

**THE FAIRFAX EXPERIENCE:
USING ISSUE EXPLORATION TO AVOID ERRORS OF THE THIRD KIND**

by

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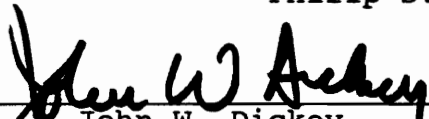
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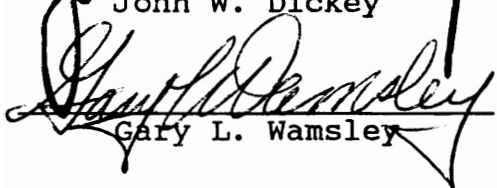
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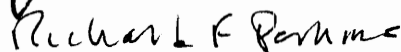
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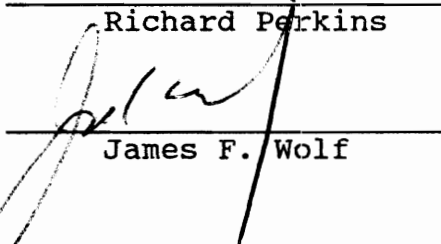
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ISSUE EXPLORATION AND THE FAIRFAX EXPERIENCE
IN STRATEGIC DECISION MAKING

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(ABSTRACT)

Issue exploration is used as a preliminary phase in strategic decision making. It performs the function of allowing strategic decision makers to encounter new information, learn from it, and use it to help them sort the strategic problems from the non-strategic problems. The function of issue exploration effort is to focus strategic resources on the strategic problems and to avoid solving the non-strategic ones. In statistics, solving the wrong problem is considered as making an Error of the Third Kind. For strategic decision makers, solving non-strategic problems can also be considered as making an Error of the Third Kind.

An "Organizational Disposition For Change Framework" was developed to research the exploration behavior of thirty strategic decision-making management initiatives for information technology development in Fairfax County, Virginia. The results supported the hypothesis that strategic decision-making initiatives that included exploration behavior significantly outperform those initiatives that did not.

ACKNOWLEDGEMENTS

My guide and mentor through my course of studies and this dissertation has been Philip Kronenberg. His wise council, wealth of knowledge about the subject matter, and personal care has been a major influence in this research. I find myself blessed with a unique committee. James Wolf has schooled me in the theory of complex organizations with real time examples in helping me through the requirements of candidacy. Gary Wamsley provided the mental foil to my wanderings through the chaos of policy subsystems that ultimately led me to this research topic. John Dickey's *The Idea Machine* provided me the research grist I needed to research the void in the pathology of problem solving models. Richard Perkins has been my mentor throughout my career at Fairfax County. He resolved several "911" incidents for me in the Fire and Rescue Department and has been the source of organizational wisdom throughout the Strategic Management Teams' efforts to transcend its sometimes treacherous situation of trying to discover how strategic managers think.

My Strategic Management Team-mates Geraldine M. Rodriguez, James Clark, and all of our co-participant researching fellow employees at Fairfax County, Virginia, have the central role in this study's research results. Special thanks to my daughter Esther for loaning me her lap-top, especially while Sharon, my wife, was completing her master's

degree on our PC. More than my dissertation was saved by that generosity. Another source of leading edge ideas came from extended discussions and arguments with Sharon's sons, Joshua and Jesse Dudley, the brain trust.

DEDICATION

To Sharon, my wife, who not only contributed to the substance but put up with all this.

Old men ought to be explorers
Here and there does not matter
We must be still and still moving
Into another intensity
For a further union, a deeper communion
Through the dark cold and the empty
desolation
The wave cry, the wind cry, the vast
waters
Of the petrel and the porpoise. In my end
is my beginning.

T. S. Eliot, East Coker

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CHAPTER ONE

INTRODUCTION AND OVERVIEW

Successful problem solving requires finding the right solution to the right problem. We fail more often because we solve the wrong problem than because we get the wrong solution to the right problem.

Russell L. Ackoff, Redesigning the Future: A Systems Approach to Societal Problems

In August 1989, Fairfax County, Virginia, government executives began to use issue exploration as a preliminary step to their strategic decision making in order to avoid solving the wrong problems. In this case, the executives' decision-making focus was in the area of developing the County's information technology used to deliver services to the community. Information technology is a somewhat new term used to describe the broad field of computer systems development. Information technology encompasses mainframe computers, minicomputers, microcomputers, workstations, and the data communication technology that connects them together.¹

¹Michael E. Porter and Victor E. Millar, "How Information Gives You Competitive Advantage," Harvard Business Review (July-August 1985): 149-160.

Like executives in many other organizations, Fairfax County executives search for the right solutions to the County's problems. In this case, the County's executives had increasing concerns whether they were choosing to solve the right problems and opportunities for the County. Right problems, in their view, were those problems that are most important to Fairfax County's strategic objectives for developing their information technology resources. Solving the wrong information technology problem can have serious consequences at the strategic decision-making level. Wrong choices can mean spending millions of dollars to build a computer system that would be obsolete before it is installed, or buying hundreds of obsolete model personal computers. Wrong choices not only waste valuable and limited strategic resources for change, but the costs of solving the wrong problem instead of the right problem can mean critical services will be needlessly missing in the community.

Therefore, Fairfax County executives added issue exploration as a preliminary process for preparing their strategic decision-making in information technology development. By exploring the issues first, they could sort out the non-strategic problems from the strategic ones, thus avoiding the allocation of strategic resources to solve the wrong ones.

Defining Terms: "Issues" and "Problems" and Errors of the Third Kind (E_{III})

It is useful to discuss the difference between the use of issue and problem as it is used in this research. Issue comes from the French and Latin usage with an intransitive meaning "to go out [from here], a going, a journey."² It's root in the Indoeuropean is *ei, to go. Problem has a transitive meaning, "a thing thrown forward." It comes from the Greek meaning: pro, forward, blema, something thrown. From the Italian ballo English gets the word, ballistic.³

These words have often been used as synonyms in current usage. However, issue exploration emphasizes issue's intransitive notion of journey, especially in the sense of encountering the unexpected, complex, and unknown. Problems (and opportunities) are viewed by issue exploration as questions or hypothetical situations thrown forward (in the mind) in order to develop solutions. Problems and opportunities are encountered while on the journey. Together, issue and problem highlight the adventure aspect of journey

²Eric Partridge, Origins: a Short Etymological Dictionary of Modern English (New York: The Macmillan Company, 1958), 315.

³Ibid., 527.

associated in myth with the trials and rewards of the journey, i.e., the Odyssey and the Quest of the Holy Grail. A parallel application of this relationship between issue and problem/opportunity is "going out" to war and fighting battles, i.e., Illiad and the Crusades.

In terms of strategic management, issue refers to an emerging change in the environment in which the organization must go on operating in order to continue its organizational mission. Issue exploration is a cognitive mapping of the changes that the emerging issue is creating. Once the new environmental terrain is mapped, then the potential problems and opportunities can be properly identified.

There is a paradox here in the sense that one, or an organization, cannot be a subject/object in the environment. Weick and Bougon, in their description of this cognitive mapping point out:

Maps help people perceive large-scale environments beyond the range of immediate perception. . . .they deal with phenomena that cannot be observed but rather must be explored. Thus maps are intimately tied to action. O'Keefe and Nadel use an early position paper by Ittelson (1973)⁴ to highlight the close ties between action and maps:

'Most perception research has been carried out in the context of object perception, rather than environment perception. The distinction between object and

⁴W. H. Ittelson, ed. Environmental Cognition (New York: Seminar Press, 1973, 18-19.

environment is crucial, because objects require subjects...In contrast, one cannot be a subject of an environment, one can only be a participant. The very distinction between self and non-self breaks down cold. The environment surrounds, enfolds, engulfs, and no thing and no one can be isolated and identified as standing outside of, and apart from it...' The fact that they surround means that one cannot observe an environment; rather the organism explores it" [emphasis added]⁵

People in organizations participate in the environmental changes, especially as they construct their social reality of it.⁶ Therefore, the going out (issue) is both the emerging change in the environment and our participating in it with all the perils and rewards it seems to offer us. Issue exploration informs us with new knowledge from, and of the emerging change. From this new knowledge we align what resources we have and need to make the most of our journey of adventure. Only with this new knowledge can we properly assess which problems and opportunities are most important to our mission in this newly emerging situation.

⁵Karl E. Weick and Michel G. Bougon, "Organizations as Cognitive Maps," in The Thinking Organization; Dynamics of Organizational Social Cognition, eds. Henry P. Sims, Jr., Dennis A. Gioia, and Associates (San Francisco: Jossey-Bass, 1986), 104-105.

⁶Peter L. Berger and Thomas Luckman, The Social Construction of Reality: A Treatise in the Sociology of Knowledge (Garden City N.J.: Anchor Books, Doubleday and Company, 1966).

With this view of issue and problem it seems appropriate to conduct issue exploration prior to identifying strategic problems and opportunities. Because an issue portends something new (to us) all of our knowledge can be of use to us. We need not limit ourselves only to the knowledge provided by established science and scholarship. Intuition, exploration behavior, fear, anger, desire, and the host of knowledge apparatus that operate in our sub- and unconscious realms of human experience may have a role here to help us relate to that changing environment in which we participate as individuals and as members of social organizations such as government agencies.⁷

On this social and organizational scale, the differentiation between issue and problems becomes one of power "relationships" and "Interpretations." An issue, as an emerging change in the environment, is perceived by various people as interesting. This interest has its origins in the pure novelty of the emerging events as different from the perceived "status quo." Also, this interest is piqued in people who notice the emerging change as posing possible opportunities or threats to them. However, at the issue stage

⁷Michel Foucault, Power/Knowledge: Selected Interviews and Other Writings 1972-1977, ed. Colin Gordon, (New York: Pantheon Books, 1980), 80-84.

of the change the novelty attracts interest mainly in observers trying to learn what this new change entails.

In this sense, issue refers to emerging change perceived in one's or an organization's situation. Then as observers begin to relate to the change, they begin to define it in terms of potential opportunities and/or problems. They are defined by the observers as to how the issue relates to their particular values. If it is seen to impinge on their values, wither as a benefit or cost, they become "stakeholders" in the ultimate outcome of the emerging issue. For some, the issue presents potential problems, while for others the issue may be viewed as presenting potential opportunities. My toothache may present a potential problem to me, while it can be viewed as presenting a potential opportunity for my dentist. However, if we get together and explore the nature of the issue, we can expect to come to a course of action that is agreeable and beneficial to us both.

For the specific purposes of this research in strategic management the definition of Strategic Issue Diagnosis (SID) by Jane Dutton, L. Fahey and V. K. Narayanan is used:

SID refers to those activities and processes by which data and stimuli are translated into focused issues (i.e. attention organizing acts) and the issues explored (i.e. acts of interpretation. We chose the term issue diagnosis to emphasize that the process is important to development which have not yet achieved the status of a decision even, i.e. the

decision alternatives which may emerge are still in the process of unfolding.⁸

In the case of information technology development for Fairfax County, an issue is defined as a significant change emerging in the County's organizational situation. Or, more specifically, an issue is a change in the County's information technology context from which varieties of problems and opportunities can be anticipated. For example, in 1989 key emerging information technology issues for Fairfax County information technology included: what is the impact of more and more powerful computer chips in personal computers? What will the developments in minicomputers mean for us in setting up cooperative computing resources in departments? When can agencies be expected to be able to develop their own systems?

Such emerging information technology issues attract interest by being new, strange, complex, unknown, risky, uncertain and novel. The emerging information technology issues attract the interest of people who may feel that they could be affected (either positively or negatively) by the problems and opportunities expected to arise out of the issue. In this manner, the issue is an attractor around which the

⁸Jane E. Dutton, Liam Fahey and V. K. Narayanan, "Toward Understanding Strategic Issue Diagnosis," Strategic Management Journal 4, no. 4 (October-December 1983), 307-308.

interested parties self-organize themselves into a community of interest known as stakeholders.⁹

Secondly, for the purposes of this research, exploration behavior is defined "a reaction to new items, new places, or familiar items in new places. . . . Only novel [events] will elicit exploration [behavior]."¹⁰ Encountering something new usually causes us to cease our behavior of the moment to fix our attention upon the source of the novelty. Then, if the unusual situation doesn't pose an immediate threat, we begin to investigate it objectively as something new. That is, we examine it with a sense of curiosity, openness, and wonder. Also, there is a temporary suspension of judgement while we take in the new experience. Our typical actions are also suspended and redirected toward investigating the nature of the novelty. In this exploration behavior we are allowing new information into the knowledge base of our view of the world. Exploration behavior is a form of learning; it is changing or enlarging our worldview, i.e., growing.¹¹ Exploration behavior,

⁹Ian I. Mitroff, Stakeholders of the Organizational Mind (San Francisco: Jossey-Bass Publishers, 1983), 4-27.

¹⁰John O'Keefe and Lynn Nadel, The Hippocampus as a Cognitive Map (Oxford: Clarendon Press, 1987), 224.

¹¹O'Keefe and Nadel, The Hippocampus, 223-263; Robert Miller, Cortico-Hippocampal Interplay; and the Representation of Contexts in the Brain (Heidelberg: Springer-Verlag, 1961), 189-200.

of course, is much more active in children because they have so much to learn. The whole world is new to them. For adults, exploration behavior is something we often forget to do; we already know so much.

Therefore, issue exploration is a process that uses emerging issues to engender exploration behavior in strategic decision-makers before strategic decision makers begin to identify and analyze the attendant problems and opportunities involved. Issue exploration becomes a process of reacting to emerging issues by exploring them openly in order to learn about them before the ensuing problems and opportunities are identified, classified, analyzed and solved sometimes in error (E_i & E_{ii}). Issue exploration is learning of the context of the issue before we categorize its problems and opportunities.

Neely Gardner had addressed a similar concern in the "Reconnaissance" step of his Action Training and Research (AT&R) process. Training participants to develop "knowledge concerning issue areas, and increasing the skill and willingness of clients to confront issues" was seen by Gardner as the context from which "will emerge an array of perceived opportunities, problems, and possible solutions."¹² The

¹²Neely Gardner, "Action Training and Research: Something Old and Something New," Public Administration review, (March 1974), 106.

Fairfax County's Strategic Management Team developed Gardner's "reconnaissance" AT&R step into formal exploration of the strategic issues by the County's strategic decision makers. Thus, issue exploration became the preliminary phase in the County's strategic decision-making process. Gardner describes the reconnaissance step of AT&R as:

developing knowledge concerning issue areas and increasing the skill and willingness of clients to confront issues. Reconnaissance is 'making an estimate of the situation' Participant researchers are encouraged to enter reconnaissance activities with an attitude of ignorance concerning substantive issues. . . . It is not absolutely necessary that clients participate in the reconnaissance activity, but from my standpoint it is highly desirable.¹³

Fairfax County's action research experience examines just how "highly desirable" the exploration behavior of Gardner's "reconnaissance step" is to executive decision makers.

The key steps of the Strategic Management Team's issue exploration process developed from Gardner's reconnaissance step of AT&R are:

- (1) develop issue papers to initiate (invite or enfranchise) research to explore the issue's nature and boundaries,
- (2) form issue exploration groups among the stakeholders to explore, discuss the issue, and develop alternative views,
- (3) conduct formal strategic issue research pilot projects when high uncertainty and risk is involved,

¹³Ibid.

- (4) report research findings and make recommendations for strategic action, and
- (5) research, report and discuss strategic decision-making results.

Fairfax County executives were not, of course, the first to notice the importance and pervasiveness of solving the wrong problems:

I believe it was John Tukey who suggested that practioners all too often make errors of a third kind: solving the wrong problem. I should like to nominate a candidate for the error of the fourth kind: solving the right problem too late [or too soon].¹⁴

An error of the first kind occurs when strategic decision makers implement the wrong solution to the problem.¹⁵ An error of the second kind occurs when strategic decision makers have found the right solution, but then have rejected it as wrong. The error of the third kind occurs when strategic decision

¹⁴Howard Raiffa, Decision Analysis; Introductory Lectures on Choices Under Uncertainty (Reading, Mass: Addison-Wesley, 1968), 264-265.

¹⁵See Howard Raiffa, Decision Analysis; Introductory Lectures on Choices Under Uncertainty, 264-265; Ian I. Mitroff and Tom R. Featheringham, "On Systemic Problem Solving and The Error of the Third Kind," Behavioral Science 19, no. 6 (November 1974): 383-4; John W. Tukey, "The Future of Data Analysis," Annals of Mathematical Statistics 33 (February 1964); Ian I. Mitroff and Frederick Betz, "Dialectical Decision Theory: a Metatheory of Decision-Making," Management Science 19 (1972), 11-24; William N. Dunn, Public Policy Analysis: An Introduction (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1981), 109-110.

makers implement the right solution to the problem, but they have chosen the wrong problem to solve in the first place.

In strategic decision making at Fairfax County, a wrong problem is deemed one that is not critical. That is, it is not expected to impinge upon the Fairfax County government's strategy of using information technology to provide community services to the citizens. Current strategic and policy analysis processes use predominantly linear problem-solving approaches that have often led strategic decision makers to allocate their resources to solve the wrong problems.¹⁶

Whether an issue provides problems or opportunities depends upon the situation of particular stakeholders among the strategic decision makers. An issue usually presents both varieties. For purposes of the research an error of the third kind will be referred to as E_{III} , and will refer both to solving wrong problems and to grasping the wrong opportunities.

Improving Productivity By Avoiding E_{III} ; an Hypothesis

The problem is, is this the problem? How do we know we are solving the right problem? Ian Mitroff and Tom Featheringham describe the importance of the "problem of

¹⁶William Dunn, Public Policy Analysis: An Introduction 109-110.

problem selection." To them E_{III} is a more fundamental decision making error than errors of the first and second kinds:

The most important as well as most difficult issue underlying the subject of problem solving is precisely, "the problem of how to represent problems". . . . the most important errors associated with problem solving [is] the error of the third kind. . . . E_{III} is a metadecision criteria."¹⁷

Fairfax County's purpose in using Gardner's AT&R approach to action research, therefore, was to determine the extent that the issue exploration process developed from Gardner's "Reconnaissance" step helped the Fairfax County executives to avoid making errors of the third kind (E_{III}). Was Fairfax County government's productivity improved by improved strategic decision making? The key research measure would be to see whether non-strategic problems (E_{III}) would be identified (and avoided) or not by issue exploration. Therefore, on August 2, 1989 the County Strategic Management Steering Committee for information technology adopted the policy that all management initiatives would begin with issue exploration.

During the two year period between August 1989 and August 1991 these strategic decision makers adopted a vision that information technology should provide a cooperative computing environment for Fairfax County agencies and departments. They

¹⁷Ian I. Mitroff and Tom R. Featheringham, "On Systemic Problem Solving and the Error of the Third Kind," 383-384.

also adopted five specific strategic objectives which defined this vision in terms of changes that needed to occur in the County's current information technology. Over a period of two years the strategic decision-makers dealt with 30 initiatives proposed by management to deal with information technology issues to achieve the cooperative processing environment envisioned.

How well did issue exploration help the strategic decision makers avoid allocating strategic resources to solve non-strategic problems? The present research has been designed by the author, who was a participant throughout, to (1) provide a case history of the strategic decision makers' strategic decision-making activities during the two year period, (2) to describe and report the strategic decision-making process evaluation conducted by the participants from the 30 management initiatives to evaluate the results of the strategic decision-making process in achieving a cooperative computing environment, and (3) to interpret the case history and evaluations in light of current strategic decision-making behavior theory, in order to provide a comprehensive and convincing accounting of what impact issue exploration had (if any) in helping the Fairfax County strategic decision makers to avoid E_{III}.

This accounting is, of course, developed from an organizational ethnographic research approach, namely, it is compiled exclusively by participants of the events. Therefore, there is a built-in participant bias in both the author's case history and the management initiative participant's issue exploration impact evaluation. With this bias in mind, an estimate of the value of issue exploration, at least as viewed by the participating Fairfax County strategic decision makers, is presented. In addition, a plausible interpretation of how issue exploration functions in organizational strategic decision-making behavior is also presented.¹⁸ In order to obtain these findings and conclusions the research hypothesis is:

Strategic decision makers who first explore the strategic issues before deciding their course of action (management initiatives), will be more likely to identify E_{III} problems, than those who do not.

The importance of researching the use of exploration behavior by the strategic decision makers can test empirically the value of acquiring new knowledge before it is subjected to rational analysis. In the terms of the research hypothesis: if the issue's new knowledge is not acquired, then the

¹⁸William Dunn, "Problem-Centered Policy Inquiry; The Principle of Bounded Ignorance," In a paper prepared for the Public Policy Symposium Project, Center for Public Administration and Policy, Virginia Polytechnic Institute and State University, December 2-3, 1991, 11.

strategic decision makers are open to E_{III} from two directions. The first direction is wrong headed thinking, "That's nothing new, that's"

If the change in the issue situation is added incorrectly into the decision maker's current worldview knowledge base, the new knowledge is misidentified as something that it is not. Clearly, any rational analysis conducted to identify the right problems based upon this mistaken knowledge will be flawed, opening the strategic decision maker to make more E_{III} s.

The second direction is ignorance, "That's nothing, forget it" If the issue's change is ignored or wrongly repudiated, the strategic decision makers continue on without the new knowledge. This ignorance of the issue's change leaves the strategic decision-maker open for more E_{III} s, as well. They keep working on the same problems as though nothing's changed.

What can we do, then, to avoid E_{III} ? William Dunn suggests that for policy analysts to avoid E_{III} , they should restructure the policy problem from their viewpoint of the policy issue.¹⁹ This agrees with Mitroff and Featheringham's view that E_{III} is as Mitroff and Featheringham described, a "problem structuring metadecision."

¹⁹Dunn, Public Policy Analysis, 109-133.

However, Fairfax County strategic decision makers felt that many wrong problems can remain wrong problems, no matter how they are restructured; they simply do not contribute to the selected strategy. They felt that in many cases, it is the point of view that must be restructured, not the problem per se. Therefore, the Fairfax County strategic decision makers decided that they would explore the issue in order to reframe their point of view in order to better determine which problems are right and strategic, and which ones are wrong and non-strategic.

Why is it so critical for strategic decision makers to get the correct problems? Making a strategic error of the third kind has greater consequences for them than it does for operational managers. A management E_{III} would be choosing a less important application for a department to automate first. A strategic E_{III} would be the County deciding to ignore new microcomputer technology and concentrating on adapting its old systems to changing community service needs. The strategic decision makers must obtain the new knowledge within the issues in order to properly frame or restructure a problem as strategic.

Summary of Chapters and Their Research Findings

This first chapter of the study presents the overview, of the issue exploration process, as practiced by Fairfax County strategic decision makers in order to assure that they have selected the right problems to solve. This discussion includes brief discussion of errors of the third kind, i.e., solving the wrong problem.

A statement of the research problem, namely, how to avoid errors of the third kind is examined to illustrate the purpose of the research. The research is focused specifically, of course, on how effective issue exploration has been in helping Fairfax County in this regard. The chapter concludes with a brief summary of the chapters.

Chapter Two, "The Issue Exploration and Organizational Strategic Decision-Making Theory," examines four leading organizational decision-making behavior models or paradigms. They are cross-related to show that they point to an emerging cognitive/cybernetic dual behavior model for organizational strategic decision making.²⁰ In this chapter the

²⁰These strategic decision-making models examined include works by: Richard M. Cyert and James G. March, A Behavioral Theory of the Firm (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956); Graham T. Allison, Essence of Decision: Explaining the Cuban Missile Crisis (Boston: Little, Brown & Co., 1971); John Steinbruner, The Cybernetic Theory of Decision: New Dimensions of Political Analysis (Princeton: Princeton University Press, 1974); and James D. Thompson and

cognitive/cybernetic dual behavior model is related to rational analysis and exploration behaviors of strategic decision-making processes. The cognitive/cybernetic organizational strategic decision-making model is linked to Jane Dutton and colleagues' recent research on strategic management decision making process for diagnosing issues and solving problems. The chapter also links these models to Cowan's Problem Recognition model. Included in chapter two is a brief examination of strategy, its evolution from its military origins, and how it relates to organizational decision-making.

Chapter Three, "Methodology & Research Design" first examines current methodologies designed to deal with the problem of problem selection and errors of the third kind. The chapter then goes on to define the research hypothesis in the form of three practical research questions for each of the 30 management initiatives: (1) did the strategic decision makers actually engage in exploration behavior; (2) were any errors of the third kind avoided; and (3) how well did the management initiatives achieve the strategic objectives and vision?

Arthur Tuden, "Strategies, Structures, and Processes of Organizational Decision," ed. David A. Kolb, Irwin M. Rubin and James M. McIntyre, In Organizational Psychology; A Book of Readings (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1971).

The chapter presents a research design to address each of these three questions for each of the 30 management initiatives through detailed case histories and organizational ethnographic research by the participants of the management initiatives. For this latter research task, specific research instruments were designed for the participants to conduct the research and then report their findings to the stakeholders.

Chapter Four, "The Fairfax Experience." is a case history of the 30 management initiatives as their issues were (or were not) explored, strategic problems and solutions chosen and implemented. The first part of the case history describes the general situation and conduct of issue exploration in the area of information technology development for the County and its strategic decision-making behavior. It also includes an interpretation of Fairfax County's Strategic Management Team's research evaluation of the strategic decision making for these 30 strategic management initiatives.

The second part of the case history tracks the events of two of the 30 management initiatives as they do (or do not) explore the issues of their respective strategic management initiatives. The narrative will describe the way each group's behavior came to grips with errors of the third kind.

Chapter Five, "Interpretive Analysis of Research Findings and Conclusions" interprets the two year case history of the

strategic decision-making process for information technology. It also interprets the evaluation results that the participants from the 30 management initiatives involved. The object of this interpretation is to assemble a plausible presentation of the role that issue exploration had in strategic decision making in Fairfax County's development of a cooperative computing environment.

In order to conduct the interpretive analysis, a research instrument has been developed from the Strategic Management Team's research. The Organizational Disposition For Change Framework (Figure 9. page 208) is an adjustable apparatus that incorporates Michel Foucault's approach to interpretive analysis and his concepts of "dispositif."²¹ The research framework has been created to allow the research participants to more closely examine the role of issue exploration in their behavior for two of the individual strategic management initiatives in Fairfax Experience. This framework produces several micro-level views of the detailed behavior, from which the interpretive analysis develops multi-level Organizational

²¹Michel Foucault, Power/Knowledge, 1980), 137-138; Hubert L. Dreyfus and Paul Rabinow, Michel Foucault: Beyond Structuralism and Hermeneutics, 2nd ed., with an Afterword by and an Interview with Michel Foucault, (Chicago: The University of Chicago Press, 1983), 120-122.

Disposition For Change Profiles for the two strategic management initiatives.

This interpretation analysis is intended as a useful account of the impact that issue exploration had in helping avoid errors of the third kind. It is created to stand as a testimony of what happened in the Fairfax Experience that is compelling enough to inform others in their strategic decision making, and to help them to avoid E_{III}.

Possible Importance of This Research to Public Administration

This research serves to make three main contributions to the field of public administration:

1. To enhance the ability of government executives makers to manage change in the complex demands peculiar to the public sector.
2. To provide theoretical and empirical research of strategic decisions that support the mission of public administrators as agents of the public interest.
3. To improve productivity of the use of the public goods in the delivery of services to the community.

The research utilizes current and past research to link the action research efforts of Fairfax County, Virginia to strategic management methods of the private sector, scientific research of the cognitive sciences, and philosophical advances in our understanding of social systems. To the degree that

these linkages are viable Fairfax County's results may apply to other organizations in both the public and the private sectors, as well.

CHAPTER TWO

ISSUE EXPLORATION AND STRATEGIC MANAGEMENT-THEORY

There must, in the nature of human institutions be a mental language common to all nations which uniformly grasps the substance of things feasible in human social life and expresses it with as many diverse modifications as these same things may have divers aspects.

Giambattista Vico, The New Science

Our so-called limitations, I believe, apply to faculties we don't apply. We don't discover what we can't achieve until we make an effort not to try.

Piet Hein, Grooks II²²

Strategic decision makers differ from operational managers in solving problems in one crucial way: managers are usually handed a problem to solve; strategic decision makers must find them. True, managers find problems within their area of responsibility, and in that sense, they are strategic decision makers. However, in the main they are assigned organizational problems to solve. If they have any question about their strategic importance, or lack of importance they usually have to pass the question back up the chain of

²²Cited by Dudley Lynch, "Brain Strategies: Applications for Change and Innovation," in an interview by Elizabeth Shey Gorovitz, Training and Development Journal, (August 1982): 68; Piet Hein, Grooks II (Cambridge, Mass: MIT Press, 1968).

command. Strategic decision makers are usually executives. They are generally at the apex of the chain of command.²³ Therefore they must judge the problem's strategic value to the organization. The responsibility for having chosen the wrong problem rests ultimately with the executives; it is this exercise of their judgement that is a key function of the executive in an organization.²⁴

²³John D. Steinbruner, The Cybernetic Theory of Decision: New Dimensions of Political Analysis (Princeton: Princeton University Press, 1974), 182-131.

²⁴Peter Drucker, Management; Tasks, Responsibilities, Practices, (New York: Harper and Row, Publishers, 1974), 480. "In sum: decision-making is not a mechanical job. It is risk taking and a challenge to judgement. The 'right answer' (which usually cannot be found anyway) is not central. Central is understanding of the problem. Decision-making, further, is not an intellectual exercise. It mobilizes the vision, energies, and resources of the organization for effective action."

See also, Herbert Simon, Administrative Behavior; A Study of Decision-Making Process in Administrative Organization, (New York: The Macmillan Company, 1957), 45-52. "The division of the premises of decision into those that are ethical [values] and those that are factual might appear to leave no room for judgement in decision-making. This difficulty is avoided by the very broad meaning that has been given to the word 'factual': a statement about the observable world is factual if, in principle, its truth or falsity may be tested. That is, if certain events occur, we say the statement was true; if other events occur, we say that it was false.

This does not by any means imply that we are able to determine in advance whether it is true or false. It is here that judgement enters. In making administrative decision it is continually necessary to choose factual premises whose truth or falsehood is not definitely known and cannot be determined with certainty with the information and time available for reaching the decision."

Hence, decision makers recognize the boundedness of their rational analysis and satisfice in their selected solutions.

There is an abundance of research on problem solving in organizations. Although, it is not within the scope of this work, it is necessary to examine the formal problem-solving methods used in current organizations, and to relate them to current organization problem-solving theory and practices. The typical approach to strategic decision making in large organizations is based upon the rational analysis model of problem solving exemplified by Herbert Simon's description of "administrative man":

Limits of Rationality: The central concern of administrative theory is with the boundary between the rational and the non-rational aspects of human social behavior. Administrative theory is peculiarly the theory of intended and bounded rationality -- of the behavior of human beings who satisfice because they have not the wits [or the resources] to maximize.²⁵

Simon's decision-making model is representative of most problem-solving methods. It has three basic steps, (1) Problem Identification, (2) Restructuring/design, and (3) Choice.²⁶ Administrative man identifies the problem, structures it, designs the key alternatives solutions, and selects the best solution for implementation.

²⁵Herbert A. Simon, Administrative Behavior, (1957), xxiv.

²⁶Herbert A. Simon, "A Behavioral Model of Rational Choice," Models of Man, Social and Rational; Mathematical Essays on rational Human Behavior in a Social Setting (New York: John Wiley and Sons, Inc., 1987), 242-245.

An example of the adaptation of Simon's approach in organizations' training for managers in practical methods for problem solving, is the one created by Zenger-Miller, Inc., "Problem Solving for Individuals and Teams."²⁷ Like other problem-solving models, this process begins with identifying the problem. However, the Zenger-Miller approach uses both the bounded rational analysis of Simon's administrative man to "focus your thinking," as well as various exploration behavior exercises to "open up your thinking." The exploration behavior techniques in the Zenger-Miller program include, brainstorming, nominal group process, creating different points of view, double reversal, force field analysis, and various situation diagramming techniques:

Being creative by following step-by-step procedures might sound at first like a contradiction. Following [exploration] procedures, however, forces you to break out of your habitual [rational analysis] patterns of thinking and try something new.²⁸

Using exploration behavior to deal with problems, therefore, is not new to most organization managers and executives. More important, it is clear that using exploration

²⁷Zenger-Miller, Inc., "Problem Solving for Individuals and Teams," FrontLine Leadership, (San Jose, Calif.: Zenger-Miller, Inc.).

²⁸Zenger-Miller, Inc., "Solving Problems: Tools and Techniques," FrontLine Leadership, (San Jose, Calif.: Zenger-Miller, Inc.), 11. Comments in brackets added.

behavior does not mean that strategic decision makers are to abandon the rational analysis aspects of the problem-solving process in any way.²⁹ Problem solving uses both rational analysis and exploration behavior. A third, and perhaps more primary behavior must be included in any analysis of strategic decision making. It is instinctual behavior. Instinctual behavior incorporates behavior engendered by primary motivations such as fear, anger, protection, aggression and desire. Not only does this behavior look after a person's survival, reproduction and physical well-being, it is the major source of the energy drive for action.³⁰ Strategic decisions found lacking in this behavior often end up without the required commitment to implement the solution.

²⁹Steinbruner, The Cybernetic Theory of Decision, (1974), 14. "It is important to note at the outset that the argument being developed is not that rational theory is wrong, invalid, or useless. This certainly not the case. The argument asserts rather that rational theory cannot handle all the observed phenomena of decision-making and should not be relied upon, therefore, as the only base theory for political analysis."

³⁰Paul D. MacLean, A Triune Concept of the Brain and Behavior, ed. T. J. Boag and D. Campbell (Toronto: University of Toronto Press, 1973), 8-22.; William Taggart and Enzo Valenzi, "Assessing Rational and Intuitive Styles: A Human Information Processing Metaphor," Journal of Management Studies 27, no. 2 (March 1990), 149-171; Karen Horney, Our Inner Conflicts, (New York: W. W. Norton and Company Inc., 1945), 34-47. See also, Dudley Lynch, "Brain Strategy: Applications for Change and Innovation," interview by Elizabeth Shey Gorovitz. Training and Development Journal (August 1982): 66.

A prominent example of the use of these behaviors in problem identification and solving is provided by the "New Rational Manager" developed by Charles H. Kepner and Benjamin B. Tregoe. This problem-solving and decision-making approach also includes exploration behavior in the "Situation Appraisal" and "Potential Problem Analysis" phases of their process.³¹

Thus, there is a basic paradox that confronts strategic decision makers. The inherent differences between the rational analysis, instinctual and exploration behaviors often make them countervailing. They are often inimical to each other when they are used in the same phase of the strategic decision-making process. Therefore, in problem-solving models such as those represented by the Zenger-Miller and Kepner-Tregoe models, the rational analysis, instinctual and exploration behaviors are combined in a complimentary and alternatively phased fashion throughout the problem-solving process. For example, problem-solving models begin with focused rational behavior to identify the problem in the first phase. In the second phase, they move to a more open exploratory behavior to generate innovative potential

³¹Charles H. Kepner and Benjamin B. Tregoe, The New Rational Manager, (Princeton, N.J.: Kepner-Tregoe, Inc., 1981), 139, 163.

solutions. In the third phase, rational analysis is phased back in to evaluate the "solution" power of the alternatives, i.e., solve the problem. The instinctual behavior mode is brought to bear to gain a "gut reaction" evaluation and personal commitment in selecting and implementing the preferred choice based on all three behaviors. In this phased approach, one type of behavior is used, then it is phased into the background as another behavior is phased into the foreground.

All three of the behaviors are, of course, concurrently active at least to some degree at any given time. Usually one is in the foreground and the other two in the background, contending for preeminence as the strategic situation unfolds. The strategic decision-making process is constantly trying to keep them in balance, letting one forward and then the next, depending on the phases of the problem-solving cycle.

The value of phasing instinctual and rational analysis behaviors with an exploration behavior in organizational strategic decision-making situations stems from the complexity and uncertainty inherent in organizational settings. Instinctual, rational analysis and exploration behavior differ most markedly in how they deal with uncertainty and complexity:

The complexity and uncertainty in the organizational strategic decision-making process is due to the fact that there are multiple actors/decision makers, each with multiple sets of values, and with uncertainty pervasive all around.³²

The instinctual behavior seeks to avoid or eliminate the uncertainty immediately, and to unravel the complexity with immediate decisive action. Rational analysis strives to delimit uncertainty and to simplify complexity by restructuring the situation.³³ This is Simon's "bounded rationality" and "satisficing" effect. In contrast, the exploration behavior is actually triggered by uncertainty (novelty). Exploration behavior views complexity as a basic resource for new knowledge and learning.³⁴ This complexity is the source of the "requisite variety" in Karl Weick's description of how selection works in organizational decision making.³⁵

³²Steinbruner, The Cybernetic Theory of Decision, (1974), 103-124.

³³Richard M. Cyert and James G. March, A Behavioral Theory of the Firm, (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), 118-119.

³⁴O'Keefe and Nadel, The Hippocampus, 246-247.

³⁵Karl Weick, The Social Psychology of Organizing, 2nd Ed., (New York: Random House, 1979), 188. "The law of requisite variety 'states that the variety within a system must be at least as great as the environmental variety against which it is attempting to regulate itself. Put more succinctly, only variety can regulate variety' (Buckley 1968,

However, when the three behaviors are used together in the same problem-solving phase they can easily cancel each other out. It is, of course, the research hypothesis that this cancellation effect increases the chances for strategic decision makers to make the error of not recognizing the correct problems to solve (E_{III}). Further, it would appear that using one of the behaviors without the tempering effects of the alternative phasing of the other can also lead strategic decision makers to making similar errors. Although the three behaviors are in relative opposition, we have seen that they can be quite complimentary when used serially in the dynamically phased decision-making processes such as the practical problem-solving models of Zenger-Miller and Kepner-Tregoe.

Three-Tiered Foundation in Organizational Strategic Decision-Making Theory

Problem solving is preceded in the organizational strategic decision-making process, by exploration of the issue. The organizational problems and opportunities appear with these strategic issues. In turn, this strategic issue

495). It's because of requisite variety that organizations have to be preoccupied with keeping sufficient diversity inside the organization to sense accurately the variety present in ecological changes outside it."

management process is included in many of the organizational strategic decision-making models of current organization theory. This three-tiered linking model (page 27) represents the foundation support for the research of issue exploration to minimize E_{III} .

The Top Tier: Problem Solving at Fairfax County

In the top tier, exploration behavior is linked to the practical problem-solving methods already discussed. This tier uses David Cowan's "Process Model for Problem Recognition" to illustrate this link. Cowan's model identifies major stages that frame individual strategic decision makers experience in recognizing problems. Cowan is quick to point out that it is a characteristic of his model that all problems are not identified exactly in the same sequence or manner. His model presents the different views of problem recognition process. Cowan's model presents problem recognition in three general stages that frame the views of problem recognition process:

- (1) gestation/latency,
- (2) categorization & definition,
- (3) diagnosis.

Issue Exploration & Its
Foundations in Organization Theory

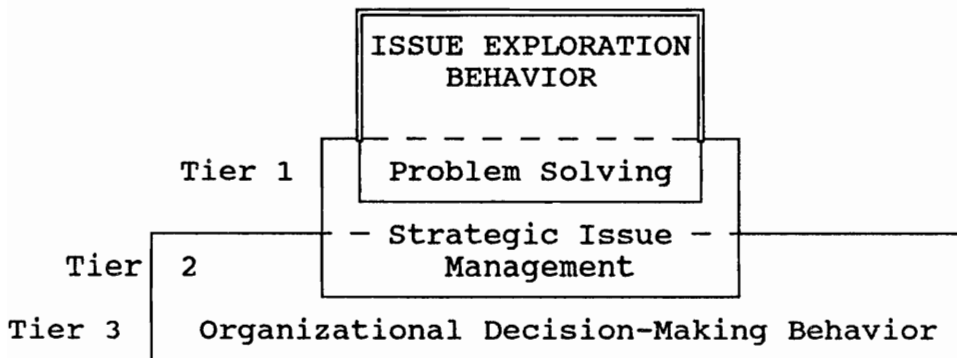


Figure 1. Issue Exploration and Its Three Tiered Foundation in Organizational Decision-Making Theory

These stages frame several "cognitive process elements."³⁶ Cowan's stages also frame the elements of instinctual, exploration and rational analysis behaviors.

