial reallocation of program or administrative budgets in next year's budget
5. Who are the following people?
  - a. key decisionmaker(s) \_\_\_\_\_
  - b. champion \_\_\_\_\_
  - c. master \_\_\_\_\_
  - d. systems integrator \_\_\_\_\_
6. What is the desired outcome of this planning effort? (choose one)
  - a. create awareness among faculty of external environment
  - b. improve internal communication among faculty
  - c. tap faculty thinking on important topics
  - d. identify options for future direction
  - e. improve internal procedures and policies
  - f. improve faculty performance in teaching or research
  - g. improve existing programs and refine budgets
  - h. define new direction and mission for college
  - i. other
7. What are the corresponding outputs desired? (choose as many as apply)
  - a. Summary paper on external environment
  - b. New communication networks among faculty
  - c. Summary or consensus among faculty on important issues
  - d. List of identified strategic objectives
  - e. List of identified tactical objectives
  - f. Documented policies and procedures changes
  - g. List of new measures of faculty performance
  - h. List of new measures of program improvement
  - i. New organization chart and budget
  - j. Mission statement for new direction
  - k. other
8. What level of involvement of the faculty is desired in each output?
  - a. no involvement, information disseminated only
  - b. representative involvement through small group
  - c. all faculty invited to participate
  - d. faculty responsible for output
9. What planning steps will best meet the desired outputs and outcomes?

**FIGURE 8**

## **PREPLANNING INSTRUMENT**

The logic behind the choice of these questions in the preplanning instrument and their sequence form the framework of this research. Four of these questions, (3,4,5,8) relate directly to the success/fail criteria found in the literature. Questions 1,2, and 7 bridge the criteria with the selection of planning methodology through the steps in question 9 to meet a desired outcome, question 6. In effect, the preplanning instrument operationalizes the theory of successful academic strategic planning.

The first question in the preplanning instrument, why are you planning, will set the tenor of the planning process by identifying the purpose for planning. If the academic planner does not have a logical reason for planning, then the effort will lose credibility and support as time passes.

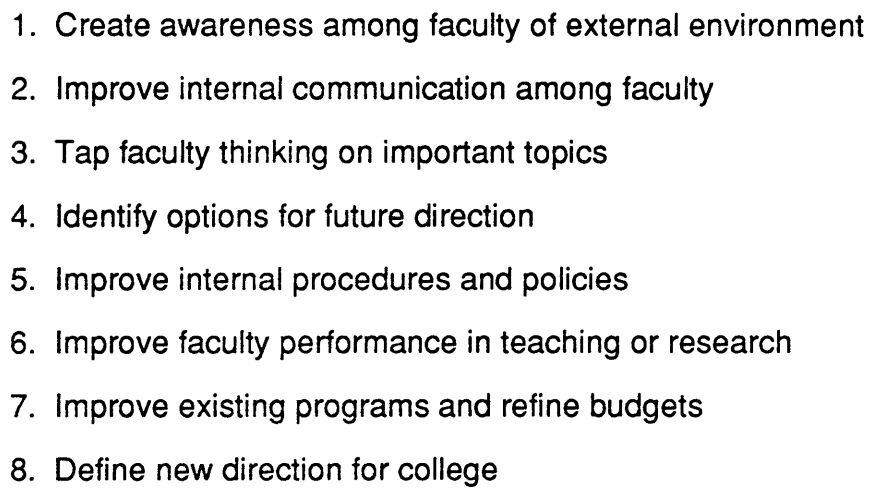
The second question, which approach is most suitable, suggests the timeframe for implementing recommendations of the plan. Evolution suggests a slower teaching, negotiating approach to any change. Revolution suggests a more autocratic approach because time is of the essence and the threats or opportunities are great and cannot wait for faculty discussions and consensus.

The next two questions, about timing and budgets (questions 3 and 4), surface situational variables which must be considered before choosing a desired outcome. If time is short and the budget is unalterable, then attainable planning outcomes are limited.

Next, the academic planner must consider desired outcomes of the planning effort (question 6) and who the key decision makers are or will be (question 5). The key players may affect the choice of desired outcome or vice versa. The champion, planning master, and system integrator are all necessary roles depending on the unit of analysis and the preference for involvement. These two questions of the preplanning instrument will set the scope of the planning methodology. Possible outcomes identified in the literature search are listed in Figure 9. These eight outcomes were enhanced from the six discussed in the Search for Data and Information chapter. This list of eight possible outcomes may not be exhaustive. The role of key players is described in Figure 10.

Next, the planner will decide what outputs are required (question 7) to meet the outcomes. The planning outcomes to which these outputs correspond is noted in parentheses. Outputs are generally tangible, physical evidence of an accomplishment. Outputs are short-term, some can be completed by the end of a meeting, others may require a few weeks or months. The list of ten outputs in Figure 11 gives examples and is not exhaustive. The planning unit may have a prescribed output required by a superior office that is not listed in Figure 11. This list is to stimulate thinking but can be added to at any time during the planning process.

Question eight investigates the level of involvement for the faculty and staff for each output. The level of involvement for each output will depend on time availability, quality of response needed, who has knowledge for that output,

- 
1. Create awareness among faculty of external environment
  2. Improve internal communication among faculty
  3. Tap faculty thinking on important topics
  4. Identify options for future direction
  5. Improve internal procedures and policies
  6. Improve faculty performance in teaching or research
  7. Improve existing programs and refine budgets
  8. Define new direction for college

**FIGURE 9**  
**LIST OF POSSIBLE OUTCOMES FOR ACADEMIC STRATEGIC PLANNING**

Key Decision Maker	one who has the authority to effect change.
Champion	one who promotes the need and value of planning. Must be respected and of a position to be a key decision maker.
Master	one who understands planning methodologies and can direct the planning effort.
Systems Integrator	one who administers the planning effort; seeing that documents and meetings are scheduled, completed, and reviewed.

**FIGURE 10**  
**ROLES TO BE FILLED FOR EFFECTIVE PLANNING**

- |   |       |
|---|-------|
| 1. Summary paper of current environment                           | (1)   |
| 2. New communication networks among faculty                       | (2)   |
| 3. Summary or consensus on important issues                       | (3)   |
| 4. List of prioritized strategic objectives                       | (4)   |
| 5. List of prioritized tactical objectives                        | (5)   |
| 6. Documented policies and procedures changes                     | (5)   |
| 7. List of new measures of faculty performance                    | (6)   |
| 8. Improvements in organizational structure                       | (5,6) |
| 9. Rearrangement of program domains and<br>reallocation of budget | (7)   |
| 10. Mission statement for new direction                           | (8)   |

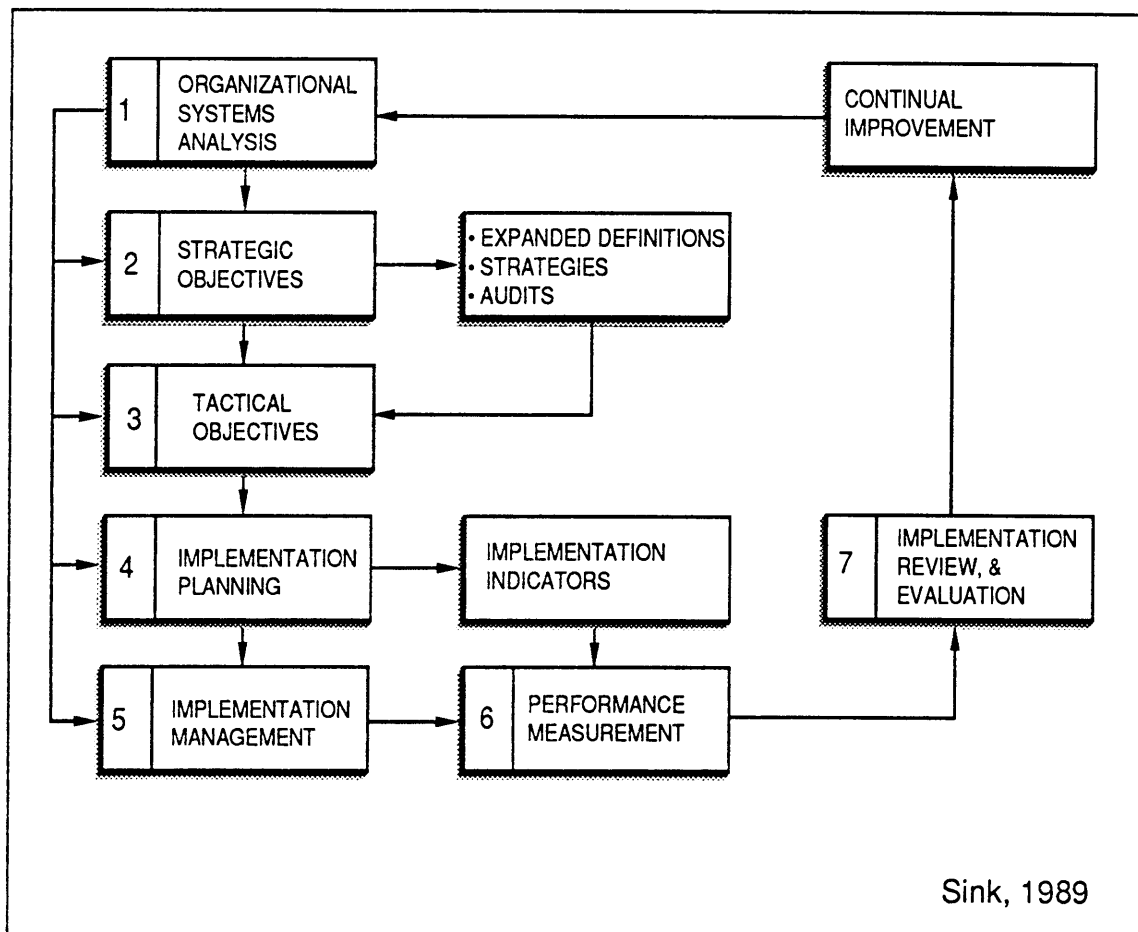
( ) refers to planning outcome that may require this output. See Figure 9 for list of possible planning outcomes.

