MEASUREMENT AND EVALUATION OF ALTERNATIVE PLANNING STRATEGIES

by

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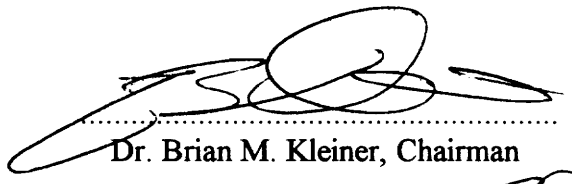

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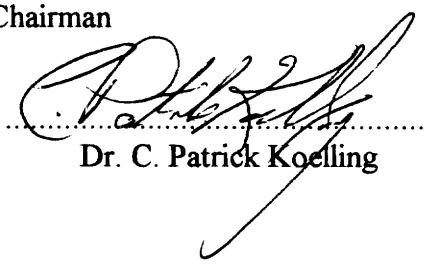

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(ABSTRACT)

Strategic Planning is a function practiced by most public and private sector organizations. Most managers are familiar with the concept of strategic planning and associated processes. There has been some research in the field of management focusing on the alternatives to strategic planning approach. "Management by groping along" is one such approach. The "management by groping along" strategy attempts to make an organization capable of adapting, responding and, allocating resources and focusing energies.

The purpose of this research was to empirically test the existence and viability of an alternative planning strategy and to provide experimental results. Some of the outputs of this research are: a set of indicators for the strategy of "management by groping along" and an analysis of the performance difference between "management by groping along" and strategic planning approaches.

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CHAPTER 1 - INTRODUCTION

1.1 Strategic Planning

Strategic planning can be defined as the process by which an organization envisions its future and develops the necessary procedures and operations to achieve that future (Pfeiffer, 1991). Most organizations do some type of long range or strategic planning, and the formal strategic planning process has been used for over thirty years. In the past ten years, the image of planning has been reversed. Once a specialized function found only in the largest corporations and for the most part ignored by their members, planning is now a "socially accepted" business function. In the past twenty-five years, strategic planning has become a standard part of managerial thinking and practice in the business world (Bryson, 1988). Planning is taught in business schools, companies run planning seminars, journals devoted to planning are published, and professional societies exist (Reinharth, L., et al., 1981).

Planning differs among different organizations and among various levels in an organization. The planning function operates through the managerial sub-system, to adapt the organization to the external environment. In simple terms, the planning function can be defined as "*making decisions about the future.*" This future oriented decision process involves (Reinharth, L., et al., 1981):

- Setting objectives
- Gathering and organizing information
- Determining feasible courses of action
- Selecting among feasible courses of action
- Implementing the actions
- Monitoring the results to insure compliance with objectives

The main purpose of strategic planning is to select future areas of activity and future courses of action for the organization. This planning must keep in mind the mission of the organization, its objectives, and the values and preferences that can be attributed to it. The primary aim of strategic planning is to choose a set of activities for the organization that will result in a high degree of achievement of its objectives. The process of strategic planning provides as output a set of strategies and policies that constitute a framework for planning and decision making throughout the organization. Strategic planning is not necessarily concerned exclusively with matters that are "long range" in nature (Radford, 1980).

1.2 Management by Groping Along

Consider an alternate philosophy and approach. *"Management by groping along" is a sequential process of adaptation in pursuit of a goal* (Behn, 1988). The manager tries some approaches, achieves some successes, adapts the more successful approaches and continues to pursue his goal (Behn, 1988). There are probably dozens of definitions of management today. There are thousands of management principles and it is never obvious which ones apply in a particular managerial situation. Every new management task confronts even the most experienced manager with a new organizational, political and cultural situation. Rather than develop a detailed strategy to be followed unswervingly, a good manager establishes a specific direction - a very clear objective - and then gropes his way towards it. He knows where he is trying to go but is not sure how to get there. Good managers "grope along." They understand their goal and design their groping to move them towards it (Behn, 1988). Some of the ideas behind the concept of "management by groping along" are in conflict with some of the concepts behind traditional strategic planning. Behn (1988) says the following in regard to this:

- It is difficult, impossible and a mistake to develop a comprehensive plan for the future.
- Long-range planning creates long-range commitments that possess tremendous inertia, sometimes in allocating resources.
- The worst thing one can do with strategic planning is to allow an extrapolation of the past into the future.
- The job of managing does not develop reflective planners; rather it breeds adaptive information manipulators who prefer a stimulus-response milieu.
- A firm's strategic planning should not start by establishing ends but by creating means.
- Managers should not spend their time attempting to plot out carefully their exact course, with all the details.

The concept of "management by groping along" is a dramatic challenge to traditional strategic planning concepts and philosophies.

1.3 Public Sector Organizations

The public sector and the private sector together form the infrastructure of every society. Major studies analyzing many different organizations to develop taxonomies and typologies have produced little evidence of a strict division between public and private organizations (Rainey, 1991). Pugh, Hickson and Hinings (1969), classifying a sample of some fifty-eight organizations into categories based on measures of their structural characteristics, had predicted that the government organizations would show more bureaucratic features, such as more rules and procedures and found that the government or public sector organizations have higher degrees of control by external government authorities, especially over personnel procedures. Public organizations perform crucial functions, and they need effective management. The elaborate body of writing and

research on organizations and their management that developed over the last century has valuable applications to the management of public organizations. But, the material on organizations and management usually takes a generic approach (Rainey, 1991).

1.3.1 Administration in Public Sector Organizations

The focus of public management is on public sector administration as a profession and on the public manager as a practitioner of that profession (Perry and Kraemer, 1992). The field of administration is the field of business. The management literature increasingly repeats refrains about complexity, flux, turbulence, paradox, conflicting values, and even chaos (in public sector organizations) (Kiel, 1989). The mounting complexity raises the question of whether human organizations can manage to avoid failure and crisis (Lindblom, 1977). For public organizations, additional pressures from public and political hostility have created what many experts depict as a crisis, especially at the federal level (Volker Commission, 1989), although state and local governments face similar pressures (Beck, Rainey, and Traut, 1990). In the private profit-oriented sector, the threat of survival compels those of strategic process and planning in fundamental decision-making. But in public sector organizations like government and non-profit agencies, where success or failure is much less obvious, the capacity for strategy formulation and execution is relatively scarce. Some of the general perceptions regarding administration in public sector organizations are (Fielden and Lockwood, 1973):

- A lack of vision of the future;
- Outmoded missions are pursued;
- Avoidance of serious problems;

No one disputes that our leaders and decision-makers in the public and tax-exempt nonprofit world face a multitude of issues that continue to grow and plague us. Additionally, serious concerns are extended to the complex problems faced by universities and colleges. But, the commonalty of most of these issues, problems and pressures is that they belong to institutions that operate in the nonprofit world - where there is no bottom line quest for profit to compel, guide, and evaluate the mode of operation (Fielden and Lockwood, 1973). The following are some of the salient forces which complicate the administration of public sector organizations (Fielden and Lockwood, 1973):

- The powerful claims of special, often competing, and conflicting interest groups;
- Demands for short-term or immediate action instead of longer-term perspectives;
- Stubborn resistance to forces of change;
- The difficulty of securing sufficient funds from a diminishing supply of resources to satisfy increasing social service demands;
- The serious problem of recruitment and retention of competent, but often underpaid, executives in public and other nonprofit institutions;
- The strain and frustration of working with and in unwieldy bureaucracy.

These forces can be the source of problems in private sector organizations also. All these factors complicate and hinder administrators in doing things strategically. Constantly, we are reminded that change is inevitable and the consequences can be devastating. The experts warn that we must thrive on the chaos of rapid change or face extinction (Fielden and Lockwood, 1973). It is not possible to be fully prepared for the future's unexpected events. The management of public sector organizations requires sensitivity to the inevitability of change and preparation to respond to whatever changes must be dealt with.

1.3.2 Academic Administration

The administration of public sector organizations and the complexity therein is most apparent in institutions of higher learning, such as colleges and universities. The nature of the environment in which higher education function is undergoing drastic changes: public bodies are demanding increased accountability. Even knowledge, the very commodity that higher education is in pursuit of, is expanding so rapidly that the resources needed to keep faculty and equipment up-to-date are placing a tremendous strain on some institutions. In addition, funding, particularly from state legislatures, is actually decreasing in some cases (Lee and Van Horn, 1983).

Theories and opinions over the best methods for academic management have existed since the turn of the century. In a 1910 report to the Carnegie Foundation for the Advancement of Teaching, faculty committees were criticized for demanding too large a role in university administration. University administrators were criticized for yielding too much autonomy to the departmental level, thus weakening the "essentials of real authority" (Lee and Van Horn, 1983). In a recent progress report based on its advisory planning conference comprised of twenty-three executives in higher education, the National Center for Higher Education Management Systems (NCHEMS) concluded that the key problem facing administrators was the lack of adequate research and development support for their efforts to make higher education more productive - More effective as well as more efficient (Lee and Van Horn, 1983). It is at the department level that the real institutional business is conducted - it is here that teachers and learners make contact, that researchers find encouragement and direction, and that many of the ways to contribute to the larger community are identified and explored. But, the reality of decreased federal and state support for public and private institutions alike compounds the challenge (Bennett, 1983).

Management literature acknowledges the complexities involved in the administration of an academic department. Academic department chairs must manage effectively multiple constituencies and overcome obstacles such as faculty and staff problems, shrinking student enrollments, and declining financial resources (Barge and Musambira, 1992). Although the academic department allows the organization of inquiry in clear centers and structures of learning, these structures and centers tend almost inevitably to become conservative and to deteriorate into arenas of individual privilege. For instance, the chairperson of an academic department must support both the advancement of and the retreat from fragmentation of knowledge. The specialized teaching and research of professors are to be supported. At the same time, however, isolation between inquiries is to be overcome, boundaries are to be crossed, and new areas of inquiry established. As a result, the chairperson of the academic department has both to resist and promote change in curricular and instructional requirements. He or she must learn to weigh, and sometimes to play off, one interest against another - all in the name of promoting both continuity and progress within the department (Bennett, 1983).

CHAPTER 2 - LITERATURE REVIEW

2.1 Strategic Planning and Strategic Management

Strategic planning is a term that has been introduced into the terminology of management in recent years to describe the task of choosing future directions and areas of concentration for an organization (Radford, 1980). Controller Foundation, a professional group promoting publications in the area of management, published in 1955 an annotated bibliography on management planning and control, with a supplement added in 1956 (Sweet, 1964). Radford (1980) says that the aim of strategic planning is to ensure that the present and future activities of an organization are appropriately matched to conditions in the environment in which it must operate. Strategic planning is different in many respects from other forms of planning that consist of the construction of an orderly sequence of tasks that when properly implemented, will result in the achievement of an objective. The work of strategic planning consists of the detection and consideration of opportunities and threats that may arise in the external environment of an organization (Radford, 1980).

During the 1960's, the term "strategic" was often meant by researchers and corporate managers to describe long range, longer-term, or comprehensive planning. Later in the 1970's, strategic planning began to develop a structure, staffing and technique (Koteen, 1991). Experts began to reorient strategic planning in ways that emphasize the special relationship between an organization and its environment (Steiner, 1979; Ansoff, 1979; Ohmae, 1982).

2.1.1 Definitions of Strategic Planning and Strategic Management

Pfeiffer (1991) defines strategic planning as *the process by which an organization envisions its future and develops the necessary procedures and operations to achieve that*

future. He differentiates strategic planning from long-range planning and says that long range planning is the simple extrapolation of statistical trends or forecasts. He extends the definition of strategic planning by saying that strategic planning is more than just an envisioning process and it requires the setting of clear goals and objectives and the attainment of these goals and objectives within specified periods of time in order to reach the planned future state. Peter Drucker, one of the most respected experts of management issues in the last 30 years, compares the executive and his or her strategic plan to a symphony conductor, with a complex musical score to direct.

Dess and Miller (1993) say that formal strategic planning attempts to lay out the shortest path possible for the organization to travel when moving from one point to another. They note that the recent trend towards decentralizing power in organizations has brought with it, an increased emphasis on formal strategic planning. Reinharth et al. (1981) refer to strategic planning as *the function of adapting the organization to the external environment.* Steiner (1979) defines strategic planning concisely as *the process of designing a desired future and identifying ways to bring it about.* Bryson (1988) says that strategic planning is a set of concepts, procedures, and tools designed to assist leaders and managers. Strategic planning may be defined as a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does and why it does it (Bryson, 1988).

Strategic Management is the process through which a manager ensures the long term survival and growth of a firm (Chakravarthy, 1982). Hanna (1985) says that strategic management has emerged as the latest form of planning in response to tendencies towards bureaucratization and centralization of the strategic planning function. Strategic management emphasizes an ongoing strategy management process, widespread creative thinking and the integration of strategy formulation process with other management

structures and systems (Hanna, 1985). Nutt and Backoff (1992) say that strategic change is attained through strategic management. Strategic management is applied by leaders to align an organization's direction with the organization's aims (Nutt and Backoff, 1992). Behn (1988) says that strategic planning is an effort to make management more systematic and more scientific. He also adds that strategic planners work backwards from where they want to be in the future to where they are now. The essence of strategic management, according to Koteen (1991) is the emphasis on an ongoing process that integrates strategic planning with other management systems. Strategic management employs a strategic planning process that is externally oriented, issue focused, and opportunity seeking. They also add that strategic management seeks to use and merge all necessary approaches and resources to reach strategic goals. By definition and practice, strategic management is a broad concept; it embraces the entire set of managerial decisions and actions that determine the long-run performance of an organization (Koteen, 1991).

Strategic management embraces all the managerial problems that arise when strategic plans require actions in other functions of the management process. The practice of strategic management stems largely from private sector corporate experience over the last several decades. Essential to effective strategic management is a continuing decision process that co-joins an organization's internal capability with the opportunities and threats it faces in its environment as it pursues its strategic initiatives. Five of the features that characterize strategic management are (Koteen, 1991) :

- Strategic management is oriented to the future.
- Strategic management is a way of thinking and behaving to make a difference.
- Strategic management is continuous and recurring.
- Strategic management sets a framework for guiding other phases of management.
- Strategic management is not easy to perform.

2.1.2 The Process of Strategic Planning

Strategic planning is a process that begins with the setting of organizational aims, defines strategies and policies to achieve them, and develops detailed plans to make sure that the strategies are implemented to achieve the ends sought. Strategic planning is systematic in the sense that it is organized and conducted on the basis of an understood regularity and should be conceived as a continuous process (Steiner, 1979). Le Breton and Henning (1961) in publishing the first planning book based solely on theory, offered the following sequence of steps as one possible procedure to follow in developing a strategic plan :

1. Having an awareness of need.
2. Making a statement of objectives.
3. Preparation of an outline of a proposal and obtaining approval.
4. Organizing and planning staff and assigning responsibility.
5. Making a specific outline of a plan.
6. Establishing contact with all cooperating units.
7. Obtaining, processing and evaluating all the necessary data.
8. Formulating tentative conclusions and preparing tentative plans.
9. Testing the components of the tentative plan and preparing final plans.
10. Testing the plans and obtaining approval of plans.

The dimensions (or characteristics) of a plan as offered by Le Breton and Henning served as a frame of reference in the general science of strategic planning (Sweet, 1964). Pfeiffer (1991) characterizes strategic planning as a iterative process as illustrated in Figure 2.1. He says that strategic planning and strategic management - the day-to-day implementation of the strategic plan - are the most important. They present a simple

applied strategic planning model and add that the prework of the strategic planning process involves answering a host of questions and making a number of decisions, all of which are critically important to the eventual success or failure of the entire planning process.

Radford (1980) proposes the following as the general steps in the process of strategic planning :

1. Information gathering.
2. Review of organizational missions and objectives.
3. Choice between alternative courses of action.
4. Development of detailed plans and allocation of resources to activities.
5. Implementation of the detailed plans.
6. Evaluation of the results of the activities as a preliminary to a new planning cycle.

Gilmore and Brandenburg (1962) note that the four vital components of strategic planning process are:

- Formulation of an economic mission.
- Determination of the competitive strategy.
- Specification of a program of action.
- Reappraisal of activities and results.