The Middle Tier: Strategic Management

The second linking tier is the theory of strategic issue management. This field of organization theory has a direct connection to Cowan's model. This foundation tier has a much broader theory scope, ranging from the systems approach of C. West Churchman to the traditionalist approach of James Thompson, to the interpretive approaches of Henry Mintzberg, Jane Dutton, Linda Smircich, and Karl Weick.³⁷

The middle tier centers its attention on Strategic Issue Management (SIM) and Strategic Issue Diagnosis (SID) described by Jane Dutton and her colleagues as representative of the

³⁶Cowan, "Developing a Process Model of Problem Recognition," (1986), 766-770.

³⁷The study refers to three works by Jane E. Dutton and her colleagues: (1) Jane E. Dutton, Liam Fahey, and V. K. Narayanan, "Toward Understanding Strategic Issue Diagnosis," Strategic Management Journal 4, no. 4, (Oct.-Dec., 1983), 308; (2) Jane Dutton and Robert B. Duncan, "The Creation of Momentum for Change Through the Process of Strategic Issues Diagnosis," Strategic Management Journal 8, no. 4, (1987), 297-295; and (3) Jane E. Dutton and Edward Ottensmeyer, "Strategic Issue Management Systems: Forms, Functions, and Contexts," Academy of Management Review 12, no. 2 (1987), 355-635.

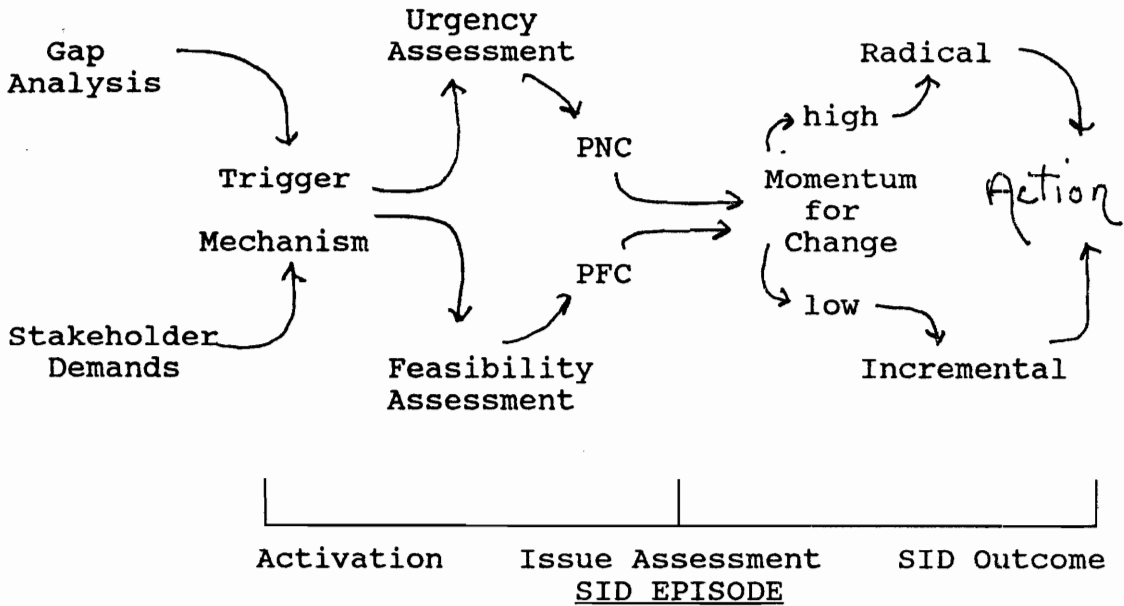
field.³⁸ Strategic Issue Diagnosis is the strategic issues management counterpart to Cowan's Process Model for Problem Recognition. The features of Cowan's three problem recognition process stages are blended here into three diagnosis episodes, activation, assessment and outcome. Dutton et al. point out that "the issues [are] explored" during Strategic Issue Diagnosis (SID) of the strategic management process. Dutton and her colleagues build upon the basic survey of strategic decision making developed by Henry Mintzberg, Duru Raisinghane, and Andre Theoret. They also included the function of decision recognition and exploration during the diagnosis phase of the strategic management process.³⁹

Jane Dutton and Robert Duncan developed their model Figure 2, "The Creation of Momentum for Change."⁴⁰ (page 38) to illustrate their concepts of Strategic Issue Diagnosis. The model is built from strategic issue diagnosis episode events such as Gap Analysis, Trigger Mechanism, Urgency and Feasibility Assessment and Stakeholder Demands that correspond

³⁸Jane E. Dutton, Liam Fahey, and V. K. Narayanan, "Toward Understanding Strategic Issue diagnosis," (1983), 308.

³⁹Henry Mintzberg, Duru Raisinghani, and Andre Theoret, "The Structure of 'Unstructured' Decision Processes," Administrative Quarterly review 21, no. 2, (1973), 246-275.

⁴⁰Dutton and Duncan, "The Creation of the Momentum for Change," 299.



PNC - Perceived need to change
 PFC - Perceived feasibility for change

Fig. 2 The Creation of Momentum for Change
 Source: Jane Dutton and Robert Duncan

roughly to the cognitive process elements in the three stages of Cowan's model:

<u>Cowan</u>	<u>Dutton & Duncan</u>
(1) gestation/latency,	Activation
(2) categorization & Definition,	Issue Assessment
(3) diagnosis.	SID Outcome

Strategic Issue Diagnosis (SID) originated in an earlier work by Jane Dutton, Liam Fahey, and V. K. Narayanan. Their description of this concept is:

What is SID? Strategic decision makers in organizations are continuously bombarded by an array of ambiguous data and vaguely felt stimuli that they must somehow order, explicate and imbue with meaning. SID refers to those activities and processes by which data and stimuli are translated into focused issues (i.e., attention organizing acts) and the issues explored [emphasis added].⁴¹

Although problem solving methods, by definition, focus on pathologies, i.e., require that something is wrong, broken or sick, diagnosis may seem to be an unfortunate term to use when looking for a view that is broader than the pathology view of problem-solving models. However, diagnosis, in its root form means: to know (something) through and through, to become familiar with (something). Therefore, it is in this meaning that Dutton, et al. use diagnosis in their concept of strategic issue exploration:

⁴¹Jane Dutton, Liam Fahey, and V. K. Narayanan, "Strategic Issue Diagnosis," 307-308.

The process of strategic issue diagnosis is labeled as such to distinguish it from the processes of problem-identification (Lyles and Mitroff, 1980) problem-sensing (Deisler and Sproull, 1982) or problem-solving, and to highlight the major interpretive component of the process. The process is more generalizable than problem-identification and problem-solving as it applies equally to the processing of opportunity as well as problem-initiated activities (Dutton, Fahey and Narayanan, 1983). Further, by applying the label of diagnosis to the acts of triggering and interpreting, one is not bound by the analytical rigor or logical sequencing implied by the process of problem solving. Instead, the label of diagnosis imbues the process with an interpretive and judgmental component which more closely captures the interpretation of problem or opportunity strategic issues in organizations.⁴²

In issue exploration, diagnosis is confronting novelty or uncertainty, examining it as it presents itself, per se, until one becomes thoroughly familiar with the event, i.e., it is no longer novel. This distinction is important to our understanding of the transition from an exploration behavior to a rational analysis behavior. As the following research shows, exploration behavior is required to acquire the new information, and rational analysis behavior is required to convert it to new knowledge by linking it to what is already known.

⁴²Dutton and Duncan, "The Creation of the Momentum for Change," 280.

The Ground Tier: Organizational Strategic Decision-Making Behavior

To complete the overview of the three-tiered foundation for issue exploration in organization theory, the even broader theoretical work on organizational decision-making behaviors is examined. This tier starts with the bounded rationalist approach of Herbert Simon,⁴³ and of Richard M. Cyert, and James G. March⁴⁴ as the latter describe the classical market or economic theory of the firm in their work, "Behavioral Theory of the Firm."

Steinbruner's three organizational decision-making behavior models integrate the work of a significant range of the other major organization theoreticians who have addressed this specific research area, including those by Simon, Cyert and March, and Allison. The ground tier also extends Steinbruner's analysis to the strategic structures and processes that James Thompson and Arthur Tuden propose.⁴⁵ Their economic, psychological and socio-logical models

⁴³Herbert A. Simon, Administrative Behavior, 1936, xxiv.

⁴⁴Cyert and March, A Behavior Theory of the Firm, 1976.

⁴⁵James D. Thompson and Arthur Tuden, "Strategies, Structures, and Processes of Organizational Decision," In Mayer N. Zald et al. (eds.), Organizations and Beyond: Selected Essays of James D. Thompson, (Lexington, Mass.: Lexington Books, 1976), 71-90.

correlate with the three-level template both Allison and Steinbruner use in their analysis.

These writers are representative of the broad spectrum of the mainstream thinking in strategic decision-making behavior for organizations. In Fig. 3, "Comparison of Organizational Strategic Decision-Making Behavior," (page 35) the various theories, models and paradigms are arrayed into a general overview of current thinking in this area. Steinbruner and the others focus on how organizations manage to make strategic decisions in the face of complexity and uncertainty in their environment. In particular, they examine how organizational decision makers cope, and even thrive in complex situations, or what William James referred to as the "humming and buzzing confusion" of the world around us.⁴⁶

For example, the elements of exploration behavior are treated differently at each level. Cyert and March dismiss the first level of decision-making behavior models as an "omnisciently rational" system as described by Herbert Simon.⁴⁷ They preferred to describe their decision-making behavior model as "adaptively rational" because it reflects some of the sentiments of organizational learning of the cybernetic level

⁴⁶William James, The Principles of Psychology, (New York: Henry Holt and Co., 1892).

⁴⁷Herbert A. Simon, Models of Man (New York: Wiley, 1957).

of the models.⁴⁸

Cyert and March describe four basic concepts that are organization's decision-making process: "The quasi-resolution of conflict, uncertainty avoidance, problemistic search, and organizational learning."⁴⁹ Their organizational decision-making behavior model is problem driven:

Goals are evoked by problems. . . . We assume that organizations make decisions by solving problems; each problem is solved as it arises; the organization then awaits for the next problem to appear. . . . This assumption of a "fire department" organization is one of the most conspicuous features of our models. . . .problemistic search is stimulated by a problem and depressed by a problem solution."⁵⁰

There is little room for exploration behavior in this model of decision-making behavior. There is no specific provision for making sure that the right problem has been selected for solution. Cyert and March include organizational learning as one of their fundamental bases of their behavior theory because learning is crucial to their "adaptively rational behavior." This organizational learning, however is limited to cybernetic trial and error, i.e., commit the E₁₁, and then learn from your mistake.

⁴⁸Cyert and March, Behavioral Theory of the Firm, 99.

⁴⁹Ibid., 125.

⁵⁰Ibid., 115.

To expand upon their example, few modern fire departments can afford to sit around and wait for the alarm bells to go off. For instance, are new building materials an issue to learn about? Firefighters want to know everything about the modern materials put into the new buildings and vehicles. They may have to enter those building and vehicles when they are on fire in order to rescue citizens. What about the new fireproof materials developed to protect astronauts? How can firefighters benefit from learning about these new materials.

Quasi-resolution of conflict, uncertainty avoidance, and problemistic search all establish Cyert and March's decision-making behavior model of the firm firmly within the instinctual and rational analysis behaviors. The accuracy of this description of the decision-making behavior in modern organizations is attested by the wide acceptance of the problems solving tools described earlier. These organizations are in the problem solving business. But are they the right problems? Where in this model is there provision for the openness to novelty and uncertainty that is required to allow new knowledge to enter the organization's decision making?

What appears to separate the cybernetic level of models from Steinbruner's and Allison's cognitive level is how the organization deals (or has to deal) with uncertainty and complexity. The first two levels of organizational decision-

making behavior treat these phenomenon as negative forces to be eliminated, avoided or overcome. However, the cognitive level of the organizational decision-making behavior models appear to thrive on uncertainty and complexity. In addition, the models offered are bureaucratic and political institutions that are spawned by the spiraling increase in uncertainty and complexity of this post-modern era.

In the first level, economic rational man lets the "hidden hand" sort things out. The basic rule of organizations is "know your business; buy cheap, sell dear." The second, or cybernetic level recognizes that if the organization adapts to events by solving inherent process problems (reducing your level of uncertainty below your competitors) you add value. This means the organization could reduce both costs and price, making a profit and gaining in market share. At this point, all businesses became problem solving businesses as described by Cyert and March, and managers became interchangeable problem solvers.

However, Steinbruner shows us that in the post-modern era we must now embrace more and more uncertainty and complexity as part of our day to day reality. It is not so much that the world has changed in terms of uncertainty and complexity, we have just become more aware of it:

In summary, then, these five general principles -- inferential memory, consistency, reality, simplicity, and stability -- provide enough basis for a discussion of how the human mind, as we know it through logical analysis and empirical study, handles the complex decision problem.⁵¹

Since the human mind has usually been able to resolve the uncertainty and complexity of the mass of world stimuli it receives, Steinbruner looks to emulate this cognitive process in his cognitive model for organizational decision making. And, since uncertainty and complexity are anathema to the other two levels of models, we might expect his third cognitive level organizational decision-making paradigm to make different use of exploration behavior and organizational learning.

Therefore, for purposes of linking exploration behavior elements to the other foundation tiers, this third tier focuses primarily upon Steinbruner's cybernetic and cognitive paradigms. For example, Steinbruner puts forth three thinking modes that decision makers use: Grooved, Uncommitted, and Theoretical. These thinking modes are not mutually exclusive; all of them can be active in the strategic decision maker, depending upon the situation:

A second syndrome which operates in an organizational setting is what can be called uncommitted thinking. It appears in response to the

⁵¹Steinbruner, The Cybernetic Theory of Decision, 103.

problems of decisions at high levels in an organizational hierarchy. . . . The pattern of uncommitted thinking which tends to occur in this organizational situation has a number of features. First the decision makers do adopt generalized concepts which are embedded in larger, theoretical belief structures are not simply determined by a small number of specific variables. . . . Second, . . . their belief structures (relating an alternative and an outcome via a causal theory) will be associated with a sponsor [key stakeholders] (a utilization of the principle of social reinforcement to bolster belief strength) And finally, the critical point, the high-level policy maker beset with uncertainty and sitting at the intersection of a number of information channels, will tend at different times to adopt different belief patterns for the same decision problem.⁵²

Uncertainty presupposes the prospect of new knowledge for the strategic decision maker. In Steinbruner's cognitive level paradigm, this new knowledge is to be gained by moving away from the grooved thinking of the analysis level paradigm and engaging in theoretical thinking of the cognitive level of organizational decision-making models. However, only after the new knowledge is acquired can the theoretical thinking Steinbruner describes be brought into play to develop new beliefs, i.e. cognitive learning.

Therefore, uncommitted thinking relates more to exploration thinking and its role in acquiring new knowledge. If so, this would mean that exploration behavior, in Steinbruner's scale of decision-making models would have to

⁵²Steinbruner, Paradigms of the Decision Process, 131-139.

be a step back to the middle or cybernetic level of decision-making models. This "step back" could be viewed as a "prior step" to theoretical thinking in the cognitive model, placing issue exploration anterior to the strategic management and problem solving.

Organizational Strategic Decision-Making Behavior Theory and Using Second-Order Methods to Avoid E_{III} .

Strategic decision-making situations in large organizations are usually so complex and the causal factors so confounding it seems unreasonable to expect strategic decision makers to avoid making E_{III} . William Dunn examines this situation, namely when policy analysts make E_{III} for large public agencies. In this case the policy analysts provide "the wrong substantive or formal representation of a problem when one should have provided the right one."⁵³ Dunn suggests as a way to avoid E_{III} , that the policy analyst should restructure the problem through problem conceptualization, problem specification, and problem sensing. However, Dunn points out that this process of restructuring problems to avoid E_{III} :

raises questions about different meanings of rationality. . . . Rationality may be defined at the more fundamental level, where the unconscious or uncritical choice of a worldview, ideology, or myth

⁵³Dunn, Public Policy Analysis, 109-110.

may seriously distort the conceptualization of a substantive problem, and its potential solutions.⁵⁴

In a more recent paper, Dunn discusses the obsolescence of conventional policy analysis and proposes using second-order policy analysis methods as an even better approach to avoid E_{III} :

METHODS OF THE SECOND TYPE

The distinction between first-order and second-order problems provides a basis for assessing the appropriateness of methods available to the policy analyst. Methods can be assessed according to the principle of methodological congruence: The appropriateness of a method is a function of the type of problem under investigation. . . . When method and problem are incongruent we can expect what Mitroff and others have called a Type III error (Mitroff and Mason, 1981): solving the wrong problem. This definition can be specified further by defining a Type III error as employing a method whose level is incongruent with that of the problem under investigation. . . .

The era of second-order science requires methods which are appropriate for problems involving great systems uncertainty and high decision stakes.⁵⁵

Dunn proposes a new rationality (as opposed to comprehensive, bounded or economic rationality) for second-order methods: an interrogative (question-generating) "erotetic rationality." This dialogue approach to rationality

⁵⁴Ibid.

⁵⁵William Dunn, "Problem-Centered Policy Inquiry: The Principle of Bounded Ignorance," Paper prepared for the Public Policy Symposium Project, Center for Public Administration and Policy, Virginia Polytechnic Institute and State University, December 2-3, 1991: 10.

seeks to create "inductive plausibility (not statistical probability) for the systematization of truth-estimates in general."⁵⁶ Dunn suggests several important criteria for second-order methods. First, the estimates of the problem's boundaries must have a cultural component, namely they must be able to be couched in various representations from different stakeholders.

Secondly, the boundaries of the problem must be replicable to assure that the various stakeholders views of the problem are at least comprehensible to each other. Thirdly, the costs of determining the problem's boundaries must be economically attractive to the stakeholders. A cheap "quick and dirty" effort may be much less cost effective when "the opportunity costs of defining the wrong problem may be high."⁵⁷

As fourth criterion, Dunn suggests a second-order method criteria of "Correctness-in-Limit."⁵⁸ This means that when the information derived from the second-order method is compiled it must depict the second-order problem boundaries in a fashion that most of the key stakeholders can accept, even if

⁵⁶Ibid., 11-12.

⁵⁷Ibid., 11-12.

⁵⁸Ibid.

they disagree on the specific problems and solutions involved. But Dunn goes on to add that it is also important for the boundary depiction to provide information about the beyond-the-boundaries terrain of ignorance. In other words Dunn suggests that the stakeholders have to agree on what they don't know as well as on what they do know. Dunn refers to this dual boundary consensus as "Bounded Ignorance."⁵⁹

Finally, the collective strategic decision makers must appraise the "Correctness-in-Limit" by getting feedback on how well their decision-making efforts actually achieved their strategic objectives. Without a retrospective review of the strategic decisions made, the strategic decision makers won't even know if they had made errors of any kind, much less E_{III}.

However, an issue exploration approach confronts Dunn's "question of rationality," from a reverse position. That is, it is the strategic decision makers' worldview that may need restructuring rather than the problem. This need for worldview restructuring through issue exploration occurs when the strategic decision makers' situation has changed to the point that their current worldview is no longer operable. Thomas

⁵⁹Ibid., 12.

Kuhn characterizes this as a "paradigm shift."⁶⁰ In this case restructuring the problem will not do. It is merely (re)rationalizing the status quo. This rational analysis approach becomes moving the same pieces of the puzzle around on the table, when what is called for is a new table, or at least new pieces to the puzzle. In order to accommodate the changed situation, there must be a transformation of the strategic decision makers' worldview. This can be done only with the new knowledge of that changed situation. Rational analysis is a first order of change when what is required is a second order of change: the reconstruction of the stakeholders' worldview.⁶¹

Paul Watzlawick, John Weakland, and Richard Fisch have described this reconstruction of a world view as a second order change.⁶² For them, restructuring the problem would be

⁶⁰Thomas Kuhn, The Structure of Scientific Revolutions 2nd ed., (Chicago: The University of Chicago Press, 1970), 38, 77, and 176.

⁶¹William J. Lyddon, "First - and Second-Order Change: Implications for Rationalist and Constructivist Cognitive Therapies,": Journal of Counseling & Development, 69, no. 2 (November/December 1990): 122. For more definitive work on first and second order change see Watzlawick et al, Change: Principles of Problem Formation and Problem Resolution, New York: Norton, 1974.

⁶²Paul Watzlawick, John Weakland, and Richard Fisch, Change: Principles of Problem Formation and Problem Resolution (New York: W.W. Norton, 1974): 1-98.

a first order change. This reconstruction of one's world view is a reframing of the problem solver's situation rather than a restructuring the problem itself. A second order change sees the solution recommended in the first order change problem as the problem.

Second order change does not look for a solution but a (re)solution. Or, in Steinbruner's terms, strategic decision makers are not seeking solutions to uncertainty, nor even trying to avoid uncertainty as Cyert and March would have it. Strategic decision makers must seek (re)solution to uncertainty. Second order changes deal with the here and now rather than trying to sort out the presumed past causes and effects of a first order problem. It seeks to find a new perspective from which to view the situation rather than to go scouting around the present view for scientific facts for solutions.

Reframing means new knowledge, not restructuring old knowledge and problems for solutions. Second order change, according to Watzlawick et al, seeks to answer the what, not the why. Therefore, second order change focuses not on why is this a problem, but what is the right problem. Only new knowledge, by being able to force strategic decision makers outside of their present frame of mind, can provide the

improved vantage point from which they can more properly make this judgement.

Dunn's proposed methods of the second type directed to researching ways to avoid E_{III} for policy analysts are, therefore, especially attractive to our research enterprise as well:

A major challenge for second-order science is devising methods for dealing with the complexity arising from the mutual construction of problems of risk. Second-order policy analysts are faced not with a single well defined problem, but a problem-of-problems (metaproblem) [viz., E_{III}] which is ill structured because the domain of potentially relevant policy stakeholders, options, impacts, and values is unbounded, that is, unmanageably huge. . . . (cf: the task is to structure a problem-of-problems; Here, analysts run the risk of formulating the wrong problem [E_{III}] by confusing member and class: "whatever involves all of a collection must not be one of the collection" (Whitehead and Russell, Principia Mathematica, 1910, p. 37).⁶³

Dunn's methods of the second type can also be as useful in helping strategic decision makers restructure their points of view as they are in helping policy analysts in restructuring policy's problem-of-problems.

However, these concepts of first and second order change pose the question: how do we acquire the new knowledge for these problem restructuring and point of view reframing projects in the first place? Recent research in neuroscience

⁶³Dunn, "Problem -Centered Policy Inquiry," 7.

has shown that new knowledge is acquired from using exploration behavior to update cognitive maps in the brain.⁶⁴ This research indicates that exploration behavior prepares the brain to acquire new knowledge, and to register it into long term memory storage. Only then can it be analyzed, classified, categorized, or used in a rational fashion for evaluating and solving problems. The brain has to acquire the new knowledge through exploration behavior before it can reason about it. If exploration behavior does not occur, the new information gets misclassified or rejected.⁶⁵ This exploration behavior is, of course, the target of our research.

Strategy Examined

Before completing the discussion on foundations of issue exploration in current organizational strategic decision-making theory it is necessary to describe how strategy is understood in the research. There is confusion and differences among scholars and practitioners about issues and problems. For instance, what are strategic issues? Where do they come from? How do issues differ from problems and planning? Also, how

⁶⁴Robert Miller, Cortico-hippocampal Interplay; and the Representation of Contexts in the Brain (Heidelberg: Springer-Verlag, 1961), 189-200.

⁶⁵O'Keefe and Nadel, 246-247.

does strategic problem solving differ from strategic decision making? Not only do many scholars and practitioners alike use these terms interchangeably, they often disagree among themselves as to what they each mean.

The basic notion of strategy evolved from the Homeric Greeks. With them, strategm was the surprise and novelty that the Greek's generals used to trick the enemy. Uncertainty is not a stranger to strategy; nor is complexity (confusion). Indeed, uncertainty and confusion are an important part of effective military strategy. The goal of military strategy is to increase the uncertainty and confusion of the enemy. At the same time, generals want to reduce their uncertainty about the enemy, hence, military intelligence. Ulysses' Trojan Horse is a classic example of strategy as both intelligence and deception.⁶⁶ Stratos is the Classic Greek word for an army encamped in the field and strategos was the word for the encamped army's general. Therefore, the concept of strategy

⁶⁶Homer The Iliad & The Odyssey, trans. B. Rieu (Harmondsworth, England: Penguin Books, 1950).

"For nine long years we toiled to bring them down by every stratagem we could devise - even when final victory came Zeus seemed to grudge it to us. And all the time there was not a man that dared to match his wits against the admirable Odysseus, who in every kind of strategy proved himself supreme." Nestor to Odysseus' son Telemachus (The Odyssey, III. Telemachus with Nestor), 53.

has been heavily weighted toward military models of conducting warfare, as evidenced in the U.S. military establishment in dealing with the Cold War, the Gulf War, and U.S. Security.

However, as armies became more permanent, then more complex organizations were required to support them. Strategy changed and ultimately became incorporated into the way organizations were managed. Today, the concern of strategy theorists is directed toward the bureaucratization of strategy. Military strategy theorists have highlighted this phenomenon. Edward N. Luttwak pointed out, the systems analyst and the "Logic of Efficiency" based on firepower exchanges sans stratagems created the bureaucratization of combat career experience and "the ignorant pursuit of civil efficiency." Luttwak questions how strategy could ever be developed, when it must be worked out in an openly democratic arena of a bureaucratic conglomeration of military and civilian agencies?

What effect does issue exploration have in dealing with this civil bureaucratization of war strategies? Since strategy has a long tradition in the military arena, a strategic E_{III} can have dramatic consequences. Therefore, if issue exploration is effective in helping Fairfax County strategic decision makers reduce E_{III} , perhaps it may also have a role in U.S. Defense strategy.

Other theorists in military defense strategy have expressed similar concerns about conducting strategic planning in today's complex world. For example, Davis Bobrow raises the question about how strategic planners can reduce the response time it takes for policy executives and generals to respond to changes in the defense/security environment.⁶⁷ The research of Fairfax County's exploration behavior speaks to this question in one of its framework's key research areas: Acquire New Information. Exploration behavior is expected to promote an open/rich variety of new information in the searching function of the exploration behavior. The parallel between current concerns about strategic decision making for U.S. defense and the research in exploration behavior is in the changing focus from strategic planning to strategic management.

For example, the County's strategic decision makers became concerned with strategic decisions they could make now to position Fairfax County's information technology development in the future. These decisions were not paper decisions about approving plans, standards, and objectives. They were purchasing decisions. For example, deciding to

⁶⁷Davis B. Bobrow, "SECURITY FUTURES: INTELLIGENCE AND intelligence," In Planning U.S. Security, ed. Philip S Kronenberg, (Washington D.C.: National Defense University Press), p. 56.

support a department in acquiring a network super client-server computer instead of a minicomputer. The network super client-server computer was a strategic decision to position the County to exploit its strategic Information Technology changes in the future. Philip Kronenberg describes the change to strategic management:

The focus is on thinking of planning as being the strategic management of the national security organizations of the U.S. Government. Strategic management consists of a process of planning and implementing plans for the future involvement or positioning of each national security organization. . . . The purpose of viewing planning in this way. . . . is to minimize the notion that planning is an exercise somewhat isolated from the operational world. . . . is to try to close the loop that historically has been characterized by the failure to sustain reliable linkages among those who must formulate plans; those who identify, acquire, and transform resources; those who evaluate the performance of all major players in the network. Planning as a form of strategic management attempts to integrate formulation, implementation, and evaluation within that network.⁶⁸

Kronenberg's list of several psychological mechanisms associated with high uncertainty have a direct parallel in exploration behavior. The psychological mechanism that informs exploration behavior is what Kronenberg refers to as Thompson's "opportunistic surveillance":

⁶⁸Philip S. Kronenberg, "National Security Planning: Images and Issues," in Planning U.S. Security, ed. Philip S. Kronenberg, (Washington DC: National Defense University Press, 1981), 76-79.

Opportunistic surveillance represents a kind of curiosity because it involves monitoring events for opportunities. This seems to be stimulated by three impulses: (1) a preference for novelty, (2) ambition which seeks to differentiate one's individual or organizational product from that of coalitional or interorganizational competitors, and (3) a strategic sense which compels efforts to control uncertain but plausible futures. . . . But action is also subject increasingly under growing uncertainty to uniquely personal interpretation of meaning associated with the "curiosity" and "discovery" [which] implies a dynamic kind of interaction over time between each individual and the puzzling setting in which he or she is operating.⁶⁹

Kronenberg goes on to link these psychological mechanisms with the cybernetic/cognitive paradigm of Steinbruner, and in particular to the "uncommitted thinking" mode of that paradigm.

Steinbruner's uncommitted thinking mode provides the fundamental linkage of his cognitive paradigm to the organization theory to the other two tiers of the theory foundation for exploration behavior in strategic decision making. In addition, Kronenberg's views on novelty, curiosity, and discovery provide an extended parallel between current

⁶⁹Kronenberg, "National Security Planning," 79-83. Other psychological mechanisms associated with uncertainty that Kronenberg included are (1) importance of values, (2) socio-political bias toward selection of requirements for action and interpretation of information, (3) "problematic search," (4) "opportunistic surveillance," (5) internal synchronicity of the other four psychological mechanisms.

concerns on military/defense strategy decision making and the elements of exploration behavior.

In the modern era context of complex organizations, strategy has evolved from enemy intelligence and battlefield tricks. Especially in the non-military sector, strategy refers more to those things that are important to the existence of the firm and its mission. Henry Mintzberg and James A. Waters suggest four definitions that attempt to capture the broad spectrum of this word's usage in private and public organizations:

1. Strategy is a plan To most people, not just lay persons but writers of dictionaries, military theorists, management practitioners, and even most management theorists, a strategy is a plan, a set of guidelines intended to influence behavior in the future. Chandler's definition is typical: ". . . The determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals" (1962, p.13). Most people, we maintain, define strategy this way, although many, as we shall discuss below, do not necessarily so use the term.
2. Strategy is a position. Not inconsistent with the first definition (although not supportive of it. either) is the definition of strategy as a position -- for example, a niche in a particular market. Under this definition strategy is the means to define or at least to identify an organization in an environment.
3. Strategy is a perception. The Germans say Weltanschauung ("world view"), behavioral scientists who have read Kuhn (1970) say "paradigm," we prefer to say "perception" or "concept." Under this

definition an organizational strategy is, therefore, how the members of an organization view their world.

4. Strategy is a pattern. Although most people, as noted earlier, define strategy as a plan, many of them often use the term in reference to a pattern, specifically a pattern in a stream of organizational decisions or actions. The press refers to the U.S. President's strategy by finding a pattern in his behavior. Competitors do the same thing, as do subordinates, to try to understand the strategies of senior executives in a company. Strategy by this definition is synonymous with consistency.⁷⁰

Mintzberg and Waters go on to combine the first two definitions to create three more sub-definitions of strategy: (5) deliberate strategies (intended and then realized), (6) emergent strategies which were intended but not realized and (7) emergent strategies that were enacted although never specifically intended.⁷¹

Strategic management encompasses all seven of these definitions, ancient and modern, working together at the same time in the organization. In this light, strategy could be defined as the organization interpreting its situation for strategic action, and representing it to others for the organization's best advantage over the long haul.

⁷⁰Henry Mintzberg and James A. Waters, "The Mind of the Strategist(s)," in The Executive Mind, ed. Suresh Srivasta and Associates, (San Francisco: Jossey-Bass Publishers, 1983), 59.

⁷¹Mintzberg and Waters, "The Mind of the Strategist(s)," (1983), 60.

This strategic interpretation/representation is a gestalt view that gives strategic decision makers the ability to reframe those strategic issues confronting it in the best possible light. At the same time the strategic decision makers can (re)present their situation to their stakeholders in a way that allows the strategic decision makers to reframe the situation any time that it is most advantageous to the organization's clients.⁷²

Mintzberg and Waters⁷³ go on to relate the various definitions of strategy to Kurt Lewin's notion of force fields and his "unfreezing, changing, and refreezing"⁷⁴ as an organizational method to use the gestalt shift in representation of strategic issues to create strategic change

⁷²Paul Watzlawick et al, Change: Principles of Problems Formation and Problem Resolution, 92-109.

⁷³Henry Mintzberg and James A. Waters, "The Mind of the Strategist(s)," (1983), 59-69.

⁷⁴Kurt Lewin, Field Theory in Social Science; Selected Theoretical Papers, ed. Dorwin Cartwright, (Westport, Conn.: Greenwood Press, Publishers, 1951), 228. "A change toward a higher level of group performance is frequently short lived; after a 'shot in the arm,' group life soon returns to the previous level. . . .A successful change includes therefore three aspects: unfreezing (if necessary) the present level L¹, moving to the new level L², and freezing group life on the new level." As an aside note here, linking Kurt Lewin's force field theory to strategic decision making is an important link to the action research method that this study uses in the field research in Fairfax County. Lewin, of course, was one of the founders of the action research approach.

in the county government's delivery of service to the community.

Another student of strategy and force fields is Foucault, whose concept of knowledge apparatus is built into the design of this research methodology. In his essay, "Power and Strategies," he defines strategy as integral to the relationships of power. He suggests that power is co-extensive with the social body; that relations of power are intermeshed with all kinds of social relations; and that these relations don't take the sole form of prohibition and punishment, but are of multiple forms.

Foucault's description of the power relations in a way that parallels Lewin's concepts of force fields:

Their interconnections delineate general conditions of domination and this domination is organized into a more-or-less coherent and unitary strategic form; that dispersed, heteromorphous, localized procedures of power are adapted, re-enforced and transformed by these global strategies, all this being accompanied by numerous phenomena of inertia, displacement and resistance; hence one should not assume a massive and primal condition of domination, a binary structure with 'dominators' on one side and 'dominated' on the other, but rather a multiform production of relations of domination which are partially susceptible of integration into overall strategies. . . .

Power relations do indeed 'serve', but not at all because they are 'in the service of' an economic interest taken as primary, rather because they are capable of being utilized as strategies;. . . .

The role for theory today seems to me to be just this: not to formulate the global systematic theory which holds everything in place, but to analyze the specificity of mechanisms of power, to locate the connections and extensions, to build little by little a strategic knowledge.⁷⁵

In addition, since strategic issues are a key unit of the research of E_{III}, it is useful to revisit this term and examine it in more detail. Strategic Issue Diagnosis, as noted in Chapter One, was developed by Jane Dutton and associates. It provides an important element of the role of exploration behavior in strategic decision making:

The term "strategic issues" is used to describe developments or events that have not yet achieved the status of decision event. The term strategic issues is used to highlight that the concern . . . on the developments and events that have the potential to influence the organization's current organization strategy (Ansoff, 1979; Dutton, Fahye and Narayanan, 1983). The triggering and interpretation of strategic issues is called strategic issue diagnosis (SID). . . . On the basis of these interpretations, forces are put into action that initiate or impede strategic change.⁷⁶

The main focus for exploration is on these initial "little" steps of the strategic decision-making process; once the problem has been identified, there is diminishing

⁷⁵Foucault, 141-145. Also see Kurt Lewin, Field Theory in Social Science: Selected Theoretical Papers, ed. Dorwin Cartwright, (Westport, Conn: Greenwood Press, 1975).

⁷⁶Dutton and Duncan, "The Creation of Momentum for Change," (1987), 280.

opportunity to change the choice of problem after that. A new problem misidentified is hard to unthink. In this case, first impressions count a great deal. They instruct the strategic decision makers' future thinking. Therefore, the key misstep toward E_{III} would appear to occur sometime during or before the problem is identified.

The research focuses on the strategic issue diagnosis routine, in order to research the error of identifying the wrong strategic problem to solve. Clearly, three phases of Simon's general problem-solving model are crucial in strategic decision making. However, the opportunity to misidentify problems begins to diminish once his first phase: problem identification begins. Of course, if the strategic decision makers commit E_{III} during Simon's problem solving phases, they do have the opportunity to discover that error during their rational analysis in their problem-solving process. The motivation for such vigilance is, of course, to minimize any potential losses that would be caused by E_{III} . For strategic decision makers the ultimate E_{III} question must be always: Is this still the right problem?

CHAPTER THREE

METHODOLOGY AND RESEARCH DESIGN

All myths. . . have their grounding in the actual generalized experience of ancient peoples, and represent their attempts to impose a satisfactory, graspable, humanizing shape on it. That shape, argues [Giambattista] Vico, springs from the human mind itself, and it becomes the shape of the world that mind perceives as "natural", "given" or "true."

This establishes the principle of verum factum: that which man recognizes as true (verum) and that which he has himself made (factum) are one and the same. When man perceives the world, he perceives without knowing it, the superimposed shape of his own mind, and entities can only be meaningful (or true) in so far as they find a place within that shape. . . .

In short, the 'physics of man' reveals that men have 'created themselves', and that 'the world of civil society has certainly been made by men, and that its principles are therefore to be found within the modifications of our own human mind.'

And this, ultimately, is the goal to which structuralist criticism ought to be directed: "to read the text as an exploration of writing, of the problems of articulating a world."⁷⁷ How we articulate our world determines, as Vico discovered, how we arrive at what we call reality. There could be no more crucial objective for any discipline.

Terence Hawkes, Structuralism and Semiotics

⁷⁷Jonathan Cruller, Structuralist Poetics: Structuralism, Linguistics, and the Study of Literature, (London: Routledge and Kegan Paul, 1975).

The objective of this research is for the author to provide, in the form of a case history, a participant's account of issue exploration as it was used by the strategic decision makers in Fairfax County to avoid making E_{III}. The case history presents Fairfax County's experience (this entire effort will be referred to as the Fairfax Experience) as an example of the effects of issue exploration in organizational strategic decision making. The County used an action research approach that was adapted by Neely Gardner from the work of Kurt Lewin.⁷⁸

The case history includes a detailed account of the action research conducted by the County to evaluate the 30 information technology development management initiatives they pursued, and to achieve their five strategic objectives required to create their envisioned goal of a cooperative computing environment. Their research, also described in the case history, examined what effects that issue exploration had in helping them achieve these results relative to their three research questions:

1. Was issue exploration actually initiated and practiced in each of the 30 management initiatives?

⁷⁸Neely Gardner, "Action Training and Research: Something Old and Something New," 106-115; Kurt Lewin, et al, Frustration and Regression: An Experiment With Young Children (Iowa City: University of Iowa Press, 1941).

2. Did each management initiative identify non-strategic problems and thus avoid trying to solve them? Or, were any problems solved by the 30 management initiatives that later were found to be not strategic?
3. Did each management initiative impact the strategic objectives as expected?

The case history describes the combined experience of the group of strategic decision-making participants (which includes the author) in the Fairfax Experience. It depicts their consensus on their strategic decision-making experience in those three questions.

This account of the participants' comparison of issue exploration among the 30 management initiatives:

permit[s] us to know how much we do not know about a complex problem for which uncertainties and stakes are high. These methods also enable a definition of erotetic [question generating] rationality on the basis of the principle of bounded ignorance.⁷⁹

Therefore, because the author was a participant in the Fairfax Experience his subsequent interpretation can become a plausible written account of the impact issue exploration had in helping Fairfax County strategic decision makers avoid E_{III}.

Research Hypothesis

The research objective as well as that of the Fairfax Experience asks the question, "What difference, if any, does

⁷⁹Dunn, "Problem-Centered Policy Inquiry," 14.

issue exploration make in strategic decision making?" The research hypothesis in response to this question is, therefore:

Strategic decision makers who first explore the strategic issues before deciding their course of action (management initiatives), will be more likely to identify E_{III} problems, than those who do not.

The critical test of this hypothesis will be a comparison between those management initiatives whose participants had engaged in exploration behavior toward the strategic issues and those that had not. The research will discover if E_{III} problems are equally identified by both groups (null hypothesis) or if one group is more likely to identify E_{III} problems rather than the other.

The overall research objective is not only to test the hypothesis, nor answer the three research questions in terms of Fairfax County's own research experience in which we participated. The aim is to establish a rudimentary linkage between both scientific analysis and a plausible interpretation of the Fairfax Experience that can be useful to strategic decision makers in other large organizations, both public and private.