**FIGURE 11**  
**LIST OF POSSIBLE OUTPUTS FOR ACADEMIC STRATEGIC PLANNING**

and the willingness and ability of the faculty/staff to participate (Vroom and Yetton, 1974). Some outputs demand a great deal of faculty/staff involvement. For the desired outcome, e.g., tap faculty thinking on important topics, the related outputs 1,3, and 9 obviously call for widespread faculty involvement. On the other hand, the outcome of refining or reallocating budgets will have an output such as 9 best completed by one or a few people who have a global and unbiased view of all units as well as a view of the external environment.

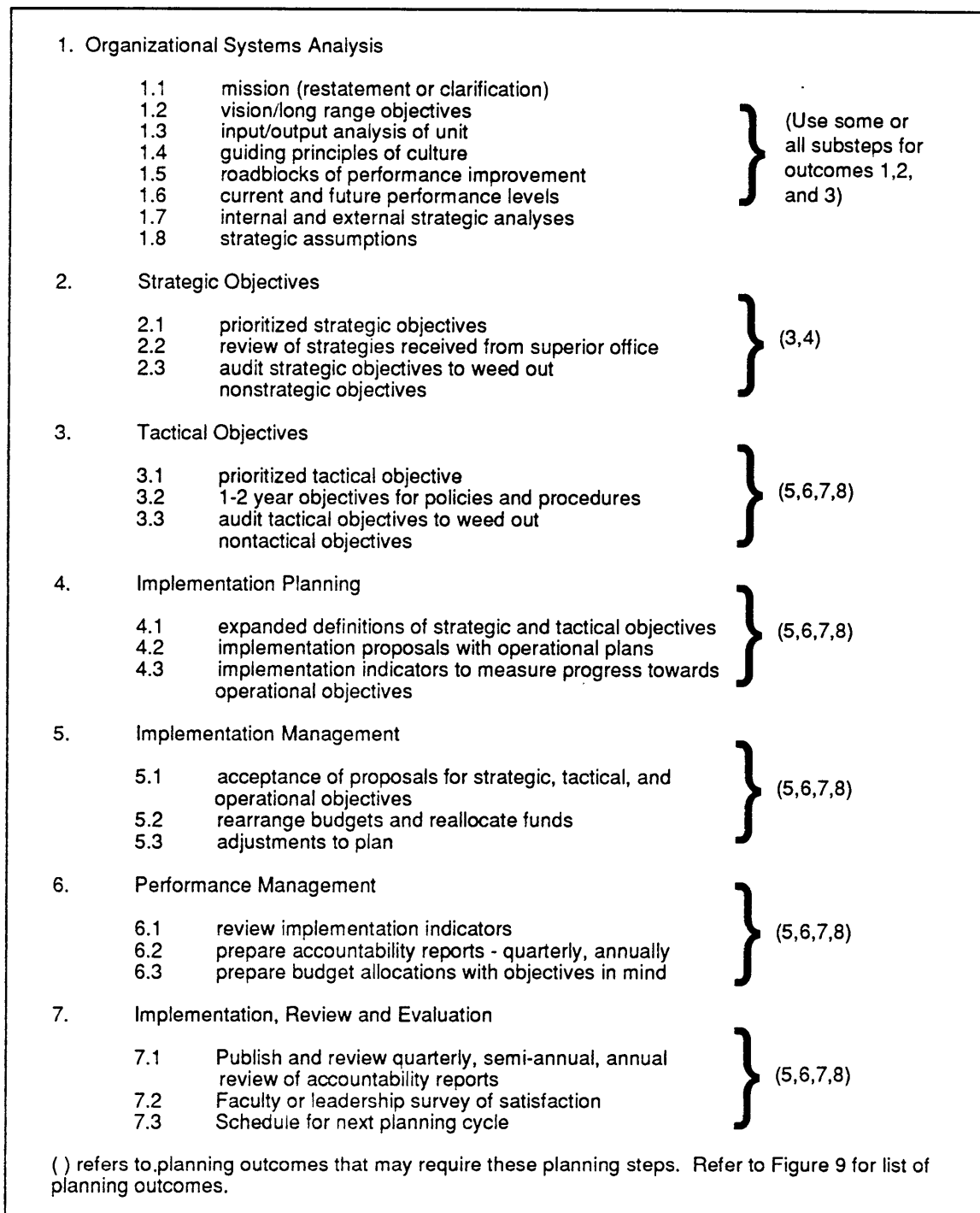
Question nine requires the planner to review the planning substeps of the 1989 VPC Planning Methodology and choose those steps that best meet the desired outputs from question eight. Given the desired outcomes, outputs, and involvement of faculty/staff, the planner chooses a methodology from a combination of the planning steps of the VPC Planning Methodology which will best satisfy and meet the outputs and the outcomes. Figure 12 is a diagram of the 1989 VPC Planning Methodology and lists the steps of the VPC Planning Methodology with some substeps enhanced for the colleges of engineering by this research. The planning outcome most related to each step is shown in parentheses. The planner will select those steps and/or substeps which seem best suited to the desired outputs and outcomes. Appendix C gives a more complete discussion of each substep. Once again, faculty involvement should be identified for each substep. The list of desired outcomes, outputs, faculty involvement for each, and the selected planning steps will be transferred to the template.





**FIGURE 12**  
**1989 VPC PLANNING METHODOLOGY**

(Continued)



**FIGURE 12 (Continued)**

**PLANNING STEPS**  
**VPC PLANNING METHODOLOGY**

## *Completing the Template*

Figure 13 is the template for the initial design of an academic planning process. In columns 1-5 the desired outcomes and outputs, and selected planning steps will be copied to the template, noting the faculty involvement preference for the outputs and the planning substeps. A final review of these selections should satisfy the planner that the outcomes and outputs are reasonable to accomplish given the commitment of key players, time, and budget. If this final review does not indicate likely achievement of the desired planning outcome, then either more resources must be directed to planning or an outcome of narrower scope must be accepted. This review will be dependent on conditions at the college using this model.

## *Preparing the Agenda and Completing the Gantt Chart*

The substeps can then be scheduled for an agenda in column 6. The agenda can include more than the planning steps. The planner may want to include training sessions in the agenda so that the planning steps are conducted more smoothly. Outside experts may need to be included in the agenda, especially if they provide education during the substeps dealing with external environments or solutions to problems identified during the planning effort. Outside experts may also fill the role of planning master by facilitating meetings as an unbiased leader.

<sup>1</sup> DESIRED OUTCOMES	<sup>2</sup> DESIRED OUTPUTS	<sup>3</sup> INVOLVE FACULTY	<sup>4</sup> STEPS SELECTED	<sup>5</sup> INVOLVE FACULTY	<sup>6</sup> AGENDA

**FIGURE 13**  
**PLANNING TEMPLATE**

The planner may know of related ideas or situations which will affect planning methodology selection for the desired outcomes. These related situations may also affect the scheduling of the agenda and should be considered when finalizing the agenda.

The final agenda including substeps, training, and perhaps, social events can be drawn on a Gantt chart. This Gantt chart will provide two benefits: a schedule for the college's calendar, and a measurement tool for VPC Planning Methodology, step 6, Performance Management.