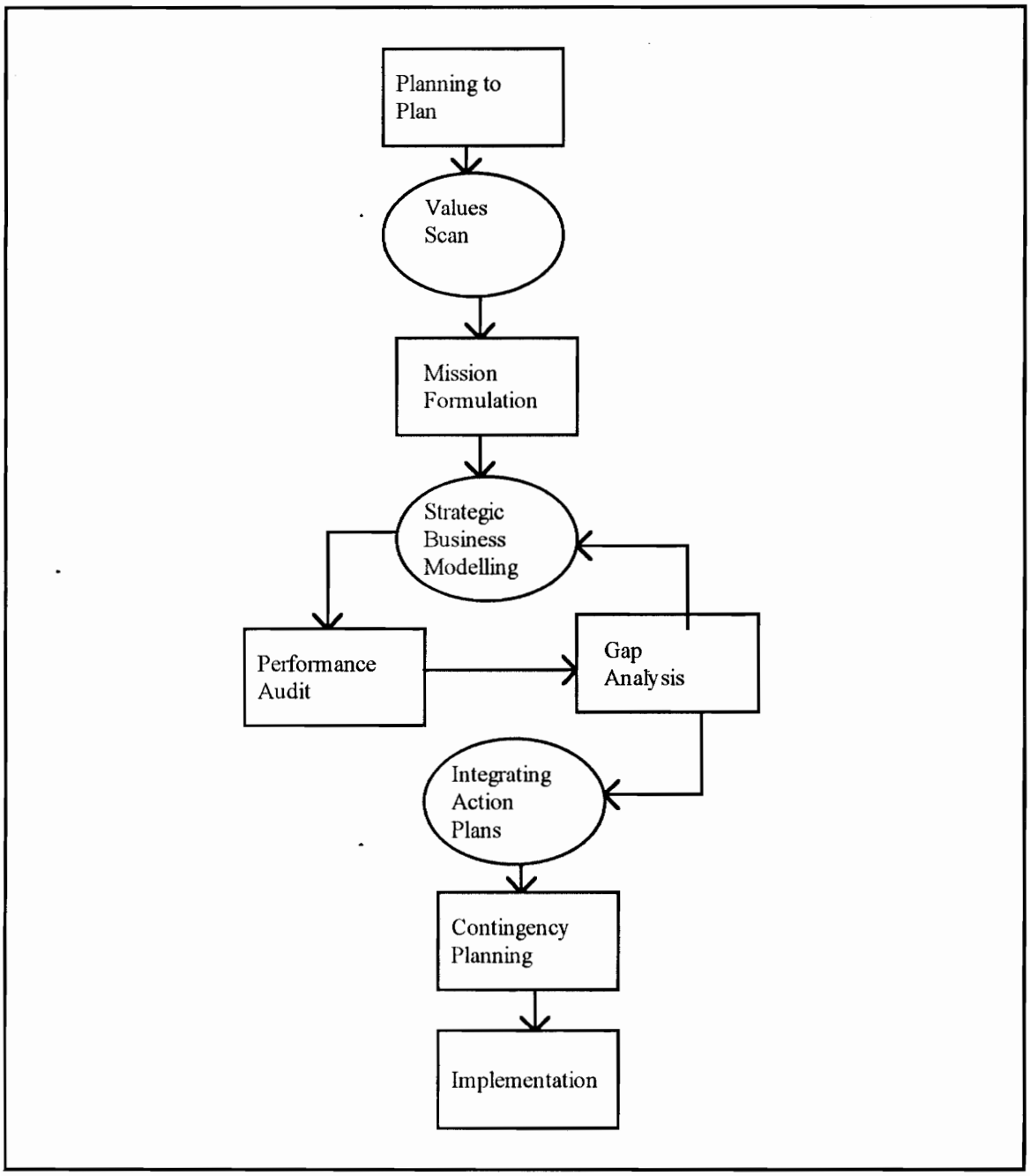

Figure 2.1 The Applied Strategic Planning Model (adapted from Pfeiffer, 1991)

2.1.3 Strategic planning for public and nonprofit organizations

The environments of public and nonprofit organizations have become not only increasingly turbulent in recent years but also more tightly interconnected (Bryson, 1988). The increased interconnectedness is perhaps most apparent in the blurring of three important types of distinctions: between domestic and international; among policy areas; and between public, private, and nonprofit sectors (Cleveland, 1973, 1985; Ring and Perry, 1985). Most of the literature on strategic planning in this century has focused on private sector applications (Bryson, 1988). There has been a long tradition of adapting management practices and ideas from the private sector to the public sector. The notion of public authority and the constraints and problems that this authority poses render the strategic management practices of firms ill-suited for public organizations. Many organizations that operate in our society have significant public features, making them more like public than private organizations. The managers of these organizations should be wary of using private sector approaches that assume clear goals, profit or economic purposes, unlimited authority to act, secret development, limited responsibility for actions, and oversight through market mechanisms that signal financial results. In public organizations, many of these assumptions are not valid. These features make some of the approaches to strategic management developed for private organizations incomplete and potentially misleading when applied in public settings. To cope with the demands posed by public sectors, managers need new approaches that go beyond strategic management ideas developed for the private sector (Nutt and Backoff, 1992).

Public and *private* are terms taken from Latin; *public* means "of the people"; *private* means "set apart." A variety of classifications have been used to distinguish between meanings as they apply to public and private organizations. Perry and Rainey (1988) identify differences in environments, constraints, incentives and culture. Benn and

Gaus (1983) distinguish between private and public organizations by whether gains and losses are communal or individual, by the openness of the organization to scrutiny, and the degree to which the organization acts as an agent for a community and not individuals (Nutt and Backoff, 1992). Others distinguish between public and private organizations by using the definitions of the public interest (Mitnick, 1982). The notion of services as public goods is often used to make public-private distinctions (Downs, 1967).

The differences between the public and private sectors have prompted a number of studies to find a set of factors that make core distinctions between the sectors and to determine the impact of public sector distinctiveness. Perry and Rainey's review (1988) found that the unique needs of public sector organizations limit the portability of many ideas derived from the private sector, particularly approaches that deal with mission and strategic direction. Allison (1984), Neustadt (1989), and others have identified factors that capture public sector distinctiveness, but they also seem to draw on the ideas suggested by Rainey, Backoff and Levine (1976) and updated by Rainey (1989). This classification uses environmental, transactional, and process distinctions (Nutt and Backoff, 1992).

Knowledgeable management experts question whether more than two decades of private sector experience and conceptualizing in strategic planning and management can be applied effectively to nonprofit institutions in government and the independent not-for-profit private sector; the fundamental difference is one of purpose. A profit oriented organization aims to make a profit. A nonprofit institution exists to render a service; its success is measured by how well it renders that service. Other differences exist, such as non-client source of funds, politics and a less responsive bureaucracy (Koteen, 1991).

Koteen (1991) identifies several differences or factors that necessitate a different

approach to strategic planning in the administration of public and nonprofit organizations, than the approach in the private sector:

- Absence of a profit measure:

The profit indices that measure the success of a business give managers a management control far superior to the tools that exist in a nonprofit organization. Business managers can make decisions in terms of the effect on profit. They can measure ensuing performance in terms of earned profit and can read automatic danger signals if profits decline. The service rendered by government or the private nonprofit can be a fuzzy, intangible concept that is difficult to measure. It is difficult to know exactly how much service is rendered, or to know precisely how much money needs to be spent to achieve a given level of service result. These experts conclude that two serious problems unique to public and nonprofit organizations require serious attention. The most serious is the difficulty of defining objectives. This makes it difficult to decide the amount of resources required to reach these objectives; then it is difficult to measure the efficiency and effectiveness with which the organizations perform to meet these objectives. A second unique problem is the need to develop better measures of "output" by which to evaluate what the organization does and how well it does it.

- Non-client source of revenue:

The characteristic that most differentiates public and nonprofit organizations from profit seeking organizations is their source of income. The profit oriented firm seeks its revenue from the sale of its goods and services to its customers and clients. For the public and nonprofit organizations, funding may come from a variety of sources. Funding may stem from appropriations by legislatures, grants from sponsoring organizations, due to assessments by its members, or donations from the community. A private sector organization has a very direct connection between its products and its customers.

Experience indicates that the pattern of influence on strategic decisions depends on an organization's source of revenue.

- Politics:

Politics affects all institutions because it is the practice of influence and the art of the influential. But public institutions and those nonprofit organizations that deal with fundamental public concerns seem to have their decisions and operations strongly influenced by the political dynamics of self-serving interests.

- A less responsive bureaucracy:

Business enterprises in the private sector are known for the ways they motivate their staff with financial and other incentives. They often can make decisions quickly, mobilizing and allocating financial and human resources as needed. In contrast, public sector processes tend to be more rigid and hierarchical, which reduces operating flexibility and delays decision making.

In summary, many experts agree that the strategic planning concepts for private sector organizations do not apply well to public sector organizations.

2.2 Management by Groping Along

Behn (1988) defines "management by groping along" as *a sequential process of adaptation in pursuit of a goal.* He says that in the terminology of control theory, management by groping along is a closed loop control system; the feedback loop provides information on the behavior of the system that can be used to correct deviations from the desired path. Comprehensive planning would be an open loop control system and there exists no feed-back loop. He also suggests that a manager adopting the strategy of "management by groping along" has a clear sense of mission and purpose for the organization and instead of developing a detailed strategy to be followed unswervingly,

he/she establishes a specific direction and gropes towards the goal of the organization. He proposes that "management by groping along" is a good strategy for managers and administrators in the public sector. Some of the arguments he presents in favor of his proposal are :

1. Public managers need to have a clear sense of mission for their agency; but they will never know precisely how to realize these purposes.
2. An excellent manager has a very good sense of his / her objectives but lacks a precise idea about how to realize them.

Altshuler (1989) also puts forward certain arguments in alignment with the strategy of "management by groping along":

- Strategies are most likely to be effective when they are broad and simple, explicitly leaving tactics to be worked out in adaptive fashion, as events unfold.
- The most powerful substantive strategies are typically about how to approach challenges, rather than pre-cooked recipes for overcoming them.
- The required capabilities (for management) are likely to be about how to stay fresh, loose and adaptive as about how to apply techniques developed in response to past challenges.

The ideas related to the concept of "management by groping along" point toward vital and previously neglected aspects of public management reality and open up important possibilities for thoughtful practitioners and public management scholars (Altshuler, 1989). Behn (1989) also says that a public manager cannot develop a perfect plan for the future and instead, must experiment with various initiatives, trying to determine which initiatives work and which do not; the successes that result from some of these initiatives

move the manager closer towards his/her goal, create new capabilities for the organization and help motivate the organization's members. He further relates the concept of "management by walking around" to other well-known management principles such as "management by wandering around" and Lindlom's (1959) science of "muddling through."

Lindblom (1959) first introduced the concept of 'muddling through' and argued that "the method of successive limited comparisons" is superior to the "rational-comprehensive method." He says that true strategic planning is impossible because the necessary "means-ends analysis" could not be done; thus every administrator "must find ways to drastically simplify" and to do this, the administrator relies upon a "comparative analysis of incremental changes." Quinn's (1982) "logical incrementalism" has a number of similarities to Lindblom's (1959) "muddling through" (Behn, 1988). Peters and Waterman (1982) put forward the concept of "management by wandering around" and say that managers need to spend their time with their customers, suppliers and employees. The prescriptive value of "management by wandering around" lies in the host of managerial concepts captured and implied in the phrase. "management by wandering around" means that managers need to know what their people - customers, employees and vendors - are doing and thinking (Behn, 1988).

2.3 Academic Administration - Role of a Department Head / Chair

The leadership / administrative role of an academic department chair is one of important responsibility and influence. Roach (1976) suggests that of all the administrative decisions made in higher educational institutions, 80% of them are made at the departmental level (Roach, 1991). The position of department chairperson in the administrative structure of American colleges and universities is just over 100 years old in the more traditional academic disciplines (Bennett, 1983). The academic department chair

is a key figure in higher education administration and governance and is instrumental in promoting academic excellence as reflected in the scholarly activities of faculty teaching and research (Moses, 1985; Barge and Musambira, 1992).

Bennett (1983) says that the nature of the position of a academic department head is ambiguous in nature because the chairperson has always to be looking in two directions, mediating the concerns of the administration to the faculty and vice versa, while at the same time trying to maintain some independent identity and integrity. He adds that the ambiguity of the chairperson's role has both psychological and political dimensions; psychologically, the position is difficult because it challenges established patterns. As institutions confront the increasing financial difficulties in the coming years, department chairpersons will be given additional burdens. Specifically, they will be expected to manage curriculum and faculty with an eye to what the times permit, not what the discipline should have. Tenure and promotion decisions will become more taxing, for ever-higher standards must be imposed and met. Individual friendships and professional associations will be tested. The conflict between disciplinary and institutional loyalties can be keen and the chairperson will probably be at the center (Bennett, 1983).

Rausch (1980) says that the general principles of administration that are useful in other environments - in business, industry and government - do not apply to the administration of an academic department. Koteen (1991) also recognizes the complexity of academic administration and says that this is primarily due to the academic department being a non-profit organization. He identifies the following distinguishing features of academic departments :

- Absence of a "profit" measure.
- Non-Client source of revenue.
- Politics and a less responsive bureaucracy.

Nutt and Backoff (1992) say that in public organizations like an academic department, the norms for efficiency, effective performance, allocation, and the like are either missing or disputed. They identify numerous features of an academic department that make the administration of a department different: environmental markets, constraints, political influence, transactional coerciveness, scope of impact, public scrutiny, ownership, organizational goals, authority limits, performance expectations and incentives. Bryson (1988) affirms that leaders, managers and administrators of nonprofit organizations such as an academic department, face difficult challenges in the years ahead and points to several causal trends such as demographic changes, value shifts, the privatization of public services, tax levy limits, tax indexing, reductions in federal mandates and the devolution of federal responsibilities, shifts in federal and state funding priorities, a volatile economy and the increased importance of the nonprofit sector.

The paucity of empirical or conceptual knowledge about administration in the academic departments was noted by Henderson (1963) and McConnell (1963). Studies based on the bureaucratic (Stroup, 1966), collegial or human relations (Goodman, 1962; Millett, 1962) and political (Baldridge, 1971) models have failed to gain general acceptance (Smart et al., 1976). The numerous and constantly changing factors which influence the functioning of a public sector organization have not been researched or identified to a large extent. The lack of this critical information makes the administration of public sector organizations even more complicated and adds to the dynamics of the situation.

CHAPTER 3 - SCOPE OF THESIS

3.1 Problem Statement

The aim of this research was to verify the existence of, and to develop a measure/set of measures for, the planning strategy of "management by groping along."

3.2 Research Questions

There are basically three questions that this research has attempted to answer.

1. Does a planning strategy for the phenomenon of "management by groping along," discussed in the literature, actually exist ?
2. To what extent is it possible to measure the existence of and develop a measure for the strategy of "management by groping along" ?
3. What characteristics distinguish the strategy of "management by groping along" from conventional strategic planning ?

The research was therefore oriented toward verifying the existence of a structure for the phenomenon of "management by groping along" and developing a set of indicators for the strategy.

3.3 Research Purpose

The purpose of this research was to empirically test the existence and viability of an alternative planning strategy. My research purpose provides the basis for my research objectives.

3.4 Research Objectives

There are several objectives for my research :

1. To develop a set of indicators for measuring the strategy of "management by groping along."
2. To apply the measures to test the existence of the strategy of "management by groping along."
3. To experimentally distinguish the performance differences between "management by groping along" and strategic planning approaches.

3.5 Outputs and Outcomes

My research resulted in the following outputs :

1. A set of indicators for the strategy of "management by groping along."
2. An analysis of the performance difference between "management by groping along" and strategic planning strategies.

I obtained the following outcomes from my research :

1. Contribute to the literature of administration in public sector organizations.
2. Improve the understanding of the strategy of "management by groping along."
3. Improve the understanding of what can be expected by the strategy of "management by groping along."
4. Stimulate further research on the strategy of "management by groping along."

3.6 Relationship of this research to management systems engineering

Management systems engineering focuses on the research, design, development, and implementation of management systems (Kurstedt, 1988). A management system has

three components: who manages (the human decision maker(s)), what is managed (the organizational system), and what is used to manage (tools and techniques). A management system also has three interfaces: the decision/action interface, the measurement/data interface, and the information portrayal/information perception interface (Kurstedt, 1988). This research focuses on the techniques ("what is used to manage") used by the "who manages" component of the management systems model (MSM) depicted in Figure 3.1.

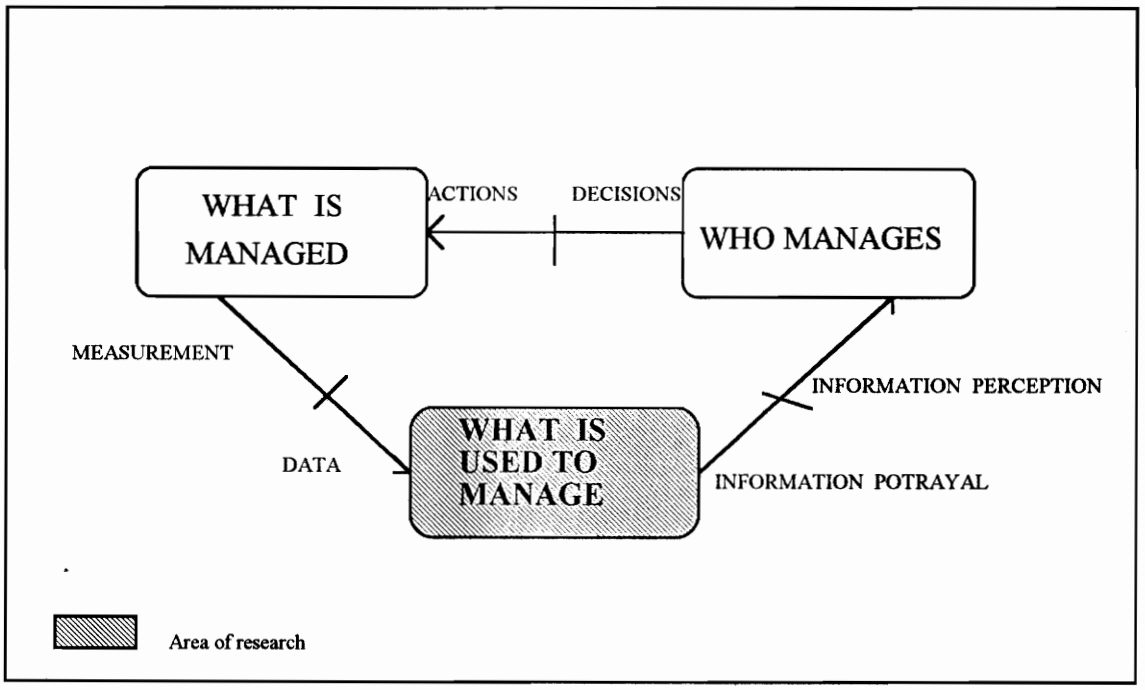

Figure 3.1 The Management Systems Model
(adapted from Kurstedt, 1988)

Scientists discover, mathematicians solve and engineers design (Tompkins, 1989). The work of a management systems engineer involves the designing of management

systems (Kurstedt, 1988). The focus of this research is to improve the "what is used to manage" component of Kurstedt's management systems model depicted in Figure 3.1. This is also depicted in Figure 3.2 below as applied to the research on "management by groping along."