Organizational Ethnography

Organizational Ethnography was selected as the research method for three reasons. First, the author was a full time and active participant in the entire use of the issue exploration process in Fairfax County. Therefore, the author was able to observe and participate in the organizational decision-making processes without disrupting it with any external research activities that were not part of the research that Fairfax County was conducting itself. The development of the case history and interpretation, of course, came afterward.

Secondly, Fairfax County's issue exploration process that was adopted by the Strategic Management Steering Committee was a design that incorporated the "unfreezing, changing, and refreezing" organizational change strategy developed by Kurt Lewin as action research.⁸⁰ Lewin's action research operates on a fundamentally participative mode, namely those who will be affected by the change need to participate as researchers in the change. Therefore, Lewin's action research approach extends organizational ethnography beyond the author, to all of the strategic decision-makers participating in the action research designed to improve the strategic decision-making

⁸⁰Kurt Lewin, Field Theory in Social Science, 228.

process to avoid E_{III}. The specific action research process used by the County was a practical adaptation of Lewin's work by Neely Gardner, "Action Training and Research."⁸¹

Finally, the Fairfax Experience included a comprehensive quasi-experimental research evaluation effort on the part of the participants to evaluate the effectiveness of the strategic decision making in information technology development. The object of this research evaluation effort was to develop evaluative data on each of the 30 management initiatives that would allow them to make credible and persuasive recommendations to the Strategic Management Steering Committee regarding the achievement of the strategic objectives, the status of the creation of a cooperative computing environment in Fairfax County, and the value of using issue exploration in making strategic decisions.

Michael Rosen's approach to organizational ethnography calls for a symbolically-based theory of organizational behavior that is both persuasive and falsifiable.⁸² He cites B. M. Staw's observation:

⁸¹Neely Gardner, "Action Training and Research," 106-115.

⁸²Michael Rosen, "Coming to Terms with the Field: Understanding and Doing Organizational Ethnography," Journal of Management Studies 28, no. 1 (January 1991): 8, 22, citing B. M. Staw, "Spinning on symbolism: a Brief Note on the Future of Symbolism in Organizational Research," The Journal of Management 11, no. 2 (1985), 117-118.

Beyond the hand-waving and travelog that characterize most articles devoted to symbolism, we are still waiting for the real contributions to organizational science - the kind that will either help bridge qualitative and quantitative data or bring new predictive powers to our understanding of organizational life. . . . Although a body of work focusing on organizational culture has been emerging within administration science, research based on ethnographic fieldwork is almost totally absent from the administration science literature.

The research methodology is designed to address this absence of ethnographic fieldwork, at least within the modest scope of the research objective. The participants' perception of their group's behavior is used as empirical research of the cultural decision-making behavior to test the research hypothesis and the research questions. The research design includes documenting Fairfax County's evaluation process to see (in the interpretive chapter) if it constitutes a rudimentary method of symbolic coding in predicting important organizational outcomes in regard to the achievement of the County's strategic goals and objectives for information technology development.

Then, by relating Fairfax County research methods to the second-order research methods Dunn proposed for measuring human behavior in severely complex, uncertain and high risk situations, the research design brings new predictive powers to our understanding of organizational life. Staw suggests

that such predictive functions will bring the organizational ethnographic research method to a more scientific footing.⁸³

Rosen defines organizational ethnography as focusing on situations very similar to the Fairfax County strategic decision-makers as:

predominantly concerned with those social relations coalesced around a subset of goal-oriented activities. The rules, strategies and meaning operating within such "structural poses" are different from those in everyday life, but likely congruent with them. People interact with each other according to this action and meaning subset for the duration of the specialized activity.⁸⁴

In the case history, the specialized activity is Fairfax County's strategic management of Information Technology. Rosen goes on to set out the organization ethnography method that this study used in the design of its research method. Rosen's approach is complementary to Smircich and Stubbart's enactment model for strategic management.⁸⁵

For example, Rosen cites that the ethnographer's method of collecting data is to live among those who are the data. "The task of the researcher is to describe and analyze the world from the perspective of those involved with its

⁸³Staw, "Spinning on symbolism," 117.

⁸⁴Rosen, 3.

⁸⁵Linda Smircich and Charles Stubbart, "Strategic Management in an Enacted World," Academy of Management Review 10, no. 4 (October 1985): 724-736.

performance." In this regard, the study's researchers were all bona fide members of the Fairfax County strategic management team. Among them were participants of each of the 30 management initiatives undertaken by the County's Strategic Management Steering Committee, over the course of the two year treatment period.

Rosen notes that the ethnographer works on the margin of administrative science because the data is primarily qualitative. However, to the degree that second order research methods were used to break down, or deconstruct qualitative data of participants' perceptions of the group's decision-making behavior into discrete behavioral elements quantitative data resulted. In particular, the research focuses upon the strategic decision-making behaviors that moved the participants' activity, quantitatively and qualitatively toward enacting the strategic environment (culture). This enacted quantitative/qualitative environment was symbolized in the more quantitative terms of administrative science as a strategic goal and more quantitative in terms of its five enabling strategic objectives.

Therefore, the principle unit of research is the strategic decision-making behavior (its history and interpretation) of the groups researching and implementing the 30 management initiatives. The degree to which symbols

(strategic objectives and goal) are enacted provides the measure for prediction of organizational behavior. The case history includes the developed language, knowledge, values and norms resulting from the issue exploration efforts that become the "envehicled meanings,"⁸⁶ to identify strategic and non-strategic problems. The organizational symbols furnish the guidelines for strategic action in the here and now.

Rosen goes on to discuss Van Maanen's approach to ethnography in the work setting:

a principal aim of ethnography and here he [Van Maanen] is specifically speaking of organizational ethnography -- is to "uncover and explicate the ways in which people in particular work settings come to understand, account for, take action, and otherwise manage their day-to-day situation." The goal of ethnography in general is to decode, translate, and interpret the behaviors and attached meaning systems of those occupying and creating the social system being studied.⁸⁷

Rosen sees organizational ethnography as a longitudinal method. In the Fairfax Experience, the case history period covers two years and interprets the thirty management initiatives that were explored as issues during that time period.

⁸⁶Ibid., Rosen cites C. Geertz, Negara, (Princeton: Princeton University Press, 1980), 135.

⁸⁷ Ibid., 11.

The organizational ethnographic research was, therefore, conducted by those people who participated in the County's thirty management initiatives in strategic decision-making efforts for that past two years. The results of the research of each management initiative has been subsequently shared with the other participants in order for the strategic decision makers to learn from their enactments.

Research Design

The organizational ethnographic research was designed into three phases for the author as ethnographic researcher:

1. Organizational Ethnographic Participation: participate fully in the strategic decision making for information technology research and development for the period of two years.
2. Case History of Action Research: compile a comprehensive case history of the Fairfax Experience from an overall effect, from their action research activities, and from the details of at least two of the 30 management initiatives.
3. Interpretation of Enactment: create a comprehensive (organizational ethnographic) interpretation of the Fairfax Experience as it relates to current organizational strategic decision-making theory and enactment.

The first phase of the organizational ethnographic research design was for the author to participate fully in the strategic decision-making, minimizing any distortion of it from external research activities. In an effort to remain as

authentic as possible, the author refrained from keeping a journal or any other research activity that was not strictly within the normal bounds of a bone fide County employee participant in the process.

However, in anticipation of compiling the case history (research design phase two), and interpreting the Fairfax Experience (research design phase three), the organizational ethnographic participation phase did allow collecting all of the Fairfax County documents that recorded the Fairfax Experience. These documents included meeting agendas, notes, and minutes. Also collected were strategic management initiative issue papers, research documents of the 30 management initiatives, records of decisions made and actions implemented, as well as the evaluation research undertaken by the County after the two year period.

The second phase of the research design was to review all of the documents and write up a case history of the Fairfax Experience as the participants had (action) researched and developed their information technology. This case history has three major sections:

- (1) the general strategic decision-making process using issue exploration as a form of action research,
- (2) subsequent County research and feedback of the results,

- (3) a detailed account of two of the 30 management initiatives in order to get a closer view of issue exploration in the decision-making process.

The ultimate objective of this case history phase of the research design is to provide substance for the research design final phase three: interpreting the Fairfax Experience.

Enactment Model of Strategic Management

This final section is an interpretation of the Fairfax Experience in light of the three tiers of organizational theory in order to provide a comprehensive (and compelling) view of organizational strategic decision making "predominantly concerned with those social relations coalesced around a subset of goal-oriented activities."⁸⁸

Interpretation is as much of what has been left out, as it is, what has been included by the researcher. Far more is omitted than can ever be included. Therefore, the function of the organizational ethnographer is central to the interpretation. Whether an interpretation is useful under these circumstances, is not determined by statistical proof, but upon the credibility of the researcher and how compelling his or her account is of what happened.

⁸⁸Rosen, "Understanding and Doing Organizational Ethnography," 3.

The primary objective of organizational interpretation is to translate the values of an organization's strategic decision-making behavior into values that can have value for other organizations' strategic decision makers. Organizational ethnography places the researcher at the very working core of the organization's behavior under study, in a fashion that strives to minimize the effect that the researcher's presence, qua researcher, will have on the organizational behavior being studied. In the Fairfax Experience, the researcher was brought in by the Director of the Strategic Management Team to work with the strategic decision makers. Therefore, the development and practice of the strategic decision making process that unfolded was minimally effected by the presence of organizational ethnographic research observation.

The negative aspect of this approach, of course, is the systemic bias of the researcher throughout the County's action research and evaluation activities. Therefore, the County's research results must be discounted accordingly. However, since the County's action research and evaluation was conducted in an open organizational crucible, where key stakeholders representing a full compliment of adversarial views and powers to effect the outcome, the researcher's bias can be expected to have been thoroughly reduced in the process.

The interpretation of the Fairfax Experience follows Smircich and Stubbart's enactment model of strategic management. This model was used to furnish the integration of the County's action research and the organizational ethnography used to study that research. Smircich and Stubbart view the organization and its environment from an interpretive perspective. "The task of strategic management in this view is organization making -- to create and maintain systems of shared meaning that facilitate organized action."⁸⁹ This research is partly in response to their (and Rosen's) call for more empirical research efforts to be devoted to the study of the enactment processes of strategic managers. Their enactment model principles are particularly suited for this study's research for several reasons. For example, their first enactment principle is:

Interpretive Research of an Industry or Organization
is done from the Point of View of the Participants.⁹⁰

This research design and its subsequent analysis has been accomplished exclusively by employee participants (including the author) of the Fairfax Experience as a natural part of their work. The interpretive research constitutes, therefore,

⁸⁹Smircich and Stubbart, "Strategic Enactment in an Enacted World," 724-5.

⁹⁰Smircich and Stubbart, "Enacted World," 733.

the ongoing enactment of their strategic cooperative computing environment.

Smircich and Stubbart's second principle provides another example of how their enactment model supports the organizational ethnographic approach to augmenting the Fairfax Experience with the interpretative research:

Interpretive research embraces the multiple perspectives within an organizational situation.⁹¹

Issue exploration relies on key participants, as stakeholders, to furnish the research process a comprehensive community of points of view to strategic decision makers. In this way, community is given to the multiple perspectives, allowing the dynamics of opposing views to exist within the organization. Only then can the multiple perspectives be examined and acted upon as the strategy of their situation warrants at any given time, i.e., the present. Indeed, it is this interaction and research of multiple participant perspectives that enacts the strategy in the here and now. Smircich and Stubbart's third principle is:

Interpretive Research is Historical-Contextual. Interpretive studies are longitudinal. They record social-political-cognitive-affective processes as these unfold.⁹²

⁹¹Ibid.

⁹²Ibid., 734.

This echoes Rosen's organizational ethnographic approach. The research hypothesis could be rephrased as: how does the strategic decision makers' exploration behavior move the organization to effective strategic action over the time of enactment? How does their exploration behavior move others to create (enact) the organization's strategic environment, in this case an environment symbolized as a cooperative computing environment? Smircich and Stubbart's enactment model for strategic planning focuses upon metaphoric and symbolic bases of organized life that create and sustain the ongoing enactment of the participants' organization/environments.

The Fairfax County strategic decision makers had designated a cooperative computing environment as a symbolic goal for Information Technology. This Information Technology goal is a metaphor for the County's strategic need to be more cooperative in how they work together in all phases of delivering community services to the citizens. Cooperative computing environment is a linguistic shift, emphasizing the importance of humans prevailing over the technical, interlinked computers systems they were installing.

This third principle of interpretive research emphasizes cognitive and affective processes of strategic decision making. Smircich and Stubbart point out the dichotomy between objective and perceived environments in the process of

strategic manager's knowing. Strategic managers try to minimize the gap between their flawed perceptions and the stimuli of the reality of the world "out there" that engendered those perceptions. Smircich and Stubbart's enactment model of strategic management suggests a third view, namely that strategic management is as much about enacting reality (change) as it is about knowing it.

According to Smircich and Stubbart's call for empirical research from an interpretive perspective is:

to encourage a more informed, more reflective, more self-conscious practice of organization. From an interpretive perspective, strategic management consists of those processes through which patterns of "organization" and "environment" are created, sustained, and changed. Interpretive research work examines the epistemologies of organizing processes. It aims to make explicit the knowledge (often taken for granted, but untested) by which organization members construe their situation and explore the multiple, often competing, systems of knowledge existing within a situation. Cause-effect logic is eschewed in favor of examination of the rules that people follow, people's reasons for their acts, and the meanings people assign to events . . . interpretive studies try to get as close as possible to experience-as-lived.⁹³

This enactment interpretation of the research design is presented as the findings in chapter five.

In order to operationalize this interpretive analysis an Organizational Disposition For Change Framework (figure 9,

⁹³Ibid., 733.

page 208) was developed to provide a means for the research participants to record and analyze their inner perceptions of their behavior and that of the other members of their particular management initiative. This framework is used to examine in various levels of detail, the comparative thinking behaviors of the management initiative participants as they explore the strategic issues.

This framework was developed along the lines of Foucault's approach to interpretive analysis and his concepts of various knowledge apparatus (dispositif) that relate the strategic powers at play in each situation's events.⁹⁴ His approach is useful to this research because his approach aims at including the "subjugated knowledges"⁹⁵ in the research. These kinds of knowledges are those expert knowledges that are generally excluded from more scholarly and scientific research. They are not common sense knowledges, but knowledges of people who are actively engaged in the events of unit of analysis, in this case their own behavior in regard to the role that their exploration behavior had in guiding events through their decision-making behavior toward the strategic issues.

⁹⁴Dreyfus and Rabinow, Michel Foucault, 120-122.

⁹⁵Foucault, Power/Knowledge, 81.

Let us give the term genealogy to the union of erudite knowledge and local memories which allows us to establish a historical knowledge of struggles and to make use of this knowledge tactically today. This then will be a provisional definition of the genealogies which I have attempted to compile with you over the last few years.

This "union" of the scholarly/scientific knowledge with other knowledge we may have gained through other sub-rational avenues, such as exploration behavior, performs the function of advocating the claims for our attention for these local, discontinuous, confused and uncertain knowledges that are acquired in the fog of overwhelming reality. Their claims are examined against the claims of current scientific paradigms "which would filter, hierarchise and order them in the name of some true knowledge and some arbitrary idea of what constitutes a science and its objects."⁹⁶

Foucault does not suggest that there is on the one hand an explicit scholarly/scientific system of right, and, on the other hand, only obscure and unspoken disciplines which carry out their shadowy operations in the unconscious depths to constitute the bedrock of the great mechanism of power.

In reality, the disciplines have their own discourse. They engender, for the reasons of which we spoke earlier, apparatuses (dispositif) of knowledge (savoir) and a multiplicity of new domains of understanding. They are extraordinarily inventive

⁹⁶Ibid., 83.

participants in the order of these knowledge-producing apparatuses (dispositif).

In terms of understanding the nature of change, especially social change in organizations, Foucault's approach of such knowledge-producing apparatus (dispositif) proposes a strategic view in the acquisition of the knowledge of events:

The problem is at once to distinguish among events, to differentiate the networks and levels to which they belong, and reconstitute the lines along which they are connected and engender one another. . . . Here I believe one's point of reference should not be to the great model of language (lanque) and signs, but to that of war and battle. The history which bears and determines us has the form of a war rather than that of a language: relations of power, not relations of meaning. History has no 'meaning', though this is not to say that it is absurd or incoherent. On the contrary, it is intelligible and should be susceptible of analysis down to the smallest detail -- but this in accordance with the intelligibility of struggles, of strategies and tactics.⁹⁷

The "Organizational Disposition For Change Framework" (Figure 9, p. 208) is used as a knowledge apparatus to integrate the expert sub-rational knowledge (exploration behavior) of the participants involved in the enactment matrix of strategic and tactical organizational change in a way which the more erudite forms of knowledge can be used to interpret them for analysis.

⁹⁷Ibid., 83-114.

CHAPTER FOUR

ISSUE EXPLORATION AND THE FAIRFAX EXPERIENCE

At the conclusion of testing, Perkin Elmer engineers claimed proudly that the surface (of the Hubble Space Telescope) was accurate to one sixty-fifth of the wavelength of light from a helium-neon laser-- considerably better than the one fortieth required by NASA. But the mirror, some scientists now believe, may have been precisely ground to the wrong shape. "You can do all the testing you want, but if you're using a yard ruler that's only 35 inches long, you're going to get the wrong result," says Max E. Rosenthal, project manager of the optical telescope assembly at Marshall.

-Tim Beardsly, "Blurred Reflections; Trouble with Hubble Puts Heat on NASA." Scientific American, Vol. 263, No 3 (September, 1990), 21-29.

The County's information technology development strategic decision-making involved 30 management initiatives over the two-year period between August 1989 and August 1991. The case history of the Fairfax Experience is presented in three parts. The first part tracks the use of issue exploration in Fairfax County from its origins in the Fire and Rescue Department to its use for strategic decision making for information technology development. Part One includes the creation of the County's information technology goal of

developing a cooperative computing environment. It also describes the five strategic objectives developed as guidelines for organizational change towards achieving the strategic cooperative computing environment goal.

In the second part of the case history, two individual management initiatives have been selected to illustrate how the issue exploration process was conducted in the strategic decision-making process. There is a description of how the organizational strategic decision-making behavior in the two management initiatives was (or was not) able to make an impact upon the strategic objectives and cooperative computing environment goal.

The third part of the case history presents the County's internal research by its Strategic Management Team, and their evaluation of the County's strategic decision making for information technology development. This evaluation includes the various results of the use of issue exploration in all 30 management initiatives brought forward to move the County toward its strategic objectives and goal. Lastly, there is a description of the County's evaluation of the effectiveness of the 30 management initiatives. The County's evaluation included researching and measuring how much issue exploration was able to help strategic decision makers to identify non-strategic problems, i.e., avoid E_{III}. It also included an

estimate of each management initiative's contribution towards achieving the strategic objectives and goal.

**FAIRFAX EXPERIENCE PART ONE:
The Fairfax Information Technology Situation**

Fairfax County, Virginia, is a recently urbanized community of over 700,000 citizens in the greater Washington, D.C., area. In the Commonwealth of Virginia many county governments, such as Fairfax County, provide both municipal and county community services to the citizens. These community services include libraries, police, fire and rescue, urban planning, social services, sheriff, judicial courts, and public schools. All of these services rely upon information technology support. The libraries have an automated book and reference look up system. The police, fire and rescue services are dispatched by a computer aided dispatch (CAD) system connected to the 911 emergency telephone system. Various social services use an automated system to track resource vendors, children day care centers, and county housing units. The judicial courts use computer systems to track cases, attorneys, and to schedule trials.

However, over the past decade, Fairfax County had experienced severe delays in its efforts to develop information technology systems. Furthermore, it had been

taking the County longer and longer to make changes in the computer systems they already had. These delays had been costing the County more and more resources in personnel and funds. The County's concern was later summarized in the County Executive Officer's presentation to the Fairfax County Board of Supervisors, "Advertised Budget Fiscal Year 1992":

The County formerly published a systems plan that represented a queue of generally unrelated, agency-specific software development projects, planned for development either in-house or through contractors. This linear approach and narrow focus was recognized as inadequate to the Information Technology needs of the 1990s.⁹⁸

Previously, many problems and opportunities had been selected to deal with this situation. For example, many positions were added to the department that develops information technology applications, a strategic planning team was created to help that department to organize the application development, and a project tracking system was installed in that department. However, the systems-planning process became more and more blocked. In the Summer 1989, after hearing the latest scheme to add more positions to relieve this situation, one County executive remarked:

Why are we solving this problem again? You managers keep bringing us this problem, we fund solutions for it, and here the same problem comes around again for

⁹⁸Fairfax County, Virginia, Information Technology Strategic Directions (1991), 3.

a new solution? Doesn't anybody ever fix these things? We've replaced the director of the data processing department two times, bought entirely new software for the mainframe, hired expensive consultants, and set up a special strategic planning group in the data processing department. The only result has been that the systems development process finally has ground to a halt.⁹⁹

An example of this information technology systems development delay is illustrated by a situation in Fairfax County's Fire and Rescue Department. A fire management information system (FIRE-MIS) proposed originally in 1982, the user requirements completed in 1989, ended up being put off until 1994. This meant that it was going to take twelve years for the County's data processing department to provide the Fire and Rescue Department managers convenient access to the management information already resident on the County's mainframe computer. The Fire Chief was not satisfied with a solution that may only possibly happen 12 years in the future. As a result, the Fire and Rescue Department began developing their own applications on personal computers linked together in a local area network (LAN).

The Fire Chief was not the only agency or department head to complain about this situation with information technology

⁹⁹a comment made during a meeting of the Strategic Management Steering Committee meeting, 2 August 1989 by the Deputy County Executive of Management and Budget, Fairfax County, Virginia.

development. In April 1989, the Deputy County Executive for Management and Budget gave the director of data processing (Office of Research and Statistics) an ultimatum:

You've had over a year to put together the Information Technology strategic management process. Either come up with a strategy for improving the development of our computer systems, or I'll take the Strategic Planning Group out of your department and put them somewhere where we can get something done around here. You have six more weeks to come up with a scheme.

Six weeks later, with no strategic planning process forthcoming, the Deputy County Executive removed the computer systems Strategic Planning Group from the data-processing department and placed it in the Office of Management and Budget. He gave the Office of Management and Budget Director a mandate to develop a strategic management process for this information systems development situation. The data-processing department director and his manager of the Strategic Planning Group left the County shortly after that.

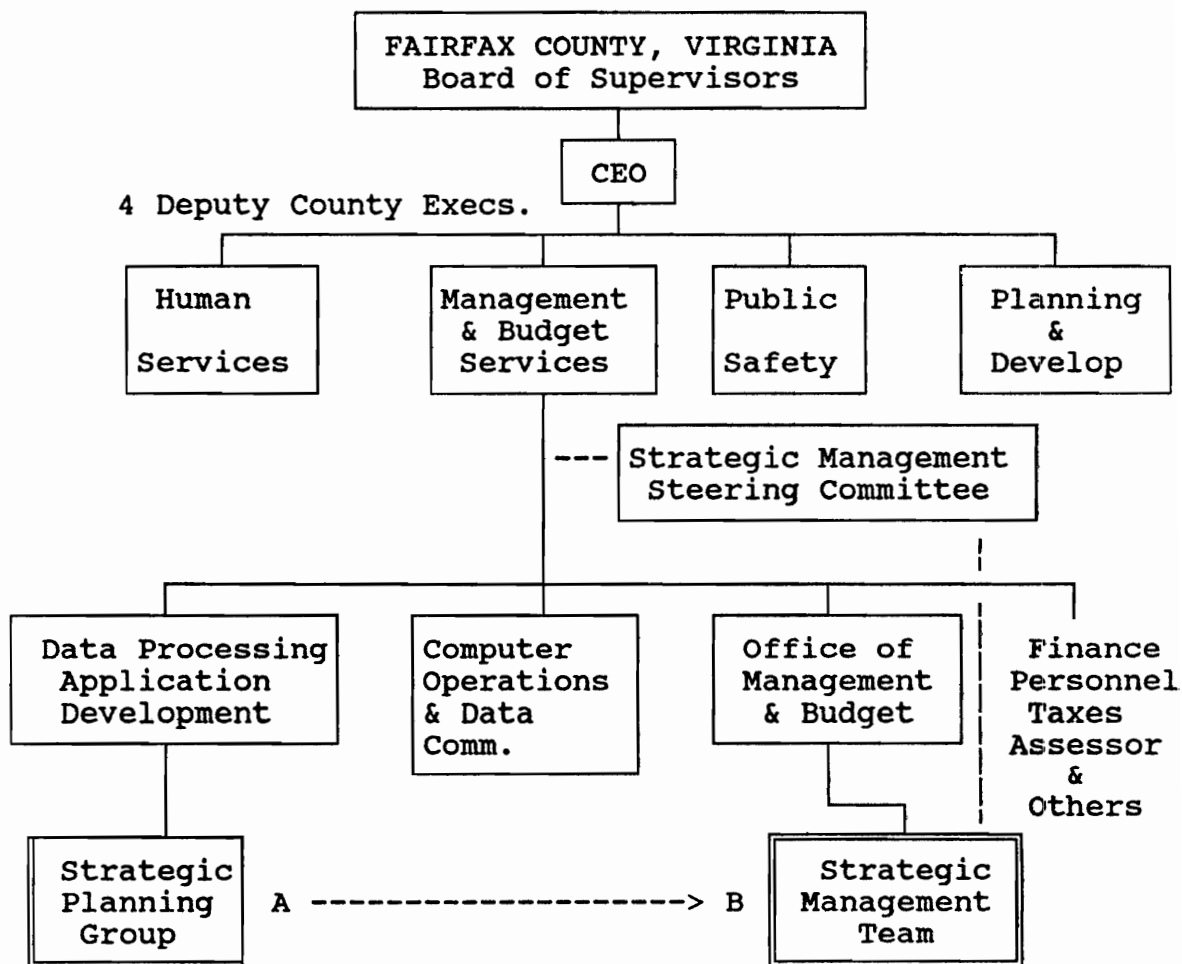
In June 1989, the Strategic Planning Group was reassigned to the Office of Management and Budget Director. The director changed the emphasis from strategic planning to strategic management. As a result, she reorganized the planning group into the Strategic Management Team. The reorganization of the Strategic Management Team implied a broadening of the County's posture from data processing systems planning to information

technology development. The Strategic Management Team was also set up to function in a dotted-line relationship as staff to the County's Strategic Management Steering Committee, as depicted in Fig. 4, "Fairfax County Organization for Information Technology," (Page 96).

The Strategic Management Steering Committee itself was comprised of the Deputy County Executive of Management and Budget, the managers of the Data Processing Department, the Computer Operations Department, Office of Management and Budget, the Communications Department, and the Property Management Agency.

Later, representatives from various agencies and departments were added to this committee to provide the views and needs of the information technology users. This steering committee, with the Strategic Management Team as staff support, was charged by the Deputy County Executive of Management and Budget to develop a strategic management process for developing the County's information technology.

It was at this point, that the Director of Office of Management and Budget became interested in the information technology development process that the Fire Chief had set up in his program to research and test innovative equipment, methods, as well as information systems. In the beginning, the Fire and Rescue Department had no departmental computers.



This organization chart depicts the move of (A) Strategic Planning Group from Data Processing Department to (B) Office of Management and Budget with "dotted line" linkage to Strategic Management Steering Committee and the Deputy County Executive of Management and Budget Services.

Figure 4. Fairfax County Organization for Information Technology

At the end of three years they had to an automated dispatch system and personal computers networked throughout the department.

The Director of the Office of Management and Budget had read that the firefighters were developing applications for the Fire and Rescue Department themselves:

A unique pilot program has been designed to train fire and rescue personnel in knowledge-engineering skills for use on personal computers (PCs). The Fairfax County Fire and Rescue Department, in conjunction with George Mason University, is developing a number of expert systems (ES) applications which will help the delivery of services to Fairfax County residents. . . . Because of the complex and growing nature of the role and challenges facing the Fairfax County Fire and Rescue Department in maintaining a high level of planning, performance, and expertise, computerization of a variety of department functions has been successfully accomplished.¹⁰⁰

In response to the director's request, the Fire Chief asked the author to meet with the Director and her Strategic Management Team. He instructed me to describe the Fire and Rescue Department's program for innovation. In meeting with the director and her Strategic Management Team staff, I explained how the Fire Chief's research process in the Fire and Rescue Department was based not on problem solving, but in getting the battalion chiefs, captains and firefighters to

¹⁰⁰Mary Ann Ericson, "Computers That Make Decisions," Fire Chief, 32, no. 1 (January 1988), 32.

explore emerging issues that might affect the department to make sure they were solving problems important to the department's future. I cited as an example, the emergence of new fire protective materials such as Kevlar and Nomex that had been developed to protect the astronauts. The firefighters worked with the manufacturers to adapt and test the new material as protective clothing for firefighters. I noted that the program to test innovative fire and rescue equipment had received a Counties Achievement Award from the National Association of Counties in 1986, and had been cited as an example for all fire departments in *Fire Chief* magazine:

Every fire department should have, as part of its mind set, a quest for new knowledge. . . . In order to maximize the use of technology and to accept the technology as rapidly as possible, a fire department should also have a research and development program. As a bare minimum, the training should maintain a professional curiosity about tools and equipment arriving on the horizon. If this is not done the organization may soon lapse into technological obsolescence. . . . One fire department utilizes a committee, representing various ranks, to serve on an R&D screening group. This group has the responsibility of preparing reports on innovations from vendors in this country and technological changes in other countries. One of the best examples of this sort of operation is the Fairfax County (Virginia) Fire Department, commanded by Chief Warren Isman.¹⁰¹

¹⁰¹Ronny J. Coleman, "Chief's Clipboard: Opportunity Knocks -- Or -- What Was That Noise!," *Fire Chief*, 31, no. 2, (April 1987), 30.

The Director of the Office of Management and Budget asked about the exploration aspect of the program. She wondered whether it could be applied to information technology for the County. I described how the Fire Chief's four step research process was based on an action research approach to managing change in organizations. I explained that exploration comes out of developing the people who are going to be impacted by the change, to become the action researchers who determine what and how the change will come about. She wanted to know how that would be advantageous to her project.

I pointed out that if the people involved in the change examine the situation, research and test the assumptions and alternatives, by the time their research is completed the change is already accomplished, for the most part. As an example I explained how the program's first step, "Initial Analysis," was designed for the firefighters to explore the issues:

This first step involves sensing what is going on in the fire and rescue field in general and in the department in particular. It involves finding new equipment, describing what it is, and identifying what is innovative about it. This analysis is usually done by the [innovation] program manager together with the persons who requested the equipment be considered for research and testing.¹⁰²

¹⁰²Raymon R. Bruce, "R&D: An Old Concept in a New Setting," 30. no. 1 (January 1986), 46.

It was because of the outside recognition that the program had received, that the Fire Chief felt confident to expand its scope to include the department's information technology as well. The director then asked me to give her examples of firefighters developing applications, using this exploration approach.

There were quite a few. I described several that came to mind. They included the automated personnel roster in the Administration Section, the Battalion Chief's monthly report in the Operations Section, the training and certification system at the Training Academy, the inspection and fee system in the Fire Prevention section, and the electronic bulletin board in one station that allows firefighters to connect from their own computers at home.

One firefighter, on his own initiative, had automated the entire County General Stores catalogue inventory system for the stations. I mentioned that the County Purchasing Department was currently interested in making it available to all agencies.

The director described the changes that had recently been made in moving the strategic management of information technology to her department. She explained that she was looking for ways to change the current information technology development process to be more responsive to new technology

and to the increasing pace of demand for improved systems by the County's departments and agencies.

I explained that the Fire Chief had the same purpose in mind for his program for researching and testing innovative fire and rescue equipment. He wanted to develop a process that focused in on innovations that would be important to the department. At the beginning of the Fire and Rescue Department's innovation program, he had pointed out that:

There's a raft of new things being invented out there. I want to make 'innovation' an OK word to use around this fire department. The problem is: there are so many new things happening; how do we identify which innovations are important to us?

The description of the use of exploration methods to enable battalion chiefs and firefighters to develop their department's information technology appeared to make a compelling case for the director:

That's exactly what I want to know about information technology in this County. Could you help us design a process to do that?

My response was that it would be, of course, up to the Fire Chief. However, if the County were willing to consider supporting the people in the agencies and departments to participate and manage their own application development, this exploration process could function much like it does now in the Fire and Rescue Department. However, I asked the director

if there was a prospect of the County's staff departments giving up this power in the near future.

The director said she had such a mandate from the executives. She described her intention to make just such a systemic change in her proposed new model for strategic management of information resources. She showed me her recent report to the County Executive Officer. It had been also distributed to all agency and department directors:

The success of strategic management depends upon the purposeful shaping of all organizational aspects toward a common vision of the future. Both a fundamental change in our approach to the process of information resource development and structural reorganization are recommended. . . . The recommended new approach to developing information systems incorporate strategic thinking at every level. . . . A reorganization is recommended to provide an adequate structure to support a new operational model, as well as the integration of culture and controls.¹⁰³

I told the director that with that mandate I thought there was a good prospect that the processes would have a good match and that I would be interested in helping develop the new process.

Later, the director asked the Fire Chief if he would assign me to assist her Strategic Management Team as an organization development and information technology resource.

¹⁰³Fairfax County, "Proposed Mode for Strategic Management of Information Resources, Fairfax Virginia, May 1989, 2-16.

After deliberating the advantages of this request, the Fire Chief came to the conclusion that the Fire and Rescue Department's strategic plan was currently in limbo. It would have to wait because of the information technology dilemma that the director had just received from the County executive as her new charge to fix. Also, the Fire Chief's strategic plan for information technology was irrevocably linked to whatever success would be coming out of the newly formed Strategic Management Team in the Office of Management and Budget.

Clearly, supporting the newly reformed Strategic Management Team would be a practical way to get the Fire and Rescue Department access to a relational data base on the County's mainframe computer, and get microcomputers installed in the rest of the fire and rescue stations. Therefore, the Fire Chief agreed to assign me to the director's Strategic Management Team.

I was interested in participating for two reasons. One was to further our information technology plan in the Fire and Rescue Department. Also, if the County were to adopt and develop the exploration aspects of the innovation program it would be an interesting candidate as a research project for my dissertation. Hence, as a result of this move, I acquired a dual perspective: that of a organizational ethnographer and

that of a consultant in the County's strategic decision making for information technology.

Reorganizing for the Network Management of Change

The first three weeks with the Strategic Management Team were spent in adapting exploration to the County's strategic decision-making process for information technology development. We developed the process steps, already described in the Introduction:

- (1) develop issue papers to initiate (invite or enfranchise) research to explore the issue's nature and boundaries,
- (2) form issue exploration groups among the stakeholders to explore, discuss the issue, and develop alternative views,
- (3) conduct formal strategic issue research pilot projects when high uncertainty and risk is involved,
- (4) report research findings and make recommendations for strategic action, and
- (5) research, report and discuss results of the strategic decisions.

The Strategic Management Team presented this issue exploration approach at the August 2, 1989, meeting of the Strategic Management Steering Committee. Using this approach, anyone wishing to propose a management initiative for information technology would have to create a one- or two-page issue paper. The issue paper would describe the strategic

issue without pointing at specific problems or opportunities that have to be dealt with. That would be the function of the issue exploration effort itself. Also, the paper would include some notion of who the key stakeholders involved in the issue, in order to include them in the issue exploration effort. The issue paper would also contain recommendations on how the issue exploration ought to proceed, any budgetary considerations that might be involved in conducting the issue exploration, what expectation the issue exploration might have on the strategic objectives, and some indication of the anticipated time frame involved.

The Strategic Management Steering Committee would review and discuss the issue paper. They also would decide whether it should be pursued. Issue exploration was used to help assure the Fairfax County strategic decision-makers that they were deciding upon the strategic problems and opportunities, namely those that can be expected to impinge significantly upon the County's ability to achieve its strategic objectives.

The issue exploration process was designed to provide a means for the strategic decision-makers to acquire the new knowledge they need to separate strategic problems and opportunities from the non-strategic ones. The issue exploration process allows people from diverse areas of the County to make sure their views, information, and professional

insights are included in the strategic decision-making process.

At the August 2, meeting of the Strategic Management Steering Committee, the Strategic Management Team staff also described how the various groups working on the County's computer systems could be linked together in a collaborative and informal network, using a network management approach. The Strategic Management Team pointed out that the many committees currently working on information systems could be linked together. They explained how the management initiatives being explored could act as threads to link the committees into a collaborative network for strategic information technology development.

The Strategic Management Team explained how the informal meeting of the various members from different committees already formed an informal network. Their informal meetings formed, what the Strategic Management Team called "virtual organizations" at the tactical level. At these informal meetings, the members comprised ad hoc groups that often made de facto strategic decisions for the several committees they collectively represented.¹⁰⁴

¹⁰⁴Fairfax County, Virginia, "Issue Presentation: Strategic Management Steering Committees," from the Strategic Management Team's presentation notes for Strategic Management Steering Committee meeting, 2 August 1989, 1.

In the proposed new strategic decision-making structure, the Strategic Management Team would become a more or less permanent unit with formalized structure, having an organic orientation, and operate under collegial norms. It would be integrated laterally among the users of information technology in the County, have access to top management, and be licensed to go to any part of the County organization as deemed necessary to help stakeholder explore the strategic issues.

The reorganization was later described in the Office of Budget and Management Director's presentation to the Board of Supervisors and community leaders:

Networked Team Organization

A network of interconnected teams was established to coordinate the activities of these separate units. . . At the core of this network structure is the Strategic Management Steering Committee . . .

The Strategic Management Steering Committee provides leadership in setting a direction for the use of IT in delivering County services -- where we want to be in the future, and how to get there from where we are today. . . .

A small, organizationally-independent team, the Strategic Management Team, provides the coordinating role among all the teams. And, finally, under each of the two senior teams are a number of focused task teams charged with developing specific policy recommendations on numerous issues.¹⁰⁵

¹⁰⁵Fairfax County, Virginia, Information Technology Strategic Directions, February 26, 1991, 5-6.

Implementation of this new issue exploration process was direct. After hearing and discussing the presentation in the Strategic Management Steering Committee, the Deputy County Executive for Management and Budget simply announced:

That's it, then. From now on we'll make it policy that all management initiatives brought before this committee will be in the form of Issue Exploration Papers before anything else can be done on them. And I'd like to see that the results of these issue exploration efforts we have approved are properly evaluated as well. We need to interject some "Baconian" research methods in this.

During the August 2, 1989, meeting, the Strategic Management Steering Committee set its strategic course (goal) to move toward a cooperative computing environment for Information Systems for Fairfax County. The core of this cooperative computing environment would be a flexible data communications system, connecting information technology users to relational databases and computer resources to help assist departments and agencies to develop their applications.

In addition, the Strategic Management Steering Committee adopted specific strategic objectives to guide their future efforts. These strategic objectives were to serve as guidelines for the County's strategic decision-making toward achieving the strategic goal of a cooperative computing environment for the County. The strategic objectives were described later in a report to the Board of Supervisors.

"Information Technology Strategic Directions -- Fairfax County, Virginia" (2-26-91):

A number of [efforts] were initiated to explore strategic issues, to build working prototypes, and to gain first-hand county knowledge about crucial aspects of IT [information technology] strategies. These efforts contribute toward building an IT infrastructure to support management vision. During the preparation phase of FY 1990 for changing the way we manage IT, cooperative processing was [a] strategy adopted to develop the County's information systems. This strategy has several major objectives:

1. Introduce relational database technology on the mainframe for agencies to develop applications.
2. Complete the development of a flexible county-wide data communications system.
3. Provide application development training for staff and agency employees.
4. Distribute application development planning, equipment, and software resources in the agencies.
5. Use Computer Aided Software Engineering (CASE) and other automated application development tools to develop new systems, to enhance current systems, and to migrate old systems onto the relational data base.