### *Descriptions of Example Designs for Planning Outcomes*

The data from the literature search and the Virginia Tech planning effort revealed four of the eight desired planning outcomes as the most commonly selected by academic planners. These four planning outcomes from Figure 9 are: 2) improve communication among faculty, 4) identify options for future direction, 7) improve existing programs and refine budgets, and 8) define new direction for college. I'll use the model and discuss it in detail for Example A. Possible planning steps to be used for the desired outcomes of 2, 4, and 7 are listed respectively in Figures 14-16. Outcome 8, defining new directions for the college, represents the most complicated planning outcome and probably requires all the steps in the VPC Planning Methodology. Example A will discuss one of the simplest planning outcomes to achieve. Choosing the planning methodology and scheduling the planning process for outcomes 4,7, and 8 is similar to the discussion for Example A.

**Outcome - Improve internal communication among faculty**

**Organizational Systems Analysis**

- 1.1 mission (restatement or clarification)
- 1.4 guiding principles of culture
- 1.5 roadblocks to performance improvement

**FIGURE 14**

**PORTRAYAL OF METHODOLOGY FOR PLANNING EXAMPLE A**

**Outcome - Identify options for future direction**

**Organizational Systems Analysis**

- 1.1 mission (restatement or clarification)
- 1.2 vision/long range objectives
- 1.3 input/output analysis of unit
- 1.4 guiding principles of culture
- 1.5 roadblocks to performance
- 1.6 current and future performance levels
- 1.7 internal and external strategic analyses
- 1.8 strategic assumptions

**Strategic Objectives**

- 2.1 prioritized strategic objectives
- 2.3 audit 2.1 to weed out nonstrategic objectives

**FIGURE 15**

**PORTRAYAL OF METHODOLOGY FOR PLANNING EXAMPLE B**

**Outcome - Improve existing programs and refine budgets**

**Organizational Systems Analysis**

- 1.1 mission (restatement or clarification)
- 1.2 vision/long range objectives
- 1.4 guiding principles of culture
- 1.6 current and future performance levels
- 1.7 internal and external strategic analyses
- 1.8 strategic assumptions

**Strategic Objectives**

- 2.1 prioritized strategic objectives

**Tactical Objectives**

- 3.1 prioritized tactical objectives

**Implementation Planning**

- 4.2 implementation proposals with operational plans
- 4.3 implementation indicators to measure progress toward objectives and operation plans

**Implementation Management**

- 5.1 acceptance of proposals for strategic, tactical and operational plans
- 5.2 rearrange budgets and reallocate funds
- 5.3 adjust plans as needed for unexpected events

**Performance Measurement**

- 6.2 prepare accountability reports
- 6.3 prepare future budgets with objectives in mind

**Implementation Review and Evaluation**

- 7.1 publish and review quarterly, semi-annual, and annual accountability reports
- 7.2 survey faculty and leadership satisfaction with progress
- 7.3 schedule next planning cycle

**FIGURE 16**

**PORTRAYAL OF METHODOLOGY FOR PLANNING EXAMPLE C**



### *Example A*

The setting for this planning effort begins with a new dean of engineering for the fictitious University America. He begins by reviewing the planning model and chooses the entire college as the unit of analysis. Next, he answers the questions on the preplanning instrument.

His planning purpose (question 1, Figure 8) is to transition from one management style to another, from the past dean's style to his own style. He thinks evolution is the best approach (question 2, Figure 8) since University America's College of Engineering is reasonably successful and does not require a rapid change in any area. He wants to commit six months to one year to the initial planning (question 3, Figure 8) and sees no budget changes in the next year (question 4, Figure 8). He plans to be the key decision maker, champion, and master (question 5, Figure 8) since he has directed previous planning efforts at another college. He will ask his associate dean to act as the systems integrator, setting up meetings, coordinating and disseminating reports, and providing other administrative support as needed.

The dean decides the desired outcome (question 6) is to improve internal communication among faculty. He chooses two outputs (question 7). The first desired output is new communication networks for the faculty, whatever form that may take as a result of the planning process. The dean envisions bold changes in the next five years and knows the faculty will need to learn team-

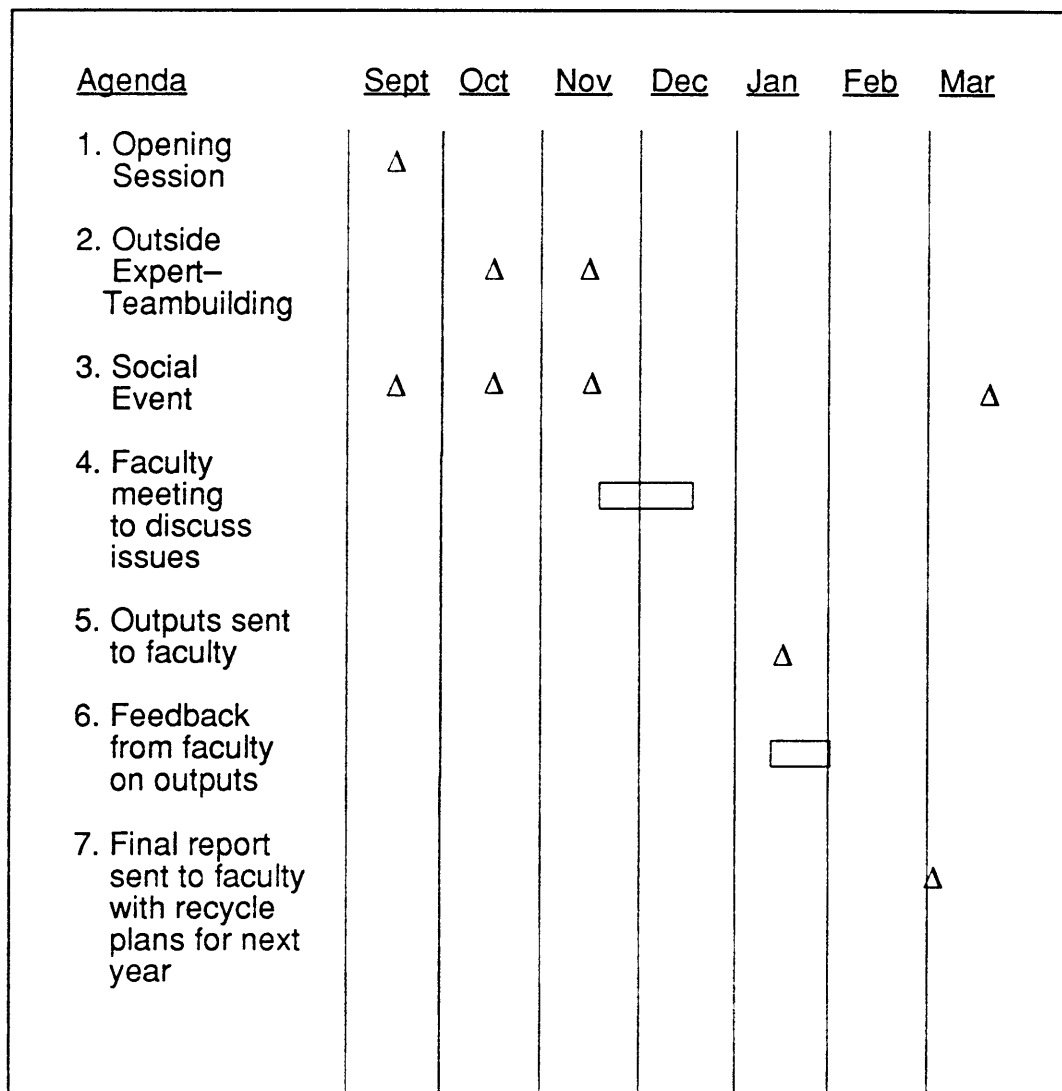
work before any substantive changes can be planned. He also wants to record the faculty consensus on certain issues and will want another output, a summary of those issues as a report to all faculty. Since this planning outcome, improve internal communication, involves the faculty thinking, he will invite all faculty to participate and consider a reward of some sort to encourage full participation.

The dean keeps these answers in mind as he reviews the planning steps from the VPC Planning Methodology (question 8). He determines the substeps which will provide the desired outputs and the desired outcome are three substeps in step one of the VPC Planning Methodology (Figure 12), Organizational Systems Analysis. The substeps he chooses are: 1.1 - mission restatement or clarification; 1.4 - guiding principles of culture; and 1.5 - roadblocks to performance improvement. He converts these selections to the columns on the template shown in Figure 17.

After reviewing the template entries, he decides he is ready to schedule an agenda. In addition to the planning steps, the dean thinks an outside consultant would be helpful in training faculty in teambuilding and he thinks occasional social events would increase effectiveness of the planning process. Column 6 on the template, Figure 17, shows the agenda. The Gantt chart, Figure 18, schedules the agenda on a timeline.