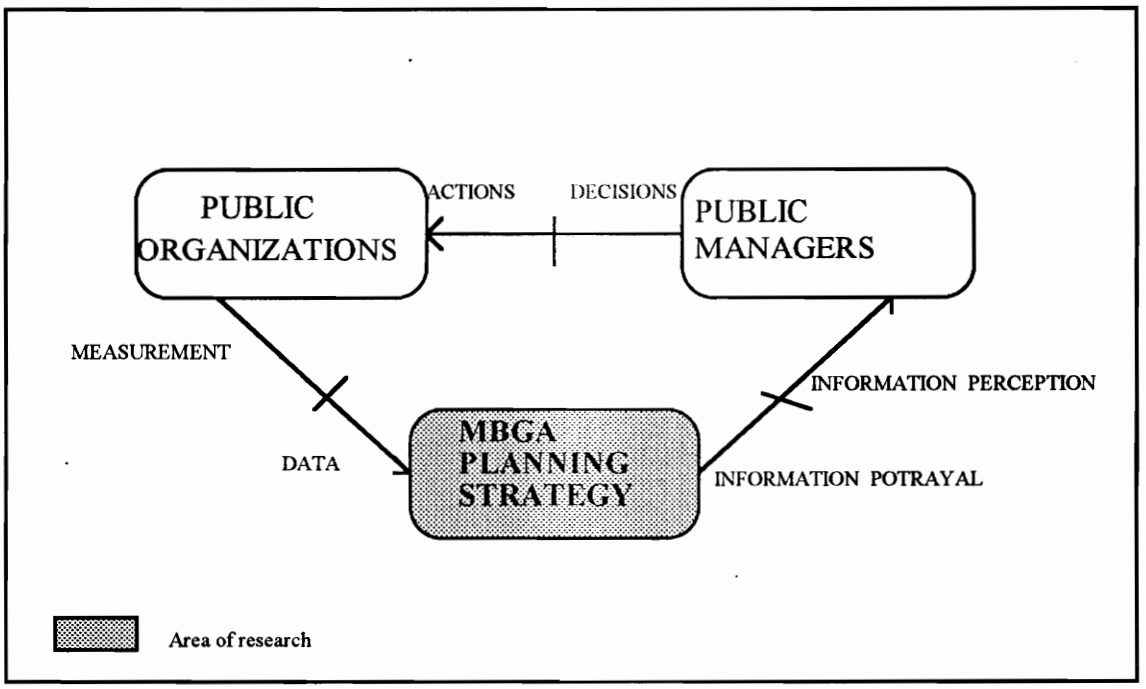

Figure 3.2 MSM Applied to the Focus of This Research

CHAPTER 4 - METHODOLOGY

4.1 Establishing Indicators of MBGA Strategy

The process of verifying the existence of the "management by groping along" strategy required a set of indicators for the strategy. A pre-test was conducted to develop a set of indicators that were most representative of the strategy of MBGA. In order to accomplish this, the salient features of MBGA were extracted from Behn (1988) and were refined into a set of indicators. The indicators were determined to be reliable and then validated. The procedure followed for establishing validity and reliability of the measures will be discussed in the latter part of this section.

The article "management by groping along" by Behn (1988) puts forward the following as primary characteristics of the MBGA strategy:

- MBGA is a sequential process of adaptation in pursuit of a goal. The manager tries some approaches, achieves some successes, adapts the more successful approaches and continues to pursue the goal.
- The mission and goal are clearly and unambiguously defined in the mind of the manager.
- Strategy of "small wins":

  The manager using the strategy of "management by groping along" does not aim to achieve his / her goal through a single major attempt; rather, the manager tries to achieve small or incremental 'successes' which take the organization nearer and nearer to the goal. In other words, he / she pursues milestone objectives or sub-objectives that lead ultimately to the main objective.
- The process or strategy of management is primarily adaptive in nature and there is continuous risk-reduction through learning over time. MBGA involves experimenting

with various initiatives, trying to determine what works and what does not. The successes that result from some of these initiatives move the manager closer towards the goal, create new capabilities for the organization.

- An open system is evident that allows the manager to respond to various and changing environments, changing needs and changing times. The system is able to adapt and respond and reform and allocate resources and focus energies. Also, there exists a process or system for MBGA and it is not just the lack of planning but is a strategy of management in itself.

All these characteristics were hypothised to be indicators of the strategy of "management by groping along." The following were extracted in order to serve as measures for the strategy of "management by groping along":

1. *The mission for the organization is clear and well-defined.*
2. *The goal(s) of the organization are spelled out distinctly.*
3. *The manager has / develops mile-stone objectives or sub-objectives that lead him / her to the main goal.*
4. *Instead of attempting to achieve a major success in one attempt, the manager tries to proceed through increment "successes" which are realizations of the sub-objectives.*
5. *There is an attempt toward continuous risk-reduction for the organization through a learning / adaptive process.*
6. *An open system is evident, wherein the organization is capable of adapting, responding, reforming and allocating resources and focusing energies. The manager is able to respond to changing environments, changing needs and changing times.*

The validity and reliability of the measures detailed earlier need to be established. The following procedure explains the process adopted to establish the reliability and validity of the indicators:

Step 1: Selection of raters for the pre-test process

This step involves the selection of a set of five persons who are knowledgeable enough to understand the theory behind the processes and strategies of management. All five persons selected for participation in the pre-test process were graduate students pursuing Masters degrees in Industrial Engineering from the department of Industrial & Systems Engineering, at Virginia Tech.

Step 2 : Training the raters

Each person selected for participation in the pre-test was asked to read and review the articles "Management by Groping Along" (by Robert D. Behn, 1988) and "A Strategic Management Process for Public and Third-Sector Organizations" (by Paul C. Nutt and Robert W. Backoff, 1987) thoroughly and was given two hours to do so. Any rater who did not need the entire two hours was allowed to proceed to Step 3 of the pre-test process.

Step 3 : Testing the raters on their understanding of the Articles in Step 2

The understanding of the content of the articles "Management by Groping Along" and "A Strategic Management Process for Public and Third-Sector Organizations" by each rater in the pre-test process was tested individually through a short quiz. The quiz served the purpose of testing the understanding of the articles "Management by Groping Along" and "A Strategic Management Process for

Public and Third-Sector Organizations" by each rater. The pre-test contained 20 questions, and any rater who scored correctly in 16 or more of the 20 quiz questions (which translates into a score of 80% accurate responses) was assumed to have obtained a very good understanding of the concepts put forth in the articles.

The short quiz taken by the raters, contained the following questions (The choices underlined represent the correct responses expected from a rater who has gained a good understanding of the articles):

1. *As a Manager, you know where you are going but never know precisely how to get there.*

   MBGA *SP*

2. *Your Strategy is to achieve a path that includes a series of small "wins" aiming at the overall goal.*

   MBGA *SP*

3. *As a Manager, you know where you are going and you have a clear notion of how to get there.*

   MBGA *SP*

4. *Your strategy is based on establishing a specific direction and "feeling" your way towards it.*

   MBGA *SP*

5. *Your strategy is based on systematically working backwards from where you want to be to where you are now.*

   MBGA *SP*

6. *The strategy is an attempt to make management more systematic.*

MBGA *SP*

7. *Management by "feeling" your way along is necessary to achieve your goals.*

   MBGA *SP*

8. *The optimal path is determined from an analysis of resources, capabilities, and the environment.*

   MBGA *SP*

9. *This strategy yields a learning process based on lessons learned from the past.*

   MBGA *SP*

10. *A learning and adaptive process helps reduce risk in this strategy.*

    MBGA *SP*

11. *This strategy relies on search, synthesis, and selection.*

    MBGA *SP*

12. *This strategy involves a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis.*

    MBGA *SP*

13. *As a manager, you are able to respond to changing needs and forces.*

    MBGA *SP*

14. *This strategy involves a stakeholder analysis.*

    MBGA *SP*

15. *In this strategy, you prioritize issues.*

    MBGA *SP*

16. *Strategies should be broad and simple.*

    MBGA *SP*

17. *Dynamic outside forces are always impacting your ability to know precisely what to do.*

    MBGA *SP*

18. *With this strategy, you experiment with various initiatives.*

    MBGA *SP*

19. *With proper analysis, you can plan and implement efficiently.*

    MBGA *SP*

20. *You identify strategic themes in this strategy.*

    MBGA *SP*

The quiz was administered to each of the selected raters and they were asked to circle the management strategy that is described most by each statement. The above quiz contains ten statements each from the concepts presented in the articles "Management by Groping Along" and "A Strategic Management Process for Public and Third-Sector Organizations" that were thoroughly reviewed by the raters in the pre-test process. The choices underlined represent the correct responses expected from a rater who has gained a good understanding of the articles. In this quiz, the statements that deal with the management strategy MBGA were randomly mixed with the statements that deal with the management strategy SP. The responses of the raters in the pre-test process to the above quiz are discussed in the section that deals with the results of the experiment (Chapter 5).

Step 4 : Validation of the measures for the strategy of "management by groping along"

These four steps involve establishing the validity and reliability of the measures for the strategy of "management by groping along" developed earlier in the chapter. The five raters who have been selected from the process described above until 'step 3' were now presented with a hypothetical situation faced by a manager and two sets of possible responses by a manager. One set of possible responses incorporates mostly the principles and theories behind traditional strategic planning approaches. The other set of responses

is indicative of the strategy of "management by groping along" and is incorporated with all the indicators/measures developed earlier for the strategy of MBGA. The scenario presented to the raters and the two possible responses provided to them are detailed in the latter part of this section. The raters of this pre-test were then asked to identify, among the two approaches, the strategy of "management by groping along." The responses of these five raters are capable of establishing the validity and reliability of the indicators / measures for the strategy of MBGA.

The following are the inferences to be drawn from possible outcomes of this final step:

- Outcome 1:

  Result : 4 or 5 raters identify the strategy of MBGA correctly;

  Inference : The measures are reliable across raters and their content is valid.

- Outcome 2:

  Result : Only 1 or 2 or 3 raters identify the strategy of MBGA correctly;

  Inference : The measures are not valid / the pre-test is not capable of establishing the validity and reliability of the measures.

The following is the fictitious scenario to be presented to the raters of this pre-test and the two possible responses by a manager :

SCENARIO :

Mr. XYZ has been appointed as the Dean of the College of Agriculture at the University of Id. He is primarily a researcher and teacher in the College of Agriculture and is completely unaware of the skills involved in the management and administration of a department in a university. There is no literature available on the subject of management of institutions of

higher education. The annual report of the college and the transition document do not offer much help or information in this regard. In order for the College of Agriculture to function, he also needs to allocate various responsibilities among the department heads.

The following are two possible approaches that Mr. XYZ might adopt in his role as the Dean of the College of Agriculture.

Approach 1:

Mr. XYZ starts out by making a long-range and wide encompassing plan for the college, by taking into account all the available resources. Thus, goals are set for the college and the individual departments are presented with goals that are to be achieved over the next five years. Then, he embarks upon developing a comprehensive enforcement strategy for attaining the goals for the college and lists out all the tactics he intends to adopt. The resources of the college are then matched to the goals needed to be attained and appropriate allocations of these resources are done. For example, one of the goals of the college was to be within the top 10 positions in the national ranking of all the colleges of agriculture. In order to achieve this, he defines the various achievements needed to be made by the college of agriculture. He does not take into account the possibility that the strategy he intends to adopt could become ineffective due to a constantly changing environment. He develops a detailed plan that has all the tactics needed to attain the above mentioned goal. He then sets out to enforce the comprehensive strategy developed, which is aimed towards attaining the various goals and objectives of the college of agriculture.

Approach 2:

Mr. XYZ sets up a meeting of all the chairpersons of the various departments in the College of Agriculture and develops a mission for the college. The various goals of the college are also

distinctly agreed upon. Mr. XYZ then sets up several milestone objectives that would lead him and his organization toward the main goals. For example, one of the goals of the college was to be within the top 10 positions in the national ranking of all the colleges of agriculture. In order to achieve this goal, he sets the following sub-objectives for the college of agriculture:

- *Increase the research funding base of the university by 100 % over the next two years.*
- *Increase the undergraduate student enrollment by 25 % over the next three years.*
- *Improve the caliber of entering undergraduate students.*
- *Increase the enrollment of graduate students by 25 % over the next two years.*

In order to achieve the major goal of being within the top ten colleges in the nation, he does not attempt to achieve the goal directly, but proceeds through incremental steps, which lead to the goal. He starts out to realize the sub-objectives listed earlier and some of his tactics work out while others do not. He aims towards continuous reduction of risk for the college, by learning from the tactics that do not succeed. In short, he sets out to transform his organization into capable of adapting, responding, reforming and allocating resources and focusing energies. He aims towards making the college of agriculture capable of responding to changing environments, changing needs and changing times.

The responses of the five raters are presented in the Results section (Chapter 5). The responses were evaluated with the intent of verifying the validity and reliability of the measures for the strategy of MBGA developed earlier in this chapter.

4.2 Experimental Test - The Academic Department Game

This section describes the experimental setup for the main test using the academic department game, and the procedure adopted for collecting the data to be used in the

experiment. The academic department game is a computer based management exercise, designed to emphasize the important decisions that must be made by the head of an academic department. The game consists of several computer programs written in American National Standard (ANS) FORTRAN-IV. The data required to be collected for this experiment was obtained from the participants of the academic department game. The participants of this experiment were chosen from a group of seventy two students who were in the final stages of receiving their Bachelor's degree in Engineering from the College of Engineering at Virginia Polytechnic Institute and State University. The consent of the participants was obtained through a standardized format used for informed consent of participants of investigative projects at that University.

4.2.1 Description of the Academic Department Game

The academic department game is structured within the State University of Id, a typical land-grant institution. The academic aim includes, in addition to the college of Arts and Sciences, a number of other colleges including agriculture and engineering. The department of statistics can be described as having a long history of instructional and research services to agricultural and engineering faculty and students. It operates an established academic program for its majors and enjoys a respectable reputation both on the campus and among peer departments at other colleges and universities. The persons who would find this game most useful are potential administrators as well as students in higher education curricula. This management exercise was designed as a training aid and not as an evaluative device.

The operating parameters of the academic department game:

The player of this game is placed in the position of a department head for the statistics department. The objective of the player (head of the department) is to maximize

the departmental reputation and, in doing so, meet the dean's objectives as closely as possible. The player(s) are required to make two decisions per year, for a period not to exceed five years. At the beginning of the game, the department has a complement of eight faculty members in different ranks, some with tenure and some without tenure. The department size (number of faculty positions) may increase or remain the same over the next five year period, depending in large measure upon its success in securing outside research funding and the enrollment in its graduate program. At the beginning of the game, the department head (player of the game) is provided with a "profile" of each of his/her faculty members.

The decisions needed to be made by the player

The player(s) (participant(s)) of this game needs to make decisions regarding the following:

- Assignment of courses to professors.
- Allocation of a limited amount of salary moneys.
- Awarding of promotions to faculty members.
- Awarding of tenure.
- Hiring of new faculty members (when positions become available).

The game is run iteratively as the players make the above mentioned decisions as game input and receive as output the results of those decisions and a measure of their effect on the department. The players are required to make two decisions per academic year, at the beginning of the fall and spring semesters respectively. The output from the game provides a report to the players on the current professional status of each of the professors

within the department as well as the reaction of the professors to the department head's decisions.

The game administrator receives a departmental summary report once every two semesters. This report includes among others, the department's current reputation, total scholarly productivity within the department during the year and a report of the overall teaching performance of the professors. In addition, other information that is used by the administrator in comparing the performance of each department during the year is also provided.

SUMMARY OF INPUTS AND OUTPUTS FOR THE FALL & SPRING SEMESTERS:

(Inputs given to the game and output received from the game)

FALL SEMESTER:

Output:

1. Dean's report.
2. Administrative summary report.
3. Professor profiles.

Input:

1. Resume requests.
2. Teaching assignments.

SPRING SEMESTER:

Output:

1. Resume' request report.
2. Professor profiles
    (a) Scholarly productivity report.
    (b) Graduate student / research activity report.
3. The Dean's satisfaction levels.

4. The reputation of the department relative to other participating departments.
5. The number of graduate students in the department.
6. The number of non-tenured and tenured professors at each rank within the department.
7. Total amount of salary money allocated by the department head.

Input:

1. Recruiting preferences.
2. Promotion recommendations.
3. Salary recommendations.
4. Teaching assignments.
5. Re-appointment decisions.
6. Early tenure decisions.

As mentioned earlier, the objective of each department is to maximize the departmental reputation. The factors affecting this departmental reputation are:

- Teaching.
- Publication and research.
- University and National service.

4.2.2 Experimental Design:

The experimental design for this research, using the academic department game, is described in this section. The total number of participants selected for this experiment was seventy two. The size of the population selected for participation in the game was constrained because the participants were students enrolled in a course (ISE 4004) offered by the Department of Industrial & Systems Engineering in the Spring semester of 1994, at Virginia Polytechnic Institute and State University. The participants were divided randomly into individual groups of 3 members each. The resulting 24 groups were asked to participate in the academic department game. The participants were asked to endorse a

consent form. The format used for this consent form is presented in the appendix. Each of the groups jointly played the fictitious role of the Head of the academic department in the game. Each group was collectively responsible for the decisions made in the game and for the feedback collected once every two iterations of the game. Every iteration of the game is equivalent to one semester.

The setup of the various teams within the experiment and the type of training received by them is depicted in Figure 4.2 below.

