

**WORKING "FASTER, BETTER, CHEAPER": A FEDERAL RESEARCH AGENCY IN
TRANSITION**

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(Abstract)

This research study explored the theoretical underpinnings of implementing government reform in the National Aeronautics and Space Administration (NASA), specifically focusing on a management philosophy called “Faster, Better, Cheaper” (FBC). It is situated within the broader context of Government reform efforts that attempt to increase the efficiency and effectiveness of government organizations in their delivery of products and services to the public.

This study employed the Grounded Theory qualitative research methodology that concentrates on a central phenomenon and generates a theory from a category or “construct-oriented” approach. The objective is to generate a substantive-level theory that describes the practice of FBC within NASA and is “grounded” in the data collected from the organization. The following research questions guided this study:

1. What is the meaning of “Faster, Better, Cheaper” for Public Professionals in the NASA organizational environment?
2. What are the interrelationships between concepts of “faster”, “better”, and “cheaper”?
3. How does the technical and cultural structure of NASA influence the implementation of “Faster, Better, Cheaper”?
4. What are the required workforce capabilities to perform “Faster, Better, Cheaper” in NASA?

The theoretical sample for this study consisted of interviews scheduled with NASA personnel involved in “Faster, Better, Cheaper” projects. NASA documents and reports were analyzed to saturate the initial 29 provisional categories. A representation of the phenomenon of FBC was developed following the data analysis, including causal conditions, strategies, environmental conditions and context, and consequences. Several findings addressed the meaning of FBC, the interrelationships between the concepts, the impact of organizational infrastructure, and required workforce capabilities. Topics for future research are the nature of risk in public organizations, tools for aligning and measuring public policy alignment and implementation, leadership of public sector teams, and generalizing the findings to other organizations.

Dedicated to my father, James A. Boyle Jr.

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CHAPTER I: INTRODUCTION

This research study focuses on the National Aeronautics and Space Administration (NASA) within the context of the new public management (NPM) and Government Reform, and the workforce development issues that accompany this environment. NASA is recognized as a world leader in scientific research and in the development of cutting-edge technologies. In many ways, NASA is viewed in the public and private sectors as a model organization for the modern age, one that exemplifies the achievements of humankind through use of scientific inquiry and application of innovative technologies. Today, the mission of NASA contains three basic elements (Sisung, 1999):

- As a research and development agency, it seeks to advance and communicate scientific knowledge of the earth, the solar system, and the universe, and it aims to use the environment of space as much as possible for its research activities.
- The Agency seeks to explore, use, and enable the development of space for human enterprise.
- NASA attempts to research, develop, verify, and transfer advanced aeronautics, space, and related technologies to industry and the public.

The environment that NASA originally learned to excel in has shifted dramatically over the past decade, just as it has for many government organizations. The last decade has been one of budget cuts and relentless technological advances. In light of this environment of accelerating changes, it is easy to overlook that the genesis of NASA occurred during a very volatile and dangerous period of world history, and that the objectives NASA were inextricably tied to national security interests of the United States and its allies during the Cold War.

NASA is now over forty years old, and the Cold War has been won. Government reform, driven by accelerating technology and systems, is attempting to sweep away inefficient and ineffective public policies and practices in order to make government more responsive and adaptable to people's needs. Can NASA survive and prosper in this new era of technological acceleration, modern government politics, Government reform, a changing international climate, and a blurring of the boundaries between private and public organizational agendas and responsibilities?

Background of the Study

The public has not been receptive to the idea of more and bigger government since the Vietnam War and Watergate. There has been steady erosion in the ideas that

government can provide the answers, and that government can be trusted. America has not been alone in this transformation. Since 1945, public sector expansion worldwide has steadily increased over the past decade, and has spawned reform movements as a result of poor service delivery and economic difficulties.

In the United States, Congress and the Executive Branch have taken steps to fundamentally change the government agencies. This has been in response to recurring management problems across Federal organizations; the requirement to reduce the yearly budget deficits; and public demands for government a leaner and more efficient government as well as a more effective one. Congress passed the Chief Financial Officer's (CFO) Act of 1990, the Government Performance and Results Act of 1993 (GPRA), the Government Management Reform Act of 1994, and the Information Technology Management Reform Act of 1996 in response to these demands for government reform. The Executive Branch, under the leadership of Vice President Al Gore, initiated the National Performance Review (NPR) in 1993, later called the National Partnership for Reinventing Government. Together, these activities force government agencies to focus on results, and create a business-like environment for management and accountability purposes. Taken together, the initiatives embrace several different business methodologies that claim to improve organizations, such as Total Quality Management, Business Process Reengineering, Full Cost Accounting, and Empowerment.

Organizational Improvement

The goal of the majority of private sector organizational improvement activities is to create a better infrastructure that captures competitive advantage to improve the delivery of products and services. Competitive advantage is not a given property of an organization, but must be strived for in a conscious and continuous fashion as demonstrated by the business failure of many organizations that do not pursue improvement activities. In business, competitive advantage is geared towards survival and prosperity of the organization, with elimination or mitigation of the competition as a result, a Darwinian "survival of the fittest" for organizations. In an opposing view of organizational improvement, Deming (1993) noted that competition is a destructive process, and that it is more preferable for people to work together in a system that allows everyone to win. This view possesses significant meaning for NASA, as can be seen as this research project progressed.