Over the two-year period between August 2, 1989, and August 2, 1991 thirty strategic management initiatives were brought forward and approved for action to achieve these five strategic objectives. Nineteen of these strategic management initiatives were approved for action by the Strategic Management Steering Committee between August 2, 1989, and July

1, of 1990. At that time, one of the strategic management initiatives resulted in reorganizing the County's information systems development organization. The County executives themselves became the Strategic Management Steering Committee. The former steering committee was renamed: The Infrastructure Management Team (for purposes of simplicity and clarity this strategic decision-making group will still be referred to as the Strategic Management Steering Committee throughout this research).

Eleven strategic management initiatives were approved for action under the aegis of the Infrastructure Management Team, beginning July 1990, through August 2, 1991. It was at this time that representative members from various agencies and departments were added to the group. A chronological listing and description of these thirty strategic management initiatives results is included in Appendix A. "Strategic Decision-Making Impact Analysis." In part two we will describe two of these management initiatives in detail. In part three we will describe all the strategic management initiatives from the County's evaluation of their comparative use of exploration behavior, avoidance of E_{III} , and impact on the strategic objectives and goal.

**FAIRFAX EXPERIENCE PART TWO:
Issue Exploration In Two Strategic Management Initiatives**

Two of the Fairfax Experience strategic management initiatives have been selected to illustrate issue exploration as it was being enacted in specific strategic decision-making situations: Management Initiative #10, "Researching and Testing Applications on Minicomputers," and #29, "Joint Requirements Analysis for Maintenance Management." Both of these efforts originated as pilot projects funded to research the management initiative #10 on minicomputers. However, the Parks Authority later elected to work on a specific strategic problem of developing a countywide maintenance management system that was expanded to include the County's fleet, buildings maintenance, as well as parks.

The Department of Public Works chose to remain with the original minicomputer management initiative. Therefore, this case history will refer to the #10 minicomputer management initiative minicomputer effort as the Department of Public Works Group. The #29 management initiative effort will be referred to as the Parks Authority Group.

It is, nevertheless, very important to keep in mind that this nomenclature is used merely for the convenience of reporting the events in this case history. Neither the Department of Public Works Group nor the Parks Authority Group

were comprised solely of people from these respective agencies. Each group included key stakeholders from other agencies affected, and stakeholders from central staff departments involved, i.e., Cooperative Computing Center, Office of Research and Statistics, Purchasing, the Office of Management and Budget as well as members from the Strategic Management Team.

The County Situation on Minicomputers

The participation of the Department of Public Works as a pilot to research the minicomputer issue began in September 1989, during a telephone conversation with the Assistant Director of the Department of Public Works. She wanted to know what the Strategic Management Team was going to do about minicomputers. I gave her the background on the issue exploration effort and promised to include her in the round of creating the issue paper for minicomputers. She expressed the Department of Public Works interest in joining in the effort:

You know, we sent our department systems plan to ORS [the Office of Research and Statistics] and CCC [the Cooperative Computer Center], but they have declined to evaluate it because we have included a minicomputer in it. What provision is the Strategic Management Team going to make for minis in the agencies?

I replied that the issue exploration effort would explore the whole issue of minicomputers. I explained how the Office of Research and Statistics branch chiefs had responded by expressing serious concerns that their programmers could not support minicomputers in the agencies. Each minicomputer vendor had a different proprietary operating system which would require the Office of Research and Statistics to staff systems analysts and programmers for each different kind of minicomputer in the County. Any application development support for each different minicomputer would, therefore, require additional staffing in the Office of Research and Statistics.

The Cooperative Computer Center claimed that they can support any computer that observed IBM's Systems Network Architecture (SNA) requirements. However, at present staffing levels, they would not be able to provide actual computer system operations support for the same reasons that the Office of Research and Statistics cited. There were too many minicomputer vendors. Each minicomputer vendor required a different system support just to operate the machines. The Cooperative Computer Center would also require extra staffing for each kind of minicomputer that the County acquired. That would have to be included in the cost benefit analysis of any minicomputer acquisition. In addition, they cited a series of

other concerns and problems that minicomputers create in the County's information technology systems.

For example, Office of Research and Statistics' Word Processing Unit claimed to be the County experts on minicomputers. They felt that they should be in charge of supporting all minicomputers. The assistant director described their situation:

We at the Department of Public Works have been using minicomputers for years without outside support. We are not all that concerned about how the Office of Research and Statistics and the Cooperative Computer Center will support us at this time. They have been against minicomputers all along, anyway. We have several minis in DPW already. They were all acquired over these same objections by ORS and CCC. We can handle minis. That's not our problem. So what's the issue?

I described the management initiative requesting that we examine all of the problems that arise out of formally adopting minicomputers into the County's information technology strategy. I told her that there had been several requests for minicomputers during the year, besides the one for the Department of Public Works. The management initiative would examine these requests and recommend that two pilot projects to be funded to test the strategic assumptions about the role of minicomputers in the County's cooperative computing environment. She responded by volunteering her lead systems analyst as a member of the effort.

As a result of the development of the original issue paper, the key stakeholders organized themselves into the Departmental Computing Evaluation Group (DCEG). The name itself was purposefully general in order to prevent the use of minicomputers in the group's name from becoming a self-fulfilling prophesy. They felt that if they studied the issue as a minicomputer group, then the results would likely take the shape of how best to use minicomputers. Many of the stakeholders thought that the County shouldn't use minicomputers at all. The Departmental Computing Evaluation Group members represented the complete spectrum of views on the issue of minicomputers in the County. This Departmental Computing Evaluation Group served as a technical review and selection staff to the Public Works and the Parks Authority, who had been selected to be funded to acquire the minicomputers for the pilot research project.

All of the departments that had an interest in the minicomputer issue were represented, including the Department of Public Works and the Parks Authority. This technical review team examined all aspects of the situation and identified technical, as well as organizational, conflicts revolving around the use of minicomputers.

The Departmental Computing Evaluation Group agreed that the key issue revolved around the lack of a system or process

to properly define an agency's system function needs before the computer hardware/software solution was put out to bid. The County uses a Request For Proposal process to solicit competitive bidding when acquiring computer systems. Therefore, since the Departmental Computing Evaluation Group members had the expertise to do this technical analysis and evaluation, they designated themselves to perform this function for the two issue exploration pilots. They decided that if they documented their process as a technical advisory group for the pilots they would have the foundation of a technical advisory process for future information technology development in the agencies.

The group then proceeded to develop the guidelines for the process of evaluating agency computer system needs. The representative from the Office of Research and Statistics developed a comprehensive technical review form (Appendix D) and process for a countywide technical review team to help agencies identify and describe their functional requirements in a group setting. This technical review form and process reflected all of the concerns and problems that the stakeholders had raised during the initial issue exploration phase. In this way, the technical review process would guide the group in examining these concerns and problems in the

process of actually selecting and acquiring the best information technology solution for the two pilot projects.

It was at this point, that the Parks Authority decided to split off from the #10 minicomputer management initiative. They submitted their own management initiative, #29 for a countywide maintenance management system for its minicomputer pilot project.

Issue Exploration With the Public Works Group

With the Parks Authority forming their own group around their own management initiative #29, the Department of Public Works became the sole client agency of the #10 Minicomputer management initiative and its Departmental Computing Evaluation Group. Under the new technical review process, the Public Works representative took over the chairing of that group through the remainder of the issue exploration process. They were the agency that was going to be most directly impacted by the change. Leading the computer selection process was now their responsibility.

The representatives from the various supporting staff departments now took on their new supporting role in the Departmental Computing Evaluation Group. In this new configuration, the technical review team used the new technical review form and process to help the Department of

Public Works develop their specific system requirements as a Request For Proposal (RFP) to acquire their minicomputer replacement system. In addition, the use of the new technical review form and process also assured that the concerns and problems of the whole issue regarding the strategic role of minicomputers would be addressed as well.

For example, the Departmental Computing Evaluation Group was now able to agree that the core of the issue regarding minicomputers involved nomenclature. The key stakeholders could not agree on the proper definition of a minicomputer. They also found that they were not alone in this situation. No one in the information technology industry could seem to agree on the difference between mainframes, minicomputers, and microcomputers (personal computers, PCs) either. The spectacular rise of the microcomputer (PC) technology had blurred all useful distinctions between these categories.

Therefore, rather than try to define what even the trade journals couldn't define, the group decided to base the Public Works' Request For Proposal (RFP) on the specific needs and requirements of the department. The responding vendors could propose a mainframe, a minicomputer, or a microcomputer solution. The Departmental Computing Evaluation Group decided that if the proposal selection criteria were actually the needs and specific requirements of Public Works, the

subsequent evaluation of the proposals received from interested vendors would put all of the concerns and problems in proper perspective. In addition, the strategic decision making recommendations to the Strategic Management Steering Committee would also be based upon the experience of acquiring and using an actual minicomputer in Public Works.

To the Department of Public Works Group, the idea of issue analysis where they would have an equal footing with former adversaries was novel and intriguing. This new prospect triggered the group's sense of exploration and discovery. During the development of the new technical review form and process, the group discovered that they had been able to discuss their concerns openly, with an even exchange to win their point.

As the process continued, each member acted for the most part within the expected behavior of their work situation. For example, the members from the Department of Public Works came from a civil engineering environment. They stayed very close to their rational problem-solving approach throughout the strategic decision-making process.

The central staff departments' computer operations and system analysts participating in the Public Works Group tended to display a predominantly rational analytic approach, as well. They focused on detailed analysis and setting up strict

procedures for the technical review process they were developing. To the degree that they were disgruntled about losing their former exclusive technical review power, they expressed anger, fear, and the desire to restore it.

However, when the Department of Public Works representative found himself as the chair of the technical review group, it constituted a new experience for him and for the Department of Public Works. In the past, agencies were not even present during the central staff departments' technical review process. And, there was little opportunity for agencies to appeal the central staffs' findings and recommendations. Even when projects were approved in the technical review, it was the central staff departments who presented the agency's request to the executives for budget approval.

However, in their new leadership role of the technical review, the Department of Public Works had to come up with their own functional requirements and ones that the County's staff departments would also sign-off on as a Request For Proposal. This opportunity allowed room for the Department of Public Works Group to be somewhat creative and realistic since their own criteria would be the main determining criteria that would decide which vendor proposal would be chosen.

As the user requirements were initiated by the Department of Public Works members and staff, they were reviewed several

times by the Departmental Computing Evaluation Group. Revisions were suggested, made and then agreed upon. The Request For Proposal (RFP) was then handled by the Purchasing Department and released for responses from vendors. Purchasing also organized a small RFP selection committee composed of three members selected from the Departmental Computing Evaluation Group and two additional members from the Department of Public Works. Again, the Public Works representative was chairperson. In addition, two Public Works' employees, who were responsible for operating the department's current minicomputers, were also selected as members of the RFP selection committee.

When the vendor's proposals and bids were received, the results were startling and unsettling to the group. The Department of Public Works was happy because its favored minicomputer choice met and exceeded the RFP functional requirements criteria (see Figure 5, page 122, "Comparing Bids for DPW's RFP Selection"). The bid also came in slightly less than the amount budgeted for the minicomputer, resulting in

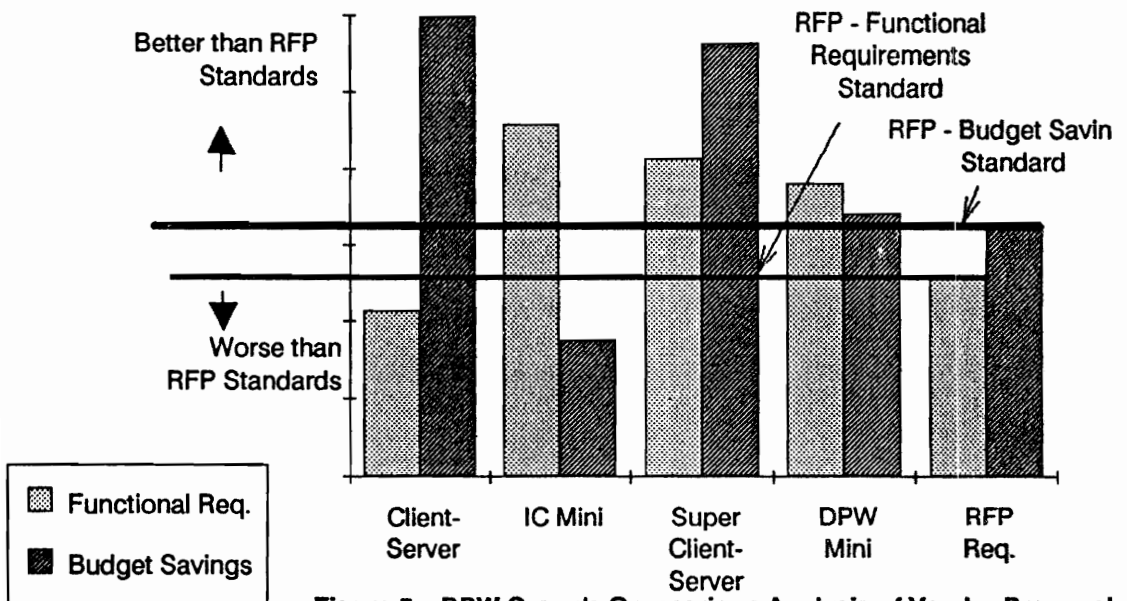


Figure 5. DPW Group's Comparison Analysis of Vendor Proposal

some budget savings.¹⁰⁶ It was exactly what Public Works wanted. Another minicomputer proposal was favored by the Information Center representative (and also by the author) partly because it was the same vendor as the mainframe the Information Center's department operated. This second minicomputer would not only simplify central department support, the proposal was rated by the RFP selection committee as having the highest functionality. However, it also was by far the highest cost, almost double the amount budgeted, showing a significant budget shortfall.

The surprise bid was a super client-server proposal. Most client-servers use a single PC as a central processing unit (CPU) to handle everything. A super client-server uses a very fast CPU for its main processing and several parallel CPUs to handle all of the data flowing in and out of the system.

The super client-server proposal had almost as high functionality rating as the best minicomputer, but it cost nearly one half the cost of the budgeted amount, resulting in

¹⁰⁶Budget savings is a term that reflects potential public benefit savings through the reduction of costs. Since public organizations cannot refer to profit and loss in any meaningful way, other terms are used for decision-making criteria. See discussion of "benefit savings" for Public Management Information Systems (PMIS) by Barry Bozeman and Jeffrey D. Straussman, Public Management Strategies; Guidelines for Managerial Effectiveness, San Francisco: Jossey-Bass Publishers 1990), 121-134.

a very high budget savings. The proposed super client-server provided nearly the highest functionality, at the lowest (one half the funded) cost. The selection of the super client-server as the obvious best proposal did not seem to please any of the key stakeholders. However, the strategic importance of the results was clear. Getting twice the functionality at half the cost was a compelling strategy in favor of the client-server as the County's cooperative computing platform. Therefore, to the surprise of none, the formal bid evaluation resulted in the RFP selection committee's recommendation for the super client-server and local area network (LAN) solution for the Public Works Department. The Departmental Computing Evaluation Group also recommended that the client-server be designated as the cooperative computing platform for the County's goal of creating a cooperative computing environment in the future.

The Departmental Computing Evaluation Group's issue exploration research found that the strategic problems surrounding the acquisition, operation and maintenance of minicomputers in the county were not going to be of strategic importance. They recommended that minicomputers be considered as solution to information technology problems on a case by case (tactical) basis, and only then, when the software application was so special and so specific that it would run

only on a particular minicomputer. For instance, the minicomputer that runs the Public Work's waste water treatment plant and those used to operate Public Safety's automated dispatch system are examples of such minicomputer exceptions.

As in many decision-making situations involving a variety of key stakeholders, not everyone was happy with the result. In this case, it appeared to the client agency, the Department of Public works, that the staff departments had once again gotten their way at the expense of the Department of Public Works. The staff departments had been against minicomputers all along, and once again Public Works's request for a minicomputer was rejected.

Although any department director would be disappointed to have his or her decision blocked, the Public Work's reaction was not just sour grapes. The Director and his Department of Public Works staff had been key stakeholders and most outspoken in their opinions against central staff department interventions that thwarted a agency's better judgement.

The director and his assistant director were both members of the Strategic Management Steering Committee. At committee meetings the director was very candid about his anti-mainframe and pro minicomputer sentiments. He constantly used his department as an example of how departments and agencies can

run their own minicomputers without central staff department support. Both the director and assistant director were in a firm position to have an experienced and expert opinion on which solution was best for their department's needs.

The issue exploration objective of the strategic pilot - - to use this real life deliberation of replacing the two minicomputers in the Department of Public Works as a way to research the strategic problems associated with minicomputers -- was put to the supreme test. At the beginning of the issue exploration, all of the key stakeholders (including the author) thought that the conflict would revolve around which minicomputers would be approved for countywide use, how to support them, or that maybe only mainframe applications would be allowed. The emergence of the dramatic advantage of the client-server solution was a surprise to all.

Clearly, the strategic decision of adopting the client-server solution toward achieving the County's cooperative computing environment was at odds with the Director of Public Works' department level decision to acquire a new, but familiar, minicomputer to replace two of his old ones. The Director of Public Works not only had an informed opinion about the choice of replacing the old minicomputer with a bigger model of the same manufacture, he also appeared dead

set against acquiring either any other minicomputer or the super client-server solution.

Nevertheless, the Departmental Computer Evaluation Group's issue exploration research had clearly established that minicomputers would not have any strategic role in the County's strategic information technology. They would be acquired only by exception, where the software application was so specialized that it required a specific minicomputer. Therefore any minicomputer alternative would be a non-strategic choice.

Further, the group's issue exploration research revealed that the Department of Public Works' particular minicomputer replacement situation was not special in any way that would warrant it as an exception to use minicomputers. Therefore, the RFP selection committee stood by their selection of the super client-server local area network system for Public Works. This selection was a strategic decision not only for the Department of Public Works but for the strategic direction of the County's information technology in the future.

The super client-server selection was not unanimous. These members of the director's staff that served on the five member RFP selection committee were equally divided on the selection among themselves. Their representative who was chairing the committee strongly opposed the selection. He read

aloud to the selection committee several passages from the Request For Proposal. These passages had specifically stated in the scope of the contract under the section on special provisions that:

The purpose of this Request for Proposal (RFP) is to solicit proposals for the hardware, software and communication needs for a minicomputer, which will replace two existing minicomputers to fulfill the Department of Public Works' (DPW) needs to centralize its operations. . . .OBJECTIVES: Provide a mechanism for the 14 agencies that comprise DPW to attain a centralized automation solution for existing and planned systems. . . .Establish a means for centralized processing among the Department's agencies. . . . Provide a centralized location for departmental systems.¹⁰⁷

The committee member from the County's Information Center countered that the County was considering a strategic move towards a decentralized cooperative computing environment. She pointed out that the super client-server in no way would keep the Department of Public Works from structuring the system into a centralized design. In fact, they would be able to change it to any departmental structure their management wanted. That was one of its main advantages over the minicomputer. She mentioned, knowing the directors distaste for the County's mainframe systems, that if they were so interested in centralizing their operations, they ought to

¹⁰⁷Fairfax County, Department of Public Works, "Request For Proposal, Number RFP10071716, Minicomputer (Hardware, Software & Communications) for DPW," September 28, 1990, 6-11.

consider using the County's mainframe as a solution as well as minicomputers.

The Public Works representative who was responsible for operating one of the department's minicomputers that was not going to be replaced, declared himself neutral in what was selected, but agreed that the super client-server was the most forward thinking solution. The third Public Works departmental representative, who was responsible for one of the minicomputers that was going to be replaced, sided firmly with the super client-server selection.

The remaining two members of the committee, the supervisor of the County's Information Center, and the Strategic Management Team's representative (the author) supported the selection of the super client-server, as well. This support was based not only upon the compelling results of the committee's analysis of the competing bids, and the County's policy to have competitive bidding to assure that the most economical selection be made.

The supervisor of the Information Center supported it also because they were staffed and charged with providing central staff department support to personal computers and local area networks, but not minicomputers. A minicomputer selection would require additional staffing of her unit if they were to provide any central staff department support.

The Strategic Management Team representative supported the selection additionally because it best supported the five strategic objectives and goal for a cooperative computing environment. The super client-server was a powerful and flexible system that could be shared across the countywide cooperative computing environment being installed in the New Government Center by another management initiative. The super client-server represented a strategic opportunity to take a quantum leap into the County's information technology future. The proposed solution included a relational data base, and a Computer Aided Software Engineering (CASE) resource that would allow the Department of Public Works to develop many of its own application.

The Department of Public Works was a microcosm of the County. It had 14 semi-autonomous agencies within it. The features of the super client-server fulfilled, in one department, all of the five strategic objectives of the County's strategic plan for information technology development. Here, in the Department of Public Works' pilot project the County would be able to test all of its critical strategic assumptions about the envisioned cooperative computing environment at no additional cost.

However, the decision to purchase the solution was strictly for the Director of Public Works to make. In this

case, the Director of Public Works and his assistant director were very distressed at the committee's recommended selection. The director requested that the RFP selection committee review and reconsider their deliberations in light of the department's stated objectives in the Request For Proposal. The RFP selection committee's subsequent review merely confirmed that their interpretation of the facts were clear, and the selection remained the same. With the super client-server solution the choice of centralization or decentralization would not be compromised in any way; it would be an option the department management could make (and unmake) at any time in the future.

During the review, the department's committee member in favor of the super client-server selection pointed out that the Department of Public Works needed to recognize that they were merely being confronted by their own data, their own functional requirements, their own criteria, and, ultimately, the reality of their own selection. He explained that to change the outcome to swing over in favor of the minicomputer that the director wanted, it would require a drastic change of their functional requirements.

The RFP selection committee agreed that a change in the selection would be justified, if the Department of Public Works had made a serious error in coming up with their

functional requirements in their Request For Proposal. They also agreed that another reason for rejecting the super client-server bid would occur if the RFP selection committee had somehow overlooked the event that the vendor proposing the super client-server had not included any key items.

On these grounds, the director and the assistant director insisted, through their representative and chairman of the RFP selection committee, that the alternatives be reviewed a third time by the RFP selection committee. The Department of Public Works's committee chairman pointed out that the super client-server vendor had failed to include certain communication hardware. Although the cost of the hardware in question was less than 1 percent of the total bid, a third careful review of the Request For Proposal showed that these items were not in the Department of Public Works' requirements of the Request For Proposal. The vendor didn't have to include them. The minicomputer bids didn't include them either.

Furthermore, after this third review it was determined that even if the Department of Public Works changed their functional requirements drastically, the results would be the same. There were no realistic changes in the department's requirements that would not result in essentially the same cost and performance spread among the vendors' resubmitted costs and equipment functions. Changing the requirements would

be like changing the key of a song. All the notes would move in their exact relationship up or down the scale, but the tune would be the same. The super client-server solution remained as the RFP selection committee's recommendation. The RFP selection committee submitted its selection of the super client-server to the director and to the Departmental Computing Evaluation Group. The Director of Public Works could decide either to purchase the recommended solution or to discard the Request For Proposal and start all over with a new one.

The Departmental Computing Evaluation Group then arranged to present their strategic recommendations on the #10 minicomputer management initiative. They recommended that the County adopt the client-server local area network (LAN) as the strategic cooperative computing platform of the future. They recommended further, that the minicomputer should not be considered as a strategic information technology resource. Therefore, the group found that to pursue any of the many problems that had been raised by minicomputers would be committing strategic resources to non-strategic problems, i.e., E_{III}.

However, when the findings were taken to the Strategic Management Steering Committee for presentation on March 20,

1991, the Director of the Department of Public Works preempted the group's presenter and said to his peers on the committee:

I want to preface this presentation with this account. The RFP selection committee has worked hard on this Request For Proposal and its evaluation. But, I want you to know, I didn't like what they came up with. I sent them back to deliberate again - - twice. And twice they came back with the same unacceptable selection. Therefore, I have taken their research to outside experts in the private sector to evaluate their selection. And I want to tell you all here now -- that the outside experts looked at the analysis and told me that, "The emperor has no clothes!" They told me that the Department of Public Works was missing a great opportunity if they pass up this super client-server solution. Therefore, I support the selection committee's recommendations, and I am requesting that this committee approve our acquisition of the super client-server solution.

The Director of the Office of Management and Budget seconded the Director of Public Works request and the Strategic Management Steering Committee approved the purchase. In a memo handed out at the meeting the assistant director cited their basis for the director's decision:

The three finalists were [two] minicomputers and the super client-server. . . . Public Works had to choose either centralized or distributed storage and processing, the traditional way or the next generation of technology. With assistance from the technical agencies, Public Works made the decision to adopt distributed processing.¹⁰⁸

¹⁰⁸Fairfax County, Department of Public Works, "Automation Policy Statement," March 21, 1991, 2.

"Distributed processing" was their term for a cooperative computing environment. Public Works' super client-server system was installed in May of 1991. Central department staff support was not required.

The Parks Authority group

Public Works and the Parks Authority Groups are a study in contrasts. The Parks Authority Group found themselves in a different situation. The Director of the Parks Authority and the County Executive Officer were considering the idea that the unified maintenance management approach was the strategic solution, via the economy-of-scale-notion. The Strategic Management Team coordinator had convinced them that they could get an off-the-shelf software package for under \$60,000. Since the Housing Department, County fleet management unit and the Parks Authority's minicomputer pilot fund were already funded for a combined \$940,000, the joint off-the-shelf software system and a new minicomputer would be only \$250,000. The County could realize even more dramatic budget savings than the Public Works Group did.

In early May 1990 the County Executive Officer convened a budget meeting on information technology projects for the next fiscal year to consider new requests for systems. Present at this meeting were the Deputy County Executives, central

staff department directors and the Strategic Management Team.

The County Executive Officer decided:

I'm not giving Housing or any of these guys any more money for maintenance management systems. They already have plenty of funding for their maintenance management systems. Anyway, why build a lot of little fleet and property maintenance systems? I want one countywide maintenance management system everyone can use. And I want you to organize it.

As the County Executive Officer concluded his remarks he pointed directly at the Strategic Management Team's coordinator who had been the "champion" for the idea of a joint system for Parks, Vehicles, and Buildings maintenance. She had been instrumental in convincing the Parks Authority's director to split his strategic minicomputer pilot off from the parent #10 minicomputer strategic management initiative earlier. Therefore, the strategic problem given to the Parks Authority Group by the Strategic Management Team coordinator's issue paper (Appendix B) was to assemble:

joint requirements and investigating joint solutions -- either an off-the-shelf package to satisfy management needs of all three or individual off-the-shelf packages in each management area which all agencies who need that I[nformation] T[echnology] support. The intent is to avoid proliferation of different software packages and hardware which accomplish the same basic function/process in maintenance.

One area stressed at Harvard's Strategic Computing and Telecommunications conference was that in bringing in new methods and technologies to an organization, three factors must be present, executive sponsorship, an operating "champion" of

the effort, and expert assistance external to the organization. . . . We clearly have the first two elements, but are lacking in the third.¹⁰⁹

The Parks Authority Group spent their energies trying to find a way out of what they soon found to be a difficult situation. They came to view the Strategic Management Team's Coordinator as an agent for the County Executive Officer and the Parks Authority's director. The Parks Authority Group began to focus their strategic decision-making process on the Coordinator.

The Parks Authority Group's #29 Maintenance Management effort, therefore, displayed a great deal of animosity. Most of it appeared, of course, in the form of anger at being manipulated by an executive that knew less about their information technology needs than they did. In addition, they felt that the County Executive Officer had turned the power of decision over to the Strategic Management Team coordinator, who they felt knew even less than the County Executive Officer did about their needs in particular. They also soon found out that the coordinator had no personal experience in information technology at all.

¹⁰⁹Fairfax County, "Joint Requirements Analysis for Using IT Strategically for Managing Maintenance of Vehicles, Grounds, and Facilities," April 1990.

Their first reaction was to search out each others feelings on the joint enterprise. For instance, during the coordinator's first meeting to organize the new management initiative to create the joint maintenance management system (this group will still be referred to as the Parks Authority Group) the representatives of the various departments were informed about the county Executive Officer's joint system solution. After the meeting was over and the coordinator left, the representative from the building maintenance department wondered how they could use the same computer system for buildings, parks and cars. The representative from Housing explained:

Easy, you simply define a building as a car without wheels, and a car as a circulating park without grass. Then they're all the same.

The cynically aggressive behavior of the Parks Authority Group illustrated their emerging tacit strategy to avoid what they viewed as the coordinator's solution. The Parks Authority Group mounted the barricades, and ignored their original strategic charge to acquire a countywide maintenance management system in order to solve their problem with the Coordinator. The Parks Authority Group agreed that it was unlikely that any off-the-shelf computer applications could ever meet the complex system requirements of the Request For Proposal. The Parks Authority Group were convinced that

proving the assignment to be impossible would solve their problem with the coordinator.

The Parks Authority Group created their Request For Proposal with 176 functional requirements criteria that were complex and convoluted with countervailing features. They hoped no vendor could realistically respond to their requirements. Any off-the-shelf package could never fit all these functional requirements without extensive and expensive modifications. The Parks Authority Group's strategic decision making was devoted to find a way to "avoid" the Coordinator's joint, off-the-shelf, one-size-fits-all solution.

Their over-kill strategy in the Request For Proposal plodded along toward its hoped for demise as the ultimate avoidance strategy by the group. At one point, there were so many requirements that the coordinator could not hope to keep track nor reconcile them into an intelligible Request For Proposal.

The coordinator used this challenge as an opportunity to bring in the third and missing element she cited from the Harvard Strategic Computing and Telecommunications conference: "expert assistance external to the organization." She contracted an outside consulting firm that was expert in maintenance management computer systems to come in and sort out the mushrooming system requirements. The consulting firm

conducted interviews in all the affected departments and organized the requirements into a composite and orderly matrix for the Request For Proposal.

When the vendor response bids to the Maintenance Management Request For Proposal were received, all of them, save one, were well over the budgeted amount. The only bid that came close to the budgeted amount was an un-strategic mainframe proposal of dumb terminals using a revised application developed some fifteen years earlier.

In both minicomputer pilot projects, the groups were confronted with a new cooperative computing platform which was not a minicomputer at all, namely, the local area network of personal computers in the form of a the client-server platform. Both minicomputer pilots were allocated the same amount of funding, with the same charge by the strategic decision makers.

When the Department of Public Works got to its decision point, the cost of the newly discovered super client-server cooperative computing platform was only one half as much as they had been allocated to spend for a minicomputer. Even though the solution appeared to be the opposite of the department's original objectives for a centralized computer operations system, they were able to turn around 180 degrees

and select the super client-server solution of a distributed computer operations system.

At the decision point for the Parks Authority Group's joint maintenance management system they were faced with a similar reversal. One vendor did bid the strategically desirable client-server computing platform in response to their Request For Proposal. It turned out to be very attractive to the group as a whole, and they all agreed to support it. However, by having to meet all of the functional requirements that the Parks Authority Group had set out in the Request For Proposal, the vendor's bid came in at a cost three times the budgeted funds available. The Parks Authority Group could not select it.

By the time they had regrouped and got the County Executive Officer to let them at least procure the separate systems they wanted originally, the funds were frozen due to the economic recession. While the Public Works Group installed their super client-server in April 1991, the Parks Authority Group ended up with nothing.

Conclusion of the Original #10 Minicomputer Management Initiative and its Two Strategic Pilot Projects

As a result of the #10 management initiative to explore the minicomputer issue (split between the Public Works and

Parks Authority Groups) the Strategic Management Steering Committee adopted the exclusion of minicomputers as strategic cooperative computing platforms as County's statement of policy:

1. Client/server architecture connected to the network via SNA/Token Ring standards, should be the architecture of choice and promulgated as the most effective and efficient county standard configuration.
2. The mainframe should continue to be the main County computer facility with non-programmable terminals attached as appropriate.
3. Microchannel architecture in microcomputer workstations is the preferred architecture and equipment options should be regularly reviewed at least annually as new products become available.

BACKGROUND:

As both mainframe and microcomputer power and versatility increase, the County should make appropriate use of these powerful data processing and communication tools for its knowledge workers. Microcomputers will increasingly be located at individual workstations linked to other workstations either directly via the mainframe or in a work group through a LAN and then to the mainframe to foster the goal of interconnectivity among users. As microcomputer (LAN) configurations become more powerful, they obviate the need for minicomputers. Therefore minicomputers should be evaluated and acquired on a case by case basis only for certain special propose users. Standard microchannel architecture facilitates the achievement of the county's seamlessness goal of a cooperative computing environment.¹¹⁰

¹¹⁰Fairfax County, "I/T Policy," July 1991.

Therefore, the original minicomputer issue exploration effort resulted in declaring minicomputers as non-strategic. It also identified, recommended and installed a pilot super client-server cooperative computing platform. This platform was used to research its strategic goal of developing a cooperative computing environment in the County.

**FAIRFAX EXPERIENCE PART THREE:
County's Evaluation of Strategic Decision Making**

One of the challenges that the County's strategic decision makers felt most important to them was their evaluation of the results of the strategic decisions they had made. Fairfax County strategic decision-makers had set out five objectives for information technology systems development. Supporting these objectives was their strategic vision that if the objectives were achieved, the County would be in a strategic position to begin operating from a cooperative processing environment.

Their evaluation of the impacts that the 30 management initiatives have had on the original strategic objectives provided them a measure of how effective their strategic decision-making had been. In addition, members of the Strategic Management Steering Committee felt that their evaluation would provide other strategic decision-makers in

the County's agencies and departments useful management information to guide them in their future strategic decision-making in the information technology systems area.

What the strategic decision makers were most interested in was, of course, how well did they achieve the cooperative computer environment originally decided upon two years earlier. In addition, they wanted to know how well the County had done in actually achieving the five strategic information technology objectives. A third area of major interest was in evaluating how much the issue exploration approach influenced the strategic outcomes in terms of achievement toward the five information objectives and in implementing a cooperative computing environment.

Three members of Strategic Management Team (including the author) were charged with conducting this evaluation research to report back to the Strategic Management Steering Committee. The results of this research on these three areas of the County strategic decision maker's interest are provided in this section.

**SMT's EVALUATION CRITERIA ONE:
How well did issue exploration support the strategic
decision makers in achieving their objectives?**

The Strategic Management Team's evaluation report noted that strategic issue exploration, as it was used in

Fairfax County, aimed at helping strategic decision-makers focus on the problems and opportunities that would most significantly impinge on their strategic objectives. By the same token, they noted that issue exploration was implemented to help strategic decision makers avoid allocating strategic resources to those problems and opportunities that would not impinge on their strategic objectives. This is not to say that the strategic decision makers considered the other, non strategic problems and opportunities were unworthy in their own right. They simply concluded that pursuing them as strategic would mislead the strategy and disillusion the participants.¹¹¹

Strategic issue exploration, as defined in the Strategic Management Team's evaluation report,¹¹² had been adopted to assure the strategic decision makers that their research efforts would include some degree of exploration behavior as they examined the issues. The Strategic Management Team's evaluation report includes a chart (figure 6, "Issue Exploration Chart," page 146 and table Table I, Strategic Management Initiatives Data," page 147) of the 30 management

¹¹¹Fairfax County, Strategic Management Team, "On Achieving a Cooperative computing Environment in Fairfax County, Virginia," September 18, 1991, 24.

¹¹²Ibid.

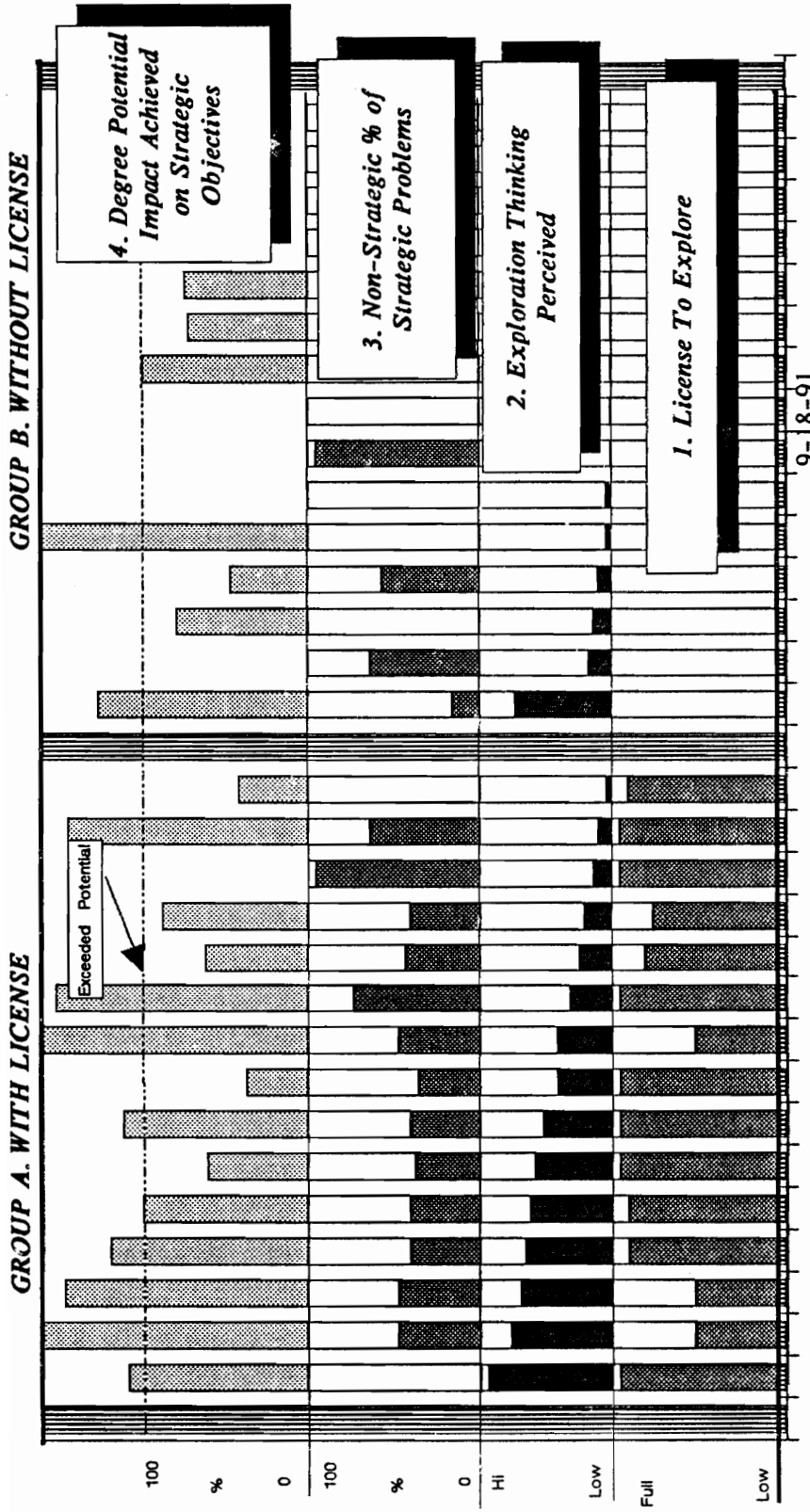


Figure 6. Issue Exploration Comparison Chart

TABLE I. MANAGEMENT INITIATIVES DATA

#	ISSUE PAPERS	Initiated	License	Explore	Sorted	Achieved
Group A: With License To Explore						
1	Exploration of Issues Associated with HRD & Mgt	26-Jan-90	100	80	0	110
2	Management of Innovation	24-May-90	50	60	50	200
3	Managing IT Training (GR)	17-Jul-90	50	60	50	150
4	Executive Information System (EIS)	25-Jul-90	90	50	40	25
5	Using the Information Systems Plan for a Model for Strategic Management of Information Resources	2-Aug-89	90	50	40	100
6	Exploration of Issues Associated with UNIX	8-Feb-90	100	50	40	60
7	Rapid Application Development (RAD)	27-Mar-90	100	40	40	110
8	Imaging	8-Feb-90	100	30	40	40
9	IT Training Needs Analysis	18-Sep-89	50	30	50	290
10	Research and Testing Applications on Mini-Computers	2-Aug-89	100	30	80	150
11	Electronic Mail, Phonemail & FAX	25-Jul-90	80	20	50	60
12	Research and Testing of Budget Applications, Using LAN	8-Dec-89	80	20	40	90
13	Microcomputer and Local Area Network Platforms	2-Jul-90	100	10	100	0
14	Electronic Desk-Top Functionality	7-Nov-90	100	10	70	140
15	Exploration of Issues Associated with Information Resources Steering Committees	2-Aug-89	90	5	0	40
Group B: Without License To Explore						
16	Using Training as an Implementation Strategy	2-Nov-89	0	60	20	130
17	Workstation-to-Knowledge Worker Ratio	20-Aug-90	0	10	70	0
18	Criteria for Selecting Candidates for Strategic IT Trng.	4-Oct-89	0	10	0	80
19	Charters for the Strategic Management, Planning and the Data Base Teams	15-Aug-89	0	10	60	50
20	Acquisition of DB2 Technology in FY1990	2-Aug-89	0	5	0	430
21	Composition of the Infrastructure Management Team	1-Jul-90	0	5	0	0
22	IT Education/Lecture Series	20-Jul-90	0	0	100	0
23	Enhancements to Existing Systems	1-Jul-90	0	0	0	0
24	Software (RFP) (JC)	26-Sep-90	0	0	0	100
25	Programmable Workstation Positions for FY 1990 and 1991	2-Aug-89	0	0	0	73
26	Adoption of Standard Language for Application Development	2-Aug-89	0	0	0	75
27	Human Resources Technical Skills Inventory for IT	2-Aug-89	0	0	0	0
28	Human Resource Development Plan for ORS	15-Aug-89	0	0	0	0
29	Joint Requirements Analysis for Maintenance Mgt,	6-Jun-90	0	0	0	0
30	Human Resource Development Management Team	20-Jul-90	0	0	0	0

initiatives approved for issue exploration. The chart provides a composite picture comparing how the strategic decision-making process for information systems development performed over the past two years.