<sup>1</sup> DESIRED OUTCOMES	<sup>2</sup> DESIRED OUTPUTS	<sup>3</sup> INVOLVE FACULTY	<sup>4</sup> STEPS SELECTED	<sup>5</sup> INVOLVE FACULTY	<sup>6</sup> AGENDA
Improve internal communication among faculty	1. New communication network	1. yes	1.1	1.1 No, dean will present	Opening Session 1.1
	2. Summary on issues & consensus	2. yes	1.4	1.4 Yes, faculty meeting	Teambuilding Session
			1.5	1.5 Yes, faculty meeting	Social Event
					Faculty Meeting 1.4, 1.5
					Output to Faculty
					Feedback from Faculty
					Final Report Sent to Faculty

**FIGURE 17**  
**PLANNING TEMPLATE FOR EXAMPLE A**



**FIGURE 18**  
**GANTT CHART FOR EXAMPLE A**

## *Recommendations Regarding Academic Planning*

In reviewing the gestalt of my research effort, I offer the following conclusions to academic planners for their consideration.

1. Be realistic about what you can achieve or what battles you're willing to fight. Planning is not a panacea or a worthless effort but somewhere in between.
2. The dean must first decide whether he wants to choose the desired outcome autocratically or in consultation with the faculty.
3. The champion and/or planning staff should be prepared to adjust their tactics and techniques depending on the phase the planning is in.
4. Guard against requests for administrative decisions creeping into plans. Administrative details that require only a decision bog down the progress of true strategic planning.
5. Plans should be measurable or little progress will be made. Plans should include measurability and inspection of those measures. This point is especially made in VPC's Planning Methodology and in talking with planning directors at North Carolina State University.
6. If the strategic plan is to be part of every decision, promote public relations to remind people of the plan. The plan and results against the plan must be constantly published and referred to.

## *Recommendations for Virginia Tech's College of Engineering*

The College of Engineering at Virginia Tech must first select the planning outcome they want. They must constantly publicize the selected outcome so it will not get lost in the shuffle as did their previous outcome of performance improvement. In discussions with the Dean, he would choose improve existing programs and refine budgets as the planning outcome in 1989. He would commit six months and will involve the faculty through small representative groups. The model generated from this research recommends the sequence of substeps previously shown in Figure 15 for achieving this planning outcome.

Based on the three-year observation, 1985-1988, the following recommendations may help in implementing this methodology in the College of Engineering.

1. Involve only department heads, deans and selected faculty; long-term, involved people.
2. Weed out strategic issues from those requiring only administrative decisions or policies.
3. Limit the number of recommendations in the plan.
4. Maintain continuity of membership throughout the planning effort.
5. Have a schedule for completion before involving too many people and stick to it.
6. Analyze the need for faculty review.
7. Analyze and choose the definition of consensus.

## Recommendations for Future Research

The model developed from this research has not been validated. Using this model to select a planning methodology and to schedule a planning process is the next step in determining its value. The success of the model depends on whether the college of engineering achieves its desired planning outcome. Extraneous environmental and personnel factors will also affect the college's ability to achieve its desired planning outcome. If the model can be shown to increase efficiency through saving time and resources, and increase the effectiveness of the outcomes of a strategic planning process, then the model will have merit.

The list of desired outcomes as well as other questions in the preplanning questions need to be tested for clarity and validity.

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## Appendix A

### *Virginia Tech College of Engineering Strategic Planning Process, 1985-1988*

This research study included an observation of a strategic planning process in the College of Engineering at Virginia Tech. The observations spanned three years, 1985-1988. This section will discuss the following:

1. Research setting
2. Description of the College of Engineering's  
chosen planning methodology
3. Description of the planning process
4. Observations made during the planning process
5. Summary of strategic planning action team  
recommendations

### *Research Setting*

During 1985-88, the College of Engineering at Virginia Tech conducted a participative strategic planning effort that included all tenure-track faculty, approximately 270 professionals. While not faced with any severe threat or

obvious opportunity, the Dean of Engineering felt the need to consider options for future success.

Virginia Tech experienced tremendous enrollment growth during the twenty-year period 1965-1985. Enrollments grew from 4,000 to 22,500. National stature increased along with enrollments; faculty were recognized experts in many areas. Engineering student profile was among the highest for large land-grant universities. The college is seventh largest college of engineering in the U.S. and ranks 18th nationally in the amount of research dollars expended in 1987.

The College of Engineering at Virginia Tech has 12 degree granting majors housed in 10 departments. In addition to the 10 departments, the college includes the Dean's Office and an Engineering Fundamentals Division which teaches and advises engineering freshmen. These 12 departments have separate budgets, although the Dean's Office allocates all resources provided by the university to engineering. Department heads report directly to the Dean and serve at his pleasure. The department heads meet weekly as a group with the Dean and the Dean's staff.

The Dean allows considerable autonomy to the department heads. Each department manages its own faculty hiring, curriculum, and initial promotion and tenure decisions. The Dean meets with the individual department faculty on an annual basis to discuss the strengths and weaknesses of the

department as well as their satisfaction with their department head. A more formal review of the department head is conducted at approximately five year intervals.

### *Description of College of Engineering Planning Methodology*

In early spring 1985, the Dean of Engineering felt the college was ready for new challenges. The college had just completed several endeavors which had placed it on a new plateau of success: a PC computer initiative integrated into the curriculum, private funding for 30 chaired professorships, an increasingly high-quality student profile, and increased research funding. New additions to engineering buildings and reassignment for engineering use of existing university buildings added to the other successes.

In April, 1985, the Dean appointed a committee of six faculty to produce a strategic plan for the college for the next five to ten years. The committee was comprised of 2 associate professors, 2 full professors, 1 university distinguished professor, and 1 department head. Their time at Virginia Tech ranged from 3 years to 30 years. The committee members represented seven departments of various sizes; one of the professors held a joint appointment between two departments.

The Dean asked the committee to offer suggestions for opportunities or chal-

lenges for the college to address. The Dean met with the committee for its initial meeting to discuss its charge. At the following meeting, the committee selected a participative approach in developing the strategic plan. The committee also selected performance improvement for the college as the desired outcome of the planning process.

The planning methodology selected by the committee was the 1986 VPC Planning Methodology (Figure 19, page 102) developed by the Virginia Productivity Center, (VPC). The director of the VPC was a member of the strategic planning committee. The 1986 planning methodology was similar to the 1989 methodology (Figure 12) discussed throughout this research study. The VPC combined three of the 1986 steps, (steps 1,2, and 3) and renamed some steps (step 4 became step 2, strategic objectives) to produce the revised 1989 methodology. The description of the 1986 planning methodology is shown in Figure 19.

The director of the VPC suggested the committee invite the faculty to participate in the planning process. The process was estimated to require one year for completion. The VPC Planning Methodology had been used in several industrial settings, Burlington, Naval Research Lab, etc. The process had also been used at two other universities, The Ohio State University and Okla-



Step 1	<b>Internal Strategic Audit</b> What internal factors (strengths, weaknesses, problems, needs, trends, etc.) should/must we consider as we develop the strategic plan?
Step 2	<b>External Strategic Audit</b> What external factors (trends, constraints, threats, opportunities) should/must we consider as we develop the strategic plan?
Step 3	<b>Planning Assumptions</b> Convert the data from Steps 1 and 2 into clearly stated planning assumptions that our strategic plan will be based upon.  Importance/certainty grid analysis
Step 4	<b>Strategic Planning</b> Development of consensus and prioritized strategic (2-5 years with an "eye" on the year 2000) goals and objectives.
Step 5	<b>Performance Measurement Criteria</b> Identification of performance measures or criteria against which the performance of the college over the next 1-5 years will be assessed. How will we know if we are accomplishing our goals and objectives and how well we are doing?
Step 6	<b>Action Planning</b> Development of consensus and prioritized action programs. What objectives will have to be budgeted for (time and/or money) during the next year in order for us to begin to move toward accomplishing our goals?
Step 7	<b>Action Team Assignment</b> Program/project planning, resource estimates, resource allocation, accountabilities, project management.
Step 8	<b>Implementation Evaluation</b>

FIGURE 19

THE 1986 STRATEGIC PLANNING METHODOLOGY APPLIED  
TO THE COLLEGE OF ENGINEERING AT VIRGINIA TECH

## *Description of the Planning Process*

Based on the autonomous nature of the 12 departments, the strategic planning committee chose to work separately with each department for initial planning sessions. The Dean wrote memoranda to the department heads and faculty asking for their support in responding to the requests of the committee.