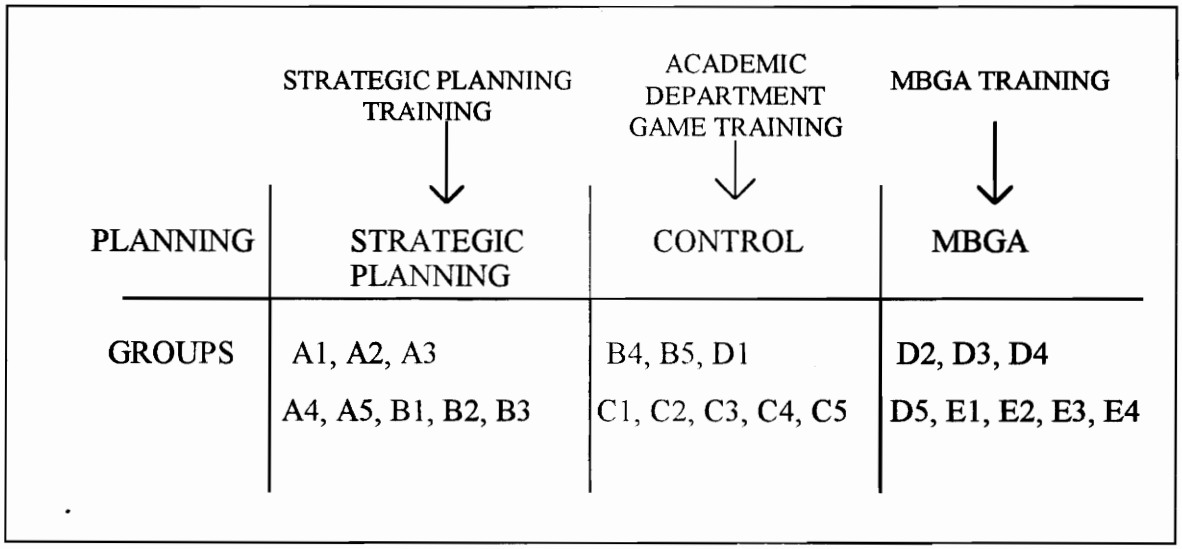

Figure 4.2 Experimental setup using the Academic Department Game

There are three types of groups among all the 24 teams. The teams A1, A2, A3, A4, A5, B1, B2, and B3 form the SP group which received the training session on the concepts related to SP and the teams D2, D3, D4, D5, E1, E2, E3, and E4 form the MBGA group that received the training session on the concepts related to MBGA. The training sessions in SP and MBGA, given to the SP and MBGA groups, are described in the latter part of this chapter. The third group forms the Control group and consists of the

teams B4, B5, C1, C2, C3, C4, C5, and D1. They did not receive training in either SP or MBGA. They were given an overview of the operating characteristics of the academic department game.

In this experimental setup of the academic department game, teams were assigned to a particular treatment. The experimental setup depicted in Figure 4.2 is a nested experiment, where groups were nested within strategy treatments. The experiment is called a nested experiment if the levels of one factor are nested within, or are sub samples of, levels of another factor. Such experiments are also sometimes called hierarchical experiments (Hicks, 1973). The model for this experiment is:

$$Y_{ijk} = \mu + S_i + T_{j(i)} + \varepsilon_{k(ij)}$$

with i = 1,2,3 and j = 1,2,3,4,5,6,7,8 and k = 1

where,

Y_{ijk} = Representation of the observed value

μ = Overall Mean

S_i = Effect due to the strategy adopted by the team

$T_{j(i)}$ = Team effect within each strategy

$\varepsilon_{k(ij)}$ = Random error on the jth observation in the ith treatment

It was assumed that the SP, MBGA and Control groups did not have any prior experience in managing a real academic department and at the end of the corresponding training session, these three groups (SP, MBGA, and Control) started to play the academic department game and manage the department according to the principles of the management strategy provided to them in the training session. The details of the training sessions follows.

4.2.2.1 Training

Each of the eight teams that form the two groups of SP and MBGA received a one hour training session in the corresponding management strategy.

The eight teams that form the SP group were given a training session by Dr. Kleiner on the basic principles behind traditional strategic planning approaches and were encouraged to apply those principles for playing the fictitious role of the head of the academic department, during the course of playing the academic department game. In addition to this, the SP group members were given a basic outline by Dr. Torgersen to be followed for adopting a strategic planning approach in managing the academic department, while participating in the academic department game. This outline is detailed in the appendix. This strategic planning model for the academic department game participants incorporates most of the popular concepts behind traditional strategic planning approaches described in the literature. The strategic planning model detailed in the appendix has been tailored to be applied conveniently by a participant in the academic department game. The model represents an iterative process and involves the establishment of five year and one year objectives and an annual review of these objectives. The members of the eight teams that form the SP group were also supplied with a copy of the article, "A Strategic Management Process for Public and Third Sector Organizations" and were asked to thoroughly review the article. The responses of this SP group in a feedback form were then compared to the responses of the remaining two sets of sixteen groups, referred to as the MBGA group, who were provided with a short training session on the principles behind the strategy of "management by groping along" and the Control group, which did not receive any formal training in either SP or MBGA principles

The second set of eight teams participating in the academic department game, referred to as MBGA group received a short training session lasting for one hour, from

Dr. Torgersen, regarding the principles and concepts behind the strategy of "management by groping along" as put forward by Behn (1988). These MBGA teams were not given any type of formal training or information on the traditional strategic planning approaches. The members of the eight teams that form the MBGA group were also supplied with the article, "Management by Groping Along" and were asked to thoroughly review the article.

The members of the eight teams which form the Control group were not given any formal training on the principles behind SP and MBGA and were supplied with a copy of the article, "The Roles and Responsibilities of Departmental Heads and Chairpersons in Schools of Education as Perceived by Deans" by Norbert Maerten (1988) and were asked to thoroughly review the article. This article does not deal with the concepts behind either SP or MBGA approaches but presents some research done by the author on the roles and responsibilities of departmental heads and chairpersons in schools of education as perceived by Deans. This was done to maximize face validity. The members of the Control group were also given a short lecture by me on the various aspects of the academic department game.

The members of the teams that form the SP group, MBGA group and the Control group were then asked to fill out a survey instrument which is presented in the latter part of this section. The participants were asked to fill out this questionnaire at the end of every academic year of the academic department game. This means that each of the participant groups submitted a total of four feedback forms over the duration of the academic department game. The feedback form used for getting information from the teams is presented below and is aimed toward measuring the perceptions of the participant groups in the academic department game toward the management strategies adopted by their teams during the course of playing the game. The participant groups were asked to

circle the response that they perceive as closest to the truth. The Likert type scale offered each participating group had for each question as follows:

SA - strongly agree

A - agree

U - undecided

D - disagree

SD - strongly disagree

The questions that make up the questionnaire that the participants of the academic department game are asked to fill out are outlined below:

The following questions are about the management strategies used by your group in the role of department chair of the statistics department. Please circle the response you feel is closest to the true response

SA - Strongly Agree *A - Agree* *U - Undecided*
D - Disagree *SD - Strongly Disagree*

1. We knew where we were going but never knew precisely how to get there.

SA A U D SD

2. Our strategy was to achieve a path which included a series of small wins aiming at the overall goal.

SA A U D SD

3. We knew where we were going and we had a clear notion of how to get there.

SA A U D SD

4. Our strategy was based on establishing a specific direction and feeling our way towards it.

SA A U D SD

5. Our strategy was based on systematically working backwards from where we want to be to where we are now.

SA A U D SD

6. Our strategy made management of the department more systematic.

SA A U D SD

7. Management by feeling along was necessary to achieve our goals.

SA A U D SD

8. Our optimal path was determined from an analysis of resources, capabilities, and the environment.

SA A U D SD

9. Our strategy resulted in a learning process based on lessons learned from the past.

SA A U D SD

10. A learning and adaptive process helped reduce risk in our strategy.

SA A U D SD

11. Our strategy relied on search, synthesis and selection.

SA A U D SD

12. Our strategy involved an analysis of our strengths, weaknesses, opportunities and threats.

SA A U D SD

13. Our strategy allowed us to respond to changing needs and forces.

SA A U D SD

14. Our strategy involved performing a stakeholder analysis.

SA A U D SD

15. In our strategy, we prioritized issues.

SA A U D SD

16. Our strategies were broad and simple.

SA A U D SD

17. Dynamic outside forces were always impacting our ability to know precisely what to do.

SA A U D SD

18. With our strategy, we experimented with various initiatives.

SA A U D SD

19. Based on proper analysis, we planned and implemented the plan efficiently.

SA A U D SD

20. We identified strategic themes.

SA A U D SD

21. What percentage of the team's time was spent planning or analyzing vs. implementing actions (since the previous feedback)?

Planning or Analyzing _____ *%*

Implementing Actions _____%

22. Please describe in your own words in the space available below, the strategy adopted by your team for managing the department of statistics:

_____

_____

_____

_____

_____

The responses of the teams in the feedback form were grouped and analyzed over a period of four academic years. The analysis process is described in Chapter Five. These items outlined earlier are aimed toward recognizing the strategy of management adopted by each of the twenty-four individual participating groups of the academic department game.

The feedback form detailed above contains ten items aimed towards measuring the extent to which the strategy of MBGA was adopted by each team and ten items aimed towards measuring the extent to which the strategy of SP was adopted by each of the twenty four teams in the experiment. The items aimed towards measuring the adoption of MBGA strategy have been randomly intermixed with the items aimed towards measuring the adoption of the SP strategy. The items in the feedback form which deal with the MBGA strategy are: 1, 2, 4, 7, 9, 10, 13, 16, 17, 18, and the items which deal with the SP strategy are: 3, 5, 6, 8, 11, 12, 14, 15, 19, and 20.

The purpose of the final section of the feedback form, in which the participant teams were asked to put in their words the strategy adopted by their respective teams, is

to correlate their responses in the questionnaire to their written response regarding the strategy. This was designed to facilitate the detection of any possible contradictions in the teams' responses, thereby allowing the discarding of invalid questionnaire responses. The performance of each of these twenty-four participant teams was monitored through the reputation score of the department. The academic department game has a feature by which the performance of each of the individual groups is rated by means of a comprehensive quantitative score at the end of every fictitious Fall semester of the game. The reputation score of each of the participating groups is calculated by the academic department game using a formula that takes into account the following factors regarding the position of the group:

- Reputation of the department in the year prior to the semester under consideration.
- Number of graduate students enrolled.
- Total department productivity (this includes the productivity of each of the faculty members in regard to publications, teaching, research, and public service).
- Level of satisfaction of each of the faculty in regard to their salary, teaching load and teaching preference

The results of the final reputation scores of the teams participating in the academic department game and the analysis of those results is discussed in chapter five.

The summary of responses by the participating teams in the academic department game on the items in the feedback form is also provided in chapter five, along with a detailed analysis of the trends and inferences of those responses.

CHAPTER 5 RESULTS AND DISCUSSION

The data collected from the participants of the academic department game was analyzed with the intent of validating and rating the measures for the strategy of "management by groping along." The six indicators / measures for the strategy of "management by groping along" developed in section 4.1 of chapter 4 were validated through the pre-test process by testing the understanding of the article by the raters of the pre-test process and validity and reliability of the raters were established through a short-quiz taken by the raters (as described in Chapter 4). The results of the pre-test process along with a summary and analysis of the responses in the feedback form for the participants of the academic department game are presented in this Chapter.

5.1 RESULTS

The results of the pre-test process and the academic department game described in Chapter 4 are presented in this section. The evaluation and interpretation of these results is presented in section 5.2 of this chapter

5.1.1 The Pre-test Process

The purpose of the pre-test was to establish the reliability and validity of the indicators / measures for the strategy of "management by groping along." This pre-test process consisted of two major tests:

1. Testing the Understanding of the MBGA and SP Articles by the Raters.
2. Validation of the Measures for the Strategy of MBGA.

The purpose of each of these tests was discussed in detail in the previous chapter.

5.1.1.1 Testing the Understanding of the MBGA and SP Articles by the Raters

As outlined in Chapter 4, the understanding of the articles, "Management by Groping Along" and, "A Strategic Management Process for Public and Third-Sector Organizations" was tested through a quiz containing twenty statements. The five raters of the pre-test process were asked to identify the management strategy associated with each of those twenty statements.

The scores of the raters of the pre-test process on the number of accurate responses are detailed in Table 5.1.1.1 above and are analyzed in Table 5.1.1.2 below. Correlation coefficients can be computed in various ways, depending on the nature of the data. The most common is the *Pearson Product-Moment Correlation Coefficient.* This takes into account not only the person's position in the group, but also the amount of his deviation above or below the group mean (Anastasi, 1976). The *Pearson Product-Moment Correlation Coefficient* will have a high positive value when corresponding standard scores are of equal sign and of approximately equal amount in the two variables (Anastasi, 1976). The following is a description of the variables depicted in Table 5.1.1.2:

- X = Total number of accurate responses by the concerned rater (in the pre-test process) in the short quiz, out of a total of ten MBGA quiz items.
- Y = Total number of accurate responses by the concerned rater (in the pre-test process) in the short quiz, out of a total of ten SP quiz items.
- Σ = Total number of accurate responses by all the five raters (in the pre-test process) on the ten MBGA and ten SP quiz items separately.
- $M = (\Sigma) / (5)$

  where 5 is the total number of raters in the pre-test process.

- x = (M) - (X); for each rater's total number of accurate responses on the ten MBGA items in the quiz.
- y = (M) - (Y); for each rater's total number of accurate responses on the ten SP items in the quiz.

Table 5.1.1.1 - Analysis of the Total Number of Accurate Responses by the Raters in the Pre-test Process on the MBGA and SP Items in the quiz: Computation of Pearson Product-Moment Correlation Coefficient

Rater	X	Y	x	y	x^2	y^2	xy
1	9	8	-0.6	-1.4	0.36	1.96	+0.84
2	10	10	+0.4	+0.6	0.16	0.36	+0.24
3	9	9	-0.6	-0.4	0.36	0.16	+0.24
4	10	10	+0.4	+0.6	0.16	0.36	+0.24
5	10	10	+0.4	+0.6	0.16	0.36	+0.24
Σ	48	47			1.20	3.20	1.80
M	9.6	9.4					

$\sigma_x = (1.20 / 5)^{0.5} = (0.24)^{0.5} = 0.489$

$\sigma_y = (3.20 / 5)^{0.5} = (0.64)^{0.5} = 0.800$

$r_{xy} = (1.80 / 5 * 0.489 * 0.8) = 0.9202$

Therefore $r_{xy} = 0.92$

where r_{xy} is the *Pearson Product-Moment Correlation Coefficient.*

These results established inter-rater reliability and split-half reliability.

5.1.1.2 Validation of the Measures for the Strategy of MBGA

The purpose of this validation step of the pre-test process was to establish the validity of the measures for the strategy of MBGA.

The five raters of the pre-test process were given a fictitious scenario and two possible responses by a manager, as described in chapter 4. The first response in this fictitious scenario constituted the principles and concepts incorporated in MBGA and the second response constituted the principles and concepts incorporated in SP. The raters of the pre-test process were asked to identify the response that represented MBGA and the response that represented SP.

The result was that all the five raters of the pre-test process identified *approach # 1* as the SP response and *approach # 2* as the MBGA response. These results are tabulated in Table 5.1.2 below:

Table 5.1.2 - The Identification of Management Strategies by the Raters in the Pre-test Process for the Validation of Measures for the Strategy of MBGA

RATER	APPROACH # 1	APPROACH # 2
1	SP	MBGA
2	SP	MBGA
3	SP	MBGA
4	SP	MBGA
5	SP	MBGA

5.1.2 The Academic Department Game

The purpose of the main experiment using the academic department game was to use the indicators developed and verify the existence of the strategy of MBGA. The experimental setup for the academic department game was described in chapter 4. The SP group, the MBGA group and the Control group contained eight teams each and each team consisted of three members. Each team was collectively responsible for the decisions for each input of the academic department game.

5.1.2.1 Measurement of Performance

The academic department game has a feature by which the performance of each team over a period of time can be measured using a "reputation score." As outlined earlier, the objective of each department is to maximize the departmental reputation. The factors affecting this departmental reputation are teaching evaluations, publication and research, university and national service by the faculty members.

The summary of the final reputation scores of the 24 teams that participated in the academic department game for a period of four academic years (in the game) is presented in Table 5.1.3 below:

Table 5.1.3 - The Reputation Scores of the Teams Constituting the SP, Control and, MBGA Groups in the Academic Department Game

SP		CONTROL		MBGA	
TEAM	REPUTATION (SCORE)	TEAM	REPUTATION (SCORE)	TEAM	REPUTATION (SCORE)
A1	20.73	**B4**	19.28	**D2**	16.73
A2	18.37	**B5**	17.28	**D3**	22.52
A3	23.70	**C1**	23.76	**D4**	21.13
A4	18.22	**C2**	22.54	**D5**	22.00
A5	22.67	**C3**	23.99	**E1**	23.12
B1	21.16	**C4**	22.58	**E2**	22.78
B2	20.42	**C5**	24.33	**E3**	22.71
B3	23.28	**D1**	21.29	**E4**	21.41

These scores were the comprehensive departmental reputations of each team at the end of four game years in the academic department game. As described in chapter 4, the higher the value of this quantitative reputation score, the better the concerned team's performance was considered to be; this inference was based on the configuration and setup of the academic department game. The following Table 5.1.4 illustrates the reputation scores of the twenty four teams among the SP, MBGA and, Control groups at the end of four years of the academic department game. The model used for this ANOVA (analysis of variance) is:

$$Y_{ijk} = \mu + S_i + T_{j(i)} + \varepsilon_{k(ij)}$$

with i = 1,2,3 and j = 1,2,3,4,5,6,7,8 and k = 1

where,

Y_{ijk} = Representation of the observed value

μ = Overall Mean

S_i = Effect due to the strategy adopted by the team

$T_{j(i)}$ = Team effect within each strategy

$\varepsilon_{k(ij)}$ = Random error on the jth observation in the ith treatment

Table 5.1.4 - ANOVA for the Final Performance Scores of the SP, MBGA and, Control Groups in the Academic Department Game

SOURCE	df	SS	MS	F	p > F
TREATMENT	2	2.5106	1.255	.2505	.7807
TEAM	21	105.23	5.0109		
TOTAL	23	107.23			

The results obtained in Table 5.1.4 above indicate that there is no significant effect of training on the performance of the teams, at the 5-percent significance level. The following Table 5.1.5 depicts the average final reputation score across the eight teams which constitute each of the SP, MBGA and, Control groups.