The thirty management initiatives are arrayed across the horizontal axis depicting their comparative ranking and distribution in the following two comparison groups:

- (A) With license to explore the issues, and
- (B) Without license to explore the issues.

Along the vertical axis, their chart compares the 30 management initiatives across four tiers of performance evaluation factors. In inverse order they are:

- (4) Degree Potential Impact Was Achieved;
- (3) Non-strategic % of Problems Found;
- (2) Exploration Behavior Perceived; and
- (1) License to Explore

A special research survey instrument, "Issue Exploration Research Framework," (Appendix C) was devised by the Strategic Management Team to research the 30 management initiatives and rank them for this four-fold comparison task.

Research Grouping Determinator Factor: License to Explore

Starting with the chart's first tier, "License to Explore," the Strategic Management Team's evaluation report

rated the issue exploration efforts as to the degree that some license to explore the issues was apparent in the management initiatives' originating issue papers. They used this measure to select the management initiatives into Groups A and B.

Synopsis of the Evaluation Group's Analysis: Their research shows that the management initiatives' issue papers observed the Deputy County Executive's issue exploration policy in varying degrees. Each issue paper text was examined by the Strategic Management Team to determine the degree that issue exploration was requested, i.e., given license to explore the issue, that was expressed in the issue paper.

They found that one half (15) of the issue papers expressed an obvious request to explore the issues. The other fifteen issue papers, in effect, ignored the issue exploration policy. Instead, they directed the management initiative research group to focus on a specific strategic problem.

This research resulted in the Strategic Management Team's evaluation report identifying the two distinct groups for them to compare. The County's first research group, A, was comprised of those issue exploration efforts that were asked, in their respective issue papers, to explore the issue in their research efforts. The County's second research group, B, was comprised of those issue exploration efforts that were

asked to start off with researching the given strategic problem(s) and solving them.

Group Comparison Factor One: Exploration Behavior Perceived

The Strategic Management Team evaluation report's second tier, Exploration Behavior Perceived, rates the issue exploration efforts relative to the degree that issue exploration behavior was actually perceived by participants as a characteristic behavior in the group. This perception was measured by at least two of the participants in each management initiative group.

Synopsis of the Evaluation Report Analysis: After researching the participants' experiences in the thirty strategic exploration efforts, the Strategic Management Team's evaluation report found that the participants used exploration behavior in varying degrees, as well. The Strategic Management Team's evaluation indicated that issue exploration was engaged in all 15 management initiatives of Group A and in only 4 of Group B:

This result is appeals to common sense. It seems only reasonable to expect people who are given a specific problem to solve will proceed as asked. They will most likely identify the problem in detail, generate alternative solutions, choose the most desirable, and then proceed to attempt the implementation of their best solution. They do not usually feel that they have much latitude to explore around the basic issue. However, the chart does

indicate that some groups will explore, regardless.¹¹³

This tier of the Strategic Management Team evaluation report's chart indicates that if it is desirable to have the group explore the issues, a formal invitation helps a great deal. Presumably, an informal invitation could be effective as well, however, no records were kept of such invitations. Therefore, the instances of informal invitations to explore issues are not reflected in the County's analysis.

Group Comparison Factor Two: Non-strategic % of Problems found

The evaluation report's next tier, Non-Strategic % of Problems Found, compares the proportion of all the problems and opportunities examined those that were considered as non-strategic. These problems were identified by the Strategic Management Team's evaluation effort by reviewing each issue exploration efforts' reports and documents. The original reason the County adopted issue exploration was to identify these non-strategic problems before strategic resources were allocated to solve them.

Synopsis of the Evaluation Report's Analysis: the chart shows that of the efforts that did engage in exploration behavior, most of them (76%) identified non-strategic

¹¹³Ibid., 22.

problems. For example, the Departmental Computing Evaluation Group, as a result of its issue exploration efforts, that minicomputers had no role as strategic computing platforms for the County's cooperative computing environment. Therefore, the Strategic Management Team concluded that of the 78 attendant minicomputer support problems identified two thirds of them were non-strategic, i.e., potential E_{III}. They didn't need to be solved.

Of the efforts that did not engage in exploration behavior, only one of them (11%) identified non-strategic problems. In fact, the people involved in that effort found that the entire problem assigned for them to solve was non-strategic. They went on to solve the strategic cooperative computer platform problem and installed the most innovative form of it with a super client-server platform.

Although the Departmental Computing Evaluation Group recommended against minicomputers, the Parks Authority Group proceeded to solve them. However, they eventually got sidetracked on their own internal problems, and failed to solve any strategic problems at all.

Group Comparison Factor Three: Impact on Strategic Objectives

The evaluation report's fourth tier depicts the Degree Potential Impact Was Achieved on Strategic Objectives. Here,

the measure was the degree that the original potential of the management initiative was actually realized in relation to the five strategic objectives.

The Strategic Management Team felt that the most important evaluation of strategic decision making to the strategic decision makers themselves, must be to provide them information on how well each effort was able to achieve the decision makers' expected impact on the five strategic objectives. The Strategic Management Team compiled this measure by rating the strategic decision makers' expectations expressed at the outset in the original issue paper. Then, at the other end of the strategic decision-making process; namely, the specific impacts that each effort had on achieving the five strategic objectives, the actual implemented results were also rated. This provided a before-and-after view of each effort.

These two measures were compared to determine how much each issue exploration effort's explored potential impact was toward achieving the five strategic objectives. This before and after measure also depicted over-achievements or shortfalls of each issue exploration effort. A matrix of the evaluation report's findings (Appendix A) relates the specific impacts of each management initiative to the achievements of the five objectives.

Synopsis of the Evaluation Report's Analysis: In looking at the overall pattern that the chart presents, the Strategic Management Team's evaluation concluded that those management initiative efforts that were perceived to engage in exploration behavior, were also the same management initiative efforts that were able to sort out non-strategic problems and opportunities. They were also more successful in fulfilling their expected impact on the strategic objectives. Those issue exploration efforts that were not perceived to engage in exploration behavior were also far less successful in identifying non-problems and in fulfilling their expected impact on the strategic objectives.

Summary of Strategic Management Team Evaluation Report's Findings

The Strategic Management Team's evaluation report¹¹⁴ found that issue exploration took a more non-linear approach to bringing about change in Fairfax County's highly uncertain, complex, and confused situation. The County's previous approach to change information technology is best illustrated by the traditional structured systems development process still being used in developing a specific computer application. The goals and objectives are drawn up in a plan,

¹¹⁴Ibid., 25-26.

the specific requirements defined, a design developed, and step-by-step tasks and resources are specified. The plan is then implemented to achieve the original goals and objectives.

The new County strategy for information technology development included issue exploration as a preliminary phase to the traditional problem-solving approach. This issue exploration phase outlines a desired position or direction toward which the strategic decision makers wanted their current situation to move into the complex and uncertain future. To be sure, these strategic decision makers admitted that they often have an inexact notion of that desired strategic position or direction. Hence, they found the value of strategic issue exploration efforts had in clarifying their strategic goals and objectives. The consensus among the strategic decision makers who had participated in the full two year period was expressed in their evaluation of the Strategic Management Team's research report:

If your message is: "management should phrase its requests for staff research in such a manner to encourage complete coverage of an issue", then [we] concur.

SMT's Evaluation Criteria Two - How well has the County done in actually achieving their five strategic objectives?

Overall, the Strategic Management Team's evaluation report showed that the five strategic objectives for

information systems had been achieved and implemented as the cooperative computing environment. The following observations are based upon this report.¹¹⁵

The relational database (DB2) had been acquired and was functioning on the mainframe under the administration of expert staff. The Strategic Management Team found that several relational database systems had been developed. The flexible data communications system of an enterprise wide area network (WAN) based on client-server network had been designed and installed by the Cooperative Computing Center. It was developed as a working prototype in the current government center, the Massey Building. Later it was adapted by the Cooperative Computing Center to become a working prototype for the New Government Center complex Building-3. In turn, the Building-3 prototype is then extended to other locations as the County moves into the New Governmental Center during 1991-1992.

A Computer Based Training (CBT) training program for the relational data base (DB2) had been installed on the mainframe. This training program is called CRWTH. It had been used extensively by County employees who needed to learn the relational data base and other skills appropriate to

¹¹⁵Ibid., 8-13.

application development on the relational database. Also, Computer Aided Software Engineering (CASE), local area network (LAN) and other training had been provided by the several issue exploration efforts in the Human Resources Development area. A countywide network of Human Resource Development resources had been developed along with an automated database of the County's Human Resource Development needs.

A combination of various issue exploration efforts were found to have resulted in identifying that the strategic concern in this area was in providing desktop functionality to the agencies rather than trying to standardize workstations at this time. The Strategic Management Team found that this new electronic desktop approach, coupled with the client-server cooperative computing platform, enabled agencies to develop many useful applications for themselves.

The County's data processing application department had developed the Police Department's Real Property System for the relational data base (DB2) using a Computer Aided Software Engineering (CASE) tool. They were expanding the use of this CASE tool to a department wide client-server network. In addition, 4th-generation languages were being pursued by other exploration efforts in the area of Windows 3.0™, expert systems, and the end-user application development capabilities

of the functions available on the desktop functionality described above.

SMT's Evaluation Criteria Three - How useful were the strategic objectives in providing the cooperative computer environment originally decided upon by the strategic decision makers?

The Strategic Management Team looked at the achievement toward enacting the five strategic objectives by asking themselves the question: did the strategic objectives provide the County a cooperative computing environment from which the County may build the information systems of the future? Their answer in their report was both yes and no.

When they defined cooperative computing as a network of computers that have enough commonality for application developers to access, move, and process data on any of the computers' Central Processing Units (CPU) or combination of CPUs in the system, then they felt that it would be fair for them to say that the achievements of the five strategic objectives have provided the County a rudimentary cooperative computing environment that is in place today. Of course, when cooperative computing environment is interpreted as a being a network of various computers that can automatically and seamlessly dole out the data-processing tasks in a way that

optimizes their combined CPU resources, they felt that their answer would have to be: not yet!

In summary, the Strategic Management Team found that the strategic objectives that the Strategic Management Steering Committee adopted two years ago have been practically achieved. Their conclusion was that the strategic decision-making has brought the County to a strategic position of an installed and operating cooperative computing environment from which they can now exploit by these new information systems development options that are ready at hand. Two years ago a cooperative computing environment was an abstract argument. Strategies can now be developed on an installed and operating cooperative computing environment.

One of the first benefactors of this new cooperative computing environment was, of course, the Fire and Rescue Department. They were able to install the cooperative computing platform personal computers in each Fire and Rescue station in the County's flexible data communication system. They have taken extensive relational data base training and are migrating their management information data into the relational data base on the mainframe. They have developed many applications for the department. They are participating in developing an Executive Information System and decision support center with the Strategic Management Team.

CHAPTER FIVE

FINDINGS AND CONCLUSIONS

We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.
T. S. Eliot, Little Gidding

Testing the Research Hypothesis

The basic research hypothesis states that the strategic decision makers who explore the issue in determining their course of action (management initiatives) will identify E_{III} that they should avoid, while those who do not explore the issue will not identify E_{III} to avoid. This hypothesis can be tested in a rudimentary fashion from the secondary analysis of the Strategic Management Team's results (Table I, p. 147). By transforming their findings regarding the 30 management initiatives into groups relative to whether they explored the issues and to whether they identified E_{III} the nominal data can be configured into a 2x2 cross tabulation table for analysis (Table II. p. 161).

Such nominal data analysis does not provide a very tough test for the hypothesis, however, the research design aims at

establishing a "union"¹¹⁶ between scientific knowledge apparatus and knowledge apparatus of the more "subjugated knowledges"¹¹⁷ that are analyzed in the interpretive research efforts. This test does provide a very rudimentary structure for linking the scientific aspect of Fairfax County's research with the subjective elements of their action research. Therefore, this test of the hypothesis provides a beginning for this union. As such, it is research on one of a number in indicators of the relationship between strategic thinking behaviors and strategic action. It can be useful in pointing a direction for future scientific research conducted under more rigorous experimental controls. Also, this rudimentary scientific research can serve as a link to future research that interpretive analysts might conduct on the methods people use for constructing their social reality and their strategic thinking processes.

Figure 7, "Hypothesis Test, (p. 163) shows that over three fourths (76%) of the management initiatives that had explored the strategic issue had also identified E_{III}. On the other hand, only one (11%) of the management initiatives that had not explored the strategic issue had identified E_{III}. Therefore, based upon the results of a not too challenging test, the null hypothesis is disproved within the strength of

¹¹⁶Foucault, 83.

¹¹⁷Ibid., 80-82.

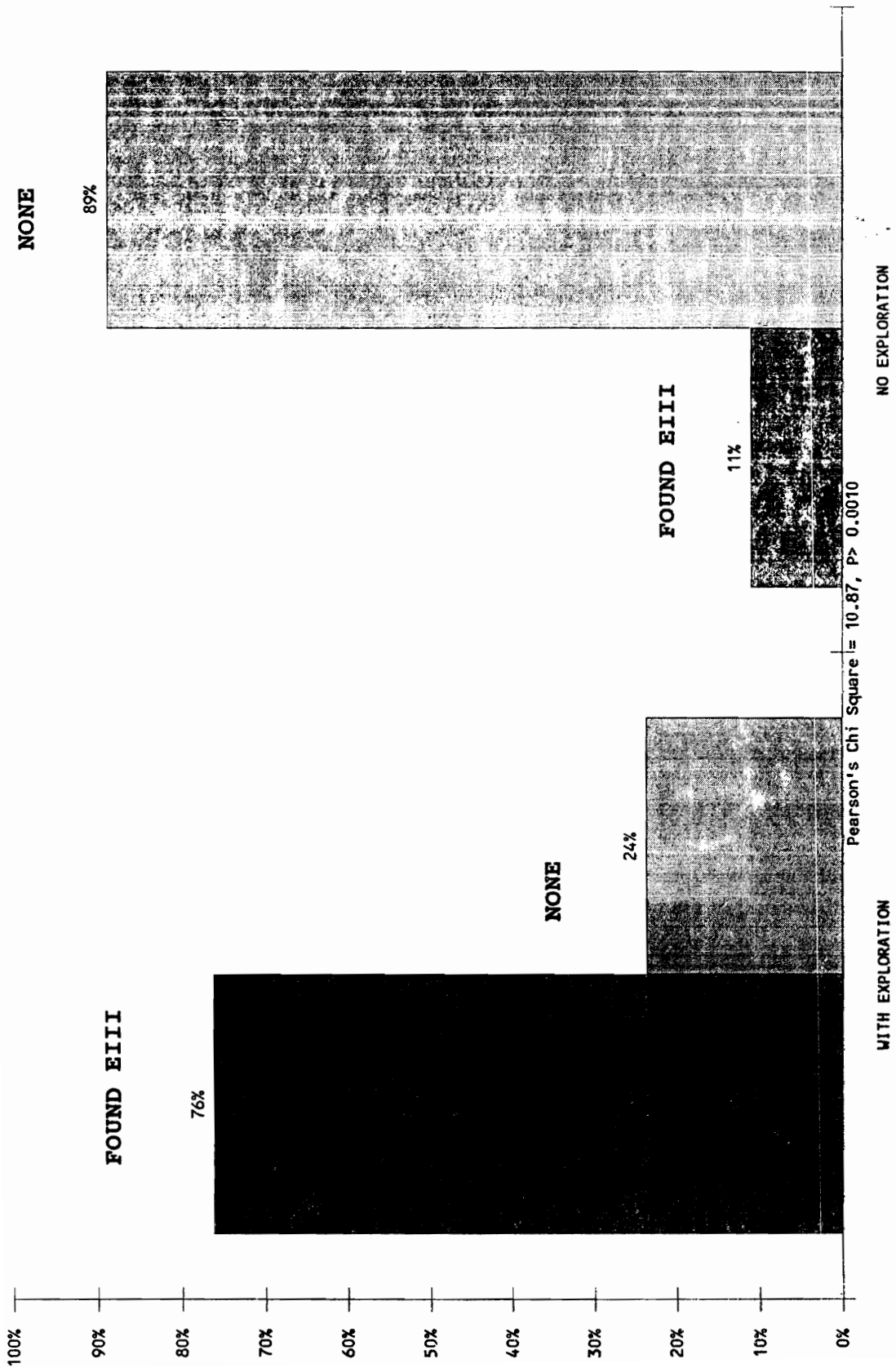


Figure 7. Hypothesis Test: Did Exploration Make Any Difference in Finding EIIIs?

this test (Pearsons's Chi Square = 10.87, $P > 0.0010$), and the hypothesis accepted.

The Strategic Management Team Report did not find any significant correlation between the degrees of "issue exploration" and the "ratio of E_{III} identified" nor with the degree of "impact on the strategic objectives." However, further analysis does indicate that there is a modest correlation between issue exploration and the impact upon the strategic objectives (coefficient of correlation = .57). Although this analysis is beyond the specific research hypothesis, the finding should also encourage future and more rigorous scientific research, since the results indicate that if strategic decision makers engage in more issue exploration they may expect to increase the likelihood of achieving their strategic objectives. Improvement in achievement of strategic objectives speaks to productivity enhancement as well as improved strategic decision making.

The research at Fairfax County was conducted with three complimentary and concurrent research efforts:

1. the County's action research to develop their strategic decision-making process and information technology;
2. the Strategic Management Team's quasi-experimental research of the County's enactment of strategic decisions; and
3. this study's use of organizational ethnography to research and interpret the use of issue exploration in the County's organizational strategic decision-making behavior.

The County's action research approach to change their strategic decision-making for developing a cooperative computing environment was adapted from the work of Neely Gardner and of Kurt Lewin. Lewin's action research method develops the participants that would be affected by organizational change to become the researchers for that change. Also, the County's action research used Lewin's strategy for change, to: -- unfreeze -- change -- and refreeze the organizational elements undergoing the organization development.¹¹⁸ The participants as researchers were, therefore, doing the action research to develop the cooperative computing environment themselves.

The Fairfax County innovation in the strategic decision-making process had decision makers researching the relationship between "exploring the reasons for and means of change," and relating them to organizational "creativity, productivity, and innovation."¹¹⁹ Issue exploration was found to promote the participation that sets the stage for creativity, productivity and innovation in Fairfax County executives' strategic decision making. The results of the County's action research effort was the successful achievement of its strategic objectives and the

¹¹⁸Kurt Lewin, Field Theory in Social Science, 228; Gardner, 1974, 106-115.

¹¹⁹Gardner, 1974, 106.

implementation of a rudimentary cooperative computing environment.

This study contributed to the County's action research with the addition of issue exploration to help them avoid E_{III} during their strategic decision making. Issue exploration was developed from Gardner's "Reconnaissance" step of AT&R as a function to operationalize Lewin's force field analysis in an organizational strategic decision-making setting. The development of this preliminary step to the strategic decision-making process was also guided by the principles of second-order change as described by Watzlawick et al., especially their notion of reframing:

To reframe, then, means to change the conceptual and/or emotional setting or viewpoint in relation to which a situation is experienced and to place it in another frame which fits the "facts" of the same concrete situation equally well or even better, and thereby changes its entire meaning.¹²⁰

Dunn's recent work on second-order problems supports this approach to avoid E_{III} , as well. Several of the second-order science methods he has suggested to help policy analysis avoid E_{III} are similar to those used in this research:

1. Multiple perspective analysis designed to enumerate alternative representations of problems by stakeholders;
2. Strategic assumption surfacing and testing [in the form of issue exploration, pilot research projects]; and

¹²⁰Watzlawick, et al., Change, 95.

3. Policy capturing through "extended peer committees" in the form of organizational networks, "extended facts" based on anecdotal evidence and everyday knowledge [through the three combined research methods of action research, empirical quasi-research replicable designs, and organizational ethnography].

Nested within the County's action research was the Strategic Management Team's research to evaluate the results of the County's strategic decisions. The Strategic Management Team used a quasi-experimental research approach to examine what effect issue exploration behavior had in enacting the County's strategic decision making. This research examined each of the 30 management initiatives to determine how they helped in achieving the five strategic objectives and cooperative computing environment goal.

The Strategic Management Team's findings showed that those management initiatives which engaged in issue exploration were the main contributors to the County's achievement of its strategic goal. In addition, the Strategic Management Team's research results provided Fairfax County strategic decision makers a compelling case, that issue exploration helped them avoid E_{III} much more effectively than when they omitted its use.

Nested inside the Strategic Management Team's quasi-experimental research was the third or the organizational ethnography research method used in this study's research. This organizational ethnographic approach was used by the author to interpret the results of the two research efforts.

The purpose of this third research methodology was to analyze the relationship of acquiring new knowledge and the strategic decision-makers power to change the organization without their making E_{III}. The result of this interpretation analysis is presented in this chapter.

The integration of these three organizational research efforts was guided by the enactment model of strategic management described by Smircich and Stubbart.¹²¹ Ordinarily, the research effort in information technology results in a plan to develop and implement the recommended system. An advantage in using Lewin's action research approach to managing change in large organizations is the opportunity for the research effort to result in strategic objectives and goals being achieved in the process. Such was the case at Fairfax county. Therefore, the research processes at Fairfax County was guided by the principles of enactment all through the three research methods. In addition, this enactment approach was followed to help assure that the combined research efforts would provide usable empirical data and anecdotal description of the Fairfax Experience to produce a credible interpretation of the dynamic linkage between acquiring new knowledge, the organizational power to decide

¹²¹Linda Smircich and Charles Stubbart, "Strategic Management in an Enacted World," (1985), 724-736.

for change, and organizational decision-making behavior to avoid E_{III}.

The overarching purpose of using combined research methods was to conduct comprehensive empirical research in organizational strategic decision making that would be credible and compelling enough to persuade other strategic decision makers to try to replicate the research results. Many groups find themselves in a decision-making situation where there is a high degree of uncertainty, complexity and risk, and a situation where avoiding E_{III} is of some compelling concern. In this case these groups might find value in trying out issue exploration for themselves. Further, the issue exploration process described in the introduction need not be restricted to strategic decision makers. It could conceivably be used by individuals or groups to assess their past decision-making behavior in order to diagnose ways to improve it, especially in their avoiding E_{III}. Therefore, we have included the Strategic Management Team's research instrument, "Issue Exploration Research Framework," (Appendix C) for those who wish to replicate this research for their own purposes.

**INTERPRETATION ANALYSIS PART ONE:
The County's Research Methods and Results**

The principal research hypothesis for each of the three methods was to determine for their respective audiences if the issue exploration practiced at Fairfax County had helped the

strategic decision makers to avoid E_{III}. The Strategic Management Team's research results indicated that those strategic decision makers who used the issue exploration approach identified non-strategic problems. Thereby, they were better able to avoid solving non-strategic problems.

Furthermore, those strategic decision makers that did not use the issue exploration approach did not identify non-strategic problems at hand. Therefore, many went on to try to solve many of them, thereby committing E_{III}.

The Strategic Management Team's research was intended primarily as an internal reflexive feedback device for the Fairfax County strategic decision makers. The third section of the Strategic Management Team's survey instrument, "Characteristic Strategic Decision-Making Behaviors Survey" was designed to allow them and other participants to appraise their perceptions of the strategic decision-making behaviors of the management initiatives in which they participated. This appraisal was as self-assessment for the strategic decision makers. In this case, the survey was taken to differentiate between those management initiatives that engaged in exploration behavior in any significant way to discover if the County should continue issue exploration as a policy. The consensus response to the Strategic Management Team's report was that the issue exploration policy should be kept and observed.

The quasi-experimental design of their research limits its external scientific value because of the many confounding factors that are present in this organizational research. For instance, their research Groups A & B were not designated as target and control research groups, but were self-selected and determined by the Strategic Management Team's research findings. In addition, the Strategic Management Team's built in bias limits the face value of their findings to their purposes.

However, with all of these disclaimers in mind, the Strategic Management Team's research data can be used in constructing a framework to help interpret the case history anecdotal data provided in the previous chapter. Their survey questionnaire data can be reused to construct an apparatus for interpretive analysis that can act, like a microscope, as an adjustable imaging apparatus. Such an apparatus would be able to interpret more closely the relationship of the acquisition of new knowledge, the strategic decision-making power to change the organization, and the ability to avoid E_{III} .

The Strategic Management Team's research instrument used three basic types of organizational strategic decision-making behavior in order to isolate exploration behavior from other typical behaviors:

- (1) Instinctual behaviors that are motivated from basic emotional responses such as anger, fear, control.

- (2) Exploration behaviors that are motivated from curiosity responses such as curiosity, wonder and inquiry.
- (3) Rational analysis behaviors that are motivated from intellectual responses such as classifying, categorizing, problem solving, and puzzling.

As with the various models described in the three tiered foundation in chapter two, the instinctual behaviors relate primarily to Karen Horney's Approach/Avoidance model of basic conflict. The exploration behaviors relate to O'Keefe and Nadel's description of exploration behavior. Rational Analysis behaviors relate primarily to Herbert Simon's Models of Man, and Cyert and March's, A Behavioral Theory of the Firm. Of course, due to the seminal role of these works in organizational decision-making behavioral theory, similar rational analysis behaviors are also cited in the other works by Allison, Thompson, and Steinbruner included in Issue Exploration's three tiered foundation in chapter two.

Since the County's organizational strategic decision-making disposition for change apparatus is very complex, the Strategic Management Team structured their assessment instrument to measure the strategic decision-making behaviors during six different phases of the strategic decision makers' efforts. A similar structuring was used by Cowan to describe the problem recognition process, and by Dutton and Duncan to describe the strategic issue diagnosis process, as described in the Three Tiered Foundation in chapter two.

For instance, Cowan breaks the problem recognition process into three process stages in his model. Dutton and Duncan present their view of strategic issue diagnosis into episodes. Table II. "Comparison of Stages, Phases and Episodes," (page 174) illustrates how the Strategic Management Team's six phases correlate to the three stages of Cowan's problem recognition model and Dutton & Duncan's Strategic Issue Diagnosis Episodes.

To the degree that the Strategic Management Team phases correspond to and encompass Cowan's stages and the episodes of Dutton and Duncan's model, the Strategic Management Team's six phases can be regarded as representing credible aspects of the strategic decision making process relative to issue exploration and identifying the right problems.

Cyert and March also compartmentalize the basic structure of their "Organizational Decision-Making Process into four "basic concepts of the theory." They are:

1. Quasi-resolution of conflict
2. Uncertainty avoidance
3. Problemistic search
4. Organizational learning¹²²

Clearly, Cyert and March's organizational decision-making process categories only vaguely track Cowan's stages and Dutton and Duncan's episodes. However, both Cowan's model and

¹²²Cyert and March, 126.

**Table 11. Decision-Making Behavior:
Stages, Phases, Episodes**

	STAGES Cowan	PHASES SMT	EPISODES Dutton & Duncan
1	Gestation/Latency	Encountering New Information	Gap Analysis
2	Categorize/Definition	Trigger Mechanism	Trigger Mechanism
3	"	Response Motivation	Stakeholder Demands
4	"	New Information Processing	Urgency and Feasibility
5	Diagnosis	Basic Cognitive Action	Diagnosis
6	"	Results/Propose	Momentum for Change

the Strategic Management team's research survey instrument break their process categories down into sub-sets of more specific strategic decision-making behaviors. These behavior sub-sets do include Cyert and March's categories as specific behaviors. In addition, Thompson¹²³ and Tuden, Allison, and Steinbruner all include similar specific decision-making behaviors in their models of the organizational decision-making process, but they do not structure the overall process in general categories as such.

By aligning the specific decision-making behaviors identified in the models described by Cowan, Cyert and March, Steinbruner, and the Strategic Management Team's phases, a more articulate framework for organizational strategic decision-making behavior emerges. Figure 8, "Organizational Strategic Decision-Making Behavior Framework," (page 176)

¹²³James D. Thompson and William J. McEwen, "Organizational Goals and Environment: Goal-Setting as an Interaction Process, American Sociological Review, 23, (February 1958), 23-31, do structure the decision-making process in a problem solving mode consisting of the following activities:

1. Recognizing an occasion for decision, i.e., a need or an opportunity.
2. Analysis of the existing situation [issue exploration].
3. Identification of alternative courses of action.
4. Assessment of the probable consequences of each alternative.
5. Choice from among alternatives.

The authors, in turn, note that this particular breakdown was taken from Edward H. Litchfield, "Notes on a General Theory of Administration," Administrative Science Quarterly, 1 (June, 1956), pp. 3-29.

STRATEGIC DECISION-MAKING BEHAVIOR FRAMEWORK

SMT	Problem Recognition	Behavior of the Firm	Cognitive Paradigm
Phase	Cowan	Cyert & March	Steinbruner
1	Encounter New Information		
	Scanning	Broad Problematic Search	Constricted Sensitivity to New Information
2	Trigger Mechanism		
	Cue Discrepance	Quasi-Resolution of Conflict	Uncertainty
	Arousal		Complexity
3	Response Motivation		
	Urgency	Uncertainty Avoidance	Resolution of Uncertainty
	Persistence of Discrepancy		
4	New Information Processing		
	Clarification	Classify	Grooved Thinking
	Classification	Cause and Effect Analysis	Uncommitted and Theoretical Thinking
	Familiarity	Association	Analogy
	Priority	Utility	Interpretation
	Inference	Deductive	Inductive
5	Basic Cognitive Action		
	Describe Problem	Identify & Solve Problem	Developing Belief
	Information Search		
6	Result / Purpose		
	Problem Recognition	Organizational Adapting & Learning	Cognitive Learning and Growth

Figure 8. SMT Phases & Current Organizational Decision-Making Behavior Models

illustrates this framework. Nevertheless, there are still significant differences in the behaviors depicted for these decision-making models. In order to relate them more closely to the Strategic Management Team's research survey instrument, a phase by phase interpretation of the Strategic Management Team's research instrument is required.

Interpreting the Phases of Strategic Decision-Making Behavior

To begin with, it is important to keep in mind that by separating the strategic decision-making process into discrete stages, episodes or phases does not mean that the strategic decision making progresses from one phase to the next, in a linear fashion. As Dutton and Duncan pointed out, strategic issue diagnosis was not bound by the analytical rigor or logical sequencing implied by the process of problem-solving:

Strategic issues do not activate decision makers' attention in packaged form. Instead, the interpretations of key issues and how they relate to the organization are highly subjective. The strategic issue diagnosis process is one of social construction (Berger and Luckman, 1967), where alternative judgements of the meaning of an event are imposed, created and legitimated in a social context. As a result, contextual influences in the form of organizational beliefs and resources importantly affect the outcomes of SID in predictable ways.¹²⁴

Conceivably, all of the so called strategic decision-making behavior phases can be operational at any time, and to

¹²⁴Dutton and Duncan, 280.

differing degrees. The phases merely describe salient recurring organizational behaviors in an ongoing strategic decision-making process of an organization dealing with change. The organization does not engage in only one decision-making phase and behavior type at a time. The strategic decision-making phases and behavior types are concurrent. They each merely move in and out of a relative passive background roles into the foreground with a more dominant roles.

Only in extreme situations would a single phase be likely to dominate all others. For example, if Fairfax County's strategic decision-making disposition for change encountered new information of a violent or extremely threatening nature such as a major budget shortfall or proposed major change in federal regulations, the trigger phase may set off a totally Stimulus/Response reaction and push all of the other phases into the passive background. The trigger mechanism phase may then close down the strategic decision-making behavior in favor of considering immediate program cuts or concerted efforts to rebut the regulation proposal (flight or fight).

Usually, the concurrent strategic decision-making behavior phases ebb and flow together in diads, triads, or other groupings. For example, one phase, "encountering new information" may tend to occur at the beginning of a strategic decision-making effort. However, it may recur in an iterative

fashion at any time during the process, as it did for the Public Works Group and the Parks Authority Group.

The purpose of the Strategic Management Team's survey instrument was to have the participant-assessors identify which of the specific strategic decision-making behaviors characterized (were perceived by them as salient) each of the six strategic decision-making phases in their group's efforts. As a result, there was no effort to monitor the specific sequence of behaviors per se. However, the case history in Chapter Four can be used as a general guide to interpret the strategic decision making process as it unfolded in these two instances of the Public Works and Parks Authority Groups.

In the following descriptions of the Strategic Management Team's six phases of strategic decision making each phase will be discussed briefly. The three behavior types will be discussed in terms of specific behaviors that are typical for the phase. Finally, the discussion will include the potential for strategic decision makers to commit E_{III} in the phase.

Phase 1: Encountering New Information

The Strategic Management Team's "Encountering New Information" phase of strategic decision-making behavior describes how decision makers orient their organizational strategic decision-making behavior towards encountering new information. As the models of Cowan, Cyert and March and

Steinbruner show, this phase is principally one of scanning, in anticipation of new information. Here, there is a confluence of information and interest. Francis J. Aguilar points out the need for congruence in this area:

The concept of information/interest/influence congruence rests on a simple premise: that scanning for strategic information by staffs and lower-level managers is useless unless the information obtained is both wanted by and understood by the executives at or near the top who decide the company's long-term policies, strategies, and plans. In other words, unless the information passed up fits the interests of the executives who have power and influence, then the acquisition of tidings, no matter how important, tends to be of little consequence.¹²⁵

In the instinctual behavior type, the strategic decision makers are basically on watch to react to territorial threats or opportunities. Since instinctual behavior type is primarily an immediate response orientation it is often counterproductive to strategic decision making. However, it is important to keep in mind that strategy as a practice for organizations had its military origins in this watchfulness attitude that later developed into intelligence surveillance.¹²⁶

¹²⁵Francis Joseph Aguilar, Scanning the Business Environment (New York: The Macmillan Company, 1967, 196.

¹²⁶Davis B. Bobrow, "Security Futures: INTELLIGENCE and intelligence." in Planning U. S. Security, ed. Philip S. Kronenberg, Washington D. C.: National Defense University Press, 1981.

In the exploration behavior type, the strategic decision makers operate out of a more peripheral vision mode. Strategic decision makers in the exploration type of behavior are scanning the organizational horizon, sensitive for the unusual, but not looking for anything in particular. Thompson and Tuden's "opportunities surveillance" typify this type of behavior:

It is possible to conceive of monitoring behavior which scans the environment for opportunities -- which does not wait to be activated by a problem and which does not therefore stop when a problem solution has been found. We will refer to this as opportunistic surveillance, and suggest that it is the organizational counterpart to curiosity in the individual.¹²⁷

Exploration scanning behavior is like an expert look-out in the crow's-nest of a ship, sensitized to look for something unusual in the ocean that might indicate landfall, or a forward military observer trying to spot something unusual in the ordinariness of the landscape that might betray a movement of the enemy.

The rational analysis type of behavior focuses strategic decision makers problems. This is the broad "problematic search" described by Cyert and March.¹²⁸ In rational analysis behavior, the decision maker's behavior is specifically

¹²⁷James D. Thompson, Organizations in Action; Social Science Bases of Administrative Theory (New York: Mc Graw-Hill Book Company, 1967, 151.

¹²⁸Cyert and March, 120-125.

directed at spotting problems or opportunities to the enterprise.

The directed broad search for problems or opportunities typical of rational analysis behavior is illustrated by Ponce de Leon's setting out to search for the Fountain of Youth in Florida, or Cortes' search for the Seven Golden Cities of Cibola. On the other hand, the exploration behavior is more like Lewis and Clark exploring the Louisiana Purchase.

When Lewis and Clark headed west from St. Louis they did not attempt to specify in advance their exact trail and how they would cope with each expected contingency. They realized that the wilderness ahead was too unknown and the contingencies too many. Rather, they set out with a general sense of their route (up the Missouri River and over the Rockies), a good store of resources, and a team that had familiarized itself with everything known about the wilderness ahead. The expedition took advantage of opportunities as they presented themselves, most notable the appearance of Sacagawea, the guide they met in route. They consciously ran experiments; for a significant portion of the return trip, they separated into two groups to time alternate routes. And they documented every step of their journey for those who would follow.

Too often managers forget that new technologies have more in common with Lewis and Clark's wilderness than today's travel when one can simply decide to go, plan a route,¹²⁹ and arrive safely at the planned destination.

Lewis and Clark were sent out by Thomas Jefferson to wander through terra incognita with this general purpose: to discover a water route to the Pacific Ocean. In pursuing their

¹²⁹W. Bruce Chew, Dorothy Leonard-Barton and Roger E. Bohn, "Beating Murphy's Law, Sloan Management review 32, no. 3 (Spring 1991): 12-13.

mission, they were instructed to wander through the wilderness, make a map of their route and keep a journal of anything they noticed of interest.

The potential for strategic decision makers to make E_{III} in this phase is the danger that a premature identification of the destination and its narrow focus will leave the strategic decision maker unaware of new information whose importance is not yet clear. Too often, strategic decision makers set out to find a "Fountain of Corporate Youth" or "The Seven Cities of Budgetary Gold," while overlooking the less glamorous information they encounter in their own organizations on the way.

Phase 2. Trigger Mechanism

The framework's "Trigger Mechanism" phase is directed towards what triggers strategic decision-making behavior. Cowan refers to this behavior trigger as "arousal" and "cue discrepancy" in his model for problem recognition. Dutton and Duncan use the "trigger mechanism" term as a dynamic link between stakeholder demands and a widening gap between what is expected and what ought to be. They point out that strategic issue diagnosis can be triggered through both formal and informal mechanisms. But in either case, Dutton and Duncan point out the signal that triggers "attentional investment"

is new information that the organization's status quo has changed or will change significantly. And further, this change suggests that the organization's current modes of operating may become potentially ineffective, and consequently inappropriate.

The instinctual behavior type usually is triggered in strategic decision-makers by new information that poses an eminent major threat to the organization's position. Or the new information can promise a chance for immediate major gain in the market place or political power. Of course, the time frame is important. Obviously, if the time is perceived as short and the new information is a surprise then it may be too late for strategy. Crisis management and forces that push organizations into crisis for management control are pseudo-strategies that often appear with this behavior type.

According to John O'Keefe and Lynn Nadel, what triggers the exploration behavior is novelty.¹³⁰ They cite curiosity, wonder and oneness as basic exploration behaviors that novelty triggers. Thompson's "opportunistic surveillance" is the prelude to this triggering effect of novelty. If the new information encountered is judged by the strategic decision makers as not being an immediate threat it is deemed as novel,

¹³⁰O'Keefe and Nadel, The Hippocampus, p. 244-264.

and perhaps worthy of investigation (Thompson's organizational curiosity).

For rational analysis, encountering something puzzling or problematic is what triggers people to begin analyzing, according to Thomas Kuhn.¹³¹ In Cyert and March's model the trigger is a shortfall or a problem with goal achievement in the "Quasi-resolution of conflict" concept phase of their model. Once the problem is recognized and classified, the organization sets its resources to find a way to solve the problem to the organization's best advantage.