Each department arranged a participative planning session using portions of the VPC Planning Methodology. Some departments completed steps 1-5 and others completed steps 1-6 of the 1986 VPC Planning Methodology. Department size ranged from 8 to 45 participants. Each department chose the setting and duration for the planning session. Setting choices were departmental conference rooms, continuing education center conference rooms, or off-campus hotel conference rooms. Duration varied from 3-1/2 hours to 8 hours.

Each department session was conducted by a strategic planning committee member as a facilitator and often an additional committee member as an assistant. The facilitator was always from another department so that bias was minimized. The department planning sessions were to focus on goals relevant to their own unit for the next 2-5 years.

The VPC Planning Methodology uses the Nominal Group Technique (Delbeq, Van de Ven, and Gustafson, 1975) in certain steps to structure the faculty

participation. The Nominal Group Technique (NGT) was consistently used in all departments and the college session to generate prioritized consensus on strategic goals in step 4 of the 1986 VPC Planning Methodology.

A two-day college session occurred after all departments had participated and completed reports of those department sessions were completed. Each department sent the department head and one faculty to attend the college session. Some departments elected the faculty representative. In other departments, the department head selected the faculty representative. These people were joined by the Dean and Associate Dean for Administration in the college of engineering. The 1986 VPC Planning Methodology, steps 1-4 was conducted again, this time with the focus on identifying strategic goals for the college with the departments' goals in mind. The college session participants generated and prioritized 12 strategic objectives.

Typically, the VPC Planning Methodology expected the people who identified and prioritized the strategic goals to be members of the action teams which implemented the strategic goals through tactical and operational planning. However the participants in the college planning session chose not to continue as action teams.

Members of the college planning session volunteered to write scoping proposals for these 12 strategic recommendations before action teams addressed the tactical and operational planning. The purpose of the scoping proposal was to capture the intent of the discussions on the strategic objectives during the

college planning session and to structure a consistent approach for the action teams. On May 21, 1986, a forum was convened to discuss the scoping proposals so all faculty could once again offer opinion and advice on the direction of the planning effort. In the strategic planning committee's final report to the faculty, May 21, 1986, Sink offers the following summary of progress to date:

"The planning process chosen to be implemented in the college of engineering focuses primarily on performance improvement planning. The process assumes that conventional business planning that focuses on budgets, facilities, equipment, staff, etc., is occurring effectively. The process we utilized tended to result in identification of goals and objectives, that either had been overlooked in the past, that represent problems or roadblocks to improved performance, or that represent opportunities we need to capitalize on at the Department and College levels." (Sink, et al., May 21, 1986).

At the end of the forum which included a presentation of the strategic planning committee's final report and discussion on its contents, faculty volunteered to serve on action teams for tactical and operational planning of the strategic objectives.

Not all action teams had three members after the volunteering, so the Dean solicited department heads and other faculty to complete the action team membership. The action teams met for one calendar year, 1986-87, and discussed the strategic planning objectives assigned to their team. In December, 1986, the Dean requested an update meeting with the action team

chairs. The twelve action teams submitted final reports to the Dean on recommendations for the 12 strategic objectives in August, 1987. Shortly after, in Fall, 1987, the Dean became the Interim President. The Interim Dean assumed the leadership role in the planning effort. He had been an action team chair and felt strongly about the need to finalize the planning effort. The Interim Dean compiled a report of all action team final reports of recommendations and sent a complete set to each department for faculty review.

The VPC Planning Methodology assumed that the output of the action teams would be step seven: program/project planning, resource estimates, resource allocation, accountabilities, and project management. However, the output of the action teams was a list of tactical recommendations for each of the 12 identified strategic objectives. Operational planning which would have dealt with resource allocation, accountability, and project management was not completed. While the scoping proposals briefly addressed step five and six of the 1986 VPC Planning Methodology, they did not fully explore or state the performance criteria for assessment of success. Nor did they discuss budgets of time or money to reach any of the recommendations. Thus, a key point of step six, budgeting, was not accomplished in the planning process and unfortunately, no one noticed until much later. Development of consensus and prioritized action programs were not accomplished in step six. Some programs were suggested in step seven, but attention to resources or budgets was not mentioned.

The Interim Dean first discussed with the department heads and the EFO

which recommendations were in their respective domains. After these recommendations were assigned to the deans and department heads, the EFO, or the larger university, the Interim Dean set an agenda to discuss and resolve recommendations. He met with Department Heads and the Engineering Faculty Organization executive chair several times in the first eight months of 1988. In August, 1988, the Interim Dean issued a Status Summary Report on the Strategic Planning Recommendations to the faculty. The Interim Dean returned to his prior position as Associate Dean when the Interim President returned in September, 1988.

### *Observations Made During the Planning Process*

A timeline of the critical incidents for the planning process is shown in Figure 20. The agenda was not planned, but rather evolved as time passed and personnel changed.

The observations documented during the planning process sometimes related to critical incidents, but often related to group dynamics and logistical issues. The observations are categorized as follows: general, process, dean, department heads, and faculty. The list of observations are shown in Figure 21.

1985	J	
	F	
	M	
	A	Dean considers planning
	M	Dean appoints committee, committee choose chair
	J	
	J	
	A	
	S	Committee chooses a participative planning process
	O	Dean approves process, literature sent to depts
	N	Departments choose time, place of planning session
	D	Departments conduct planning sessions
1986	J	Dept Heads, selected faculty conduct college session, faculty surveyed on satisfaction
	F	Scoping proposals written
	M	Dean reviews scoping proposals
	A	Proposals reviewed by faculty
	M	EFO meets to discuss, action teams initiated
	J	
	J	
	A	
	S	Action teams begin meeting, new EFO chair
	O	
	N	
	D	
1987	J	Dean reviews status of action teams
	F	
	M	
	A	
	M	Action team reports to dean and faculty
	J	
	J	
	A	Summary of action team recommendations sent to faculty
	S	Dean begins department head discussions
	O	
	N	Dean announces he will become Interim President
	D	Interim Dean continues discussions w/dept heads
1988	J	Dept heads continue to discuss
	F	EFO discusses recommendations, dept heads continue
	M	EFO sends questionnaire to faculty on teaching evaluation recommendation
	A	EFO tables other recommendations, depts continue
	M	Interim Dean begins summary report of progress
	J	Work on summary report
	J	Work on summary report
	A	Semester begins, Interim President returns as Dean
	S	Summary sent to faculty, new EFO chair
	O	
	N	
	D	

**FIGURE 20**

**TIMELINE OF CRITICAL INCIDENTS  
IN VIRGINIA TECH PLANNING PROCESS**

## *A Summary of the Strategic Planning Action Team Recommendations*

A summary of action team recommendations was sent to the faculty in August, 1987. That summary is shown in Figure 22. A categorization of the 66 recommendations is listed at the beginning of Figure 22. A review of those recommendations shows that most of the recommendations applied to policy or administrative decisions and were not necessarily strategic in nature. Although some recommendations recommended new buildings or new programs, they were beyond the authority of the college to control. A lesson learned from this planning effort at Virginia Tech is to restrict the number of objectives generated and prioritized. The strategic objectives generated must be refined to assure they are strategic in nature. Otherwise, the strategic objectives from the planning methodology may end up being a wish list and not doable projects for improving the efficiency or effectiveness of the College of Engineering.



### **OBSERVATIONS - GENERAL**

1. Provost changed after year 1.
2. President changed after year 2.
3. Dean changed after year 2.
4. Two Vice-presidents changed after year 2.
5. Governor changed after year 2.
6. Board of Visitors changed after year 2.
7. Two engineering department heads changed after year 2.

**FIGURE 21**

**OBSERVATIONS OF VIRGINIA TECH PLANNING PROCESS 1985-1988**

### **OBSERVATIONS - PROCESS**

1. Training consisted of pre-workshop distribution of workshop manual.
2. Time schedules for department planning meetings varied.
3. Most faculty disagreement was about NGT consensus definition.
4. Larger departments were less efficient than smaller departments during planning meetings.
5. Compared to larger departments, smaller departments did not have different issues with the exception of enrollment concerns.
6. Compared to smaller departments, larger departments identified broader issues.
7. The sorting of identified issues into problems, decision analysis, and implementation was not done at any stage in the first two years. This was an important oversight.
8. College looked to Scott Sink for the next step in process until action teams were assigned in year 2. People did not feel engaged until then.
9. The scoping teams were not the same people as the action teams, causing discontinuity.
10. The number of major recommendations considered by:

EFO:	9
Dean, Dept. Heads:	22
University Officials	33

**FIGURE 21**

### **OBSERVATIONS OF VIRGINIA TECH PLANNING PROCESS 1985-1988**

### **OBSERVATIONS - DEAN**

1. The Dean's reason for initiating strategic planning process was not re-emphasized during process.
2. The Dean was surprised by amount of time needed for process.
3. The Dean was experienced and could have resolved most recommendations by himself.
4. Working with the Provost, the Dean was successful in increasing the resource allocation to support graduate programs in engineering.
5. The Interim Dean was interested in detail and finalizing the process - really pushed action team chairpersons and department heads for closure.
6. Interim Dean had served as chair of an action team.
7. Interim Dean organized the status summary so faculty would be informed of results.