Table 5.1.5 - Average Reputation Scores of the SP, MBGA and, Control Groups in the Academic Department Game

STRATEGY	AVERAGE PERFORMANCE
SP	21.07
CONTROL	21.55
MBGA	21.88

5.1.2.2 Measurement of Strategy

The feedback form used for measuring the strategy used by each of the twenty four participating teams in the academic department game is described in chapter 4. The participating teams were asked to respond to twenty statements on a feedback form, at the end of each academic year of the academic department game. The teams were asked to select one of five choices which were:

SA - Strongly Agree

A - Agree

U - Undecided

D - Disagree

SD - Strongly Disagree

The responses of each team were grouped together for each of the twenty questions for each year of the academic department game. The following numerical value was assigned to the following responses:

SA (Strongly Agree) or A (Agree)	-	1
U (Undecided)	-	0
SD (Strongly Disagree) or D (Disagree)	-	-1

The SA and A responses, and the SD and D responses were grouped together and given the same weight in order to simplify the evaluation and analysis of the responses by the teams. The following Tables summarize the responses of the teams and the numerical values 1, -1 and 0 indicate the responses ranging from SA to SD as described earlier. Table 5.1.5 contains the responses of the twenty four teams that form the SP, MBGA and Control groups that participated in the academic department game after one year of the game. The items on the feedback form used for obtaining the responses from the

participants of the academic department game consisted of ten items oriented towards measuring the extent to which the strategy of MBGA was adopted by the team and ten items oriented toward measuring the extent to which the strategy of SP was being adopted by the team, for the concerned year of the game. The ten items for SP and the ten items for MBGA were intermixed randomly on the feedback form used for obtaining the responses from the participating teams in the academic department game. The questions were rearranged and the MBGA and SP item responses were grouped apart in order to simplify the evaluation and analysis of the responses by the teams. The following Table 5.1.6 shows the items ranging from Q1 to Q10 representing the SP items on the feedback form and the items ranging from Q11 to Q20 representing the MBGA items on the feedback form.

Table 5.1.6 - Representation of Feedback Form Items for Analysis

Item Number for Analysis	SP Item Number	Item Number for Analysis	MBGA Item Number
Q1	3	Q11	1
Q2	5	Q12	2
Q3	6	Q13	4
Q4	8	Q14	7
Q5	11	Q15	9
Q6	12	Q16	10
Q7	14	Q17	13
Q8	15	Q18	16
Q9	19	Q19	17
Q10	20	Q20	18

The responses of the teams on the feedback form are summarized in Tables 5.1.7, 5.1.8, 5.1.9 and, 5.1.10 for the SP group, Tables 5.1.11, 5.1.12, 5.1.13 and, 5.1.14 for the Control group and, Tables 5.1.15, 5.1.16, 5.1.17 and 5.1.18 for the MBGA group (Appendix F). These responses of the various teams in the SP group, Control group and, the MBGA group have been categorized based on the years 1, 2, 3 and, 4 of the academic department game.

The responses of the twenty four teams that participated in the academic department game have been collected by using a feedback form and those responses are presented in the appendix (Table 5.1.7 to Table 5.1.18 - Appendix F).

The following Tables 5.1.19, 5.1.20 and, 5.1.21 present a concise summary of the SP, MBGA and, Control groups' responses over a period of four years in the game. The term "C" used in the analysis henceforth was calculated according to the formula shown below:

$$C = (Q11 + Q12 + Q13 + Q14 + Q15 + Q16 + Q17 + Q18 + Q19 + Q20) - (Q1 + Q2 + Q3 + Q4 + Q5 + Q6 + Q7 + Q8 + Q9 + Q10)$$

where Q1 - Q20 represent the responses of the academic department game participants on the instrument (feedback form) used for collecting information from the various teams.

Table 5.1.19 - Summary of the Average "C" Values of the Teams in the SP Group Over a Period of Four Years in the Academic Department Game

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
MEAN	- 14.75	- 15.37	- 11.63	- 8.50
σ	2.55	2.56	3.46	4.00
MINIMUM	- 18.00	- 19.00	- 17.00	- 15.00
MAXIMUM	- 11.00	- 12.00	- 6.00	- 4.00

Table 5.1.20 - Summary of the Average "C" Values of the Teams in the MBGA Group Over a Period of Four Years in the Academic Department Game

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
MEAN	+ 16.25	+ 15.88	+ 15.75	+ 14.87
σ	1.16	1.64	2.71	3.14
MINIMUM	15.00	13.00	10.00	9.00
MAXIMUM	18.00	18.00	18.00	18.00

Table 5.1.21 - Summary of the Average "C" Values of the Teams in the Control Group Over a Period of Four Years in the Academic Department Game

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
MEAN	+ 9.38	+ 8.63	+ 11.00	+11.63
σ	1.19	2.92	3.34	2.93
MINIMUM	7.00	4.00	8.00	6.00
MAXIMUM	11.00	13.00	18.00	15.00

. Table 5.1.22 presents the average "C" values of the SP, Control and, MBGA groups across their eight constituent teams, for the four-year duration of the academic department game. The data in Table 5.1.22 below is also depicted graphically in Figure 5.1.2.

Table 5.1.22 - Average Values of "C" of the Teams which Constitute the SP, Control and, MBGA Groups in the Academic Department Game Over a Period of 4 Years

TRAINING	YEAR 1	YEAR 2	YEAR 3	YEAR 4
SP	- 14.75	- 15.37	- 11.63	- 8.50
MBGA	+ 16.25	+ 15.88	+ 15.75	+ 14.87
CONTROL	+ 9.38	+ 8.63	+ 11.00	+11.63

In order to statistically evaluate these results, observations and, inferences outlined above, some statistical test were conducted on the data in Table 5.1.20, which presents the average values of "C" for the SP, MBGA and, Control groups over the four year duration of the academic department game. The following were the objectives of those statistical tests:

1. To determine and verify the statistical significance of the influence of training method (SP, MBGA or Control).

2. To identify and verify statistically any possible linear, quadratic or cubic trends in the strategy adopted by the three participant groups in the academic department game.

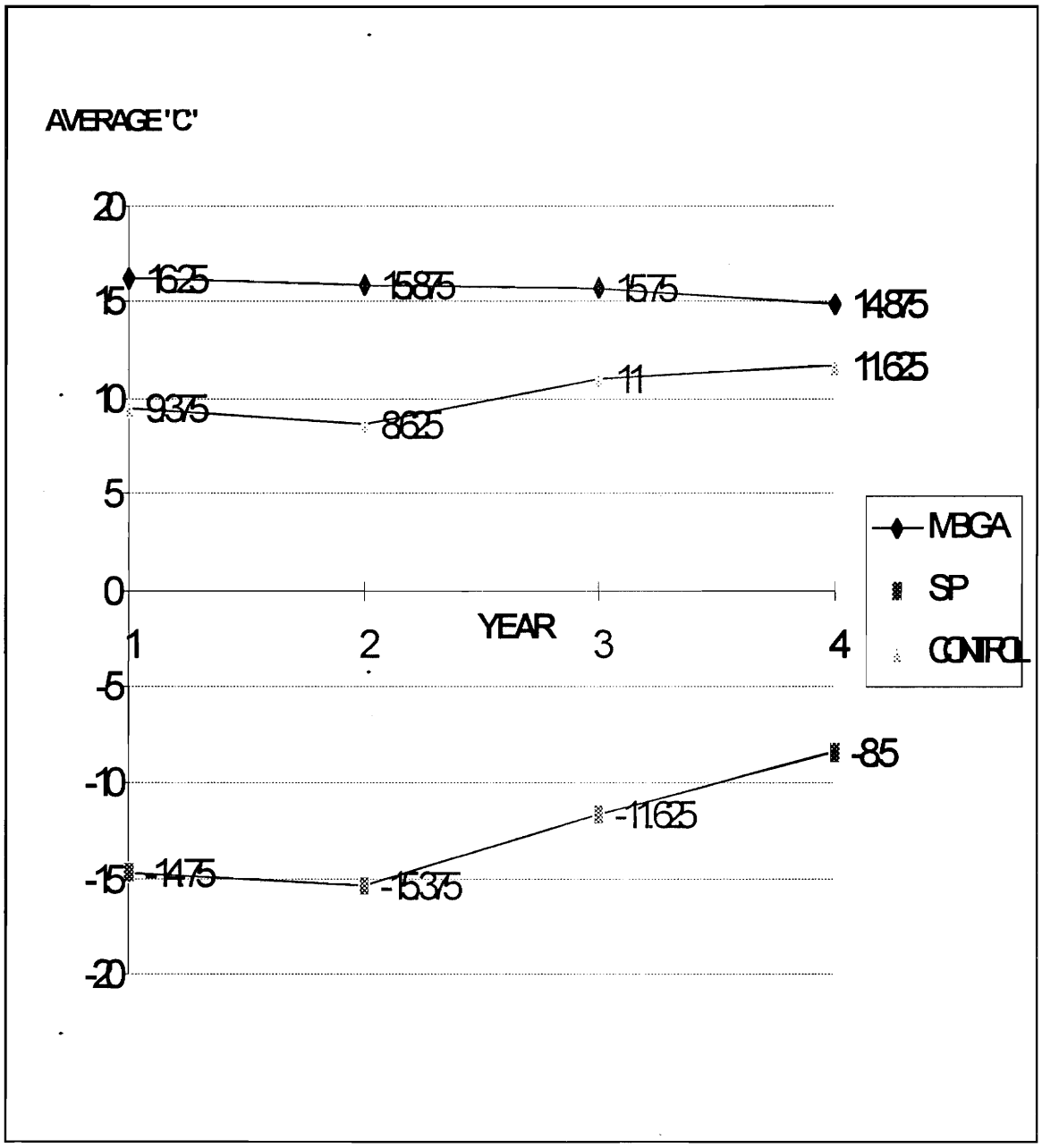

Figure 5.1.2 - Average Values of "C" for the SP, MBGA and, Control Groups in the Academic Department Game Over a Period of Four Years

The Statistical Analysis Software (SAS) (Mainframe Version) was used to perform the statistical tests. Tables 5.1.23 and 5.1.24 present the summary of the results obtained from the performance of an F-Test, and an Analysis of Variance of Contrast Variables on the data presented in Table 5.1.22. These results are discussed in the next section.

Table 5.1.23 - General Linear Models Procedure on the Average Values of "C" of the Teams which Constitute the SP, Control and, MBGA Groups in the Academic Department Game Over a Period of 4 Years

SOURCE	df	SS	MS	F	p > F
TRAINING	2	14344.52	7172.26	1152.96	0.0001
TEAM (TRAINING)	21	251.72	11.98	1.93	0.0239
YEAR	3	129.95	43.32	6.96	0.0004
(TRAINING) (YEAR)	6	165.39	27.56	4.43	0.0008

Table 5.1.24 - General Linear Models Procedure
Analysis of Variance of Contrast Variables

CONTRAST VARIABLE: LINEAR / QUADRATIC / CUBIC			
SOURCE	Time.1 (LINEAR)	Time.2 (QUADRATIC)	Time.3 (CUBIC)
MEAN	0.0015	0.0909	0.1385
TRAINING	0.0011	0.1605	0.7360

5.2.2 Discussion

The following section outlines the inferences that can be made from the previously mentioned results.

5.2.2.1 The Pre-test Process

The interpretation of the results from the pre-test process are presented in sections 5.2.2.1.1 and 5.2.2.1.2 below.

5.2.2.1.1 Testing the Understanding of the MBGA and SP Articles by the Raters

The following inferences can be made from the results, concerning the understanding by the raters in the pre-test process, of the principles and concepts put forward in the articles, "Management by Groping Along" and, "A Strategic Management Process for Public and Third-Sector Organizations":

1. The high number of accurate responses of the five raters on the MBGA and SP items in the quiz process indicates that they had obtained a reasonably good understanding of the articles reviewed by them for the pre-test process. This increases the reliability of the results from the pre-test process.
2. The high value of r_{xy} which is the Pearson Product-Moment Correlation Coefficient (0.92) indicates that there is a statistically significant correlation between the variable 'x' and variable 'y'. This, in effect, indicates that the raters in the pre-test process had attained a good understanding of the principles and concepts put forward in the articles, "Management by Groping Along" and, "A Strategic Management Process for Public and Third-Sector Organizations" and could distinguish between constructs.

5.2.2.1.2 Validation of the Measures for the Strategy of MBGA

The purpose of this validation step of the pre-test process was to establish the validity and reliability of the measures for the strategy of MBGA.

The five raters of the pre-test process were given a fictitious scenario and two possible responses by a manager, as described in chapter 4. The first response in this fictitious scenario constituted the principles and concepts incorporated in MBGA and the second response constituted the principles and concepts incorporated in SP. The raters of the pre-test process were asked to identify the response that represented MBGA and the response that represented SP.

The result was that all the five raters of the pre-test process identified *approach # 1* as the SP response and *approach # 2* as the MBGA response (as summarized in Table 5.1.2). The results of this validation step enable us to infer that the measures for the strategy of MBGA are valid and are reliable across the -raters.

5.2.2.2 The Academic Department Game

The following sections 5.2.2.2.1 and 5.2.2.2.2 present the inferences that can be drawn from the results of the analysis of the responses by the teams participating in the academic department game

5.2.2.2.1 Evaluation of Performance

As outlined earlier, the objective of each team participating in the academic department game was to maximize the departmental reputation. The factors affecting this departmental reputation are teaching evaluations, publication and research, university and national service by the faculty members.

A summary of the final reputation scores of the 24 teams that participated in the academic department game for a period of four academic years (in the game) was presented in Table 5.1.3.

These scores were the comprehensive departmental reputations of each team at the end of four game years in the academic department game. As described in chapter 4, the higher the value of this quantitative reputation score, the better the concerned team's performance was considered to be; this inference is based on the configuration and setup of the academic department game.

The summary of information in Table 5.1.4 and Table 5.1.5 allows us to make the following inferences:

1. The ANOVA (analysis of variance) conducted on the reputation scores of the teams in the SP, MBGA and, Control groups indicates that there are no significant differences between groups, at 5-percent significance level.
2. The average reputation scores among the eight teams does not appear to be significantly different across the three groups of SP, MBGA and, Control.

5.2.2.2.2 Evaluation of Strategy

The summary of the responses of the twenty four teams in the three different groups that participated in the academic department game, was presented in Table 5.1.7 to Table 5.1.19.

The following observations can be made from the trends in the value of "C" in the three different groups, over the four year academic department game period:

1. The average value of "C" for the SP group appears to be increasing over the period from year 1 to year 2.

2. The average value of "C" for the MBGA group appears to remain the same over the four year period, apart from marginal changes from year to year.
3. The average value of "C" for the Control group appeared to have a noticeable increase from year 1 to year 4, with the single exception of a minor decrease from year 1 to year 2.

The observations made above indicate that the following inferences can be made:

1. SP Group

- There appears to be a significant shift in the strategy adopted by the SP group in the academic department game, over the four year period. This shift in strategy seemed to be away from SP and towards MBGA, over the duration of the game.
- The SP groups, on the whole, seemed to adopt SP during the initial phases of the game and the extent to which SP was adopted appeared to decrease from year 1 to year 4.

2. MBGA Group

- The MBGA groups, on an average, seemed to adopt MBGA to a large extent from the beginning of the game until the conclusion of the four year game period.
- There was a marginal decrease in the average value of "C" over the four year period. Hence, on an overall basis, there appeared to be no major shift in the strategy adopted by the MBGA groups over the four year period of the academic department game.

3. Control Group

- The Control groups, on an average, seemed to adopt MBGA to a considerable extent over the four year period.

- There was a marginal increase in the average value of "C" over the four year period. Hence, on an overall basis, there appeared to be no major shift in the strategy adopted by the Control groups over the four year period of the game.
- A single exception to the marginal increase in the average value of "C" over the four year period was the marginal decrease in the average value of "C" from year 1 to year 2 of the game.

The set of six indicators for the strategy of MBGA, developed in Section 4.1 of Chapter 4, were validated through the pre-test process and used for designing the content of the items in the feedback form used for collecting information from the participants of the academic department game. These indicators for the strategy of MBGA were validated through the pre-test process by selecting a group of qualified individuals as raters and testing the understanding of the MBGA and SP articles. The validity and reliability of the six indicators was also established through the remaining stages of the pre-test process. The reliability of the raters in the pre-test process was also established on the basis of the *pearson product-moment correlation coefficient.*

The six measures / set of indicators for the strategy of MBGA were then applied to the development of the instrument used for obtaining the information on the strategy used by the participants of the academic department game. The MBGA group was observed to follow the MBGA strategy more than the SP and Control groups. The existence of the strategy of MBGA was tested through the monitoring of the responses of the academic department game participants, in the feedback form. The set of measures for MBGA were also used to experimentally distinguish between SP and MBGA.

The set of indicators for the strategy of MBGA was one of the outputs for this research. The analysis of the performance differences between the MBGA, SP and,

Control groups based on the reputation scores of the teams in these groups is the second output for this research. The reputation scores of the various teams which constitute the SP, MBGA and, Control groups over the period from year 1 through year 4 of the academic department game were also analyzed using the ANOVA (analysis of variance) test. The patterns and trends of the changes in the reputation scores from year 1 through year 4 of the game were also analyzed. This research has provided several outcomes which include extended research opportunities and contribution to the literature on MBGA. An understanding of the phenomenon of MBGA and what can be expected from the strategy of MBGA is also a significant outcome of this research.

CHAPTER 6 - SUMMARY AND CONCLUSIONS

This final chapter summarizes the contents of this thesis, and inferences about the existence and measurement of alternative planning strategies, and provides recommendations for extended research in this subject area.

6.1 Thesis Summary

This thesis is focused on developing a set of measures for the strategy of "Management by Groping Along" and comparing this strategy to the traditional strategic planning approach, in a simulated public sector administration setting.