The basic potential for E_{III} in this phase is two fold. If new information is interpreted strictly as a threat to strategic decision makers, their instinctual behavior may seek to destroy or avoid it all together. If the new information is analyzed before it is properly acquired, the strategic decision makers may identify it incorrectly as something they already know how to deal with. Since exploration behavior is triggered only by novelty, rational analysis may preempt exploration behavior from being triggered at all. Even if the organization's rational analysis solution results in strategic gain through adaptation of current practices, the strategic decision makers still retain an error in their knowledge base. This kind of error provides the basis of wrong headed thinking

¹³¹Thomas S. Kuhn, The Structure of Scientific Revolutions, 36-37; Garth Morgan, "Paradigms, Metaphors, Puzzle Solving in Organization Theory," 607-613.

in their knowledge base. It may come back to haunt them when the issue matures to reveal its true import to the organization's situation. In this case, the organization learns to adapt to the new situation, but the strategic decision makers do not learn any thing new about their changed situation. They will continue on with the delusion that they know something that they do not. Dunn's "bounded ignorance" in the form of useful awareness is lost to them. Thus, in trying to avoid uncertainty they replace it with erroneous certainty.

Phase 3. Response Motivation

The "Response Motivation" phase looks at what it was in the emerging issue that interested the strategic decision makers, once the issue has attracted their attention. It is useful to look closely at the word "interest." In its root forms (inter + esse) are the Latin words for "between or among" and "being." Hence interest refers to something we feel might be vitally concerned to our own being. In the case of strategic decision making what attracts interest are things vital to the organization, or, in the case of government, vital to the community: the public interest.¹³²

¹³²Charles Goodsell, "Public Administration and the Public Interest," TMs [photocopy], a paper presented at the "Mountain Lake Colloquy", 12 June 1989, 22-25. Mountain Lake, Virginia. Goodsell provides a distinction between the "self-interest" as a guide to action for individuals and organizations as

This strategic decision-making phase is most important because it is the valuation or priority-setting function of problem recognition. "Priority is the precedence that a person assigns to a problematic situation relative to other problems and activities and depends both on a problem's importance and the expected timing of the consequences."¹³³ Dutton and Duncan's "Urgency Assessment" episode also reflects this valuation behavior. Fundamentally, it is here that E_{III} can be expected to most likely to occur for strategic decision makers.

When strategic decision makers give the problems, opportunities, and crises that emerge out of strategic issues the incorrect priority in importance or in timing, they can elevate non-strategic problems, opportunities and crises to the strategic status, i.e., E_{III} . A similar instance of E_{III} was described by Dunn as being caused by policy analysts, "employing a method whose level is incongruent with that of the problem under investigation."¹³⁴ At the same time, the analysts reduce the right or strategic problems to reduced resource allocation. Therefore, E_{III} can have a doubly negative effect on the strategic outcome.

opposed to government agencies relying upon the "public-interest" for their guide to action.

¹³³Cowan, "Developing a Process Model of Problem Recognition," (1986), p. 769.

¹³⁴Dunn, 1988, 725.

The instinctual behavior tends to respond to things of interest with direct and immediate action. This response is rarely strategic, and is the reason that instinctual behavior is pushed into the background in favor of rational analysis during the strategic decision-making process in general. The primary time for effective instinctual strategic decision-making behavior comes during the strategic decision-making action phase. Instinctual behavior tends towards tactical responses in strategic situations, often causing E_{III}.

Using the concepts of Karen Horney, the instinctual behavior of the decision makers will motivate them "toward, against or away from"¹³⁵ the object/subject of interest in the new information. Therefore, instinctual behavior depends upon how the decision makers perceive the use of the object/subject of interest to their needs. If the object/subject of interest is perceived as desirable the decision makers will move toward it. If the object/subject of interest is loathed or feared the decision makers may move away to escape it or against it to destroy it, as in the case of the Parks Authority Group in their behavior dealing with the joint maintenance management system/coordinator. Obviously, only those situations in which the decision makers feel motivation (and courage) to move toward the object/subject of interest-- that is, to examine

¹³⁵Karen Horney, Our Inner Conflicts; A Constructive Theory of Neurosis (New York: W. W. Norton & Company, Inc., 1966), 42-43.

the source of new information-- is there a credible chance that they will gain enough insight about the new phenomena to recognize its ultimate value to themselves and the organization. If they flee or go against the object/subject of interest to destroy it, little of the new information is gained.

Exploration strategic decision-making behavior is motivated mainly by curiosity. Now, as the saying goes, "Curiosity killed the cat." Nevertheless, exploration behavior is attracted by potential new information. Thus the exploration behavior views any new information as a value in and of itself, in other words, a chance to learn something new. Exploration behavior is a reflection of the strategic decision makers' interest in expanding of the boundaries of the organization's currently known world. Therefore, organization curiosity is principally knowledge for knowledge's sake. This may be the start of the nascent phase of the social construction of reality described by Berger and Luckman.¹³⁶

Rational analysis behavior responds to things of interest in a more calculating way. The strategic decision makers try to classify and categorize the new information into their current knowledge bases. The main motivating interest for

¹³⁶Berger and Luckman, The Social Construction of Reality, 60-62.

rational analysis in strategic decision-making behavior is to discern the potential utility that this new information brings to their already constructed social reality. In the Cyert and March model, the strategic decision-makers motivation is to avoid uncertainty. In Steinbruner's view the motivation in the cognitive paradigm is to resolve uncertainty in the organization's situation. The resolution comes from becoming familiar with the unfamiliar, i.e., exploring it.¹³⁷

The basic potential for E_{III} in this strategic decision-making phase, as in the trigger mechanism phase, is to see new information only as a threat or boon to the old order. For instinctual strategic decision-making behavior, fear or greed will win out over curiosity in an effort to protect or enhance their currently held views, thus aborting the exploration behavior before the new information is ingested into the cognitive system. Experts who do not know that they are at the boundaries of their own ignorance may analyze the new information into a more comfortable known shape that fits the rational of their current paradigm.

Phase 4. Information Process

The "Information Process" phase is the primary research phase for the Strategic Management Team's survey instrument. Here the strategic decision-making behaviors are deceptively

¹³⁷O'Keefe and Nadel, 246-247.

different among the various models considered in chapter two.

Instinctual behavior is useful here because it tends to process information in black and white, or good and bad values. It is this function that engenders organizational commitment to change in the strategic action phase. It also plays a role in the "gut feeling" evaluation that strategic decision makers must apply due to the fact that they must operate in a situation of high complexity, uncertainty, and risk.

Exploration behavior's role in strategic decision makers' processing new information is most important in this phase. The information processing phase must include an effective new information acquisition process. This is the mystical crossing over to the terra incognita of Dunn's "bounded ignorance" and leaving for a time, the more familiar land of Simon's "bounded rationality." The Dunn/Simon view of boundaries is an example the paradox of seeing the bottle half full or half empty.

In this question generating case: is the boundary one that is excluding ignorance or one that is constraining reason? Simon's administrative man, would view the bounded rationality as excluding what there is neither time nor opportunity to know in order to get on (satisfice) with the decision-making event.

Or, is the boundary one that is containing reason and indicating potential new knowledge? Dunn's second order policy

analyst would view the bounded ignorance as demarking reason and remarking (erotetic -- question generating) about the prospects of acquiring new knowledge from the unknown.

Exploration behavior joins these two views by focusing on the boundary itself. The boundry between knowledge and ignorance is a kind of Demilitarized Zone (DMZ) or no-man's-land. Exploration furnishes a boundary osmosis function that allows agents (strategic decision makers and/or policy analysts) from Simon's citadel of knowledge to pass into Dunn's outer marches of ignorance. Like Lewis and Clark, they are expected return through the boundary area with new knowledge. Issue exploration is sending out reconnaissance parties (and pilot information technology projects) to experience the unknown (ignorance) with the hope that they can bring some new information back to expand the organization's knowledge base.

For instance, Steinbruner's cognitive paradigm emphasizes moving out of reason's "grooved thinking" into an uncommitted and/or theoretical type of thinking. His cognitive paradigm values inductive reasoning, using analogy and interpretation. These are also exploration behavior's information gathering tools for strategic decision makers.

Cyert and March's behavior theory of the firm, emphasizes the rational analysis behavior of strategic decision-makers' information processing. It is a deductive, categorizing,

classifying type of analysis that codifies the new information to the known knowledge base. Clearly, this is an important behavior. Otherwise, all the new information explored by the strategic decision makers would be lost if it is not attached to what is already known in some meaningful fashion. It is clear an effective information processing phase of strategic decision making requires a dynamic balance of the three behavior types.

The basic potential for E_{III} in this phase occurs in impulsive problem choices from instinctual behavior or from rational analysis that excludes new information as being beyond the bounds of rationality, i.e., crazy, mad, mystical, intuitive or religious.

Strategic decision-making exploration behavior is described by the second principle of second-order change:

While first-order change always appears to be based on common sense (for instance, the "more of the same" recipe), second-order change usually appears weird, unexpected, and uncommonsensical; there is a puzzling, paradoxical element in the process of change.¹³⁸

If the issue is truly new to the strategic decision makers then their information process must include some way to acquire the new information in the first place. If the new information is processed as a problem (first-order change), or dismissed from the strategic decision-making arena by

¹³⁸Watzlawick, et al., Change, 82-83.

categorizing it as simply weird, mystical, intuitive, etc., the potential that the strategic decision makers of making E_{III} increases as well.

Phase 5. Basic Cognitive Action

The "Basic Cognitive Action" phase touches the core of the research question. The ultimate enactment of a strategy requires that instinctual behavior be tapped here, channeling it in along with the other two behavior types. For example, in the strategic management initiatives # 12, "Exploration of Issues Associated with Human Resource Development and Management Strategies," the strategic decision makers were so engaged in exploration and rational analysis behavior that the instinctual behavior was not significantly engaged. There was no conflict within the group. Therefore, the congenial group had a lot fun. They "blue skied" their entire universe and came up with over 40 issues. However, no specific problems were identified and no effective strategic action resulted.

Instinctive behavior in strategic decision makers during this cognitive action phase tends to focus on a win/lose stance. Translated to strategic decision-making behavior the behavior is readiness to take action: controlling action if in a superior relationship to the issue situation, or, if in an inferior relationship, waiting for a better opportunity for action with less exposure to loss.

The basic cognitive action for strategic decision makers engaged in exploration behavior is discovering and creating something new out of the unknown. Steinbruner's cognitive paradigm emphasizes the development of belief as the basic cognitive action:

If, despite uncertainty, the mind operates so as to establish strong beliefs and to act upon them, then neither the analytic nor the cybernetic paradigm can accurately reflect the implications of uncertainty for the decision process. The principles of cognitive processing assert that this is exactly what happens, thus introducing new factor though to shape the decision process. . . . cognitive theory readily accounts for the existence of firm, categorical, non-probablistic beliefs in the presence of intense uncertainty. The cognitive processing mechanisms of the mind provide a number of ways in which beliefs become established, independent of the weight of objective evidence.

. . . This process of resolving uncertainty by imposing an inferential structure is a critical assumption of cognitive theory. . . . let us refer to the cognitive paradigm to mean cybernetic assumptions supplemented by cognitive theory (i.e., value separation and the subjective resolution of uncertainty).¹³⁹

Since Steinbruner's cognitive paradigm is seeking resolution of uncertainty, he posits the development of belief as a foundation of that resolution. The human mind has constantly faced enormous uncertainty throughout history. However, as Steinbruner points out, this has not kept us from pressing on with our lives (and history). We have learned to

¹³⁹Steinbruner, 111-112.

live with the increasing complexity, and uncertainty that surrounds us.

When strategic decision makers are willing to peer into uncertainty, if they are able to give up, or at least suspend for a time, cherished beliefs for the sake of acquiring new information, they can then develop new beliefs and gain new knowledge. Dutton and Duncan pointed out that contextual influences in the form of organizational beliefs had important effects on the outcomes of strategic issue diagnosis in predictable ways.¹⁴⁰ Dunn cites the importance of investigating the social construction of meaning as part of knowledge systems in which stakeholders transact plausibly true beliefs by offering and contesting competing knowledge claims. The reluctance or inability to do this is one of the limitations of current and obsolete policy analysis methods.¹⁴¹ Therefore, the basic potential for E_{III} in this phase is the urge to fix upon the known pathology of the situation and ignore the possibility of reframing the situation it into a developmental one.

Rational analysis seeks to identify the problem. This is the first step in Simon's problem solving model for his "administrative man." The basic action is to identify why the situation is a problem, and to solve the problem. However,

¹⁴⁰Dutton and Duncan, 280.

¹⁴¹Dunn, "Problem -Centered Policy Inquiry," 14.

the strategic decision maker must first seek to discover what the problem is.¹⁴² The answer to this question often resides in the issue's context, rather than in the anatomy of the problem itself. The major difference is that rational analysis assumes that there is a problem, one must only understand its causes to solve it. Exploration wonders what the problems are and whose they are. Discovery allows a strategic decision maker to find whether the new information is (or is not) of strategic interest, and whether it is (or is not) a problem of concern for strategic decision makers. The strategic decision makers' mottos ought to be: all problems do not have to be solved.

Strategic decision makers must literally "bootstrap" themselves out of the comfort of their current beliefs, or at least suspend them, in order to acquire new beliefs that better reflect their changed situation. Since belief structure is grounded in all three types of strategic decision-making behaviors, changing beliefs requires a dynamic mix of the three types of behavior in order to effect the organizational paradigm shift required to reconstruct and act upon the social reality based now upon the organization's new knowledge.

The basic potential for E_{III} in this phase is that both reason and instinct tend to hold on tenaciously to current beliefs. The instinctual and rational behaviors view changing

¹⁴²Watzlawick, et al., 95.

beliefs as being unfaithful, treasonous, treacherous, illogical, and fuzzy thinking. If the strategic decision makers belief structure is not changed, the new information will continue to appear as weird, other worldly, and wacky. Or the new information may be mutated to fit into existing categories, much like the fleet management representative phrased it, "One size fits all. If the toes don't fit, amputate 'em; if the heel don't fit -- slice off the tendon."

Phase 6. Results/Purpose

The result/purpose phase of strategic decision-making behavior is not the same as that of the County's strategy, namely, the strategic objectives and goal for a cooperative computing environment. Rather, the result/purpose phase of the strategic decision-making behavior involves the purposefulness of the strategic decision-making behavior.

For example, Cyert and March pose organizational learning as the purpose of organizational decision-making behavior. The ability for the organization to adapt to the changing environment is what secures its rigorous endurance as a viable entity in that new environment. Steinbruner views Cyert and March's adaptive behavior theory of the organization as basically reactive, or at most, cybernetic. His view of the propose of strategic decision-making behavior as cognitive learning. Where Cyert and March's organizational behavior

theory fits Darwin's evolutionary theory of adaption or perish, Steinbruner sees this evolution occurring on the cognitive level of expanding the knowledge base. This means that the strategic decision makers are expanding the boundaries of their rationality through cognitive learning rather than just reacting to incidental problems and opportunities that happen to occur on the immediate organizational horizon. Strategy is not so much a question whether the organization can survive, but whether it can grow and prevail. As with the various models considered, it is in the Results/Purpose phase that the three strategic decision-making behavior types are most divergent.

Any decision-making process needs to include the outcome of the emerging issue's resolution with the organization's status quo, in other words, (re)resolution = organizational growth. The notion of free will is dependent on the ability to change. Strategic decision making is not deciding what to do in the future; it is deciding what to do (change) now with the hopes to be in a better place in the future. Strategic decision making is changing the organization's status quo in order to bring the organization's purpose in better congruity with its socially constructed reality, a reality they have come to suspect is or will soon will be changing in a significant way.

Therefore, the results/purpose of organizational strategic decision-making behavior guides the three behavior types throughout the process. However, as can be seen from the various strategic decision-making models and paradigms reviewed, the three behavior types are guided by different purposes and seek often countervailing results. Crucial to effective strategic decision making, is how well and how appropriately these three purposes are knitted together by the strategic decision makers.

Instinctual strategic decision-making behavior is primarily interested in preserving and nurturing the organization. Change is seen basically as a violation of the normal order, representing a threat or a capturable gain. Without tempering by curiosity or intellectual thought, instinctual strategic decision-making behavior would be limited mostly to the primordial features of a strategy of stealth and deceit.

Exploration behavior functions to transform the new information into new knowledge. This corresponds to Lewin's developmental behavior. Exploration behavior sees new information as an opportunity to grow and develop new knowledge.

Exploration behavior seeks to learn/develop/grow. The similarity of these otherwise contrasting behaviors was noted by Kurt Lewin in his comparison between regression and

developmental changes. Lewin defines regression as the opposite of development:

The indirect way to studying regression may prove to be fruitful for the whole theory of development¹⁴³

His studies determined that when an individual meets an obstacle or is some way prevented from doing what one expects, a tension is generated between the person and the desired goal. This tension leads to frustration of which the symptom is: the person returns to previously successful behavior, i.e., a reversion to old practices. Lewin calls this retrogressive behavior.¹⁴⁴ If the frustration continues or increases, the person resorts to a less mature or regressive behavior.

In this context, rational analysis is a behavior that tries to 'retro-fit' the new information into what it already knows. Rational analysis is primarily fixed upon pathology. Rational analysis sees new information as an aberration that must be rectified, solved, fixed or cured so that status quo of the organization's socially constructed reality might be restored.

Cyert and March's model results in organizational learning to adapt to problematic situations. It is basically

¹⁴³Kurt Lewin, et al. Frustration and Regression: An Experiment With Young Children (Iowa City: University of Iowa Press, 1941), 1.

¹⁴⁴Ibid.

a reactive mode of learning and change. Again, it is like Kuhn's puzzle solving by moving the known pieces around into a new pattern. This is primarily a form of deductive learning. On the other hand, Steinbruner's cognitive paradigm suggests that through cognitive learning, that is, acquiring new knowledge, the organization not only learns, but it develops and grows.

INTERPRETATION ANALYSIS PART TWO:

Organizational Disposition for Change; An Interpretive Framework for Strategic Decision-Making Behavior

The view that emerges from this interpretation of the various organizational strategic decision-making models is very general and on a macro-level of refinement. It shows the organizational "decision-maker" as a completely diffused force throughout the strategic decision-making processes as exemplified in the Fairfax Experience. As we saw in the two management initiatives of the Fairfax Experience, it was not clear throughout the process just who the decision maker was. In addition, the decisions seemed to occur either just out of frame or out of focus. They were not seen to be made by one decision maker, nor at any one moment in time. Even when there was an organizationally authorized decision maker such as a director, a fire Chief, or the Chief Executive Officer, their decisions seemed to be made "off camera." Just who and when

the decisions were made is not clear at this macro-level of interpretation.

For instance, in the case of the Public Works Group, the authorized decision maker, the director, originally made a decision for a centralized information technology system. But, in the course of the decision-making process, he changed his decision for the exact opposite, a distributed information technology system. In the case of the Parks Authority Group, the organization's chief decision maker, the County Executive Officer, decided for a joint maintenance management system and the County ended up with no change of their status quo at all. The strategic decision-making in these two management initiatives was decidedly an organizational phenomenon.

Often, organizational decision making does not result in isolated decision-events or plans. It is most of all an organizational disposition for change. This term reflects Foucault's interpretative analysis concept of dispositif, frequently translated as "apparatus."¹⁴⁵ We choose "disposition for change" primarily for its literal meaning as "placing or arranging things in order in anticipation of change." This is, as we have seen, also the literal and original meaning of strategy for the Homeric Greeks.

¹⁴⁵Hubert L. Dreyfus and Paul Rabinow, Michel Foucault; Beyond Structuralism and Hermeneutics, 2nd ed., with an Afterword by and an Interview with Michel Foucault, Chicago: The University of Chicago Press, 1983, 121.

However, the term loses the interpretive utility of Foucault's term, which he described as including, "discourses, institutions, architectural arrangements, regulations, laws, administrative measures, scientific statements, philosophy, etc."¹⁴⁶ As an instrument for interpretation, Herbert L. Dreyfus and Paul Rabinow describe dispositif as a establishing a set of flexible relationships, and merging them into a single apparatus in order to isolate a single historical problem or social feature:

This dispositif is, of course, a grid of analysis constructed by the historian. But it is also the practices themselves, acting as an apparatus, a tool, constituting subjects, and organizing them. Foucault is seeking to isolate and establish precisely the kind of intelligibility that practices have. The problem is: How to locate and understand a set of coherent practices which organize social reality when one has no resource to a constituting subject (or series of practitioners), to objective laws, or to the sort of rules Foucault once thought avoided these alternatives [being interpreted].¹⁴⁷

This study's research has these characteristics as well. Therefore, Dreyfus and Rabinow's description of Foucault's use of his interpretive apparatus (dispositif) can inform our own interpretations of the Fairfax Experience. Dreyfus and Rabinow point out that interpretive understanding can only be obtained by a person who shares the subjects' involvement, but distances him or herself from it in some way. One must

¹⁴⁶Dreyfus and Rabinow, Michel Foucault, 121.

¹⁴⁷Dreyfus and Rabinow, Michel Foucault, 121-125.

undertake the hard historical work of diagnosing and analyzing the history and organization of the current cultural practices of interest. In this case, the current cultural practices of interest are Fairfax County's organizational strategic decision-making behavior. Dreyfus and Rabinow go on to explain:

The resulting interpretation is a pragmatically guided reading of the coherence of the practices of the society [organizational strategic decision making]. It does not claim to correspond either to the everyday meanings shared by the actors or, in any simple sense, to reveal the intrinsic meaning of the practices. This is the sense in which Foucault's method is interpretive but not hermeneutic.¹⁴⁸

Using the term, "disposition for change," to describe strategic decision-making behavior, therefore, lacks the pragmatic connotation of "apparatus" included in Foucault's method described by Dreyfus and Rabinow as "interpretive analytics."¹⁴⁹ Without this practical feature, it is not possible to refine our macro-level view of the Fairfax Experience. In order to examine the management initiatives more exactly, an instrument that provides a view of their strategic decision-making behavior as a microcosm is required; such an interpretation is our final project in this chapter.

Fortunately, the Strategic Management Team's survey instrument shares important similarities with Foucault's

¹⁴⁸Ibid.

¹⁴⁹Ibid, 121.

instrumental grid for interpretive analysis. The organizational decision-making behavior framework that emerged from the comparison of current theory's models and paradigms in chapter four, seems to provide a beginning basis to reformat the Strategic Management Team's survey instrument into an instrumental grid or framework to research the organizational disposition for change.

This framework can be constructed by arraying the three behavior types along the top or horizontal axis of the framework. The Strategic Management Team's six phases can then be arrayed down the side as the vertical axis of the framework. The result is a grid in which the specific strategic decision-making behaviors are placed to create an instrumental framework of the organization's disposition for change (figure 9. "Organizational Disposition For Change Framework," page 208).

The main value of this framework to interpretive analysis is that it can be adjusted to reveal several micro-level views of the Fairfax Experience that provide finer resolution of detail of the strategic decision makers' behavior profile. In this instance, the interpretation analysis framework will be focused upon the two management initiatives that were described in chapter 4, the Public Works and Parks Authority Groups. Their case histories provide examples of the

"discourses, institutions, architectural arrangements for information technology] regulations, administrative measures, scientific statements, philosophy, etc."¹⁵⁰ that Foucault associated with his interpretive apparatus (dispositif). Therefore, applying the Organizational Disposition For Change Framework as an adjustable interpretive microscope on the case histories of the Public Works and the Parks Authority Groups may reveal a more credible interpretation of the strategic decision makers' behavior, and the role that exploration behavior may have had in helping them avoid E_{III}.

The Fairfax experience: an Interpretative Redux

A significant part of the Strategic Management Team's research of the County's strategic decision making ability to avoid E_{III}, was its evaluation of the degree that the three different types of strategic decision-making behavior were engaged during each of the six phases they included in their survey instrument. The results of this analysis was displayed in chapter four as a macro-level view of the entire strategic decision-making effort in Fairfax County for two years (see figure 6., "Issue Exploration Comparison Chart," page 146). The Organizational Disposition For Change Framework is used as an adjustable microscope to examine this data more closely in four micro-levels of magnifying power.

¹⁵⁰Ibid., 121.

ORGANIZATIONAL DISPOSITION FOR CHANGE FRAMEWORK			
STRATEGIC DECISION-MAKING BEHAVIOR TYPES			
Phase	INSTINCUAL	EXPLORATION	RATIONAL ANALYSIS
1	<i>Encountering New Information</i>		
	Avoid	Open	Focused
	Counter	Sought	Scanned
2	<i>Trigger Mechanism</i>		
	Fear/Desire	Excitement	Measure
	Anger	Wonder	Utility
3	<i>Response Motivation</i>		
	Withdraw	Curiosity	Identify
	Justify	Value	Solve
4	<i>Information Process</i>		
	Challenged	Relate	Classify
	Ignored	Patterns	Cause/Effect
5	<i>Basic Cognitive Action</i>		
	Awaited	Discover	Identify
	Controlled	Create	Solve
6	<i>Results / Purpose</i>		
	Unchanged	Learned	Understood
	Refocused	Growth	Achieved

Figure 9 . Organizational Disposition For Change Framework

The Strategic Management Team was interested only in determining the degree (if any) of exploration behavior that had been engaged in, during the progress of a particular management initiative (see figure 6, item 2. "Exploration Behavior Perceived," page 146). The Strategic Management Team decided that in order to isolate this macro-level measure, they would need to obtain companion measures of the other two strategic decision-making behavior types for each management initiative group, as well. They expressed some concern that exploration behavior might occur in small scattered portions, therefore, they designed the measuring instrument to provide a more sensitive measuring capability. This sensitivity was built into the design by taking a separate measurement for each of the six phases of the strategic decision-making behavior.

The data resulting from the Strategic Management Team's more refined measures of the specific strategic decision-making behaviors appropriate for each phase were reviewed using an "Organizational Disposition For Change Framework." The data was examined by this adjustable focus apparatus to obtain four much more detailed micro-level views of the Public Works and Parks Authority Groups' disposition for change and their comparative abilities to avoid E_{III}.

The Strategic Management Teams report chart represents the most general countywide, or macro-level view of the 30

management initiative groups behavior. However the Strategic Management Teams data allows us to create more detailed or "micro-level views of the participants' decision-making behavior. For example, a first micro-level (1) view can be created by magnifying item 2, "Degree exploration behavior perceived," for only Public Works and Parks Authority Groups (strategic management initiatives #10, and #29). The Strategic Management Team's survey data for these two management initiatives is furnished in Table II. "Strategic Management Team Data for Public Works and Parks Authority Groups," (Appendix E). The data is arrayed in separate formats to generate the four micro-level Organizational Disposition For Change Behavior Profiles.

An interpretive analysis Micro-level (2) view can be created by adjusting the Organizational Disposition For Change Framework to show the degree that all three behavior types were perceived in that group. Similarly, even more refined micro-level views of the Strategic Management Team's data can be created to improve the interpretation analysis of the strategic decision makers' acquisition of new knowledge, their power to change the organization, and their avoidance of E_{III} :

- (3) Show the relative degrees of all three types of strategic decision-making behavior during each of the six phases,
- (4) Show the relative degrees of the specific strategic decision-making behaviors during each of the six phases.

Although the following views tend to resemble a narration format of the process as it unfolded, they are not intended to be taken as a scenario of events, nor as a recreation of the strategic decision-making process per se. The format is merely a convention used in this study to examine more closely the integration of new knowledge, the group's disposition for change, and their ability to avoid E_{III}.

Three Decision-Making Behavior Types - Micro-Levels (1&2)

The charts in Figures 10 and 11, "Strategic Decision-Making Behavior Types - Micro-Levels 1 & 2" (page 213) show the first and second micro-levels views of the strategic decision making behavior for the groups. Figure 10, Micro Level 1 "Strategic Management Team Measure of Exploration Behavior" is simply an enlargement of the two management initiatives' measurement on the chart in chapter four (figure 6, page 146). With this measurement the Strategic Management Team was able to compare management incidents that did engage in exploration behavior against those that did not.

Figure 11, Micro-Level 2 (page 212) is this same enlargement, but includes the degree that the other strategic decision-making behavior types were measured by participants of each group. This more detailed view of the Strategic Management Team's research data reveals that the Parks Authority Group's effort, for the most part, was governed by

Organizational Disposition For Change Profile

Micro-Level 4

Public Works Group

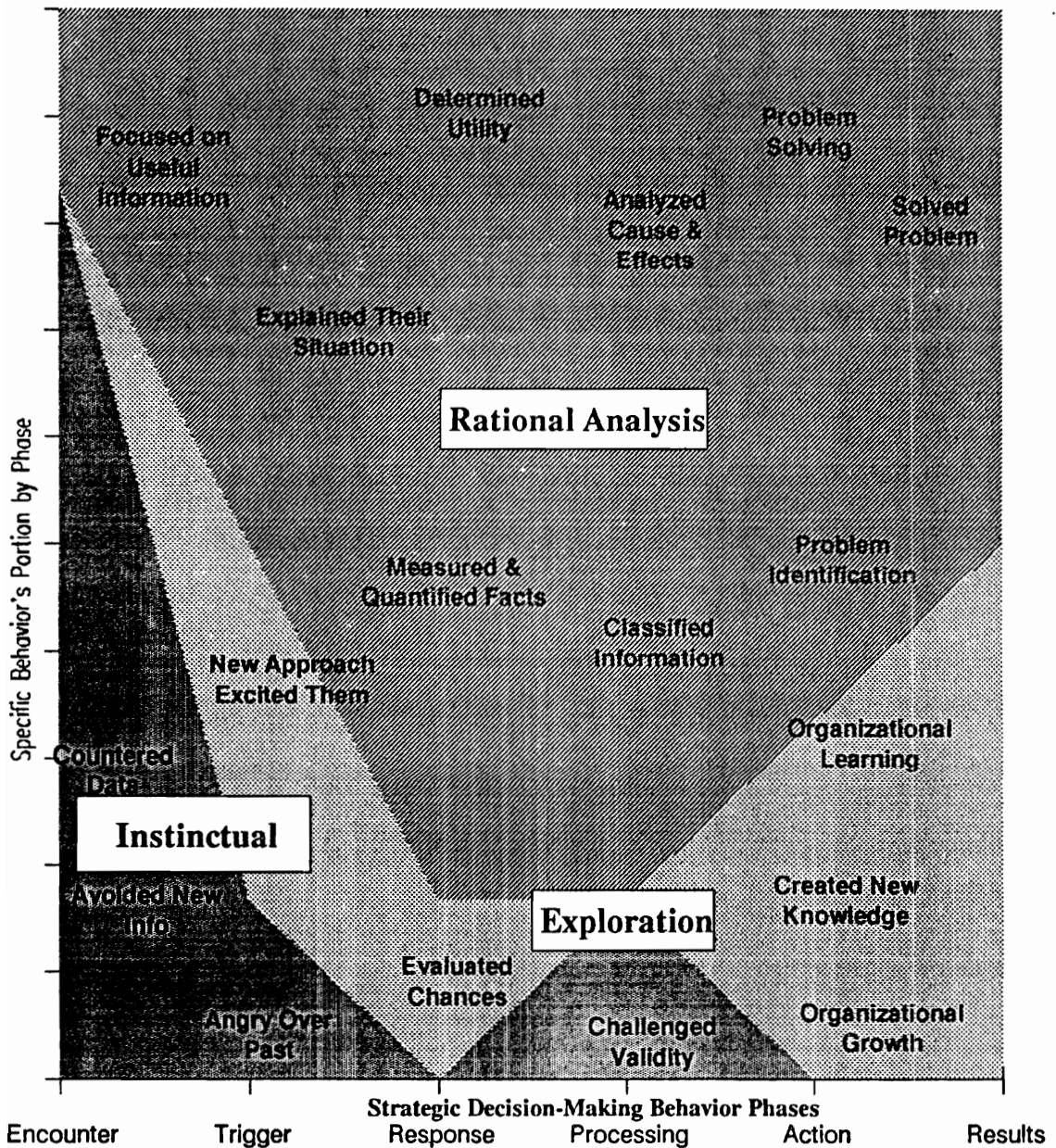


Figure 1 3. Public Works Group's Micro-Level 4

instinctual and rational analysis behavior, while the Department of Public Works group mostly favored rational analysis.

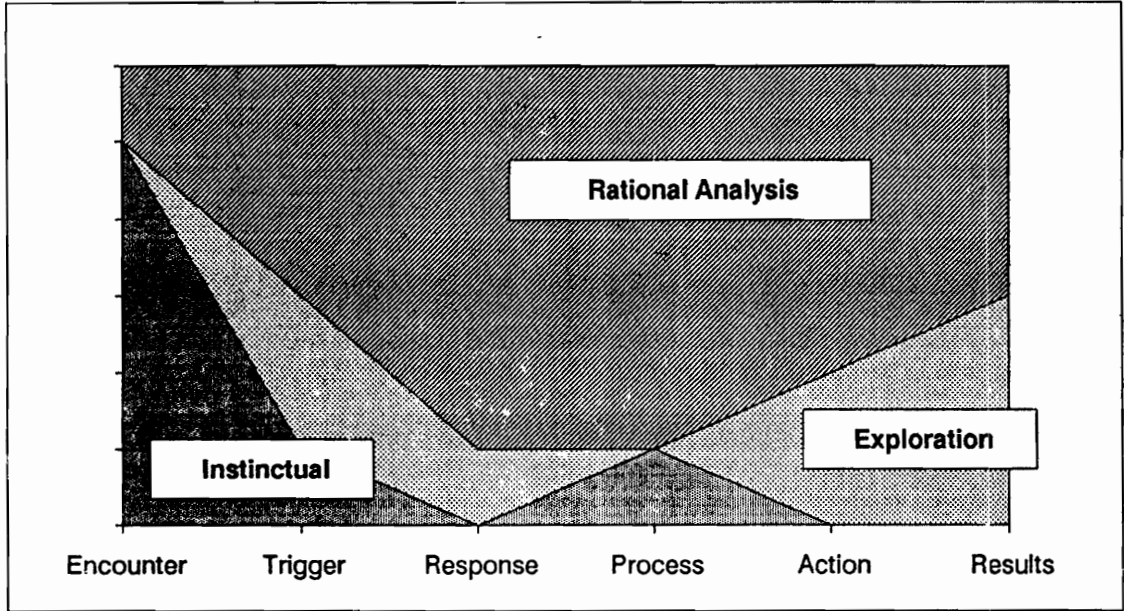
From this second micro-level view of the Strategic Management Team's data, we can see that the Department of Public Works group appears to have spent most of their effort in the rational analysis of problem solving. However, there was some exploration behavior to allow the group the opportunity to gain some new knowledge. Their organizational cognitive learning had the opportunity to have been increased.

The Parks Authority group, at least interpreted from this second micro-level of detail, seems to have gotten mired down into a large degree of instinctual behavior of territory protection, anger, fear, or power control.

Decision-Making Behavior Types Across Phases - Micro-Level (3)

The third micro-level of magnification is added to the two management initiative comparison views by showing the engagement of three strategic decision-making behavior types across the six phases (previously illustrated in Figure 9. Organizational Disposition For Change Framework, page 208). This third micro-level of magnification is illustrated in figure 12. "Decision-Making Types Across Phases - Micro-Level (3)," (page 214). These charts provide a look into how the use of the three behavior types appeared throughout the different

ORGANIZATIONAL DISPOSITION FOR CHANGE PROFILE
Micro-Level 3



Parks Authority Group

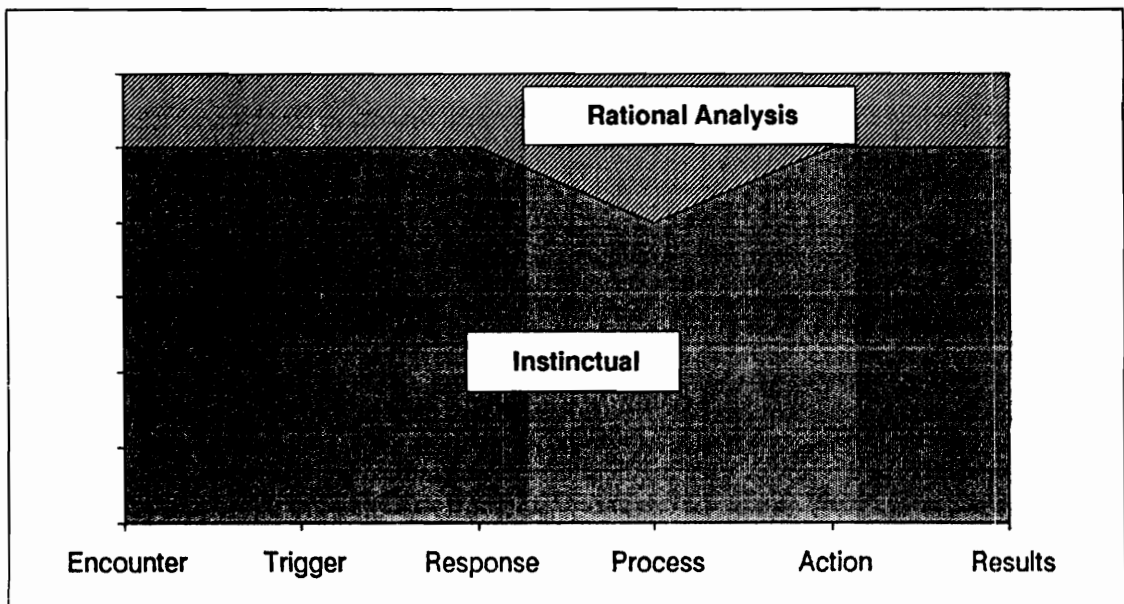


Figure 1 2. DPW & Park's Disposition For Change Profile Micro-Level 3

phases of the strategic decision-making process. This view reveals a very dynamic strategic decision-making behavior of the Department of Public Works group, while the Parks Authority group seems to have locked itself into a particularly instinctual behavior style throughout its strategic decision-making process.

The Department of Public Works group clearly had some balance to its use of the three types of behavior. Admittedly, there was a preponderance of rational analysis behavior. However, this would not be unusual for current management practices, especially for group members in the engineering environment of the Department of Public Works or a system analysis environment in the County's central staff departments. The chart indicates a much more dynamic turn of events. From the minor role of instinctual behavior in the Action and Results phases, one could expect that the group had developed an innovative solution.

This close-up view of the Parks Authority group simply confirms what appeared from the previous first and second micro-levels of detail. They were deeply mired in instinctual behavior. Most of their behavior would appear to have been spent in a Stimulus Response (SR) approach/avoidance behavior.

Also, the charts show that the Department of Public Works group was able to move from the same basically instinctual behavior type that the Park Authority had in encountering new

information, to one of open rational analysis and exploration. By comparison, the Parks Authority group were unable to change their behavior profile in any significant way. In the "result/Purpose" phase, Parks Authority remained in their win/lose situation. As the Parks Authority's case history showed, they won by losing and lost by winning.

Strategic Decision-Making Behavior by Phase and Specific Behavior - Micro-Level 4

Refining the Strategic Management Team's data down to the fourth and finest micro-level of detail revealed the degree that specific strategic decision-making behaviors were engaged in each phase of the strategic decision-making process. Figures 13 and 14, "Strategic Decision-Making Behavior by Phase and Specific Behavior, Level 4" (pages 217 & 225) for Public Works and the Parks Authority respectively, illustrate the Strategic Management Team's research data for both groups. The specific strategic decision-making behaviors embedded in these two charts were taken, of course, from the Strategic Management Teams survey research instrument and were arrayed in the Organizational Disposition For Change Framework for this interpretative analysis.