**FIGURE 21**

**OBSERVATIONS OF VIRGINIA TECH PLANNING PROCESS 1985-1988**

### **OBSERVATIONS - DEPARTMENT HEADS**

1. Autocratic department heads were more outspoken during planning sessions.
2. Except when discussing recommendations for research, department heads sent substitutes 1/3 of the time to department head/dean meetings.
3. Some department heads complained when the Interim Dean requested their opinions in writing on action team recommendations.

### **OBSERVATIONS - FACULTY**

1. Full professors had broader view of department, college, and university.
2. During department planning meetings, identified departmental issues often polarized around specific research areas.
3. Half the faculty surveyed had negative comments about the process regarding "too much time" taken for the planning effort.
4. More than half of the faculty came to planning sessions unprepared - had not read workshop manual.
5. Faculty seemed to enjoy the social aspect of planning sessions.
6. EFO leadership declined to act on any issue but teaching evaluations.

**FIGURE 21**

**OBSERVATIONS OF VIRGINIA TECH PLANNING PROCESS 1985-1988**

**College of Engineering**  
**Strategic Planning Action Team Recommendations**  
**1987**

- I. Completed Changes**  
3 Recommendations
- II. Consensus Needed**  
10 Recommendations
- III. New Policy--No Faculty Consensus Needed**  
9 Recommendations
- IV. Recommendations for Larger University**  
27 Recommendations
- V. Dollars Required**  
8 Recommendations
- VI. New Committees**  
4 Recommendations
- VIII. New Responsibility for Existing Office**  
5 Recommendations

**FIGURE 22**

**STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS**

**College of Engineering**  
**Strategic Planning Action Team Recommendations**

1987

**I. COMPLETED CHANGES**

1. Grade, pave, and re-mark the existing gravel lot including the portion adjacent to Whittemore. Many more spaces can be created as a result of this action, for example, fifty more spaces were created in the CEC lot following re-painting. In addition paving will minimize dust, mud, and pot-hole problems which faculty and staff in this area have endured for so long. (#8)
2. Construct the lot planned between Turner and Stanger Streets. This lot will be necessary even if the existing gravel lot is paved since the total number of spaces available would still be inadequate. This situation becomes even more critical with the loss of spaces resulting from the construction of the Architecture-Engineering building. (#8)
3. A development officer for the College of Engineering has been hired. (#5)

**II. CONSENSUS NEEDED**

1. 75% U.S., 25% international mix in graduate program. (#1)
2. Undergraduate enrollment of 5,000; graduate 1,200. (#1)
3. Student/faculty of 12 to 1. (#1)
4. A 10% reduction in the total number of engineering undergraduates be effected by the 1991-92 AY. (#2)
5. The evaluation form completed by students at the end of the course would be mandatory. All faculty members would be required to submit evaluation forms for all courses. (#7)
6. Explicit recognition and appointments should be accorded to the following four segments of the College of Engineering faculty:
  - a. The Collegiate Faculty, i.e., those primarily concerned with on campus instructional and research programs.
  - b. The Engineering Fundamentals Faculty, i.e., those primarily concerned with the instruction of engineering freshmen.
  - c. The Engineering Extension Faculty, i.e., those primarily concerned with off campus credit and non-credit instruction.

**FIGURE 22**

**STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS**

- d. The Administrative Faculty, i.e., those primarily concerned with the administration of College activities. (#10)
7. Criteria for promotion in academic rank and the granting of tenure to the faculty identified in 1a-c should be adopted. These criteria should be distinct for the three groups and should reflect performance and achievement with respect to the assignments for each particular group. These criteria must be consistent with University policy but should reflect the particular attributes of the College of Engineering. A draft of a possible set of such criteria is attached as an Appendix to this Report. (#10)
8. The titles and academic ranks of assistant professor, associate professor, and professor should be strictly reserved for those faculty involved explicitly with teaching. (#10)
9. The academic ranks granted to those faculty identified in 1a-c should be modified to explicitly denote the faculty group, e.g.:
  - a. Associate Professor of Mechanical Engineering
  - b. Associate Professor of Engineering Fundamentals
  - c. Associate Professor of Electrical Engineering Extension (#10)
10. The College should establish two separate Tenure and Promotion Committees. The first committee would carry the traditional role of evaluating the Collegiate Faculty. The second committee would be responsible for the evaluations of engineering fundamentals and engineering extension faculty. (#10)

### III. NEW POLICY - NO FACULTY CONSENSUS NEEDED

1. The College and University establish a policy that overhead can be used only for the development and encouragement of research. (#2)
2. Ensure that the contributions of an individual faculty member in a team effort are recognized in the annual faculty review and tenure and promotion deliberations. (#2)
3. The College establish a committee to develop guidelines for the creation, operation, and dissolution of centers, groups, and laboratories as appropriate. (#2)
4. Added attention be given to other factors in assessing or evaluating research, including quality, the nature of the topic and how it fits in with the goals of the College and University, and the significance of the research and its potential impact on the field. (#2)
5. Faculty, department heads, deans and the University Administration make genuine efforts to learn about, and show greater interest in, the research going on in the College and University. (#2)

FIGURE 22

## STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS

6. Within the College of Engineering, the use and distribution of core research staff positions be re-examined to ensure that these positions are being used only for the support of research activities. (#2)
7. The end-of-course teaching evaluation form would be the only mandatory review process implemented. Peer review and in-class observation of instruction would not be mandatory. (#7)
8. Faculty members in administrative roles should be considered for tenure and promotion in academic rank under the criteria established for the faculty groups identified in 1a-c. The designation of appropriate functional titles, e.g., associate dean, assistant department head, etc., reflects the level of assigned responsibilities and duties. Recognition of excellence in performance of these functions should be through annual salary adjustments and functional titles. (#10)
9. A MENTOR Program teaming new faculty with experienced teaching and research faculty. At a minimum, a monthly luncheon seminar continue to orient and support mentor program participants. (#12)

#### IV. RECOMMENDATIONS FOR LARGER UNIVERSITY

1. The College and University seek to provide non-laboratory office space for all graduate students engaged in research programs. (#2)
2. The College and University Administration seek increased funds to cover the cost of maintenance and replacement of research and laboratory equipment and furniture. (#2)
3. The College strongly urge the Research Division to implement methods which will allow expenditures to be encumbered immediately. (#2)
4. Efforts be redoubled to get equitable GTA support/positions. (#2)
5. Research staff positions currently supported by the Research Division from the 30% indirect cost account be re-examined with a view to identifying reallocations that can be made to optimize total position use. (#2)
6. The Internal Auditor be requested to establish how a Project Director can be allowed to authorize the expenditure of contract funds without the need for a Department Head signature. (#2)
7. The University Administration provide resources to implement an electronic purchasing system. (#2)
8. The space for Engineering should be on campus, readily accessible to the faculty and students of the College of Engineering, suitable for the needs of the College, and free of financial encumbrance to the College for its acquisition or operation. (#3)

FIGURE 22

### STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS



9. Endorsement of a strong justification for increased growth of supporting personnel to the College totaling 61.5 FTE in an attempt to meet the carefully documented needs of the departments. (#6)
10. Campus Police (Parking and Vehicle Registration) issue parking permits annually so that only currently authorized vehicles have access to faculty/staff parking space (effective Fall 1987). (#8)
11. Designate a fraction of the parking spaces in close proximity of each Engineering Building as Faculty-Staff only (at all times, 24 hours per day, 7 days per week). This fraction should be determined in a more comprehensive survey over more than a two day span. Our preliminary survey indicates that approximately 40% of the paved spaces should be so designated. (#8)
12. Our committee recommends that vehicles parked in the faculty/staff parking stalls without a permit or with a student/commuter permit be towed at the owner's expense. The effectiveness of such a policy can be assessed through its immediate pilot implementation in the parking areas around Randolph Hall. (#8)
13. CEC should provide an office with persons experienced in budgeting to guide an organizer through the budget procedure. Procedures should be established to allow organizer control, at least through his department Head, for initiating charges to the established project number, including expenses for faculty release time where budget money exists. (#8)
14. The CEC should provide an office of personnel who are conversant with the organization details needed to operate a successful conference and who will interact with faculty to aid and instruct on things to do and when to do them. (#8)
15. Schedule all maintenance (inside and outside of buildings) and janitorial tasks to minimize interruptions and interferences. (#8)
16. Involve the College of Engineering Administration and appropriate Departmental Administrators in plans for extensive remodeling and maintenance. (#8)
17. Encourage LRC to provide more guidance and instruction for effective use of improved instructional delivery techniques. (#8)
18. Request from the university information systems organization regular submission of short and long range plans on programs for college evaluation and comment. (#8)
19. Air condition all classrooms so external noises do not disturb the instruction process. (#8)
20. Encourage the University to develop a more aggressive plan to maintain classroom furnishings and the functionality of the teaching environment. (#8)
21. We recommend that the backlog of design projects be reduced to a more reasonable level as quickly as possible through the evaluation of current procedures and responsibilities, the use of CAD techniques,