The first objective of this research was to develop a set of indicators for measuring the strategy of "management by groping along." This was done through the process of extracting the salient features of MBGA as outlined in the literature and establishing the validity and reliability of these measures, through the pre-test process. The participants selected for the pre-test process were tested for their understanding of the concepts and principles involved in SP and MBGA approaches.

The second objective of this research effort was to apply the set of measures for MBGA to test the existence of the strategy of "management by groping along." This was done through the academic department game experiment. Three groups were formed to participate in the academic department game and the set of teams constituting the first group (MBGA group) were given training in the concepts of MBGA. The set of teams constituting the second group (SP group) were given training in the concepts of SP. The set of teams constituting the third group (Control group) were not given training in either SP or MBGA approaches. A feedback form was developed which was oriented towards measuring the extent of adoption of MBGA or SP strategies by the participants of the

game. The items used for getting the responses from the participants were developed through the set of measures for the MBGA approach and through the literature for SP approach.

The third objective of this research was to experimentally distinguish between "management by groping along" and strategic planning. This was done through the academic department game experiment described above and then comparing the performance (reputation score) of each of the three participating groups (SP, MBGA and, Control) in the game. The strategy adopted by each of the teams constituting the three participating groups was also monitored through the duration of four years of the game and analyzed for trends and changes in the strategy adopted by the respective teams.

6.2 Conclusions

The following conclusions can be drawn from the various results and the analysis of those results. The ANOVA (analysis of variance) conducted on the reputation scores of the teams in the SP, MBGA and, Control groups indicates that there is no significant effect of training over the performance scores, at 5-percent significance level. The average reputation scores among the eight teams does not appear to be significantly different across the three groups of SP, MBGA and, Control. One of the possible causes of this result could be the inadequacy of the training sessions provided to the three groups which participated in the academic department game. Another possible cause for the lack of significant effect of training over the performance scores could be the effectiveness of the strategy (MBGA or SP) adopted by the teams. The various weak points in the academic department game itself could also be the cause of this result.

The following observations can be made from the trends in the value of "C" in the three different groups, over the four year academic department game period: The average

value of "C" for the SP group appears to be increasing over the period from year 1 to year 2. The average value of "C" for the MBGA group appears to remain the same over the four year period, apart from marginal changes from year to year. The average value of "C" for the Control group appeared to have a noticeable increase from year 1 to year 4, with the single exception of a minor decrease from year 1 to year 2.

These observation allow us to draw the following inferences:

- There appears to be a significant shift in the strategy adopted by the SP group in the academic department game, over the four year period. This shift in strategy seemed to be away from SP and towards MBGA, over the duration of the game.
- The SP groups, on the whole, seemed to adopt SP during the initial phases of the game and the extent to which SP was adopted appeared to decrease from year 1 to year 4.
- The MBGA groups, on an average, seemed to adopt MBGA to a large extent from the beginning of the game till the conclusion of the four year game period.
- There was a marginal decrease in the average value of "C" over the four year period. Hence, on an overall basis, there appeared to be no major shift in the strategy adopted by the MBGA groups over the four year period of the academic department game.
- The Control groups, on an average, seemed to adopt MBGA to a considerable extent over the four year period.
- There was a marginal increase in the average value of "C" over the four year period. Hence, on an overall basis, there appeared to be no major shift in the strategy adopted by the Control groups over the four year period of the game.

A single exception to the marginal increase in the average value of "C" over the four year period was the marginal decrease in the average value of "C" from year 1 to year 2 of the game.

6.3 Extended Research Opportunities

An experiment using the academic department game does not represent completely the dynamics involved in public sector administration. Real-life management decisions require a lot of insight into the numerous factors which affect the performance of the concerned organization. Strategic planning principles are also being researched extensively and some of this research is focused on transforming the traditional SP concepts and procedures to accommodate the continuous changes which occur in the environment surrounding an organization.

The academic department game can be conducted for a more extended period of time, instead of four years, and the performance and strategy trends can be analyzed over a larger set of observations. This extension of the duration in the academic department game has the potential for providing valuable insights into the performance and strategy variations due to different planning strategies. The opportunities, risks, advantages, and disadvantages involved in extending / modifying the MBGA principles beyond the public sector domain, into the private sector, can also be explored. This would also provide the opportunity of evaluating the true effectiveness of traditional SP approaches in private and public sector organizations when compared to the MBGA approach.

The possibility exists for developing computer simulation programs, similar to the academic department game, which take into account more of the total factors and variables influencing organizations. Similarly, computer programs that simulate the private sector environment could also be developed in order to test experimentally the applicability of the MBGA principles to the domain of private sector administration. Also, the opportunity exists for comparing the performance of MBGA and SP approaches in the public sector to the private sector domain (field research, as opposed to using simulation

programs). Extended research opportunities also exist in the area of combining MBGA and traditional SP approaches and principles.

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APPENDICES

APPENDIX A

The short quiz taken by the raters (participants of the pre-test process):

1. As a Manager, you know where you are going but never know precisely how to get there.

   MBGA SP

2. Your Strategy is to achieve a path which includes a series of small "wins" aiming at the overall goal.

   MBGA SP

3. As a Manager, you know where you are going and you have a clear notion of how to get there.

   MBGA SP

4. Your strategy is based on establishing a specific direction and "feeling" your way towards it.

   MBGA SP

5. Your strategy is based on systematically working backwards from where you want to be to where you are now.

   MBGA SP

6. The strategy is an attempt to make management more systematic.

   MBGA SP

7. Management by "feeling" your way along is necessary to achieve your goals.

   MBGA SP

8. The optimal path is determined from an analysis of resources, capabilities, and the environment.

   MBGA SP

9. This strategy yeilds a learning process based on lessons learned from the past.

   MBGA SP

10. A learning and adaptive process helps reduce risk in this strategy.

    MBGA SP

11. This strategy relies on search, synthesis, and selection.

    MBGA SP

12. This strategy involves a SWOT (Stregnths, Weaknesses, Opportunities, and Threats) analysis.

    MBGA SP

13. As a manager, you are able to respond to changing needs and forces.

    MBGA SP

14. This strategy involves a stakeholder analysis.

    MBGA SP

15. In this strategy, you prioritize issues.

    MBGA SP

16. Strategies should be broad and simple.

    MBGA SP

17. Dynamic outside forces are always impacting your ability to know precisely what to do.

    MBGA SP

18. With this strategy, you experiment with various initiatives.

    MBGA SP

19. With proper analysis, you can plan and implement efficiently.

    MBGA SP

20. You identify strategic themes in this strategy.

    MBGA SP

APPENDIX B

The instrument (feedback form) used for collecting information from the participants of the academic department game:

The following questions are about the management strategies used by your group in the role of department chair of the statistics department. Please circle the response you feel is closest to the true response

SA - Strongly Agree A - Agree U - Undecided
D - Disagree SD - Strongly Disagree

1. We knew where we were going but never knew precisely how to get there.
SA A U D SD
2. Our strategy was to achieve a path which included a series of small wins aiming at the overall goal.
SA A U D SD
3. We knew where we were going and we had a clear notion of how to get there.
SA A U D SD
4. Our strategy was based on establishing a specific direction and feeling our way towards it.
SA A U D SD
5. Our strategy was based on systematically working backwards from where we want to be to where we are now.
SA A U D SD
6. Our strategy made management of the department more systematic.
SA A U D SD
7. Management by feeling along was necessary to achieve our goals.
SA A U D SD
8. Our optimal path was determined from an analysis of resources, capabilities, and the environment.
SA A U D SD
9. Our strategy resulted in a learning process based on lessons learned from the past.
SA A U D SD
10. A learning and adaptive process helped reduce risk in our strategy.
SA A U D SD

11. Our strategy relied on search, synthesis and selection.

SA A U D SD

12. Our strategy involved an analysis of our strengths, weaknesses, opportunities and threats.

SA A U D SD

13. Our strategy allowed us to respond to changing needs and forces.

SA A U D SD

14. Our strategy involved performing a stakeholder analysis.

SA A U D SD

15. In our strategy, we prioritized issues.

SA A U D SD

16. Our strategies were broad and simple.

SA A U D SD

17. Dynamic outside forces were always impacting our ability to know precisely what to do.

SA A U D SD

18. With our strategy, we experimented with various initiatives.

SA A U D SD

19. Based on proper analysis, we planned and implemented the plan efficiently.

SA A U D SD

20. We identified strategic themes.

SA A U D SD

21. What percentage of the team's time was spent planning or analyzing vs. implementing actions (since the previous feedback)?

Planning or Analyzing _____%

Implementing Actions _____%

22. Please describe in your own words in the space available below, the strategy adopted by your team for managing the department of statistics:

_____

_____

_____

APPENDIX C

The SAS code used for analyzing the information collected from the academic department game participants:

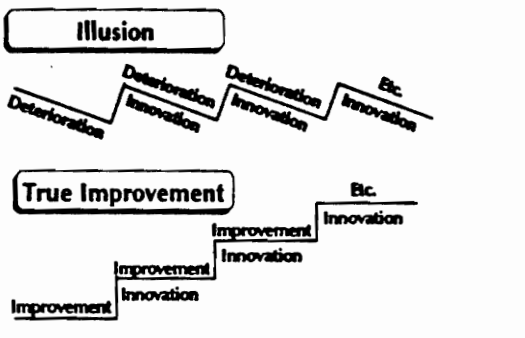
```
/*  AUTOEXEC Processing begin; file is VTSAS  LINEMODE */
DATA ONE;
INPUT TEAM $ WEEK Q1-Q20;

IF (TEAM = 'A1') OR (TEAM = 'A2') OR (TEAM = 'A3') OR (TEAM = 'A4') OR (TEAM = 'A5') OR
(TEAM = 'B1') OR (TEAM = 'B2') OR (TEAM = 'B3') THEN TRAINING = 1;

IF (TEAM = 'D2') OR (TEAM = 'D3') OR (TEAM = 'D4') OR (TEAM = 'D5') OR (TEAM = 'E1') OR
(TEAM = 'E2') OR (TEAM = 'E3') OR (TEAM = 'E4') THEN TRAINING = 2;

IF (TEAM = 'B4') OR (TEAM = 'B5') OR (TEAM = 'C1') OR (TEAM = 'C2') OR (TEAM = 'C3') OR
(TEAM = 'C4') OR (TEAM = 'C5') OR (TEAM = 'D1') THEN TRAINING = 3;

/* Data Set WORK ONE 96 OBSERVATIONS AND 23 VARIABLES */

PROC PRINT;
PROC SORT; BY WEEK;
PROC FREQ; BY WEEK;
TABLES TRAINING (Q1-Q20 C);
PROC GLM;
CLASS TRAINING TEAM WEEK;
MODEL C = TRAINING TEAM(TRAINING) WEEK WEEK*TRAINING;
TEST H = TRAINING E = TEAM(TRAINING);

DATA WEEK 1; SET ONE(KEEP = TEAM TRAINING C WEEK);
IF WEEK = 1; WEEK 1_Q = C;
DATA WEEK 2; SET ONE(KEEP = TEAM TRAINING C WEEK);
IF WEEK = 2; WEEK 2_Q = C;
DATA WEEK 3; SET ONE(KEEP = TEAM TRAINING C WEEK);
IF WEEK = 3; WEEK 3_Q = C;
DATA WEEK 4; SET ONE(KEEP = TEAM TRAINING C WEEK);
IF WEEK = 4; WEEK 4_Q = C;

DATA ALL; MERGE WEEK1 WEEK2 WEEK3 WEEK4;
PROC PRINT DATA = ALL;
PROC GLM; CLASS TRAINING; MODEL WEEK1_Q WEEK2_Q WEEK3_Q WEEK4_Q =
TRAINING;
REPEATED TIME 4(POLYNOMIAL);

PROC SORT DATA = ONE; BY TRAINING; BY WEEK;
PROC MEANS; BY TRAINING WEEK; VAR C;
OUTPUT OUT = NEW MEAN = AVG_C;
PROC PLOT DATA = NEW;
PLOT C * WEEK = TRAINING;
PROC PLOT DATA = ONE; BY TRAINING;
```

APPENDIX D

The format of the training process and illustrations used for the strategic planning training of the SP group in the academic department game.

Strategic Planning
for the
Academic Department Game

Change vs. Improvement



(adapted from Joiner Associates, Inc., 1990)

The Window of Improvement

	This change was a bad idea, the wrong thing to do.	This change was a good idea, the right thing to do.
This change was poorly planned and/or executed.		
This change was well planned and executed.		

(adapted from Joiner Associates, Inc., 1990)

General Characteristics of Strategic Planning

- You know where you are going and you have a clear notion of how to get there.
- Strategic Planning is an effort to make management more systematic.
- Strategy is based on working backwards from where you want to be to where you are now.
- Optimal path is determined from an analysis of resources, capabilities, and environment (political, cultural, economic).

Common Steps in Strategic Planning

- Vision Statement
- Mission Statement
- Goals/Objectives
- Guiding Principles/Values
- SWOT Analysis
- Strategy Formulation

Vision

- Vision = a picture of a desired future.
- Vision = the "What?"
  - Purpose (or "mission") = the "Why?"
- After the vision has (or has not) been achieved, it is one's sense of purpose that draws you further, that compels you to set a new vision.
- Mission
- Guiding Principles

(adapted from Senge, 1990, The Fifth Discipline)

Mission

- Mission = purpose, reason for being.
- Mission = "Why?" an organization exists.
- Domain of responsibility = customers served, technologies employed, products and services offered, niche in market.

Guiding Principles

- Guiding Principles = the values (desired) and beliefs (accepted) that guide our behaviors.
- Guiding Principles (core values) = the "How?" They answer the question "How do we want to act, consistent with our mission, along the path toward achieving our vision?" (Senge, 1990).
  - Vision = the "What?"
  - Mission = the "Why?"
- We all have "actual" and "desired" guiding principles. Recognizing our actual guiding principles can help us adhere to our desired guiding principles.

Strategic Planning Process

- Historical Context
- Situational Assessment
- Strategic Issue Agenda
- Strategic Options
- Feasibility Assessment
- Implementation

Strategic Management Group

- Task Force
- CEO, senior staff
- Consulting support

Stage 1: Historical Context

- Trends and events
  - *What are past trends and key events in the organization?*
- Directions
  - *How are directions of emphasis likely to change in the future?*
- Ideals
  - *What is your vision of the organization?*

See Form A.2, Form A.3, and Form A.4

Stage 2: Situational Assessment

- Strengths
  - *What are ranked strengths?*
- Weaknesses
  - *What are ranked weaknesses?*
- Opportunities
  - *What are ranked opportunities?*
- Threats
  - *What are ranked threats?*

See Form A.5

Stage 3: The Strategic Issue Agenda

- Issues
  - *Which 4-7 high-priority issues require active management?*
  - *What forces are pulling or pushing the organization?*

See Form A.6

Stage 4: Strategic Options

- Action Sets
  - *What concrete actions could be undertaken to manage each issue to build on strengths, overcome weaknesses, exploit opportunities and prevent threats?*
- Strategic Themes
  - *What themes emerge from actions?*

See Form A.7

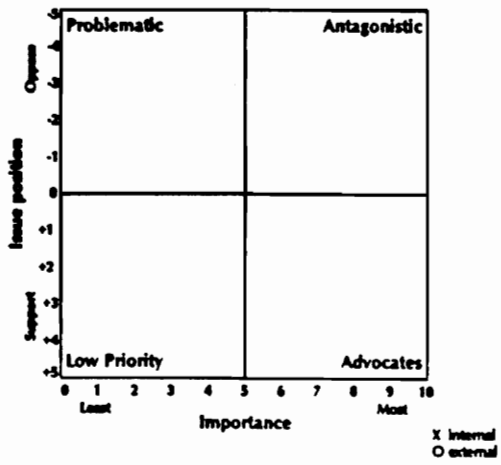
Stage 5: Feasibility Assessment

- Stakeholder Analysis
  - *How will those with political, financial, managerial, or professional interests respond to strategies?*
- Resource Analysis
  - *What resources are required to implement the strategy?*

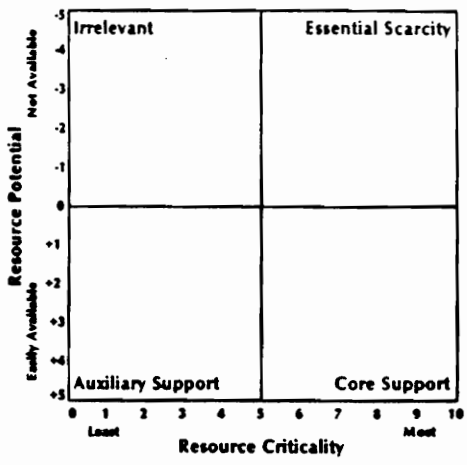
See Form A.8, Form A.9, Form A.10, Form A.11, and Form A.12, A.13

Plot Forms A.10a, A.13a

A. 10a



A.13a



Stage 6: Implementation

- Resource Mobilization
  - *What are broad-scale concerns due to change in strategy?*
- Stakeholder Management
  - *What programs are needed to monitor and evaluate stakeholder's predicted actions?*

Form A.1. Delphi Instructions.

On _____, you and your fellow members of the strategic management group will meet to launch a strategic management process. I am looking forward to working with you and to an opportunity to assist you in identifying your strategic management position.

In order to make the best of the limited time we will have together and, perhaps more important, to give you time to think about some things that are central to effective strategic management, we are asking you to complete the enclosed forms. Effective strategic management is premised upon sound analysis of the organization, its characteristics, and the environment in which it operates. The questions we are asking are designed to gather your perceptions about where the organization is in its world and where you see it heading.

Please note that the forms call for answers of short phrases or paragraphs. Your responses should focus on capturing the essence of what you are raising. You will note, too, that some questions seem to build on others. For this reason, it will be best if you find a block of time sufficient to permit you to work through all the forms at one sitting.