These charts reveal a profile of each group's encounter with potential new knowledge, their ability (or inability, i.e., E_{III}) to recognize its strategic importance, and their disposition to change through strategic action and

Organizational Disposition For Change Profile

Micro-Levels - 1 & 2

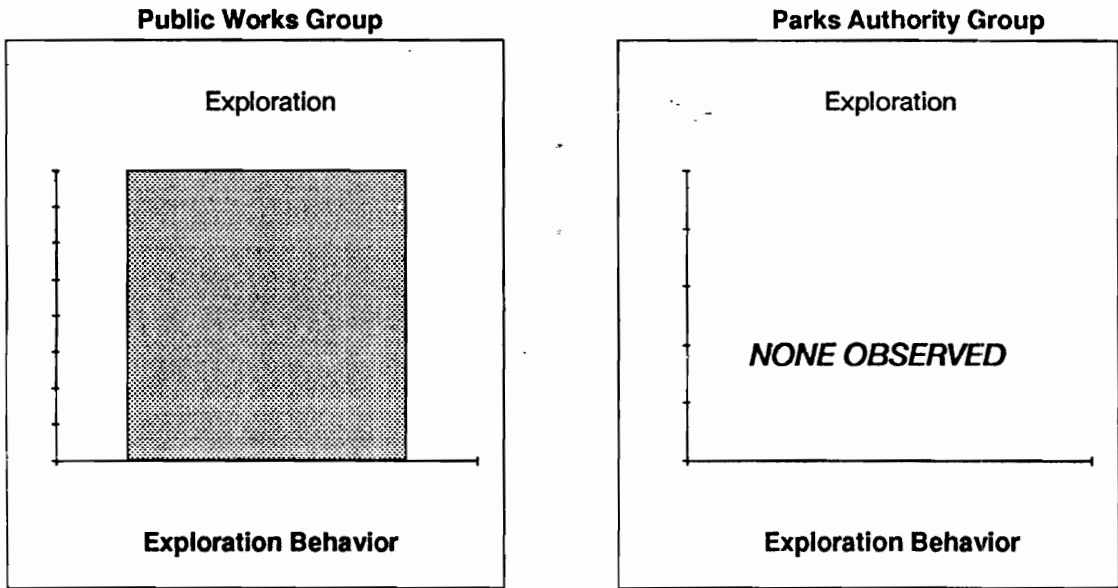


Figure 10. Disposition For Change - Micro-Level 1

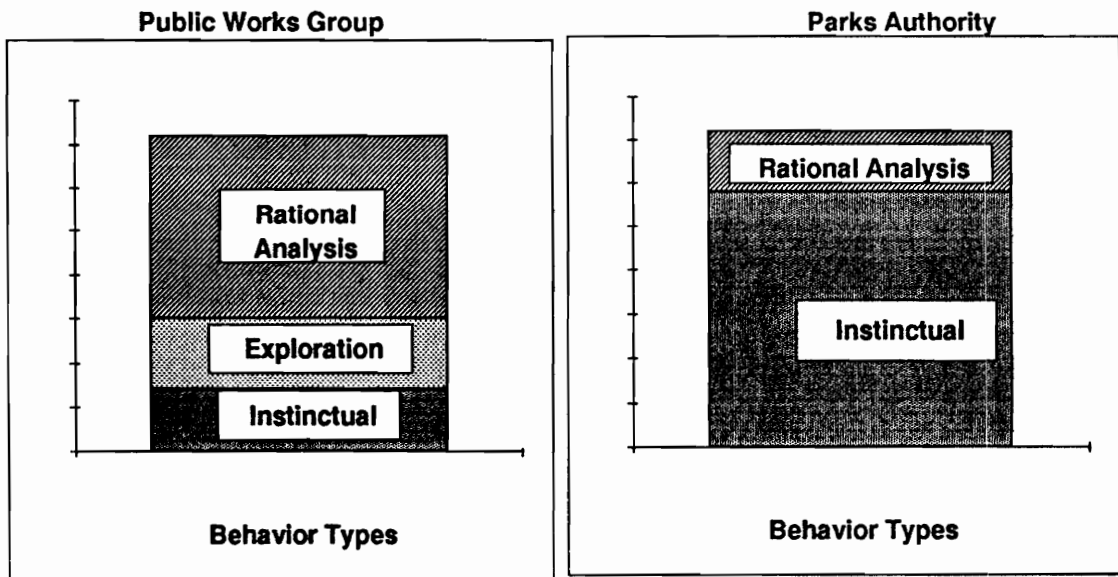


Figure 11. Disposition For Change - Micro-Level 2

implementation. Each group will be examined separately for the final level of interpretation analysis.

Public Works Group's Disposition for Change; An Interpretative Analysis

As we have noted elsewhere, both groups started out with the same basic situation: research pilot projects to acquire a minicomputer system. Both groups disposition for change profile for the "encountering new information" phase is also similar: each group avoided by discounting the new data at the outset, countered the data with arguments, yet ultimately focused on potential uses of the data. This disposition toward the impending change of the technical review process reflects their guarded suspicion, with a degree of aggressive opportunism. In light of the case history of these two groups antagonistic relationships with central staff departments having denied the agencies minicomputers in the past, this is not an unreasonable behavioral stance.

However, in the "trigger mechanism" phase, the Department of Public Works Group found that the approach of having the agencies participate in the development of the technical review process was intriguing enough for the department to decide to play this new game out. Being able to furnish the leadership of that effort was a surprise to the agency members, namely those from the Department of Public Works. Their reaction was one of the excitement at being able to move

something through the County's central staff department processes with the same dispatch as they could in their own agency. Nevertheless, they retained their anger over past treatment by their fellow key stakeholders, the central staff departments. They also set out explaining and documenting their case to the group. To the Department of Public Works group, the idea of issue analysis where they would have an equal, or better footing with their former antagonists (central staff departments) meant that they would be able to give and take --and maybe win.

The Department of Public Works has a civil engineering culture. Therefore, in the "response phase," the chart's disposition for change profile reflected this predominantly rational analysis behavior. However, the Public Works Group became curious about creating the new process and became active in developing it to be an open and fair (to each key stakeholder) process. The group's discussion on the definition of a minicomputer was left open because the emerging client-server local area network of personal computers turned out to fit any minicomputer definition they could devise.

In the "Information Processing" phase the group relied on its past expertise in rational analysis, classifying the new information, searching out the cause and effect logic with cost/benefit analysis, etc. This analysis was undergirded with their traditional critical view, challenging the sources of

the information to fit into their notions of arguable proofs. Most vendor information was treated with deserved skepticism, and individual stakeholder prejudices were retained. For example, the central staff departments viewed the complex operational aspects of minicomputers as supporting their views of increased central staff as a requirement. The agency people saw it a proof that they could operate the minicomputers without any central staff support.

During the "Cognitive Action" phase the group assumed a familiar, and therefore comfortable problem identification and problem solving model of behavior. The group decided to identify the problem by first developing a comprehensive technical review form and process that addressed all of the major concerns of all of the key stakeholders. The task moved from a pathology of what's wrong with the technical review old process approach, to a research task of addressing all of the key stakeholders' concerns. The problem solving aspect was then transformed into defining the user agency's system needs. The needs were defined as comprehensive and specific user requirements for a Request For Proposal for vendors to bid on meeting the requirements. Thus, the formal problem solving would be addressed by the selection process of the vendor's various responses to meet those needs with their hardware and software proposals.

The group's research on the emerging client-server platform technology and its potential role in the County's information technology development strategy created some of the most significant potential new knowledge for the group. Previously, everyone in the group assumed that PCs were stand alone computers for minor and individual computing tasks. However, in the time frame of the group's research (1989-1990) the client-server technology was just emerging to compete with minicomputer and mainframe systems.

In the "Results/Purpose" phase of the strategic decision-making behavior the key stakeholders had retained their original views of the situation. Each felt that the process had vindicated their original positions about bringing minicomputers into the County's information technology strategy. The central staff departments remained negative, and agencies, positive. In the conflict between new knowledge, and the desire to avoid E_{III} , the group's organizational disposition for change was impacted most dynamically in this phase.

Although key stakeholders in the County held their original positions, the outside key stakeholders, namely the vendors, did not. Four of the bids received were judged by the selection committee as achieving all of the Department of Public Work's user requirements (see Figure 5, page 122). However, the best bid proposal was not a minicomputer but a very high performing client-server system, often referred to

in the industry as a "mainframe killer." This bid was at the same time one of the highest performers in meeting the Department of Public Work's user requirements and one with the second lowest cost.

Because even the director's own staff was divided about acquiring the new super client-server rather than the familiar vendor's minicomputer, the director went outside the County to experts in the private sector for their appraisal of the selection committee's analysis. He learned, as he said to his peers on the Strategic Management Steering Committee, that "the emperor has no clothes." In turning from his original central computing design for the department to accept the distributed (cooperative) computing design of the super client-server, the director and the Department of Public Works Group displayed organizational growth.

It was not possible to pin point the specific moment the strategic decision was made in this process. Clearly, when the director changed his mind and supported the super client-server solution he had made the decision for the Super client-server system. However, he was really undeciding his original decision. This "undeciding," is an excellent example of Steinbruner's "uncommitted thinking." It would not have come about, had some of this staff not decided for that different super client-server solution. Or, to retrogress in the process even further, this study's research concludes that it was the

acquisition of the new knowledge through exploration behavior in the form of a new technical review process, and research about the new client-server technology that made it possible for the Department of Public Works staff to decide for the new solution. It also lead the central staff departments members to decide for it as the computing platform for the County's strategic cooperative computing environment.

Most important to this research study was the outcome regarding the non-strategic nature of the minicomputer acquisition problems. The group found that the minicomputer and all its attendant problems that had been argued in the County for years were non-strategic, namely E_{III}, and that the strategic decision makers should avoid trying to solve them.

The Parks Authority Group's Disposition for Change; An Interpretive Analysis

As the case history noted, the Parks Authority Group found themselves in a very different situation. The Director of the Parks Authority and the County Executive Officer had the idea that the unified maintenance management approach was the strategic solution, via the economy-of-scale-notion. The strategic problem given to the group by the Strategic Management Team Coordinator's issue paper was to describe and find the right off-the-shelf package to buy for a joint maintenance management system to run on the Parks Authority's new minicomputer.

The Parks Authority Group's behavior was equally descriptive of their strategic decision making (figure 14. Organizational Disposition For Change Profile - Micro-Level 4, page 226). In the first place, the key stakeholders were from different agencies, two of which had their Request For Proposals (and funding) for minicomputer systems halted and merged into the Parks Authority pilot research project on minicomputers by the Strategic Management Team's coordinator. She had recently been appointed by the County Executive Officer to organize this expansion of the Parks Authority Group's minicomputer pilot project.

The Parks Authority Group encountered new information with disbelief by avoiding going to the group meetings. They tried to ignore it in the hopes that it would go away. At first they couldn't believe that the County Executive Officer could have made such a decision to merge such different agencies and system applications. They mounted and documented counter arguments to show how unsound such a combination was. The coordinator countered back by having the group compile and release a Request For Information (RFI). This Request For Information was a lengthy user requirement that covered the user needs for a maintenance system for Parks, Vehicles. County offices, and the Housing Departments units for needy citizens. Vendors from all over the country were shipped copies of the Request For Information. They were asked to

Organizational Disposition For Change Profile

Micro-Level 4

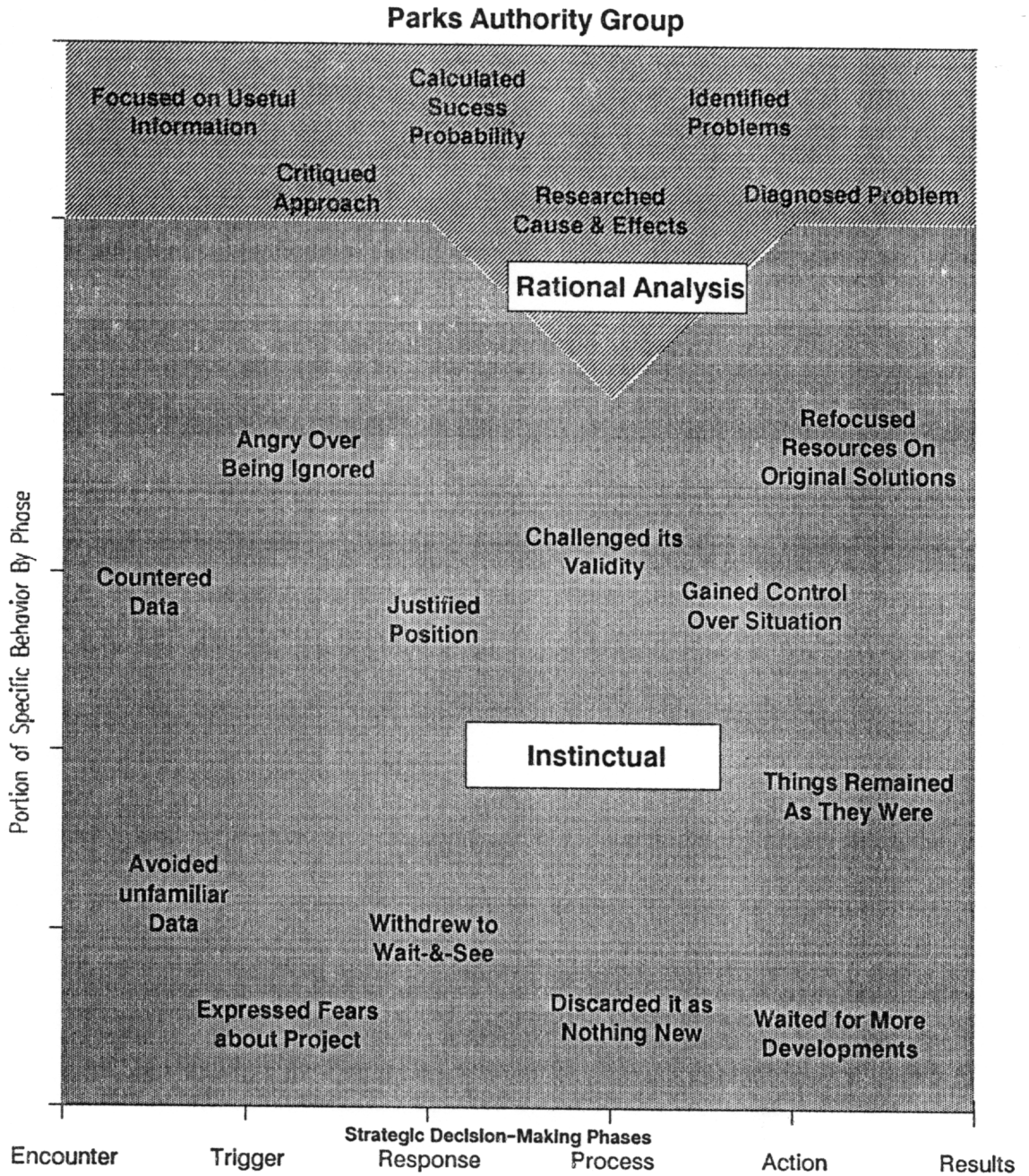


Figure 14. Parks Authority Group's Micro-Level 4

respond if they had any off-the-shelf software that could run on a minicomputer system for the County and would meet these departments combined user requirements. There were nearly three dozen positive replies.

The group soon discovered that although the coordinator had no personal experience in developing information technology systems, she has worked out a convincing plan to create budget savings for the County with this joint off-the-shelf software approach. They found out from the Parks Authority representative that she had convinced the Director of the Parks Authority on this approach, and later they convinced County Executive Officer agree to it. As a result of this information, the group began to focus their behavior on dealing with the coordinator as the source of their problem.

The coordinator's ability to convince their director and the County Executive Officer triggered fear in the group that this project was not going to go away and that they better make the best of it. Furthermore, three of the key stakeholders now discovered that the coordinator had succeeded in reallocating all their information technology funds to this project. They could not just walk away from the project, nor treat it with malign neglect. They also became angry at having been trapped in this unpopular and uncomfortable situation and criticized the coordinator's lack of technical credentials to

even be in the group, much less lead it. She let them know her credentials come from the County Executive Office and the Parks Authority Director. She explained to them that her job was to organize the effort for the Request for Proposal and their's was to come up with the joint users requirements.

In the Response Motivation phase the Parks Authority Group agency members withdrew from active participation in the groups tasks. They attended meetings, but were reluctant to perform any of the basic tasks of user requirement development and analysis. When challenged by the coordinator, they repeatedly justified their position that one system can't be made to work well for such diverse system uses. The representative from the fleet management system phased it: "It's one size boot that fits all. If the toes stick out, amputate 'em. If the heel doesn't fit, slice off the tendon."

The agency group members met informally to measure and calculate the chances of their actually being a viable joint off-the-shelf system on the market. They decided that after reviewing the responses to the Request For Information that none of those vendors had been candid in their responses.

When the Request For Proposal goes out, responding vendors are liable for their claims if they respond. The agency members of the group were convinced that the actual Request For Proposal would not bring many responses, and the products would require substantial and costly modifications.

In the "Information Process" phase the Parks Authority Group simply ignored the idea of a joint system as a pipe dream that would never come about. When pressed by the coordinator to prepare the case for it, they challenged its very validity, and began researching into the dynamic cause and effects of their situation with the idea to develop some strategy to deal with the coordinator.

In the "cognitive action" phase the coordinator countered the agency members reluctance to participate by hiring an outside consulting firm to come in and interview each of the agencies involved to identify and document their user requirements. By the time the consultants came around, the group had identified their problem as the possible event that the coordinator would come up with the off-the-shelf system and make them look like amateurs. The Parks Authority Group decided to make sure that all of their user requirements were in the Request For Proposal. With this strategy, if the sheer number and countervailing requirements did not sink the Request For Proposal, then the winning proposal would at least have to provide them with the system functions that they all could live with. With this win/win strategy, the Parks Authority Group could take control of their situation to some degree. Then they sat back and awaited the coming of the consultants.

In the "results/purpose" phase of the Parks Authority Groups strategic decision-making behavior they achieved their solution: the bids all came in over the budgeted amount by an order of magnitude. The coordinator was proven not only wrong, but wrong-headed by the group. As with the Public Works Group result, all were surprised that the client-server solution was extremely attractive to everyone. However, the over burdening user requirements that the Parks Authority Group developed made this solution's cost far out of range. There would not only be any budget savings, but the cost was three times the group's combined budgeted funds. The coordinator's pilot project was over.

The group then refocused their effort without the coordinator and recommended to the Strategic Management Steering Committee that the each agencies send out their previous minicomputer system Requests For Proposal as they had originally intended. The County Executive Officer concurred. However, by this time the national recession had caught up to Fairfax County, which just experienced an over \$90 million deficit. The funding for the delayed Requests For Proposal were withdrawn, and the participating agencies situation remained in the end, unchanged.

In the Parks Authority Group, potential new knowledge was shunted aside in the internal dispute between the agency members and the coordinator. Therefore, the disposition for

change never came about. In the end, the group was perfectly prepared to solve the minicomputer problem, even after it had been designated a non-strategic problem earlier by the more successful Public Works Group. The study's conclusion is that only by the intervening circumstances of a recession did the group avoid this E_{III}.

Again, the decision making process is blurred. In this case, the County's decision maker of the highest authority decided the implementation of a joint minicomputer system. Who was responsible for its undoing, in this case? The Strategic Management Team coordinator did her best, but lost. The injured agency representatives instigated a general resistance movement, as did the staff at the Department of Public Works. This study suggests that the exploration behavior made a major difference. Without the acquisition of new knowledge, the disposition to change does not ensue. The power of decision, therefore appears to hinge upon this organizational disposition to change. Without an organizational disposition for change, perhaps organizational change can be made only by a despot who can enforce it.

Interpretation as Conclusion

There are four major aspects of the Fairfax Experience, that may be interpreted as issue exploration's impact on the County's organizational decision-making behavior. They are:

1. Framing and reframing the strategic issue through exploration behavior can be a major key to identifying the right, or strategic problems.
2. Acquiring new knowledge requires and is required for reframing the strategic issue and its problems, i.e. organizational cognitive learning.
3. A dynamic balance of the three strategic decision-making behavior types probably leads to better strategic decision making throughout the phases from encountering new information to purpose and results.
4. Enacting the change is everything in the end: organizational learning without organizational growth is hollow.

In the Fairfax Experience wrong problems (E_{III}) were often chosen because of constricted or misdirected vision of the situation by the strategic decision makers. When the strategic decision makers proceeded upon strategic assumptions based solely on their current point of view, they enacted projects that often missed their strategic objectives. Those who explored the issues often reframed their point of view to see that problems that formerly appeared as strategic were not strategic, in light of the emerging issue.

On one hand, what had appeared a problem, as in the case of Public Works, turned out to be the solution. On the other hand, what had appeared to the County Executive Officer and the coordinator as the solution, became the problem. Frequently, the problem was not the problem, getting the key stakeholders point of view (frame) revised was. This latter case situation is a metaproblem according to Mitroff and Featheringham, or a problem-of-problems to use Dunn's term.

In order to avoid solving wrong problems, Dunn proposes that the strategic decision makers restructure the problem through the use of second order science methods. This study would add to Dunn's suggestion as a complimentary alternative: issue exploration to help strategic decision makers reframe their view of their changing situation.

One difficulty that reframing has, however, is that there is always residual doubt: is this the right (re)frame? For example, the County's research focused on whether the 30 management initiatives were posing the right problems. The subsequent test they applied was how well the problems chosen addressed (and impacted) the strategic objectives and goal for information technology. However, those strategic objectives and goal generated new questions: are these the right strategic objectives and goals? Did the strategic decision makers have the right frame to choose them? Was information technology worthy of strategic attention in the first place? Shouldn't we be redesigning our work processes first? If they are the wrong objectives and goals are they not committing E_{III} of an even greater scope?

The answer must be: yes. The framing difficulty is an infinitely regressive frame-within-a-frame. There is always another frame surrounding any frame that the strategic decision makers may have chosen in their reframing efforts of

issue exploration. And there is always a continuing regression of frames within the one we have.

For example, when the County Executive Officer decided that a joint off-the-shelf maintenance management system was the solution, the subordinate agency managers and staff involved felt that they had no recourse but to work within the Chief Executive Officer's frame. A smaller frame would be to view the key stakeholders in a cooperative environment, rather than County Executive Officer's economy of scale view. These key stakeholders had nothing in common but their system needs. Otherwise, they jealously guarded their current degree of autonomy. There was no way they would cooperate without a significant organizational change. Or a view frame larger than the County Executive Officer's might provide the new knowledge that such comprehensive off-the-shelf systems do not exist. As the Request For Proposal responses proved, each off-the-shelf response required over one million dollars of changes to meet the other Request For Proposal requirements.

Off-the-shelf meant to enterprising vendors to take their highly customized fleet or parks or building maintenance management system that they had already built for another customer and expand it (at Fairfax County expense) to meet the Parks Authority Group's requirements for a joint maintenance management system. Some vendors had fleet software packages they would modify to meet the Parks and building maintenance

requirements. Others had building maintenance packages they would modify to take care of the fleet and parks.

Therefore, acquiring new knowledge is a second important finding that came out of the Fairfax Experience. Acquiring new knowledge is a key ingredient for enabling strategic decision makers to reframe their point of view. New knowledge triggers the exploration behavior that allows the strategic decision makers redraw their frame of reference. However, there is also a difficulty here for organizational strategic decision-making behavior. New knowledge is not usually acquired either by rational analysis nor instinctual behavior. To be sure, the evolutionists can make a case for acquiring instinctual new knowledge by natural selection, but that change operates on a biological clock measured by generations, not by the days or years of an organizational clock. Also, the rationalists can make a case of acquiring new knowledge through analysis. But as Kuhn shows us, this is usually finding new arrangements of knowledge already acquired, solving a puzzle.

The key question for promoting issue exploration behavior is: how do we find out things that we don't already know, things that are strange and unfamiliar to us? The source of this kind of new knowledge required for properly framing the situation is contained in the issue itself. The Fairfax Experience illustrates that when the strategic decision makers

explore the issue, they have a better chance to encounter and become familiar with the emerging unknown elements. In examining the novelty of the issue situation, they become familiar with it, thus acquiring new knowledge, something they had not known before. This is Steinbruner's "cognitive learning."

Furthermore, the strategic decision maker must acquire a new knowledge that, as Kuhn tells us, may even wreck the entire knowledge structure he or she already has. And, this threatened old knowledge structure is often the bulwark of the very knowledge that had made the decision maker successful in the organization in the first place.

An example of this happened with the Director of Public Works and with the directors of the various maintenance management organizations. In the first case the Director had to acquire new knowledge about the client-server computing platform, before he could ultimately recommend it to his peer strategic decision makers on the Strategic Management Steering Committee. However, his reversal (Steinbruner's uncommitted thinking) did not hinge upon the director alone. It was just as important that his staff, who were involved in the issue exploration process, to acquire the new knowledge first, and to stand their ground against the director's efforts to sway them back to the traditional approach and away from the new generation of technology.

The third major aspect of the Fairfax Experience was brought into focus when using the Organizational Disposition For Change Framework in interpretive analysis. This analysis indicated that a dynamic balance of the three strategic decision-making behavior types is required throughout the strategic decision-making process. Although it is not clear from this research just which profile or dynamic phase scenario is appropriate to any given strategic decision-making circumstance, the results are compelling enough to continue research for ways to promote this multi-behavior mix. One, for example, would be to include issue exploration before problem identification is begun.

The fourth important point demonstrated by the Fairfax Experience is the role of enactment. What good does it do for strategic decision makers to reframe their point of view for more accurate strategic problem selection if the process does not also include a way for the enactment forces to track along as well? The Fairfax Experience illustrates that strategic decision makers can avoid E_{III} by selecting the right problem. In addition the strategic decision makers can avoid E_I by coming up with the right solution, and they can avoid E_{II} by not rejecting it. But if the strategic decision-making process does not include the enactment of the solution, what's the use? Can this be considered an even more egregious error than the other three combined, an error to the third power, E^3 ?

Our findings suggest that lack of congruence in the balance of these three behavior types can lead the strategic decision makers to E_{III}. In particular, the over emphasis in most organizations' on rational analysis behavior, to the exclusion of exploration behavior may be the most pervasive root of E_{III} in strategic decision making. In Fairfax County's efforts to develop their information technology, where exploration behaviors were engaged, E_{III} was, in the main, avoided.

The main contributions of this research to the field of public administration include the development of issue exploration as a practical method for strategic decision makers to avoid making E_{III} in the public sector's complex situation of multiple agencies, departments and semi-autonomous organizations. In this regard, strategic issue exploration methods can also be applied to larger, public policy development issues as well.

Issue exploration supports the public administrator's sworn obligation to look after and be an agent of action for the public goods and interest. This is accomplished by including all of the stakeholders in the exploration of the strategic issues.

Finally, issue exploration, in conjunction with Gardner's Action Training and Research process for managing change in public organizations, aims at developing and redeploying

resources rather than acquiring new resources. Developing current resources is making the most of what we have. By reconfiguring scarce strategic resources only to viable strategic problems and opportunities, the AT&R process is able to increase productivity through better strategic decision making. Not only do the strategic decision makers save strategic public resources by not allocating them to non-strategic purposes, but they are able to achieve strategic goals and objectives by co-opting resources already funded for tactical and operational purposes. Thus, there can be a cooperative sharing of mutual resources for communal goals.

For example, the 30 management initiatives required comparatively little additional funding that was not already allocated for other operational objectives. The major exceptions were the minicomputer pilot, the purchase of the relational data base for the mainframe, and the training resources for the relational data base. The entire strategic goal to develop a cooperative computing environment was achieved in two years for less than \$300,000.

Of course, the value of the resources required to reach the goal was much greater. But by pooling research and mutually supportive operational objectives to obtain a second order framing, a much more focused impact and organizational value was realized. Both strategic and operational objectives were realized. What was required was for agencies to be

willing to change their points of view in order to share resources to achieve their separate objectives together.

What this study suggests, is that strategy is basically the disposition of an organization to change their constructed social reality in the light of significant emerging issues. This change is not simply changing parts of the current constructs of their social reality to adapt to problematic situations. That activity is a tactical first order change. Rather, strategic change means reconstructing social reality by reframing the organization's belief structures in order for the organization to grow to accommodate new knowledge. This disposition for change involves a fundamental or second order change that uses the organizational behavior apparatus reflected in the Organization's Disposition For Change Framework. This combined new knowledge and decision-power apparatus (dispositif) integrates organizational strategic decision-making behavior to avoid E_{III} . This integration must include the exploration behavior required to acquire new information emerging from the issue, the rational analysis behavior required to convert the new information into new knowledge, and the instinctual behavior required for the organizational members to find the courage to commit themselves and their resources for change in the face of high uncertainty, complexity, and risk.

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Appendix A
Strategic Decision-Making Impact Analysis
Fairfax County, Virginia

Appendix A. Strategic Decision-Making Impact Analysis Matrix						
Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	I-CASE and 4-5th GLS
1 Exploring issues with HRD & Mgt.: (1) Comprehensive report on HRD issues presented to SMSC (2) 40 issues identified and evaluated; (3) Trends presented and evaluated; (4) A model for HRD was designed and presented; (5) comprehensive network was developed.	26-Jan-90	Raised key issues.	No direct impact.	Raised 40 key issues. Developed active countywide network. Designed model for HRD development.	Raised key issues.	Raised key issues.
2 Management of Innovation : (1) Acquired RISC-6000 & AIX to research UNIX in the IC. (2) Participated as 'beta' type site for many software products.	24-May-90	DBA worked with vendors to develop a versatile GUI interface between PC/LANs and DB2.	COC and DBA worked with vendors to develop a versatile use OS/2 LAN as basic enterprise Wide Area Network..	Working with the Training Resource Consortium to see about joining forces.	AIX research have been disappointing to date.	The DBA has been doing a great deal of innovative research in using Windows 3.0 based tools such as "Bridge" to develop applications.
3 Managing IT Training: (1) IT training sponsored by various agencies/groups publicized; (2) CRWTH publicized; (3) Identified process for the planning of IT training; (4) identified training resources via ASTC; (5) Managed training funds-pilot projects.	17-Jul-90	CRWTH courseware provides agencies with needed curriculum for DB2 end users.	No direct impact	(1) CRWTH courseware provided county-wide self-paced learning on critical IT topics; (2) Planning process for IT training emphasized agencies and staff departments and automated design was	No direct impact.	DB2, OMF & Focus training provided by CRWTH and training support network.
4 Executive Information System (EIS): (1) Executive Office installed PCs; (2) Informal negotiations with potential 'clients' who have management information already on machine-readable media; (3) Preliminary design.	25-Jul-90	Developed ways to access potential EIS data on the mainframe via DB2, and port it to the client-server network.	No impact yet	No impact yet	No impact yet	No direct impact

Appendix A. Strategic Decision-Making Impact Analysis Matrix							
#	Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	I-CASE and 4-5th GLs
5	Using the Information Systems Plan for a Model for Strategic Management of Information Resources. (1) Provided foundation and budget support for research efforts and (2) research pilots.	2-Aug-89	Provided budget support to acquire and staff Relational Data Base group.	No direct impact.	Provided budget support to (1) acquire CRWTH; (2) specific training in DB2; and (3) CASE tools in ORS.	Provided budget support and initiated agency platform pilots in DPW, Park Authority and Judicial Operations.	Provided the first CASE tool and workstation to ORS pilot effort.
6	Exploration of Issues Associated with UNIX : (1) Purchase and test a RISC-6000 computer using AIX (UNIX) operating system; (2) Put machine in Information Center under the Action Research Consortium concept.	8-Feb-90	Confirmed that DB2 is a viable choice even under UNIX (IBM's AIX-ESA) data communication operating environment.	Confirmed that UNIX (IBM's AIX-ESA) was several years away from being a viable alternative in the County.	Information Center sent analyst to training seminar on RISC-6000 and AIX.	Basic research in the Information Center is still in progress.	No direct impact.
7	Rapid Application Development (RAD): (1) Don't do JAD until ORS CASE pilot is done; (2) Do a pseudo-RAD with Juvenile Courts and DB2; (3) Let Office For Children set up a mini RAD unit by funding their equipment.	27-Mar-90	In two 'bottom-up' RAD type efforts: Juvenile Court developed an MIS application by porting their records (1 million)	No direct impact.	No direct impact.	(1) Office For Children has been using RAD techniques to develop their own systems on a Novell-386/DOS LAN. (2) Juvenile	Office For Children has been using RBase as a 4th GL
8	Imaging: (1) Test interoperability of imaging and County's systems; (2) Let RFP for Court's deed information system to be shared among other agencies.	8-Feb-90	No direct impact.	No direct impact.	No direct impact.	No direct impact.	No direct impact.
9	Training Needs Analysis : (1). Complete training needs analysis was accomplished; (2) An automated database application for this information was designed and developed.	18-Sep-88	No direct impact	No direct impact.	Provided a comprehensive and automated data base of the County's IT training needs.	No direct impact.	No direct impact.

Appendix A. Strategic Decision-Making Impact Analysis Matrix						
Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	HCASE and 4-5th GLs
10 Research and Testing Applications on Minicomputers: (1) Fund two minicomputer pilots; (2) Install super client-server with Oracle application development software in DPW; (3) Made client-server as County strategic standard.	2-Aug-89	Installed Relational Data Base (Oracle) on super client-server as optimal strategic cooperative computing platform.	Will be a major player in client-server enterprise WAN in New Government Center.	No direct impact.	DPW's super client-server configuration provides them the complete 'kit' for application development by an agency.	The Oracle Relational Data Base installed on DPW's super client-server system has many CASE features.
11 Electronic Mail, Phonemail & FAX: (1) Opened the use of E-Mail countywide.	25-Jul-90	No direct impact	Provided WAN wide E-Mail communication to requesting subscribers.	Full training was made available by the Information Center and the ASTC.	No direct impact.	No direct impact
12 Research and Testing of Budget Applications. Using a LAN operating under full OS/2 environment: (1) Automate the budget document process (2) Developed applications in DBM.	8-Dec-89	Targeted possible IDMS/R data dump to OS/2 Data Base Manager	Developed a full version OS/2 LAN that could interface between the prototype OS/2 LAN in ORS and SMT on the 6th floor. Created an application on the OS/2 relational data base.	OMB developed a comprehensive training and development plan for all of the potential users of the LAN. They implemented this plan and trained all of their employees.	Developed an approach to create the budget document on the LAN. Also developed an application in OS/2 Data Base Manager relational database.	Some budget analysts used the relational data base in OS/2. It is considered a 4th GL

Appendix A. Strategic Decision-Making Impact Analysis Matrix							
#	Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	
						I-CASE and 4-5th GLS	
13	Microcomputer and Local Area Network Platforms: (1) Standards were set on what was in place; (2) Led to issue paper #29 on desk-top functionality.	2-Jul-90	No direct impact.	No direct impact.	No direct impact.	Led to issue paper # 29 on desk-top functionality.	No direct impact.
14	Electronic Desk-Top Functionality: (1) Move from equipment/application software standards to 'desk-top' functionality; (2) Take 'Manager-Of-LANs' approach to B-3 ap prototype cooperative computing environment for New Govt. Center.	7-Nov-90	Assured a viable degree of interoperability.	Became the fundamental model for the enterprise 'Wide Area Network' based upon the client-server building LANs linked by fiber backbone.	No direct impact	Links agencies together and the mainframe so they may start sharing IT resources.	Included the most advanced "desk-top" to include support to GIS and CASE level functions.
15	Exploration of Issues Associated with Information Resources Steering Committees: (1) Restructured SCMC to be Deputy County Execs; (2) SMT Coordinator took over networking the various committees.	2-Aug-89	No direct impact.	No direct impact.	No direct impact.	Approved DPW's request for its super client-server system	Approved ORS request for CASE tools on a Client-server LAN platform.

Appendix A. Strategic Decision-Making Impact Analysis Matrix							
#	Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	
						ICASE and 4-5th GLs	
16	Training as Implementation Strategy: (1) Training needs for pilot projects identified and funded. (2) DB2 & CASE training implemented. Organization structure and support created. (3) CRWTH (computer-based training) funded, implemented.	4-Oct-89	Completed DB2 and QMF training.	Provided LAN training for pilots.	1. Computer-based technology demonstrated and pilot tested. 2. Curriculum for critical IT topics identified. 3. Self-paced learning technology researched via pilot testing.	1. DB2 training planned for end-users, application developers and systems administrator that included CBT and vendor workshops	1. Information Engineering and CASE tools training planned for application developers.
17	Workstation-to-Knowledge Worker Ratio: (1) Standard proposed was one PC per knowledge worker as defined by Personnel Department; (2) Only piecemeal work done. It remains incomplete.	20-Jul-90	No direct impact	No direct impact.	No direct impact.	No impact. Analysis indicated that it would cost \$45 million to outfit all the knowledge workers as defined by the Personnel Department.	No direct impact
18	Criteria for Selecting Candidates for Strategic IT Training: (1) Specific candidates for IT training were identified; (2) Funding per pilots and Issue Papers 8 & 10; (3). Proper candidates selected and trained.	2-Nov-89	Trained DBA people, ORS and selected agency people in DB2, QMF, information Engineering, CASE Tools, Networking as required.	No direct impact.	Training plans and resources developed provided major impact in achieving this objective. Network of training support staffs from agencies, CCC, ASTC and Personnel was created to support activities.	Police and Juv. Court teams used DB2 & QMF training to develop applications in their agency. ORS, CCC and other county agencies received an overview of DB2 concepts. CASE training provided to ORS and Police systems staffs.	Selected key people to learn KnowledgeWare CASE tool.

Appendix A. Strategic Decision-Making Impact Analysis Matrix							
#	Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	ICASE and 4-5th GLs
19	Charters for the Strategic Management, Planning and the Data Base Teams: (1) SMT and DBA approved	15-Aug-89	Expert Data Base Administrator staff was hired.	No direct impact.	No direct impact.	No direct impact.	No direct impact.
20	Acquisition of DB2 Technology in FY1990: (1) DB2 was acquired and installed on the mainframe; (2) Query Management Function (QMF) was also installed.	2-Aug-89	DB2 and QMF installed on mainframe.	DBA played a major role in working with CCC to prototype the enterprise WAN	A comprehensive Computer Based Training resource was intalled on the mainframe for DB2 training.	The DBA staff has worked with several agency clients to help them develop applications applications on approved issue exploration efforts #22 - #30.	Query Management Function (QMF) was used by one agency as a 4GL application Approved issue exploration efforts #22 - #30.
21	Composition of the Infrastructure Management Team: (1) Members of previous SMSC appointed to IMT, along with agency reps from each Deputy Exec. Area. (2) HRD Core Team taken over as Human Resources Development Team. (see # 25 below).	1-Jul-90	Approved issue exploration efforts #22 - #30.	Approved issue exploration efforts #22 - #30.	Approved issue exploration efforts #22 - #30.	Approved issue exploration efforts #22 - #30.	Approved issue exploration efforts #22 - #30.
22	IT Education/Lecture Series: (1) Only piecemeal work done. It remains incomplete.	20-Jul-90	No direct impact.	No direct impact.	No direct impact.	No direct impact.	No direct impact.