**FIGURE 22**

**STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS**

the employment of hourly personnel, and the use of outside design sources. We also recommend that action be taken to reduce the current two to three week review process for remodeling/renovation projects by the Health and Safety Office. (#11)

22. We recommend that procedures be developed so that clients can request and receive accurate preliminary estimates on remodeling/renovation. Architectural Services and Work Management should coordinate their efforts in developing these estimates which, hopefully, will be within 25% to 30% of final costs. (#11)

23. We recommend that PPD provide to the client a breakdown of total estimated project costs after the design has been completed. In addition, a detailed breakdown of actual Project costs incurred should be provided to the client during construction (if requested) and prior to final billing for the project.

If during construction it becomes evident that actual project cost will exceed the estimated and encumbered amount, PPD should immediately notify the client by telephone and secure written approval of PPD's revised final estimate and authorization to proceed. (#11)

24. We recommend that all remodeling/renovation projects be reviewed with Purchasing prior to and during the design process to identify long lead time material requirements. A procedure should be instituted to identify these requirements and initiate the requisition of this material. (#11)
25. We recommend that UPD develop open-end contracts with one or more local A&E firms which will, upon short notice, accept projects which UPD decides it cannot undertake in view of priority or backlog and for which services the client is willing to pay. (#11)
26. We recommend that UPD and PPD consider greater use of private contractors for accomplishing larger and more costly remodeling/renovation projects to take advantage of the potential economy of the competitive bidding process. (#11)
27. We recommend that PPD manage remodeling/renovation projects under a fixed-cost concept as a normal procedure, except on those projects which are unusually difficult to accurately estimate. (#11)

#### V. DOLLARS REQUIRED

1. The College make a strong appeal to the Vice President for Finance for funds adequate to cover operating expenses. (#2)
2. Funds be generated to ensure that new faculty are required to teach no more than one course per quarter during their first year. (#2)
3. Funds be generated to ensure that new faculty are provided with at least one summer quarter of research release in the first year. (#2)

FIGURE 22

### STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS

4. Within the next four years, The College should acquire sufficient new space to meet the critical needs defined by the faculty of the College, which are summarized in Attachment I. This will require acquisition of 200,000 square feet of new space in the next four years. (#3)
5. Within the next eight years the College of Engineering should acquire sufficient new space to bring it up to the average of the 44 peer institutions listed in Attachment II. This will require acquisition of an additional 100,000 square feet of new space beyond that needed to satisfy the current critical needs cited by the faculty. (#3)
6. Within the next four years, the College should undertake renovations of Randolph Hall, Patton Hall, and Holden Hall, to improve them to conditions suitable for operations of first-rank engineering teaching and research programs. (#3)
7. Within the next two years, the College of Engineering should acquire eight lecture rooms, either through remodeling and renovation of existing space, or by new construction. These classrooms should be well equipped for engineering classes and sufficiently attractive to be suitable for special lectures by prominent visitors to our campus. Four of these rooms should have sufficient capacity for 160 students, and four should have capacity for 80 students. (#3)
8. Develop funding proposals to obtain endowed monies to support Ph.D. students. (#4)

#### VI. NEW COMMITTEE

1. The College of Engineering should appoint a Teaching Effectiveness Committee which would be responsible for assessing the performance of instructors in the College. The committee would consist of both faculty and student representatives. It would serve three major functions: (a) make recommendations to the College regarding which instructors should receive awards for excellence in teaching; (b) receive and act upon documented formal complaints filed by students regarding instances of woefully inadequate course instruction; and (c) report to the College of departmental compliance with the mandatory aspect of the evaluation process. (#7)
2. A standing committee composed of representatives from the engineering college and appropriate representatives from the Continuing Education Center should be established. This committee would receive input from faculty who have encountered various difficulties involved with meeting, planning and organizing. The committee would serve both as a source for recommending policies and as an ombudsman to facilitate the resolving of conflicts arising between faculty and administrators of CEC conference activities. (#8)
3. The dean will coordinate establishment of a committee for information systems support with one representative from each department. The

FIGURE 22

### STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS

committee would integrate university plan and college needs permitting development of a short and long range plan for external vs. internal information systems services for the College of Engineering. Prepare plan of implementation, review with departments and college routinely every six months. (#8)

4. A standing committee should be given the responsibility of assessing the quality of undergraduate education in the College of Engineering. A logical choice may be the existing college Standards Committee. (#9)

#### VII. NEW RESPONSIBILITY FOR EXISTING OFFICE

##### Dean

1. Assign Associate Dean for Administration as College of Engineering Coordinator to facilitate the request for and provision of UPD/PPD services for the College of Engineering. (#11)

##### other

1. Develop an exposure/motivation campaign which will increase the number of U.S. applicants to the programs. This campaign will be in the form of published materials. (#4)
2. Conduct survey of Ph.D. students. (#4)
3. Have frequent physical inspections of classrooms and develop a simple procedure for faculty to report physical deficiencies in classrooms on a continuing basis to some one designated by the Dean for action. (#8)
4. Develop and conduct a one-day "Workshop" to orient new faculty. (#12)

FIGURE 22

### STRATEGIC PLANNING ACTION TEAM RECOMMENDATIONS

## Appendix B

### *Summary*

Four universities with large colleges of engineering were identified as currently involved in a strategic planning process. Telephone discussions with three university officials (Lehigh, North Carolina State, Ohio State) revealed logistical detail not found in their planning reports.

### *Lehigh University's Strategic Plan*

In June, 1984, the Board of Trustees adopted a statement of Mission, Principles, and Goals of the University. LeHigh's comprehensive planning process has an annual cycle. The Dean or Vice President of each academic or administrative department or research center collects progress and priority reports in their domain. The Dean or Vice President then integrates a general overview and establishes local priorities for the college or administrative unit.

The university-wide integration is achieved by the President's Council which

consists of four college deans, the vice presidents and the president. This council produces the annual Progress and Priorities report which is disseminated to faculty and staff for feedback. This document provides guidance for the budgeting process as well as establishes university priorities.

The budget plans are developed between the President's Council and the Budget Director. The budget recommendations are reviewed relative to the Progress and Priorities report. Planning and budgeting are linked through the President's Council. Integrated planning is achieved and strategic management can respond to the clearly stated priorities established. The existence of priorities enhances LeHigh's reactive capacity to unforeseen and unforeseeable events. (Lehigh, 1988).

As the Lehigh planning process developed from 1984-1988, more departments submitted worthy plans requiring reallocation of resources. Lehigh had so successfully refined its planning process that implementation of the best plans was constrained by resources. Good planning could not always be rewarded as a university priority. The president, Peter Likens, was the champion of the process and allocated a great deal of time and effort to the process. Lehigh conducted a workshop in 1988 to discuss their progress. Planners and officials from other universities were invited to attend. Some gave educational presentations.

## *The North Carolina State University Planning Process*

The North Carolina State University established a two-year planning cycle. In year one, the Chancellor and Vice-Chancellor determine 5-10 year long range goals. In year two, the colleges and departments identify goals that fit into the university goals and are tied to the budget. The planning process was originally designed as a prebudgeting exercise. In the second cycle, the process asks for measures of how the departments and colleges are meeting those identified goals from the previous cycle.

An 18-member university task force on planning prepares initial goals and objectives for the chancellor and vice-chancellor's review. This task force uses the Delphi technique for developing consensus on priority goals. After the chancellor's review and editing, the goals are announced in the faculty newsletter and sent to all deans, standing committees, faculty and student senates for feedback.

North Carolina State focuses on processes, not on formal documents. The departments and colleges use standard worksheets and must report how the faculty was involved in completing the worksheets. Deans and department heads vary in how they include faculty. The Director of Planning at NC State does not consider their planning strategic since the external environment is not considered in the planning process. (Helm, NC State, 1989).

## *The Ohio State University Planning Process*

The College of Engineering at The Ohio State University prepared a college level strategic plan in March, 1989. The impetus for the college plan came from the university the previous year. Each department prepared a plan in addition to the college's plan. The faculty and the department and dean's advisory boards reviewed and suggested improvements for the plans. The college plan was completed by the dean and his office staff. The process for completing the department plans varied.