We will be providing feedback based on the overall group response. Anonymity will be protected, but you may place an identifying notation on your responses if you think you might want them back after the work session. Please return the completed forms to me by _____, at the address below. Please contact us if you have any questions.

Thank you.

Form A.2. Strategic Direction Worksheet.

Briefly describe the current strategic direction of the organization. What basic movement does the organization have? It is helpful to look back over the past three to seven years and ahead over a similar period to identify major changes the organization has experienced or will experience. Describe below the organization's movement in the areas (dimensions) listed.

Dimension	*In my opinion, we are moving away from*	*In my opinion, we are moving toward*
Demands/Needs (things we must or should respond to in order to serve the needs and wants of clients or to give recognition to groups important to the agency)		

Dimension

Resources (means at our disposal to carry out our program—our fiscal, human, and physical facility resources, including data)

In my opinion, we are moving away from	*In my opinion, we are moving toward*

Dimension

Programs (the mix of programs and services we offer and the clientele we target)

In my opinion, we are moving away from	*In my opinion, we are moving toward*

Resource A

Dimension

General Managerial and Organizational Practices (the competencies and strategies around which our administrative mechanisms are organized)

In my opinion, we are moving away from	*In my opinion, we are moving toward*

Form A.3. External Events and Trends Worksheet.

List below the specific external events and trends that you feel will impact upon the functioning of the agency over the next three to seven years. Think broadly in terms of the economic, client-related, managerial, technical, political, and social factors that ought to be considered because of their strategic impact. This is your chance to explicitly identify the external events and trends that you think the organization will be confronted with in the future.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

Form A.4. Ideal Agency Attributes Worksheet.

Looking into the future, what attributes do you think would describe the organization in the best of all possible worlds? What attributes would characterize the organization in the worst of all possible worlds?

Best-case attributes

Worst-case attributes

Form A.5. Situational Assessment Worksheet.

Strengths are defined as one or more skills, distinctive competencies, capabilities, competitive advantages, or resources that the organization can draw on in selecting a strategy. List the strengths that the organization can use in any future strategy.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Weaknesses are defined as the lack of one or more skills, distinctive competencies, capabilities, competitive advantages, or resources. List the weaknesses that any future strategy for the organization must take into account.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Opportunities are situations in which benefits are fairly clear and likely to be realized if certain actions are taken. List the opportunities that are open to the organization.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Threats are situations that give rise to potentially harmful events and outcomes if action is not taken in the immediate future; they must be actively confronted to prevent trouble. List the threats that currently confront the organization.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Form A.6. Strategic Issue Agenda Worksheet.

rategic issues are anticipated or actual conditions or tensions, ternal or external to the organization, that, if they continue, ll have a significant effect on the functioning of the organi-tion or its ability to achieve its desired future.

List below strategic issues that the organization must anage to be successful in the future. To state an issue as a sion, follow two steps. First, identify the issue using the def-ition above. Second, find the most significant factor pulling the opposite direction and pair the issue with this factor. For ample, the issue of cutbacks in a medical school department family medicine due to loss of state funds can be paired with creased service demands by low-income patients.

To explore issues, it is often useful to expand the issue's significance by identifying its important features and why it merits the organization's attention. For example, if you were to make a presentation to someone not as closely involved with the organization as you, what would you say are the significant aspects of this issue? Why is it worthy of attention?

Issue #1 _____

1.

2.

3.

4.

5.

Issue #2 _____

1.

2.

3.

4.

5.

Issue #3 _____

1.

2.

3.

4.

5.

Issue #4 _____

1.

2.

3.

4.

5.

Issue #5 _____

1.

2.

3.

4.

5.

Issue #6 _____

1.

2.

3.

4.

5.

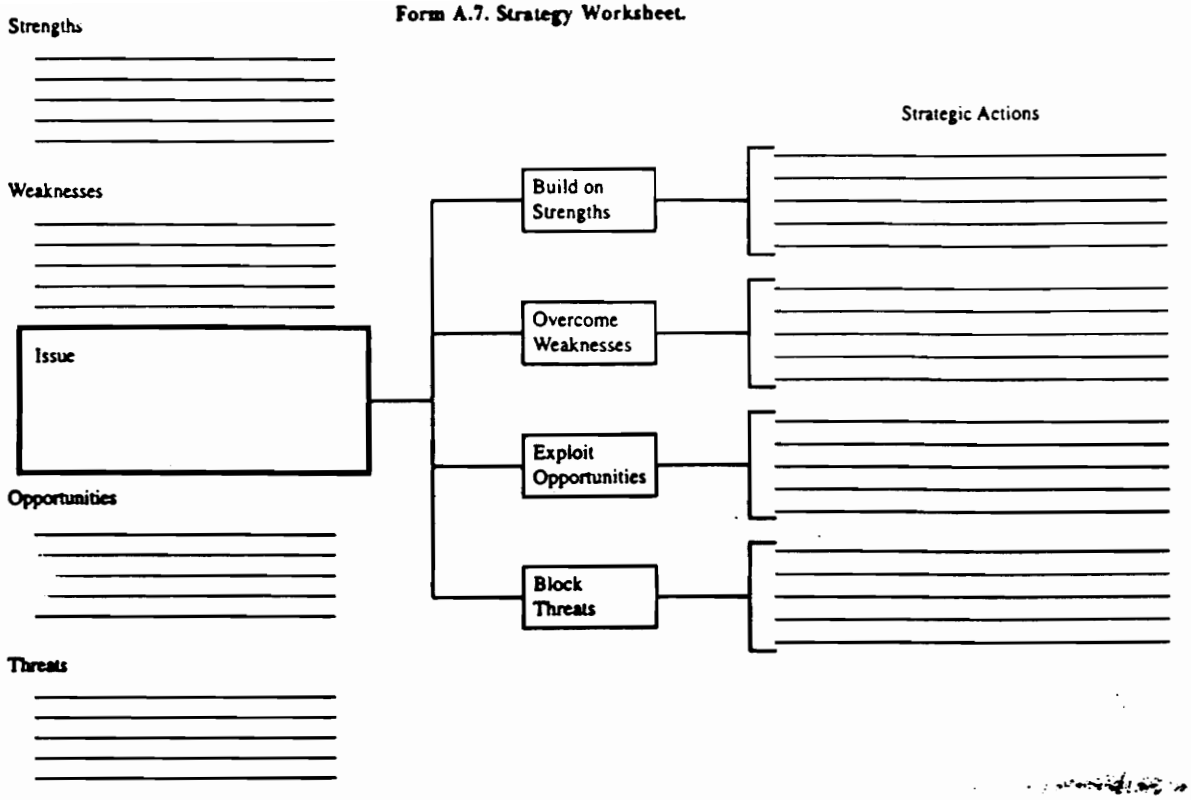
Form A.7. Strategy Worksheet.

1. On the attached worksheet, list as many strategic actions as you can that relate to the priority issue. Use the issue relevant SWOTs to assist you in this task.
2. In applying the SWOTs principles, feel free to suggest both conventional and novel action ideas. We have found that if you consider possible action that could build on strengths, overcome weaknesses, exploit opportunities, and blunt or block threats, a comprehensive yet creative set of ideas can be produced for further discussion and refinement. Enter your action ideas at the right of the worksheet.
3. When you enter the action ideas on the right-hand lines under "Strategic Actions," be sure to list the number of the SWOTs the action targets (for example, S1, S2, and 01). An action may target only one SWOT factor or several. Strategic actions that simultaneously affect strengths, weaknesses, opportunities, and threats are important to discover. If you run out of space, use the back side of the page.
4. There is no need to sign the sheets. Do write legibly so that others can read your writing.
5. When you have exhausted your ideas, let the facilitator know.

Definition and Guiding Principles of Strategic Management: Strategic management is movement toward our mission, built upon an understanding of our current situation and an identification of our desired future, which permits us to

Build on our strengths
Overcome our weaknesses
Exploit our opportunities
Block or *blunt* our threats

Form A.7. Strategy Worksheet.



Resource A

Form A.8. Stakeholder Identification Worksheet.

Both within and outside the organization, there are individuals, groups, and organizations who share an interest or have a stake in the strategies that we are considering. Stakeholders include all parties who will be affected by or will affect the priority strategy.

List below to the left the stakeholders for the strategy. List to the right the interest or stake involved (user of services, suppliers of clients, cooperation in service delivery, costs of access, and so on). In our discussion, we will not ask whether the stakeholder is internal or external; you can make an *I* or *E* next to each party to communicate this. Work slightly. Shift back and forth between strategies if you reach a dead end in your thinking.

Strategy: _____

Stakeholder	Interest/Stake

Form A.9. Stakeholder Issue Position Worksheet.

Score the stakeholder list by finding the stakeholders *most* likely to be supportive of our priority strategy and rating them +5. Find the stakeholders most likely to oppose the strategy and rate them −5. Rate neutral stakeholders 0. Rate the remainder of the stakeholders using these anchors.

Position on the Issue

(+5 = Positive, −5 = Negative)

Stakeholder or Code	Rating

Form A.10. Stakeholder Importance Worksheet.

Score the stakeholder list by finding the most important stakeholders and rating them 10. Find the least important stakeholders and rate them 1. Rate the remainder of the stakeholders using these anchors. A rating of 5 or less indicates that stakeholders do not require formal contact during implementation.

Importance

(1 = Least, 10 = Most)

Stakeholder or Code	Rating

Form A.11. Resources Identification Worksheet.

or each strategy listed below, identify the type of resource iat might be required for successful achievement of the strat-gy, together with who might be a supplier or controller of iat resource. In thinking about resources as they relate to the trategies, look for both external and internal resources. Look or both fiscal (money) and nonfiscal resources (such as labor, :gitimacy, status, acceptance, knowledge, expertise, power, time, nd an existing program) that could be used as a resource by is to achieve a strategy objective or other form of assistance hat could be tapped by us.

Strategic Theme	Resource Types	Suppliers	How to Acquire

Resource A

Form A.12. Resource Criticality Worksheet.

Rate the criticality or importance of each resource and its controller by first finding the most critical resources or controllers and rating them 10. Find the least important resources or controllers and rate them 0. Rate the remainder using these anchors. A rating of 5 or less implies that the resource is not essential to carry out the strategy.

Criticality

(1 = Least, 10 = Most)

Resource, Controller, or Code	Rating

Form A.13. Resource Potential Availability Worksheet.

Rate the potential availability (ease of funding or mobilization) of each resource by identifying easily acquired resources and rating them +5. Rate unavailable resources −5 and resources with uncertain availability 0. Rate the remaining resources using these anchors.

Potential Availability

(−5 = Not Available, +5 = Easily Available)

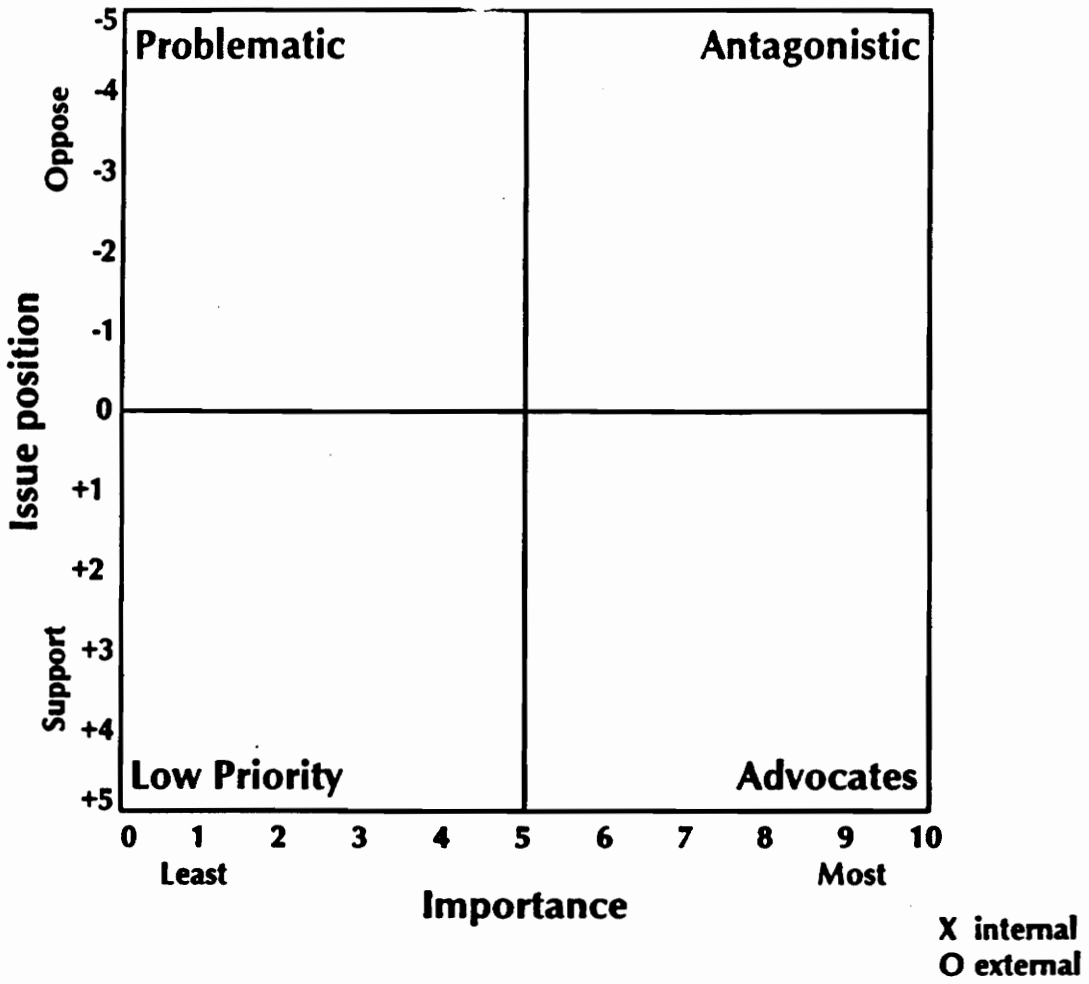
Resource or Code	Rating

Resource B

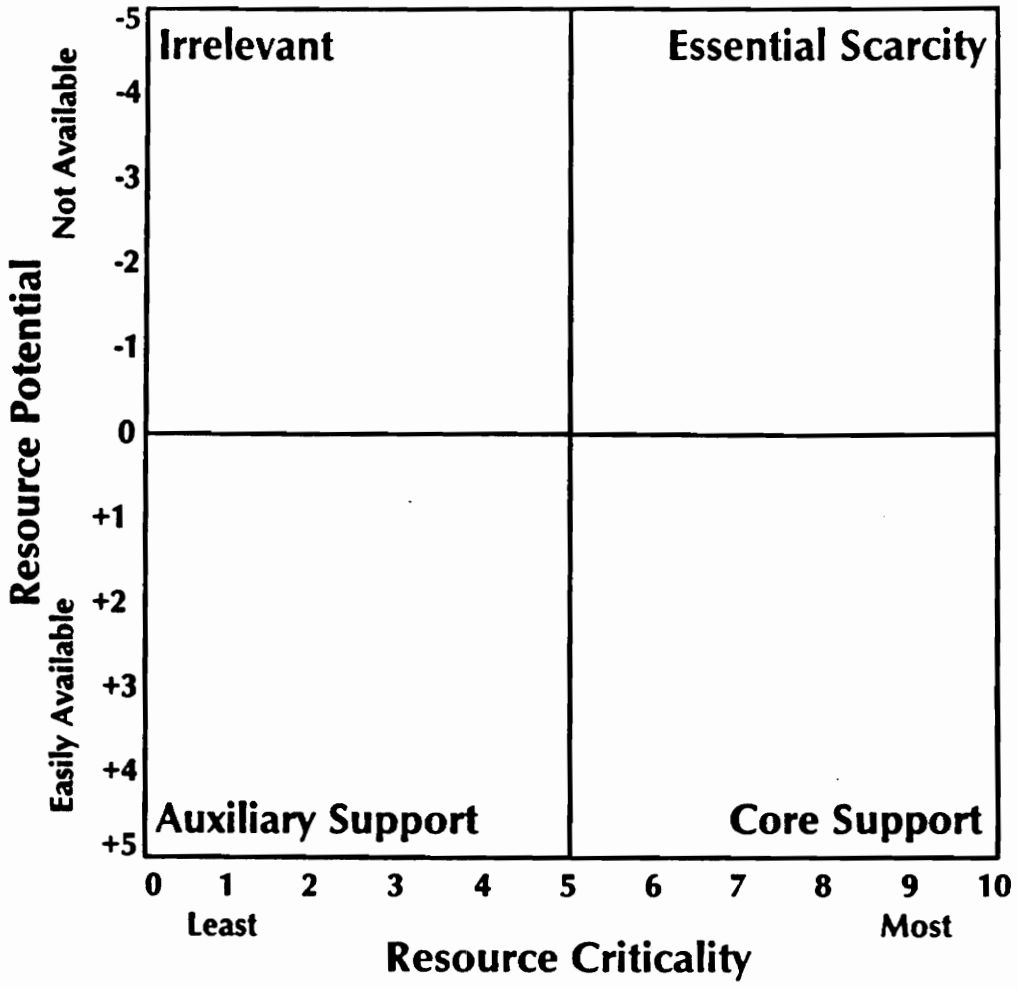
Forms and Worksheets for Support Techniques

Form B.1. Precedence Relationships Worksheet
Form B.2. Producer-Product Relationships Worksheet
Form B.3. Ranking Worksheet for Criteria
Form B.4. *Q* Sort Record Sheet

A. 10a


Problematic
Antagonistic
Low Priority
Advocates
Issue position
Oppose
Support
-5
-4
-3
-2
-1
0
+1
+2
+3
+4
+5
0 1 2 3 4 5 6 7 8 9 10
Least
Most
Importance
X internal
O external

A.13a


Irrelevant
Essential Scarcity
Auxiliary Support
Core Support
Resource Potential
Not Available
Easily Available
-5
-4
-3
-2
-1
0
+1
+2
+3
+4
+5
0 1 2 3 4 5 6 7 8 9 10
Least
Most
Resource Criticality

APPENDIX E

The consent form used for obtaining the consent from the participants of the academic department game.