Appendix A. Strategic Decision-Making Impact Analysis Matrix						
Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development To Agencies	I-CASE and 4-5th GLs
23 Enhancements to Existing Systems (1) No action was taken.	1-Jul-90	No direct impact.	No direct impact.	No direct impact.	No direct impact.	No direct impact.
24 Software (RFP) : Create RFP to include 'Clones'; (2) Software must be included as option; (3) Loading the software must be included as option.	26-Sep-90	No direct impact	No direct impact.	No direct impact.	Bids are now being reviewed. However, the lowest bidder for software is up to 40% higher than current State Contract. Added many 386 PC and client-server LANs to the infrastructure. (OMB, ORS, DPW, OFC, F&R, Jud OPS)	No direct impact
25 Programmable Workstation Positions for FY 1990 and 1991: (1) Set policy to use 386 CPU chip as the strategic standard for workstations.	2-Aug-89	No direct impact.	Setting policy for 386 CPU chip set the stage for the feasibility of the client-server approach to an enterprise Wide Area Network by CCC.	No impact.	The 386 CPU standard emerged to support a client-server LAN approach to CASE tools and is being installed by ORS.	
26 Adoption of Standard Language for Application Development: (1) COBOL II was installed on the mainframe.	2-Aug-89	COBOL II is being used to convert an application (VWERS) for the Dept. for Human Development in DB2.	No direct impact.	No direct impact.	No direct impact.	COBOL II is considered by some to qualify as a 4th GL

Appendix A. Strategic Decision-Making Impact Analysis Matrix						
Issue Exploration Papers & Strategic Decisions/Actions:	Initiated	Relational Data Base	Flexible Data Communications	Human Resource Development	Application Development Agencies	LCASE and 4-5th GLs
27 Human Resources Technical Skills Inventory for IT.	2-Aug-89	No direct impact	No direct impact.	No direct impact.	No direct impact.	No direct impact.
28 Human Resource Development Plan for ORS: (1) A plan is still in the process of being developed. It remains incomplete.	15-Aug-89	No direct impact	No direct impact.	No direct impact.	No direct impact.	No direct impact.
29 Joint Requirements Analysis for Maintenance Management: (1) The parks mini pilot would be joined to EMTA's Fleet MIS; (2) Joint requirements were developed and RFP released; (3) Aborted because, "None of the proposals meet the requirements in the RFP."	21/3/1990	No direct impact.	No direct impact.	No direct impact.	No direct impact.	No direct impact.
30 Human Resource Development Management Team-FY91: (1) Due to reductions in funding, initiated contact with other countries for resource sharing.	20-Jul-90	No direct impact	No direct impact	(1) Issues raised; (2) Network players participate in SMSC management.	No direct impact	No direct impact

Appendix B

Strategic Management Initiative Issue Papers:

- #10 Research and Testing of the Development and Placement of Applications on Minicomputers**
- #29 Joint Requirements Analysis for Maintenance Management Systems**

8-2-87

4. Research and Testing the Development and Placement of Applications on Mini-Computers
August 2, 1989

ISSUE: Clearly, there are situations now and there will be situations in the future when mini-computers are advisable as platforms for information processing systems, especially when agency users are capable of developing and managing some of their own departmental information systems. However, in the area of strategic systems development several concerns have been identified:

CHART A - STRATEGIC ISSUE EXPLORATION
Mini-Computers in Cooperative Processing

1. How can the addition of the mini-computer platform enhance cooperative processing in the County?
2. How would the use of mini-computers relate to the use of Local Area Networks (LANs)?
3. What opportunities do mini-computers present to handle the backlog of systems development requests submitted to Computer and Information Processing Systems Plan: FY 1991 -1996?
4. What should our policy be regarding central support for the use of mini-computers?

RECOMMENDATION: Convene a research group of central support staff and interested agencies to explore the issues that the mini-computer poses as a platform for cooperative processing.

TIMING: Begin in August.

BACKGROUND: Over the past years several agencies have acquired and operate mini-computers due to a variety of decision considerations. Usually, a system is let out for bid and the successful vendor determines the computer best suited for that particular system development effort. However, the county central support is not staffed to develop applications nor to provide support resources for operating the mini-computer itself. As a result the agency sets up its own systems development staff within the agency to support and operate the mini-computer. Department of Public Works, Public Safety's Computer Aided Dispatch, and the Library, are notable examples of the mini-computer option.

As an alternative to the mini-computer and its required commitment of agency system resources, some agencies are considering networks of microcomputers (LAN). Juvenile Court, Fire and Rescue, and Office of Children are examples. Cooperative processing using SAA standards envisions three strategic platforms in the design of future County information resource management

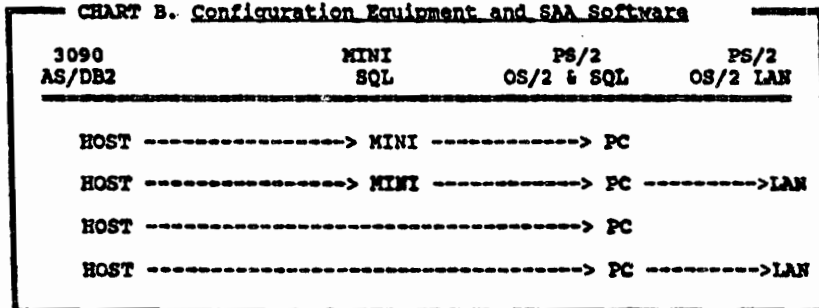
systems: Mainframe, Mini, and PC/LAN. Strategic systems development planning requires that the agency users, the Office of Research and Statistics (ORS), the Cooperative Computer Center (CCC), and the Office of Management and Budget (OMB), and the Automated Systems Training Center (ASTC) get together to explore the issues that mini-computers pose and the opportunities they present the management and development of our future information and human resources.

This working group would be established to explore the mini-computer issue area, and to provide recommendations for mini-computer utilization in cooperative processing (per the Vision principles) and its fit in the County's future systems architecture.

This working group should be tasked with:

- Preparing a list of issues concerning the acquisition of mini-computers; support for the equipment by ORS, CCC, the acquiring agency; installation; application(s) development and support; and training.
- Develop a set of criteria which can be used to determine when a mini-computer can/should be used for application in cooperative processing in the system architecture configurations listed in figure 1 below.

CHART B. Configuration Equipment and SAA Software



- Recommend one or more potential candidate agencies and applications to research, test, and evaluate the issues.

STAFF: This research group should be made up of central support staff from the ORS, CCC, OMB, ASTC, and members from the system development staff of County Agencies that have or are considering mini-computers and/or local area networks and are interested in examining central support for mini-computers.

ENCLOSED DOCUMENTS: None.

Joint Requirements Analysis for using IT strategically for managing maintenance of vehicles, grounds and facilities

ISSUE: Facilitation for developing joint requirements

RECOMMENDATIONS:

1. That services of a qualified and experienced consultant/facilitator in the area of joint requirements analysis and system design be secured to:

a. assist the maintenance team determine requirements for managing vehicles, grounds and facilities in DPW, Housing, EMTA, Fire & Rescue, Parks. This effort will result in a process-to-agency matrix, potential process changes, a data-to-process matrix and other requirements analyses. These can be used in an RFP (s), or in other acquisition documents, to research software packages, to consider any custom design needs or combinations, for using IT strategically in the management of these assets. The effort should take no longer than 30-days.

b. develop facilitation skills of Fairfax staff to use in similar management initiatives; and augment with hiring in someone with.

2. That a representative from PSMA join the maintenance group for assistance through the acquisition process of securing consulting/education services and the next step toward a portfolio RFP.

TIMING: Immediate.

BACKGROUND: On May 21, Dr. McDonald requested each Deputy County Executive to appoint a representative from agencies with responsibility for managing the maintenance of vehicles, property, and facilities to a core team responsible for assembling joint requirements and investigating joint solutions - either an off-the-shelf package to satisfy management needs of all three or individual off-the-shelf packages in each management area which all agencies who need that IT support. The intent is to avoid proliferation of different software packages and hardware which accomplish the same basic function/process in maintenance.

One area stressed at Harvard's Strategic Computing and Telecommunications conference was that in bringing in

new methods and technologies to an organization, three factors must be present, executive sponsorship, an operating "champion" of the effort, and expert assistance external to the organization with a planned transfer of skills to internal staff for replication in similar projects. We clearly have the first two elements, but are lacking in the third.

A need exists to approach these areas with experienced facilitation so that this core team can meet its responsibilities successfully. And, since it is the first effort of its kind, the eyes of the organization are upon us. This group and its outcome will serve as a role model for other joint requirements across agency and Deputy area boundaries. It is important that it succeed to the satisfaction of all team members.

ENCLOSED DOCUMENTS: May 21 memo from Dr. McDonald to Deputies; June 5 memo from Chief Isman to Mr. King; June 4 memo from Mr. Gorby to Mr. Kramer.

FISCAL IMPACT: From initial, informal inquiries on the cost and time for this effort, an average \$1200 - \$1500 per day cost for roughly 30 days appears to be a norm. An investment of \$45,000 will build toward educating County staff to assume this role, producing a document which can be used in an RFP, and, most importantly, improving the management of vehicles, grounds and facilities.

STAFF: Janet Caldow

Appendix C

**Issue Exploration Research Framework
in Strategic Decision Making,
Fairfax County, Virginia**

ISSUE EXPLORATION RESEARCH IN STRATEGIC DECISION-MAKING;
FAIRFAX COUNTY, VIRGINIA

Strategic Decision-Making Behavior Phases:

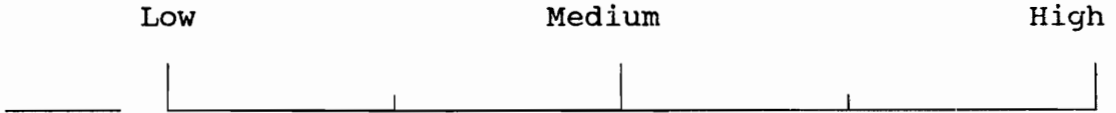
- I. Issue Exploration 'Licensing' Evaluation
- II. Expected Potential Impact on Strategic Objectives
- III. Issue Exploration Research Framework Calibration Tool
- VI. Problems and Errors of the Third (or higher) Kind Ratio
- V. Impact of Decision-Making on Strategic Objectives

Strategic Management Team

July 24, 1991
Ver 3.0

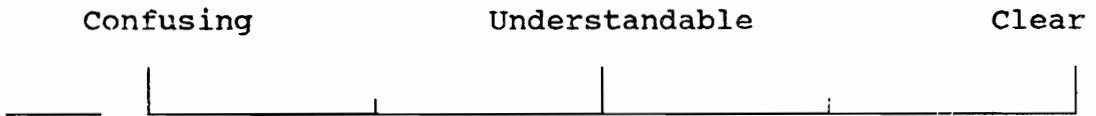
I. ISSUE EXPLORATION 'LICENSING' EVALUATION

111. Degree of Organizational Interest



Remarks:

112. Clearness of Issue's Scope



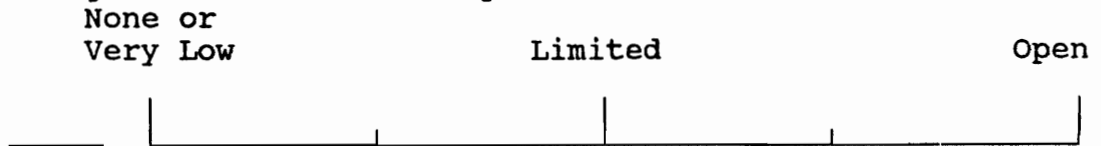
Remarks:

113. Degree Stakeholders are Included



Remarks:

114. Degree of License to Explore the Issue



Remarks:

II. EXPECTED POTENTIAL IMPACT ON STRATEGIC OBJECTIVES:

211. Developing a relational data base facility with user (agency) orientation

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

212. Develop a County-wide flexible data communications / computer platforms

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

213. Provide agencies and staff department ready access to human resource development for information technology

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

214. Provide agencies the information resources they need to develop most of their applications in the work units

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

215. Make use of the automated application development tools, methods and processes (I-CASE, 4GLs and Expert Systems)

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

III. ISSUE EXPLORATION RESEARCH FRAMEWORK CALIBRATION TOOL:
 (For the Six phases of Research)

Instructions

Each of the six "Units of Research" is described by several different calibration statements. Although all or some of them may apply at one time or another please rate the three (in rank order) that most characterize the issue exploration effort from your point of view.

=====

Research Phase 1. (311) Encountering New Information

Discussion of Issue Exploration Research Effort Profile

Criteria:

How did the group come to encounter the new situation or emerging new information? There are a number of ways that an emerging issue become known to people, begin to interest them and raise concerns in their minds. Some people scan their environment while others go out in search for it. Most of us at least have new situations come up on us unsolicited.

Calibration Rating of Research Measure 1 (311):

How would you characterize the various modes that the participants used to encounter new information in this case?

(top three in rank order, 1=high)

- a. They avoided or ignored any that...
- b. They countered it with factual arguments about...
- c. They focused their attention on the most useful...
- d. They scanned around the area of concern...
- e. They were open to any and all...
- f. They sought out a variety of new...

Discussion of Rating:

Research Phase 2. (312) Trigger Mechanism

Discussion of Issue Exploration Research Effort Profile
Criteria:

True novelty is required to trigger exploration behavior. Only if the situation is significantly new, novel and "unknown" will our exploration behavior be triggered after our attention/interest is initially aroused. The novelty must be genuine, i.e., new situation we don't understand nor recognize, for this is the source of generative learning. Otherwise the situation is merely marked as unusual to us. Our thinking proceeds along our "normal" instinctive and rational analysis thinking to assimilate this "unusualness" in a different arrangement of the knowledge we already have. In this latter case our knowledge is enhanced but not expanded.

Trigger Event:

Calibration of Research Measure 2 (312):

When the group encountered new information how did they react? (top three in rank order, 1=high)

- ___ a. They expressed fears that...
- ___ b. They became angry about...
- ___ c. They tried to explain...
- ___ d. They were curious about...
- ___ e. They were excited to find out
- ___ f. They wondered what...

Discussion of Rating:

Research Phase 3. (313) Response Motivation

Discussion of Issue Exploration Research Effort Profile

Criteria:

There are complex dynamic reactions between the thinking vectors of curiosity, fear, and rational analysis. In order to proceed along the exploration vector, fear and rational analysis for recognition must be temporarily held at bay. Exploration behavior proceeds along several stages or phases which at anytime can careen off into the fear or rational analysis vectors, thus short-circuiting the exploration behavior. These phases of exploration are: (1) Attention / interest, (2) Trigger exploration behavior, (3) Taking stock and setting forth, (4) Comprehensive examination of the terra incognita, (5) Documentation and mapping the unknown, (6) Becoming fully familiar with the territory.

Calibration of Research Measure 3 (313):

When the group obtained new information about the issue, what kinds of thinking activities did they use: (top three in rank order, 1=high)

- ___ a. Withdraw to wait-and-see if...
- ___ b. Critiqued and/or justified...
- ___ c. Measured, counted & calculated it for...
- ___ d. Checked to see if it can be used for...
- ___ e. Try to find out more about it...
- ___ f. Try to determine the value of...

Discussion of Rating:

Research Phase 4. (314) New Information Processing

Discussion of Issue Exploration Research Effort Profile
Criteria:

How did the group process the new information? There are a number of ways to process (put in order) information in our thinking. In Western Cultures, at least since Aristotle, our habitual thinking strategy is to classify and categorize any new information into our "known knowledge archives."

Other thinking strategies or styles we use to process (put in order) information, equally legitimate in human thinking and abounding in Nature besides (1) Hierarchical Categories, include: (2) cause & effect actions, (3) Image/Gestalt, (4) Networks.

Calibration of Research Measure 4 (314):

How would you describe the various ways that the group used to deal with the new information? (top three in rank order, 1=high)

- a. Discarded it as noting new to...
- b. Challenged its validity to...
- c. Classify and categorize it in...
- d. Researched the cause and estimated the results...
- e. Looked for trends and patterns...
- f. Relate it with all sorts of different...

Discussion of Rating:

Research Phase 5. (315) Basic Cognitive Action

Discussion of Issue Exploration Research Effort Profile

Criteria:

What was the basic cognitive action of the new situation: identification or discovery of the new situation? The premier action of rational analysis is to identify the problem. If it can be identified we can then categorize it, correlate it with similar problems we have solved in the past and get on towards solving it in some agreeable (satisfied) manner. On the other hand, the "generative" or learning posture of exploration seeks to discover something new. It roots around the underbrush with an eye out for the novel and strange. Then when it finds it, instead of either reacting to it in a "Stimulus-Response" knee-jerk reaction, nor jumping to conclusions by matching it to something already known, the explorer examines the novelty repeatedly and in detail in order to become familiar with what makes it "novel" and unusual, to become completely familiar with it, and then to catalogue it as a new entry in the category schema of the already known.

Calibration of Research Measure 5 (315):

What seemed to be going on in this effort was that people were:

(top three in rank order, 1=high)

- ___ a. Waiting for more...
- ___ b. Gaining control over...
- ___ c. Identifying problems and opportunities of...
- ___ d. Solving problems of...
- ___ e. Creating new knowledge about...
- ___ f. Discovering new...

Discussion of Calibration Rating:

Research Phase 6. (316) Results

Discussion of Issue Exploration Research Effort Profile

Criteria:

What was the end result? Were problems identified? Solutions? Did any of the group learn anything new or did the group just move the known pieces around the board? Did any of the organizations create new knowledge, discover something new or grow as an organization? What actually happened from this effort to explore the issue?

Calibration of Research Measure 6 (316):

What were the most important results of this issue exploration effort? (top three in rank order, 1=high)

- a. They things remained much as they were...
- b. They refocused resources in another...
- c. They diagnosed the problems of...
- d. They understood the situation's key...
- e. They learned new knowledge about...
- f. They grew as an organization in...

Discussion of Calibration Rating:

VI. PROBLEMS AND ERRORS OF THE THIRD (or higher) KIND RATIO

A. Original Issue Concern:

B. Key Strategic Problems/Opportunities Raised, Type
(S=Strategic; E_{III} etc; and Brief description of Decision:
Problem/Opportunity Type Decision

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(Attach additional sheets if necessary)

C. Key Strategic Problems / Opportunities :

COUNT

_____	41.	Ratio of Errors to Strategic Problems (Sum of 312/311)
_____	411.	Total Problems/Opportunities (Sum of 312+313)
_____	412.	Redefined as errors (SUM OF 3121-3124)

V. IMPACT OF DECISION-MAKING ON STRATEGIC OBJECTIVES

The degree and impact of issue exploration and strategic decision-making on strategic objectives for Cooperative Processing was:

511. Developing a relational data base facility with user (agency) orientation

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

512. Develop a County-wide flexible data communications / computer platforms

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

513. Provide agencies and staff department ready access to human resource development for information technology

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

514. Provide agencies the information resources they need to develop most of their applications in the work units

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

515. Make use of the automated application development tools, methods and processes

No or Negative Effect	Impacts Strategic Requirements	Exceeds Strategic Requirements

Remarks:

V. SUMMARY SCORING SHEETS

1. Evaluation Criteria for Strategic Issue Exploration

___ 11. Overall Issue Exploration Franchise Score (Averaged scores of 111-115)

___ 111. Degree of Organizational Interest

___ 112. Clearness of Issue's Scope

___ 113. Degree Stakeholders are Included

___ 114. Degree of License to Explore Issue

2. Expected Potential Impact on Strategic Objectives

___ 21. Potential (Averaged Strategic Impact Scores 151-155)

___ 211. Developing a Relational data base facility with user (agency) orientation

___ 212. Developing a County-Wide flexible data communications/computer platforms

___ 213. Provide agencies and staff departments ready access to human resource development for information technology

___ 214. Provide agencies the information resources they need to develop most of their applications in the work units

___ 215. Make use of the automated application development tools, methods and processes (I-CASE, etc.)

3. Issue Exploration Research Framework Calibration Tool
)for Instinct Explore Rational, reverse ranking for
score: viz., 1=3, 2=2, 3=1)

31. Issue Calibration (Sums of Sub Totals 311-316)

Instinct Explore Rational

=====

=====

=====

311. Encountering New Information

Instinct Explore Rational

\bar{a} \bar{b} \bar{c} \bar{d} \bar{e} \bar{f}

scores

$\overline{a+b}$ $\overline{c+d}$ $\overline{e+f}$

sub totals

312. Trigger Mechanism

Instinct Explore Rational

\bar{a} \bar{b} \bar{c} \bar{d} \bar{e} \bar{f}

scores

$\overline{a+b}$ $\overline{c+d}$ $\overline{e+f}$

sub totals

313. Response Motivation

\bar{a} \bar{b} \bar{c} \bar{d} \bar{e} \bar{f}

scores

$\overline{a+b}$ $\overline{c+d}$ $\overline{e+f}$

sub totals

314. New Information Processing

\bar{a} \bar{b} \bar{c} \bar{d} \bar{e} \bar{f}

scores

$\overline{a+b}$ $\overline{c+d}$ $\overline{e+f}$

sub totals

315. Basic Cognitive Action

\bar{a} \bar{b} \bar{c} \bar{d} \bar{e} \bar{f}

scores

$\overline{a+b}$ $\overline{c+d}$ $\overline{e+f}$

sub totals

316. Results

\bar{a} \bar{b} \bar{c} \bar{d} \bar{e} \bar{f}

scores

$\overline{a+b}$ $\overline{c+d}$ $\overline{e+f}$

sub totals

4. Evaluation of Issue Exploration Results

- ___ 41. Ratio of Errors to Strategic Problems (Sum of 3121-3124/311)
- ___ 411. Key Strategic Problems/Opportunities Raised & Decided
- ___ 412. Count of Key Strategic Problems Redefined as not Strategic
- ___ 413. Count of Actual Strategic Problems/Opportunities

5. Strategic Decision-Making Impact Analysis

- ___ 51. Strategic Impact (Averaged Score of 411-415)
 - ___ 511. Developing a Relational data base facility with user (agency) orientation
 - ___ 512. Developing a County-Wide flexible data communications/computer platforms
 - ___ 513. Provide agencies and staff departments ready access to human resource development for information technology
 - ___ 514. Provide agencies the information resources they need to develop most of their applications in the work units
 - ___ 515. Make use of the automated application development tools, methods and processes (I-CASE, etc.)

Appendix D

Alternative Analysis

(Processing Platform)

Background, Discussion, Recommendations

Review Form and Model

Department Computing Evaluation Group

ALTERNATIVES ANALYSIS (PROCESSING PLATFORM) REVIEW FORM
(CHECKLIST) AND RECOMMENDATION FORM

(Application Title)

INSTRUCTIONS

This form is to be used by the sponsoring agency or agencies in cooperation with the information systems staff to document the requirements (at a fairly high level) of an application, and to present the resulting alternatives analysis recommendation. The form should be prepared as the sponsor begins to develop its analysis of application requirements. Completion of as many sections of the document as possible will permit the sponsor to describe the application's attributes which are important to the eventual selection of the appropriate developmental method and the processing platform(s) for the application. Or, a Request for Proposal (RFP) may be developed which will allow a vendor to suggest a platform based on the requirements.

The form's contents will also be used by appropriate reviewing authority. This process will be an iterative one for the sponsor as the agency acquires information and receives data from other necessary partners. The completed form will be reviewed as part of the agency's request for applications development or release of an RFP.

Application Title: _____

Sponsoring Agency/Agencies: _____

References: What agency -or contractor- prepared materials are available for review and which provide further details and analyses for the proposed system?

Brief Description of the Proposed Application: _____

Development Option(s): What is the preference?

Acquisition of Existing Off-the-Shelf Application? _____
Application Which Will Require Customization? _____
Custom Development? _____ By Which Agency? _____

Functions: How is the application/information currently processed? What are the major deficiencies? _____

What are the requirements for the following attributes?

Transaction Volume/Time Period _____

Speed/Response Time/Number of "Operators" _____

Anticipated Number of Terminals/Workstations/PCs
Requiring Access to the System When Implemented _____

Availability (5 days, 7:00 - 5:00 with few interruptions; 7 days, 24 hours per day with few exceptions) _____

Graphics _____

Storage and Retrieval _____

Communications/Networking _____

Data/Information Sharing (is the data to be used within one department, or one agency, or is it to be shared with other agencies? How will initial data entry be accomplished, and who will be responsible for it?) _____

Backup/Recovery _____

Disaster Recovery _____

Application Technology Characteristics of the Recommended or Preferred Software and Hardware. Provide the same type of information if there is a close alternative, or where multiple platforms will be appropriate.

Operating System _____

Development Language(s) _____

Data Base Management System _____

Proposed Hardware _____

Is the hardware to be acquired for this application, or is there existing hardware on which the application will be run? Where is the hardware located?

Special Hardware Requirements (co-located printers, UPS, communications devices) _____

Multi-Platform Considerations (discuss requirements for information to be stored or processed on more than one platform?) _____

Facilities: Are the physical facilities necessary for the application available, or will other than ordinary work orders or additional facilities needed? Is physical space available? Are there plans for movement of the agency?

Capacity Planning/Sizing Estimates: Based on the previously supplied information, what are the best estimates for

Memory _____

Disk Storage _____

Communications/Networking/Server _____

Will the proposed equipment be used for other purposes?
Additional applications? _____

Future Capacity Planning Estimates (2 to 3 years):

No. of users _____

Disk Space _____

Applications to be added (Which will run on the same equipment) _____

Security:

Physical Security Considerations _____

Application Security (RACF, custom software, off-the-shelf, applications programming) _____

Network Security _____

Information Asset Considerations (Procedural Memorandum No. 129) _____

Staffing/Resource Considerations: The requirement for additional agency staffing must be evaluated in comparison to existing central support.

Agency Staffing What agency staff support is available, or what additional staffing (by classification) must be considered?

Corporate Resources What are the necessary corporate resources for development or acquisition of the application (system analyst, programmers, operators, network specialists, systems programming, data base management specialist, contract manager)?

Cost/Benefit Information Provide the application costs as applicable, and the anticipated fiscal year(s) in which the costs will be incurred.

		FY___	FY___
<u>Package (Off-the-Shelf) Acquisition</u>	\$ _____	_____	_____
<u>Custom Modifications</u>	\$ _____	_____	_____
<u>Custom Development by</u> _____	\$ _____	_____	_____
(agency)			
<u>Hardware Acquisitions</u>	\$ _____	_____	_____
<u>Additional Staffing</u>	\$ _____	_____	_____
<u>Facilities</u>	\$ _____	_____	_____
<u>Impact on Existing Computer/Network Facilities</u>	\$ _____	_____	_____
<u>Reimbursements/Savings</u>	\$ (_____)	()	()
(specify)			

<u>Other</u> _____	\$ _____	_____	_____

Discussion _____

Conclusion/Recommendations Based upon the information available, what is the recommended option for acquiring/developing the application, and what is the recommended platform(s)? What are the key criteria used in making this decision?

What is the alternative? _____

FAIRFAX COUNTY, VIRGINIA

MEMORANDUM

May 15, 1990

TO: R. P. Wahl, Jr., Director
Cooperative Computer Center

FROM: Raymon Bruce
Strategic Management Team
Office of Management and Budget

SUBJECT: Revised Scoring Sheets to Key John Steven's Alternatives
Analysis Review Criteria" paper; May 11, 1990

I have revised the Scoring Sheets to match John's revised paper. In addition, I have tried to incorporate the comments from Office of Research and Statistics staff that he included in his May 11th memo to you.

In addition I have converted the software program that produces the Scoring Sheets to Lotus, 1-2-3. I have included copies of this spreadsheet:

MINI1.wk1 is the main file. All of the fields are "protected" except the data entry fields. To use this Scoring Sheet:

1. Load Lotus and retrieve "MINI1.wk1" from the floppy diskette.
2. Enter the "Weight Factor" scores as indicated. (They can be left blank if weight factors are not needed)
3. Enter the "Raw" scores for each alternative being considered and for each criteria that is applicable.

The Lotus system will automatically compute the "Wt" scores (multiplying the "raw" score by the appropriate "Weight Factor"), and the Alternatives Totals any time a score is entered &/or changed.

4. To view the Comparison Score Chart press the (F10) function key.

If we make any more changes in John's format it should be easy to change this decision analysis tool to match it.

Attachments

cc: John Stevens

DEPARTMENTAL COMPUTER TECH REVIEW
(Decision Support Analysis)
ALTERNATIVES EVALUATION

**** Instructions ****

Enter the "Weight Factor" and "raw" scores. (OTHER FIELDS ARE PROTECTED)
The system will calculate the weighted "wt" score and totals.
Be sure to save the results under a NEW file name, not "Mini1" or "Mini2"
("MINI2" is provided as a backup copy of "MINI1")

APPLICATION(S): _____ Date: _____

AGENCY: _____

EVALUATION CRITERIA	Weight Factor +/-	MAIN		D E P A R T M E N T A L							
		raw	wt	ALT #1 raw	ALT #1 wt	ALT #2 raw	ALT #2 wt	LAN raw	LAN wt	MICRO raw	MICRO wt
I. SPONSOR											
1 Mgt. Support	_____		0		0	_____	0	_____	0	_____	0
II. OBJECTIVES											
2 A. _____	_____		0		0	_____	0	_____	0	_____	0
3 B. _____	_____		0		0	_____	0	_____	0	_____	0
4 C. _____	_____		0		0	_____	0	_____	0	_____	0
5 E. _____	_____		0		0	_____	0	_____	0	_____	0
6 F. _____	_____		0		0	_____	0	_____	0	_____	0
7 G. _____	_____		0		0	_____	0	_____	0	_____	0
III. DEVELOPMENT OPTIONS											
8 Off-The-Shelf	_____		0		0	_____	0	_____	0	_____	0
9 Vendor Customize	_____		0		0	_____	0	_____	0	_____	0
10 User Develop	_____		0		0	_____	0	_____	0	_____	0
11 By Agency	_____		0		0	_____	0	_____	0	_____	0
IV. FUNCTIONS											
12 Current System	_____		0		0	_____	0	_____	0	_____	0
13 Volume/time period	_____		0		0	_____	0	_____	0	_____	0
14 Speed/Respond Time	_____		0		0	_____	0	_____	0	_____	0
15 No. of Terminals	_____		0		0	_____	0	_____	0	_____	0
16 Availability	_____		0		0	_____	0	_____	0	_____	0
17 Graphics	_____		0		0	_____	0	_____	0	_____	0
18 Storage & Retrieve	_____		0		0	_____	0	_____	0	_____	0
19 Communications/Net	_____		0		0	_____	0	_____	0	_____	0
V. DATA SHARING											
20 Scope	_____		0		0	_____	0	_____	0	_____	0
21 B/UP & Recover	_____		0		0	_____	0	_____	0	_____	0
22 Disaster Recovery	_____		0		0	_____	0	_____	0	_____	0
VI. APPLICATION TECHNOLOGY											
23 Operating System	_____		0		0	_____	0	_____	0	_____	0
24 Applic. Dev. Lang.	_____		0		0	_____	0	_____	0	_____	0
25 DBMS/SAA	_____		0		0	_____	0	_____	0	_____	0
26 Proposed Hardware	_____		0		0	_____	0	_____	0	_____	0
27 Hardware Available	_____		0		0	_____	0	_____	0	_____	0
27 Special Hardware	_____		0		0	_____	0	_____	0	_____	0

29 Multi-Platforms	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
VI. FACILITIES														
30 Physical Facility	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
VIII. CAPACITY/SIZING														
31 Main Memory	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
32 Disk Storage	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
33 Comm/Net/Server	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
34 Add'l Application	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
35 Future Capacity	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
IX. SECURITY														
36 Physical	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
37 Application	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
38 Data and Network	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
39 Information Asset	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
IX. STAFFING														
40 Agency Staffing	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
41 Corp Resources	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
X. COSTS														
42 Impact	_____		_____	0		_____	0	_____	0	_____	0	_____	0	_____
BASE SCORES---->	0		0	0		0	0	0	0	0	0	0	0	0

Appendix E

Disposition For Change

Profile Data

Appendix E. DISPOSITION FOR CHANGE - Profile Data

Micro-level 2 Three Behavior Types
(Cumulative SMT Ratings from Micro-Level 3)

Public Works Group

THINKING MODES		
Rational	#	58%
Exploration	8	22%
Instinctual	7	19%

Parks Authority Group

THINKING MODES		
Rational	7	19%
Explorati	0	0%
Instinctu	29	81%

Micro-Level 3 Behavior Types by Phase
(Cumulative SMT Ratings from Micro-Level 4)

Public Works Group

Behavior Type	Encounter New Info.	Trigger Mechanism	Respon Motivation	Information Processing	Cognitive Action	Results/Purpose
Rational Any		1	3	5	5	4 3
Exploration		0	2	1	0	2 3
Instinctual		5	1	0	1	0 0

Parks Authority Group

Behavior Type	Encounter New Info.	Trigger Mechanism	Respon Motivation	Information Processing	Cognitive Action	Results/Purpose
Rational Any		1	1	1	2	1 1
Exploration		0	0	0	0	0 0
Instinctual		5	5	5	4	5 5

Micro-Level 4 - Specific Behaviors & Types by Phase
(Ratings from Strategic Management Teams Survey Instrument)

Public Works Group

Behavior Type	Specific Behaviors and SMT's Ratings by Phase									
	Encounter New Info.	Trigger Mechanism	Respons Motivation	Information Processing	Cognitive Action	Results/Purpose				
Rational Any	Scanned	Critique	Utility	2	ause/Effe	3	Solve	3	Adapt	3
" "	Focused	1 Explain	3 Measur	3	Classify	2	Identify	1	Understand	
Exploration	Sought	Wonder	Curiosity		Patterns		Create		Growth	2
" "	Open	Excited	2 Value	1	Relate		Discover	2	Learn	1
Instinctual	Counter	3 Anger	1 Justify		Ignore	1	Control		Refocused	
" "	Avoid	2 Fear	Withdraw		Challenge		Await		Uncharnted	

Parks Authority Group

Behavior Type	Specific Behaviors and SMT's Ratings by Phase									
	Encounter New Info.	Trigger Mechanism	Respons Motivation	Information Processing	Cognitive Action	Results/Purpose				
Rational Any	Scanned	Critique	Utility		ause/Effe		Solve		Adapt	
" "	Focused	1 Explain	1 Measur	1	Classify	2	Identify	1	Understand	1
Exploration	Sought	Wonder	Curiosity		Patterns		Create		Growth	
" "	Open	Excited	Value		Relate		Discover		Learn	
Instinctual	Counter	2 Anger	2 Justify	2	Ignore	3	Control	2	Refocused	2
" "	Avoid	3 Fear	3 lthdra	3	Challenc	1	Await	3	Uncharnted	3

VITA
of
Raymon R. Bruce

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Education

- Phd Public Administration and Public Affairs, Center for Public Administration and Policy, Virginia Polytechnic Institute and State University, Blacksburg, VA, 1992.
- MS Organization Development, Pepperdine University, School of Business and Management, Los Angeles, CA, 1980.
- MA Theatre, University of Montana, Missoula, MT, 1965.
- BA Foreign Language, University of Montana, Missoula, MT, 1962.
German Literature and Philosophy, Rupert-Karl Universitat, Heidelberg, Germany; 1958059

Special Training

- Management Information Systems, National Fire Academy, 1987.
- Center for Futures Research, University of Southern California, 1978.
- Decision Support Systems, Stanford University, 1978.
- Action Research and Planning, National Training and Development Society, Aspen, CO, 1973.
- Computers for Planning & Forecasting, UC Berkeley, 1971.
- Organization Development Lab, UCLA, 1970.

Employment Experience

1984- Present Strategic Management Team, Office of the County Executive; Fire & Rescue Dept., Program Manager for Research and Testing Innovative Fire and Rescue Equipment and Methods, develop Management Information System and Emergency Dispatch System; Fairfax County, Virginia

1967-84 Internal Organization Development consultant, Strategic Action Group for Organization Development. Senior Management Analyst and project leader for statewide computer systems development, personnel analyst; State Compensation Insurance Fund, San Francisco, California.

Consulting Contracts Concurrent with State Fund employment:

1979-80 Special Assistant to the President of Palau, assisted Palau in the transition of their government from a U.N. Trust Territory to an independent republic, U. S. Department of the Interior and The Republic of Palau.

1976-78 Management consultant to the Director of The Valley Medical Center (VMC). VMC includes a 600 bed hospital and is a research and teaching hospital for Stanford University; developed a transition management team to reorganize the Medical Center, to turn around a severe fiscal crisis, and to design an on-line patient information system.

1974-76 Organization Development consultant to the Director of the Personnel Department. Developed team approach to providing personnel services to other county agencies, developed the system requirements for management information system. Santa Clara County, CA.

OTHER

1968-71 Director and Playwright; San Francisco Repertory Company. San Francisco, CA.

1965-67 Assistant to the Producer, Metro-Goldwyn-Mayer-TV, Inc., Culver City, CA

Special Interests & Specialization

- Innovation and Action research in Local Government
- Strategic Management and Planning
- Decision Support & Management Information Systems
- Cognitive Sciences
- Organization Theory & OD
- Social Planning
- Computer Systems development
- Public Policy analysis and implementation

Teaching and Trainer

Training and Education Center, State Compensation Insurance Fund:
Trainer and a member of the curriculum committee that developed courses which included classes in management, communications, organization development, personnel assessment, and team building, 1972-78

American Management Association - Public Sector:
Conducted a three day Management-By-Objectives seminars for government managers, 1976

Golden Gate University, San Francisco:
Co-developed and taught the Capstone Seminar for the Masters Degree Program in Public Administration, 1977

Management Development Institute, State of California:
Consultant to the curriculum committee, developed and taught a course for program planning and budget systems for managers, 1977

Fire and Rescue Academy, Fairfax County, Virginia:
Assisted George Mason University's Decision Support Systems Department develop and present a course on Expert Systems for firefighters, 1988

Graduate Assistant, University of Montana, 1964-5.

Achievements, Honors & Awards

Outstanding Performance Award, Fairfax County, 1989

Program Achievement Award, National Assoc. of Counties, 1986.

Meritorious Service Award, Fairfax Co. F & R Dept., 1985

Best Paper by International Participants, American Society for Public Administration, National Conference, Hawaii, 1982

German Consul's Award for Outstanding Scholarship, 1962

B.A. Foreign Language, with honors 1962

Best Original Plays: University of Montana, 1961, 1965, and Immaculate Heart College, Los Angeles, 1964.

Professional Presentations & Papers

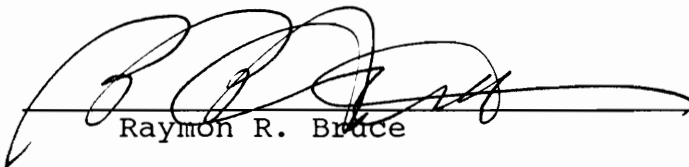
- Presenter and paper, "'Reconnaissance in Neely Gardner's Action Training & Research: Productivity and Organizational Disposition for Change," American Society for Public Administration, National Conference in Chicago, to be presented April 13, 1992
- Presenter and paper, "The Organizational Culture of the California State Compensation Fund; 20 Years After a Large-Scale OD Intervention," American Political Science Association National Conference in Washington D.C., August 5, 1991.
- Co-presenter and paper, "Policy Subsystems," American Society for Public Administrators (ASPA) National Conference, LA, 1990
- Presenter, "Using Expert Systems in Emergency Response & Planning," Capital Artificial Intelligence (AI) Users Group in August, 1989.
- Presenter, "Managing Change in Public Agencies; an International Perspective," ASPA National Conference, Miami, 1989.
- Paper "Recommendation for Reorganization, Organization Development, and Implementation at Santa Clara County" presented by Personnel Director Gary Foss in his paper, "Decentralization of the Personnel Function," at International Personnel Managers Association, San Diego, 1982.
- Paper, (Best Paper by International Participants Award), "Nation Building; The Use of Organization Development in the Emerging Pacific Island Government of the Republic of Palau," ASPA National Conference, Honolulu, 1981
- Presenter and Paper, "Point-of-Action Terminals; Their Impact on the Work Unit and the Organization," American Institute of Industrial Engineers National Conference, San Francisco, 1979
- Panelist, "Organization Development at the State Fund," International Personnel Managers Association, San Diego, 1971

Articles, & Papers Published in Journals, Books & Conference Papers

- "The Organizational Culture of the California State Compensation Fund; 20 Years After a Large-Scale OD Intervention," The Sixth Symposium Issue-Public Administration Review, Ed. Robert T. Golembiewsky, forthcoming in 1992.
- "Organization Theory and Behavior: An Approach to Managing in a Changing Environment, a manuscript by Neely Gardner" co-editing a posthumous manuscript with Professor Frank Sherwood, (in progress)
- "The State Fund Experience; Neely Gardner's Training-Of-Trainers as an Approach to Action Training and Research," accepted by Public Administration Quarterly, forthcoming, in 1992.
- "Policy Subsystems," with Professor Gary Wamsley, (in peer review)
- "What's New?" regular column on innovations in On Line, Fairfax County Fire and Rescue Department monthly magazine.
- "R&D: An Old Concept In a New Setting," Fire Chief, January, 1986.
- "Organization Development in a Medical Center," Health Care Management Review, Fall, 1978.
- "Point-of-Action Terminals; Their Impact on the Work Unit and the Organization," published in the Conference Papers: American Institute of Industrial Engineers National Conference, San Francisco, 1979

Organization Research Instruments Developed

- Cooperative Coping: a Computer Aided Group Decision-Ware (1992)
- Organizational Disposition For Change: a research instrument (1991)
- Issue Exploration for Strategic Management (1989)
- Group Climate Action Research Instrument (1974)
- The Art of Consulting Through Listening (1973)
- 'Do It Yourself' Team building Kit (1973)
- Universe Survey; An Approach to Pre-Planning (1972)



Raymond R. Bruce