The strategic objectives of the plan are far-reaching. The objectives would restructure existing departmental lines and associated budgets. I learned from discussions with faculty at Ohio State that some faculty resisted these strategic objectives and progress has slowed toward developing the tactical and operational plans to implement the strategic objectives. (The Ohio State University, 1989).

## *The University of Wisconsin System, College of Engineering*

The Wisconsin System planning process used a task force to develop priorities and define goals and objectives for the future. The task force consisted of faculty and administrators from the various university campuses in the system. Wisconsin also included members from corporations. These outsid-



ers forced the task force to explain how Wisconsin operates causing them to take a second look at recommendations for successful implementation before they were finalized. The staff work was completed by the Office of Academic Affairs. The report was submitted to the President for his review. The President was not involved in the development of the report. Implementation of the plan, accountability, budgeting factors were not addressed in this plan. However, new programs for the Wisconsin system were recommended as a first step in moving toward the future.

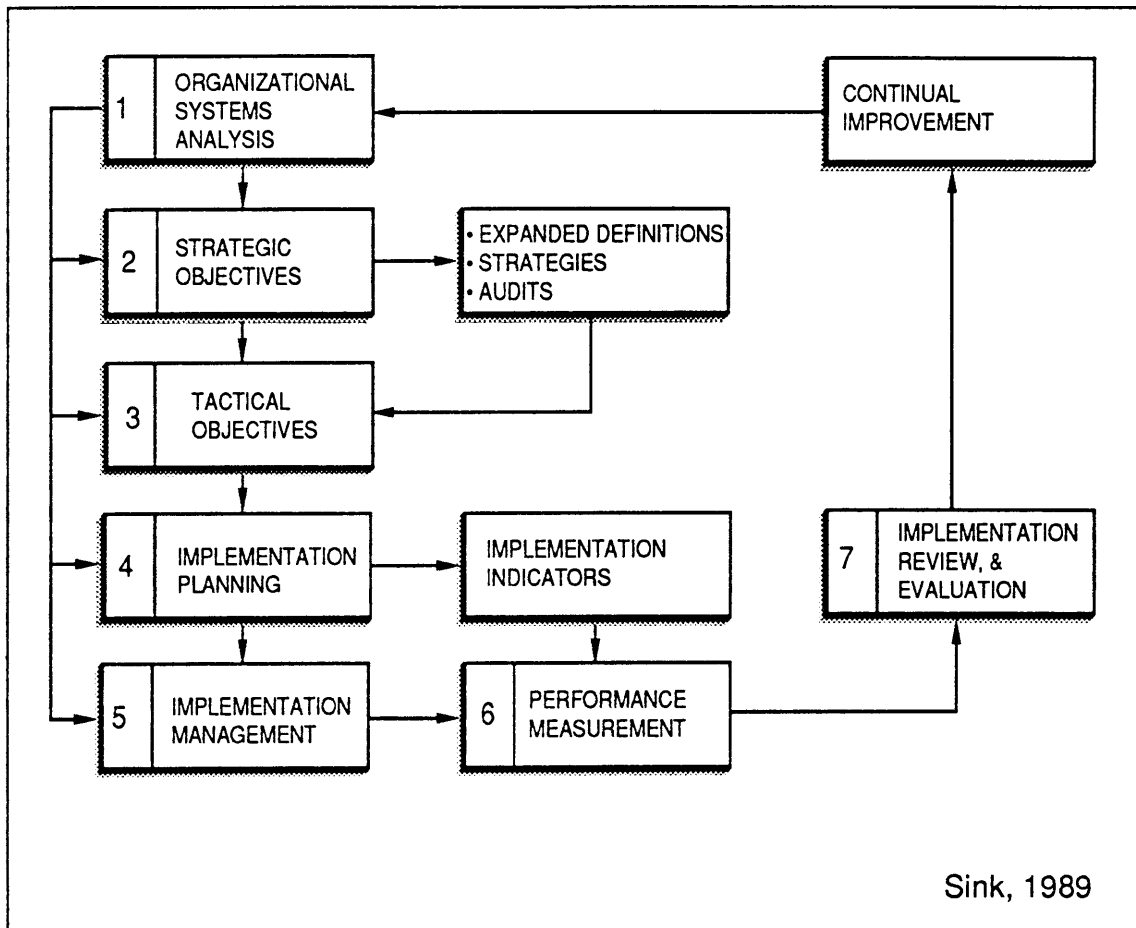
## Appendix C

### *Description of the VPC Planning Methodology*

The 1989 VPC Planning Methodology is described in greater detail in this section. This is the planning methodology initially shown in Figure 12, with the planning steps, and used in the planning model developed in this research. These steps can be used in different combinations or as a total sequence. The planning instrument asks the planner to look through these steps and choose those most appropriate to the desired outcomes and outputs of the planning process. The combination of these steps chosen will define the planning methodology for the college of engineering.

Figure 23 shows the 1989 VPC Planning Methodology diagram. Step 1 is called organizational systems analysis (OSA). Its purpose is to prepare the management team to plan for performance improvement and other desired outcomes requiring a close look at where we are and where we want to be. Substeps of OSA are described in sequence.

1.1 Mission - Most organizations have written mission statements. If this is the case, a review of this statement is appropriate. Enhancement of the statement is appropriate during this step.



**FIGURE 23**  
**1989 VPC PLANNING METHODOLOGY**

1.2 Vision/long range objectives - What are the visions of the organization for the 20-year horizon? What markets will we be in? Who will our students be? What technologies will we be employing? What will our mission be? How will we be evaluated? These questions and more should be reviewed with the faculty after the dean and top administrators and selected faculty have discussed.

1.3 Input/Output analysis - Input/output analysis forces the planning team to clarify the organizational system or unit of analysis for planning. I/O analysis develops a list of (1) desired outcomes for the college, (2) customers (internal and external), (3) outputs of the college, (4) inputs to the college, (5) key transformation activities within the college (6) suppliers and vendors to the college. This step is critical in understanding the present system if an objective is to change programs or define a new direction for the college.

1.4 Guiding principles - Guiding principles focus not on what we will do or how we will do things but on how we want to behave as we carry out our activities and plans. Guiding principles are statements expressing core values and beliefs and they shape our culture.

1.5 Roadblocks to performance improvement - The Nominal Group Technique is used to identify consensus roadblocks to performance improvement in the college. The planning team might develop its list and compare it with lists from other groups in the college. This substep provides the planning team with data as to perceptions regarding situations or policies that are preventing the college from performing as it should or could.

1.6 Current and future performance levels - This substep is designed to get the planning team to understand the current measurement and evaluation system for the college. It is intended to be a review of how the college is currently performing relative to its competition.

1.7 Internal and external strategic analysis - This substep forces the planning team to take a critical look at the college itself and secondly, at the external environment to evaluate its strengths, weaknesses, trends, problems, opportunities, and threats.

1.8 Strategic assumptions - This substep is the opportunity for members of the planning team to scan the future and develop assumptions upon which strategic objectives will be based. After assumptions are generated by the group, they are analyzed on an importance/certainty grid. The assumptions that are critical and valid are those that will most affect the strategic objectives.

Step 2 is Strategic Objectives. Step 2 employs the full NGT process to develop consensus within the planning team. The question the planning team tries to answer is "what objectives should we accomplish within the next 3-7 years?"

Step 3 is Tactical Objectives. Step 3 also employs the NGT however the horizon for accomplishments is the next 1-3 years. Optimally, completion of the tactical objectives should lead to success in completion of the strategic objectives. Tactical objectives will deal with more outputs than outcomes.

However, there is not necessarily a one-to-one correlation between strategic and tactical objectives.

Step 4 focuses on implementation planning. Small groups, subsets of the planning team volunteer to "scope out" proposals for top priority objectives. Scoping proposals focus on expanded definitions for the objectives, a definition of what has to be done, who has to do it, when things have to be done, measures of success, and budgets. Implementation planning is operational planning from the formal-rational planning model.

Step 5 is implementation management which is project management. This step is the doing step. This is when things start to change. The keys to this step are accountabilities, role clarity, attention to detail, pragmatism, and the stamina to keep things going.

Step 6 is performance measurement. This step may be tackled several months after the first five steps have been completed. The objective is to use existing or develop measures that identify progress towards the strategic objectives. This is a difficult step but necessary to keep everyone on track and focused on the goal - change for improvement, not just change for change's sake.

Step 7 is implementation, review, and evaluation. Reviews and reports should be made public on a regular basis. Faculty meetings to discuss the progress being made or the consequences of changes will help keep everyone focused on the strategic objectives and the desire to improve the college.

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