Informed consent for participants of investigative projects

Title of Project : Academic Department Game

Principal Investigator : Vidya Ranya Jwala.

I. The purpose of this research / project

You are invited to participate in a study about Management Strategies. This study involves 75 subjects in addition to yourself.

II. Procedure

The procedure to be used in this research is :

- You will be formed into separate groups of 3 - 4 members each.
- Each group will be asked to take part in a computer based simulation exercise.
- Feedback will be collected from each group once every two weeks.

III. Benefits of this project

No guarantee of benefits has been made to encourage you to participate. You may receive a synopsis or summary of this research when completed.

IV. Extent of anonymity and confidentiality

The results of this study will be kept strictly confidential. At no time will the results of the study be released to anyone other than individuals working on the project without your written consent. The information you provide will have your name removed and only a subject number will identify you during analyses and any written reports of the research.

V. Compensation

For participation in the project you will not receive any monetary compensation

VI. Freedom to withdraw

You are free to withdraw from this study at any time.

VII. Approval of research

This research has been approved, as required , by the Institutional Review Board for projects involving human subjects at Virginia Polytechnic Institute and State University.

IX. Subject's permission

I have read and understand the informed consent and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent for participation in this project.

Should I have any questions about this research or its conduct, I will contact:

Vidya Ranya Jwala : **Phone** :

Faculty Advisor : **Dr. Paul Torgersen**

Student Signature : _____

APPENDIX F

Table 5.1.7 - Summary of Responses of the SP Group for Year 1 of the Academic Department Game

YEAR 1	STRATEGIC PLANNING GROUP							
	A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**
Q1	1	1	1	1	1	1	1	-1
Q2	1	1	1	0	1	1	1	1
Q3	1	1	1	1	1	1	1	1
Q4	0	1	0	-1	0	0	0	0
Q5	1	1	1	1	1	1	1	1
Q6	1	1	0	1	1	1	1	1
Q7	1	1	1	1	1	1	0	1
Q8	1	1	1	1	1	1	1	1
Q9	1	1	1	1	1	1	1	1
Q10	1	1	1	1	1	1	1	1
Q11	-1	-1	-1	-1	-1	-1	-1	-1
Q12	-1	-1	-1	-1	-1	-1	-1	-1
Q13	-1	-1	-1	-1	-1	-1	-1	-1
Q14	-1	0	-1	-1	-1	-1	-1	-1
Q15	-1	-1	-1	-1	-1	-1	-1	-1
Q16	0	1	0	-1	0	1	0	0
Q17	-1	-1	-1	-1	-1	-1	-1	-1
Q18	-1	-1	-1	-1	1	-1	-1	-1
Q19	0	1	0	1	0	0	0	-1
Q20	-1	-1	-1	-1	-1	-1	-1	-1

Table 5.1.8 - Summary of Responses of the SP Group for Year 2 of the Academic Department Game

YEAR 2	STRATEGIC PLANNING GROUP							
	A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**
Q1	1	1	1	1	1	1	1	-1
Q2	1	1	1	1	1	1	1	1
Q3	1	1	1	1	1	-1	1	1
Q4	0	0	0	1	0	0	-1	1
Q5	1	1	1	1	1	1	1	1
Q6	1	1	0	1	1	1	1	1
Q7	1	1	1	1	1	1	1	1
Q8	1	1	1	1	1	1	1	1
Q9	1	1	1	0	1	1	1	1
Q10	1	1	1	1	-1	1	1	1
Q11	-1	-1	-1	-1	-1	-1	-1	-1
Q12	-1	-1	-1	-1	-1	-1	-1	-1
Q13	-1	-1	-1	-1	-1	0	-1	-1
Q14	-1	-1	-1	-1	-1	-1	-1	-1
Q15	-1	-1	-1	-1	-1	-1	-1	-1
Q16	-1	0	0	1	0	-1	0	1
Q17	-1	-1	-1	-1	-1	-1	-1	-1
Q18	-1	-1	-1	-1	-1	1	-1	-1
Q19	-1	0	0	0	1	0	-1	-1
Q20	0	-1	-1	-1	-1	-1	-1	-1

Table 5.1.9 - Summary of Responses of the SP Group for Year 3 of the Academic Department Game

YEAR 3	STRATEGIC PLANNING GROUP							
	A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**
Q1	1	0	1	1	1	1	1	1
Q2	1	1	1	1	1	-1	1	1
Q3	1	1	1	1	1	1	1	1
Q4	0	1	0	0	1	1	1	1
Q5	1	1	1	1	1	1	1	1
Q6	1	1	1	0	1	1	1	1
Q7	1	1	1	1	1	1	0	1
Q8	1	1	1	1	1	1	1	1
Q9	1	1	1	1	1	1	1	1
Q10	1	1	1	1	1	1	1	1
Q11	-1	-1	-1	-1	-1	1	-1	-1
Q12	-1	-1	-1	-1	-1	-1	-1	-1
Q13	-1	-1	0	-1	-1	0	-1	-1
Q14	-1	-1	-1	-1	-1	-1	-1	-1
Q15	-1	-1	-1	-1	-1	-1	-1	-1
Q16	0	1	0	1	1	0	0	0
Q17	-1	1	-1	-1	-1	1	-1	-1
Q18	-1	-1	-1	-1	-1	-1	-1	-1
Q19	0	-1	-1	1	-1	-1	-1	0
Q20	-1	-1	-1	-1	-1	0	0	-1

Table 5.1.10 - Summary of Responses of the SP Group for Year 4 of the Academic Department Game

YEAR 4	STRATEGIC PLANNING GROUP							
	A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**
Q1	1	1	1	1	1	1	1	1
Q2	1	1	1	0	1	1	1	1
Q3	1	1	1	1	1	1	1	1
Q4	0	-1	0	-1	-1	0	0	0
Q5	1	1	1	1	1	1	1	1
Q6	1	1	1	1	1	1	1	1
Q7	1	1	1	1	1	1	1	1
Q8	1	1	1	0	1	1	-1	1
Q9	1	1	1	1	1	1	1	1
Q10	1	0	1	1	1	1	1	1
Q11	-1	0	-1	-1	-1	-1	-1	-1
Q12	-1	-1	-1	-1	-1	-1	-1	-1
Q13	-1	-1	-1	1	-1	-1	-1	-1
Q14	-1	-1	-1	-1	-1	-1	-1	-1
Q15	-1	-1	-1	-1	-1	0	-1	-1
Q16	-1	0	-1	0	-1	1	0	0
Q17	-1	-1	-1	-1	-1	1	-1	-1
Q18	-1	-1	-1	-1	-1	-1	-1	-1
Q19	0	0	0	1	1	0	0	0
Q20	-1	-1	-1	1	-1	-1	-1	-1

Table 5.1.11 - Summary of Responses of the Control Group for Year 1 of the Academic Department Game

YEAR 1	CONTROL GROUP							
	B4	B5	C1	C2	C3	C4	C5	D1
Q1	-1	-1	-1	-1	-1	-1	-1	-1
Q2	-1	-1	1	-1	1	0	-1	-1
Q3	-1	-1	-1	-1	-1	-1	-1	-1
Q4	0	1	-1	0	0	-1	1	0
Q5	-1	-1	-1	-1	-1	-1	-1	-1
Q6	-1	-1	-1	-1	-1	-1	-1	-1
Q7	-1	-1	0	-1	-1	-1	-1	-1
Q8	-1	-1	-1	-1	1	-1	-1	-1
Q9	-1	-1	-1	-1	-1	-1	-1	-1
Q10	-1	-1	1	-1	-1	-1	-1	-1
Q11	1	1	1	1	1	1	1	1
Q12	1	1	1	1	1	0	1	1
Q13	1	-1	1	1	1	1	1	1
Q14	1	1	1	1	1	1	1	0
Q15	1	1	-1	1	1	1	1	1
Q16	0	1	0	1	-1	0	0	0
Q17	1	1	1	1	1	1	1	1
Q18	1	1	1	1	1	1	1	1
Q19	0	1	0	0	-1	-1	-1	0
Q20	1	1	1	1	1	1	1	0

Table 5.1.12 - Summary of Responses of the Control Group for Year 2 of the Academic Department Game

YEAR 2	CONTROL GROUP							
	B4	**B5**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**
Q1	-1	-1	-1	-1	-1	0	-1	-1
Q2	-1	0	-1	-1	-1	-1	-1	-1
Q3	-1	-1	-1	-1	-1	-1	-1	-1
Q4	-1	-1	-1	0	1	0	1	0
Q5	-1	-1	-1	-1	-1	-1	-1	-1
Q6	-1	-1	-1	-1	-1	-1	-1	-1
Q7	-1	1	-1	-1	-1	-1	-1	-1
Q8	-1	0	-1	-1	1	-1	-1	1
Q9	-1	-1	-1	-1	-1	-1	-1	0
Q10	-1	1	-1	-1	-1	-1	-1	-1
Q11	1	1	1	1	1	1	1	0
Q12	1	1	1	1	1	1	1	1
Q13	1	1	1	1	-1	1	1	1
Q14	1	1	0	1	1	1	1	1
Q15	1	1	1	1	1	1	1	1
Q16	-1	1	1	0	0	-1	-1	0
Q17	1	1	1	1	1	1	1	1
Q18	1	1	1	1	1	1	1	1
Q19	0	0	1	1	0	0	1	0
Q20	1	1	1	1	1	1	1	1

Table 5.1.13 - Summary of Responses of the Control Group for Year 3 of the Academic Department Game

YEAR 3	CONTROL GROUP							
	B4	**B5**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**
Q1	-1	1	-1	-1	1	-1	-1	-1
Q2	-1	-1	1	-1	1	-1	-1	-1
Q3	-1	-1	1	-1	1	-1	1	-1
Q4	0	1	0	1	1	1	0	0
Q5	-1	-1	-1	-1	-1	-1	-1	-1
Q6	-1	-1	-1	0	-1	-1	-1	-1
Q7	-1	-1	-1	-1	-1	-1	-1	-1
Q8	-1	0	-1	1	-1	-1	-1	-1
Q9	-1	-1	-1	0	-1	-1	-1	-1
Q10	-1	-1	-1	-1	-1	-1	-1	-1
Q11	1	-1	1	1	-1	1	-1	1
Q12	1	0	1	1	1	0	1	1
Q13	1	1	-1	1	0	1	1	0
Q14	1	1	1	1	-1	1	1	1
Q15	1	1	1	1	1	1	1	1
Q16	0	1	0	-1	0	-1	0	-1
Q17	1	-1	1	1	1	1	1	1
Q18	1	1	-1	1	1	-1	1	1
Q19	0	0	1	1	1	-1	0	0
Q20	1	1	1	1	1	1	1	1

Table 5.1.14 - Summary of Responses of the Control Group for Year 4 of the Academic Department Game

YEAR 4	CONTROL GROUP							
	B4	**B5**	**C1**	**C2**	**C3**	**C4**	**C5**	**D1**
Q1	-1	1	-1	-1	-1	-1	1	-1
Q2	-1	-1	1	-1	-1	1	-1	-1
Q3	-1	-1	-1	1	1	-1	1	-1
Q4	-1	0	-1	0	0	-1	0	0
Q5	-1	-1	-1	-1	-1	-1	-1	-1
Q6	-1	1	-1	1	-1	1	-1	-1
Q7	-1	1	-1	-1	-1	-1	-1	-1
Q8	1	-1	-1	1	-1	1	1	-1
Q9	-1	-1	-1	-1	-1	-1	-1	-1
Q10	-1	-1	-1	-1	-1	1	-1	-1
Q11	1	1	1	-1	-1	-1	1	1
Q12	1	-1	-1	-1	0	1	-1	1
Q13	1	1	-1	1	1	-1	-1	1
Q14	-1	1	1	1	-1	1	1	1
Q15	1	-1	1	-1	0	1	1	-1
Q16	0	1	-1	-1	0	-1	-1	0
Q17	1	1	-1	1	1	1	1	1
Q18	1	1	1	1	1	1	1	1
Q19	-1	-1	0	0	1	0	-1	0
Q20	1	1	1	1	1	1	1	1

Table 5.1.15 - Summary of Responses of the MBGA Group for Year 1 of the Academic Department Game

YEAR 1	MBGA GROUP							
	D2	D3	D4	D5	E1	E2	E3	E4
Q1	0	1	0	0	0	0	1	1
Q2	1	1	1	1	1	1	1	1
Q3	1	1	1	1	0	0	1	1
Q4	0	0	-1	0	0	1	-1	-1
Q5	1	1	1	1	1	1	1	0
Q6	1	1	1	1	1	1	-1	1
Q7	1	1	1	1	1	0	1	0
Q8	1	0	1	0	0	1	1	1
Q9	0	1	1	1	1	1	0	1
Q10	1	0	0	0	-1	0	1	1
Q11	-1	0	0	-1	-1	1	-1	-1
Q12	-1	-1	-1	0	0	-1	-1	0
Q13	1	0	0	-1	-1	1	1	-1
Q14	1	-1	-1	-1	-1	-1	-1	-1
Q15	0	-1	0	-1	0	1	-1	-1
Q16	0	0	0	0	1	1	-1	0
Q17	-1	0	-1	-1	-1	-1	0	1
Q18	0	0	-1	0	-1	-1	0	0
Q19	0	1	1	1	0	0	-1	0
Q20	-1	-1	-1	0	-1	-1	-1	-1

Table 5.1.16 - Summary of Responses of the MBGA Group for Year 2 of the Academic Department Game

YEAR 2	MBGA GROUP							
	D2	**D3**	**D4**	**D5**	**E1**	**E2**	**E3**	**E4**
Q1	0	1	0	1	1	1	1	0
Q2	1	1	1	1	1	0	0	1
Q3	1	0	1	0	1	1	0	1
Q4	0	1	0	1	0	-1	-1	0
Q5	1	1	1	1	1	-1	1	0
Q6	0	-1	1	1	-1	1	1	-1
Q7	1	1	1	0	1	1	1	1
Q8	1	1	1	0	1	0	-1	1
Q9	0	0	1	1	0	1	1	1
Q10	1	1	-1	1	0	1	1	0
Q11	-1	-1	-1	-1	-1	0	-1	-1
Q12	0	-1	-1	1	1	0	-1	0
Q13	-1	-1	-1	-1	-1	-1	1	-1
Q14	-1	0	0	1	0	-1	0	-1
Q15	-1	0	-1	-1	0	-1	0	-1
Q16	0	-1	-1	0	1	1	1	0
Q17	-1	-1	-1	0	-1	-1	-1	-1
Q18	1	-1	-1	0	1	-1	0	0
Q19	0	1	0	1	0	1	0	0
Q20	-1	1	0	-1	-1	0	-1	-1

Table 5.1.17 - Summary of Responses of the MBGA Group for Year 3 of the Academic Department Game

YEAR 3	MBGA GROUP							
	D2	**D3**	**D4**	**D5**	**E1**	**E2**	**E3**	**E4**
Q1	0	1	1	1	1	1	1	1
Q2	1	1	0	1	0	1	1	1
Q3	1	0	1	1	1	1	1	1
Q4	-1	0	1	1	0	-1	-1	0
Q5	0	1	1	1	1	1	1	-1
Q6	1	1	1	0	-1	-1	1	1
Q7	1	1	0	1	1	1	1	0
Q8	1	1	0	1	1	1	1	0
Q9	1	1	1	1	1	0	1	1
Q10	1	-1	1	1	-1	1	1	1
Q11	-1	1	-1	0	-1	-1	-1	-1
Q12	0	0	-1	-1	-1	-1	-1	0
Q13	0	-1	-1	0	-1	-1	-1	1
Q14	-1	1	-1	-1	-1	-1	-1	-1
Q15	-1	-1	0	-1	1	0	-1	-1
Q16	1	0	1	0	1	0	-1	0
Q17	-1	-1	1	-1	-1	-1	-1	-1
Q18	-1	0	-1	-1	1	-1	-1	0
Q19	1	0	1	1	-1	-1	-1	0
Q20	-1	-1	-1	0	-1	0	-1	-1

Table 5.1.18 - Summary of Responses of the MBGA Group for Year 4 of the Academic Department Game

YEAR 4	MBGA GROUP							
	D2	**D3**	**D4**	**D5**	**E1**	**E2**	**E3**	**E4**
Q1	0	0	1	1	1	0	1	1
Q2	0	1	1	1	1	1	1	1
Q3	1	1	1	0	1	1	1	1
Q4	-1	0	0	0	0	0	0	0
Q5	1	1	1	1	1	1	1	1
Q6	0	-1	1	1	1	0	1	1
Q7	1	1	1	0	1	1	1	1
Q8	1	1	1	1	1	1	1	0
Q9	1	-1	1	1	1	1	1	1
Q10	1	1	1	1	1	1	-1	0
Q11	-1	-1	1	-1	-1	1	-1	-1
Q12	-1	1	-1	-1	-1	1	-1	0
Q13	-1	-1	-1	-1	-1	-1	-1	-1
Q14	0	-1	-1	0	-1	0	-1	-1
Q15	-1	-1	-1	-1	1	-1	-1	-1
Q16	1	0	0	0	0	0	0	0
Q17	-1	-1	-1	0	-1	-1	-1	-1
Q18	-1	1	-1	-1	-1	0	1	-1
Q19	0	0	0	0	0	0	0	0
Q20	-1	1	-1	0	1	-1	-1	-1

Vita

Vidya Ranya Jwala was born on March 31, 1972 in Hyderabad, India. In June 1992, he received his Bachelor of Engineering degree in Mechanical Engineering from Osmania University, India. In August 1992, he began his graduate studies at Virginia Polytechnic Institute and State University, where he served as a graduate and teaching assistant.