Regardless of the underlying philosophy, organizational improvement theories and methodologies usually focus on the elements of people and processes, and the management of these elements in an organizational system guided by its mission, the reason for being. The management of this system involves several dimensions of activities, including the manipulation and deployment of information, the timing and synchronization of efforts, the technical structure that supports the implementation of

business processes, the defined functions that the organizational structures perform, the resources required for the organization, and the behavior of the individuals and teams that implement and operate the business processes. This system is how the organization meets the needs of its members, customers, and stakeholders. The system is grounded in the attributes of business activities, including cost factors, human resources issues, mathematics and metrics, quality and customer service, and science and engineering project and product management. An example of methods applied to business activities to achieve continuous improvement in this system includes Total Quality Management, ISO 9000, Six-Sigma, Full-Cost Accounting, Activity-Based Costing, Project Management, Concurrent Engineering, Systems Engineering, Malcolm Baldrige Quality Criteria, Value Engineering, Empowerment, Teams, Integrated Product/Process Development, Design-for-Cost, and Design-for-Quality. Many of these methods have been embraced and implemented by Government reform advocates, some in a piecemeal fashion, others in a more strategic way.

NASA and Government Reform

The end of the Cold War resulted in the questioning of the need for NASA's existence, since the focus of this particular government Agency had been to beat the Soviets to the moon. The downsizing and budgetary pressures that have resulted from mandates by the Executive Branch and Congress have severely affected operational effectiveness and employee working conditions in NASA. Additionally, the pace of technology has driven NASA (as well as the rest of the government) into a competitive environment for talent in which the private sector can offer significantly better rewards for technological capability.

The rapid pace of technology has also flattened the NASA hierarchy and pushed information availability and access to the project team level, requiring strong project leadership skills to be demonstrated by all team members. NASA is shifting to a technology-based organization, with information available to every employee. Project managers must now be business people as well as technical experts for a project to succeed, requiring the learning of completely new skill sets. The project environment has grown increasingly fragmented and complex in terms of the number of stakeholders, customers, international issues, support requirements and resources, performance requirements, testing requirements, public interest requirements, mission parameters, scientific expectations, technology resources and impact, budgetary issues, and private-public sector teaming arrangements. Included in this environment are the changing attitudes and values that exist between the genders, between cultures, between organizations, between nations, between disciplines, and between individuals, to name but a few sources of differences. Interdependence and networking are keys for success, but are difficult to achieve in this world of differences.

In response to these challenges facing the organization, former NASA Administrator Daniel Goldin began a new policy initiative in 1992 that emphasized doing more with less. He termed this approach “Faster, Better, Cheaper” (FBC), and believed that the future of the Agency hinged on the success of projects that were executed under this paradigm. Goldin realized that more frequent less expensive missions were needed in order to deliver the science, and that the science projects could not compete with the manned efforts of the STS and the International Space Station. NASA would become irrelevant if it could not produce scientific value on a more frequent basis, and be able to prove this value to the public. This shift in emphasis coincided with the overall emphasis of former Vice President Gore’s Government Reinvention program to conduct government activities in a more businesslike environment.

“Faster, Better, Cheaper”

Dan Goldin challenged NASA and its government, industry, and academic partners to conduct business in a FBC mode. He directed NASA to focus on smaller missions, to incorporate advanced technology into missions, to reduce NASA Headquarters and shift more program responsibility to the Centers, to construct exciting visions and roadmaps in aggressive planning for future missions, and proclaimed that “It’s OK to fail!” (NASA FBC Task Report, 2000).

Some of the concepts represented by FBC are in many ways a worldwide trend. International organizations are moving to project-based infrastructures in order to cope with rapid change in the globally competitive environment. Technology, or the application of science, plays an increasingly big role in this change, moving hand-in-hand with changes in the workplace and in societies. Rapid change and the changing nature of work are forcing organizations to simultaneously deal with many levels of problem solving under severe time pressure. It is hard to argue against doing things faster, better, and cheaper. In this era of governmental reform, organizations are forced to show value delivered for every dollar spent. Delivering products and services faster is usually easily defined. Given the budgetary pressures for government agencies, delivering products and services in a less costly manner is practically mandatory. The trick is to deliver these products and services in a timely fashion, costing less money, and with better quality and customer service.

At one point, FBC projects were taking root and are spreading across NASA. The reputation of the Agency was tremendously enhanced through several FBC successes, and Dan Goldin was acclaimed as one of NASA’s most effective Administrators. However, the long-term success and continued growth of this new way of business depended on the technical and cultural mechanisms that allowed individuals and teams to overcome obstacles and achieve personal and organizational goals and objectives. Critics of the agency say that despite the efforts towards FBC,

most programs are trapped by a bureaucratic tendency of planning missions that are big, slow, and expensive, selling programs to the public and Congress by understating their costs and overstating their usefulness, such as the STS, originally proposed in 1972 at a cost of \$88 million per launch and now costing \$1.8 billion per launch (Sisung, 1999).

Criticism grew towards the FBC approach because of several high-profile mission failures. These failures are described in the Historical Perspective in Appendix I of this dissertation. In particular, the Mars Program Independent Assessment Team found that the lack of an established definition of FBC policies and procedures to guide implementation resulted in project managers having different interpretations of what constitutes prudent risk (NASA Mars Program Report, 2000). In a major attempt to define FBC, NASA found that there were several definitions and perceptions of FBC in the Agency, and because of these mission failures, the FBC study panel recommended that project managers and project team members should be “certified” in terms of competencies and capabilities (NASA FBC Task Report, 2000).

NASA is doing more missions in less time, and is doing more activities in parallel. In creating these efficiencies, the Agency is spending less money to achieve scientific results, applying new technologies in order to achieve results that were out of reach only a few years ago. The Viking missions landed missions on Mars for \$2 billion: Mars Pathfinder landed a scientific mission on Mars for \$250 million. NASA is attempting to achieve competitive advantage by delivering products and services that cost less, are delivered in a timely fashion, and provide value for the customer.

Statement of the Problem

NASA is realizing that it does not currently possess adequate knowledge to be able to function as well and successfully as it has in the past where there were unlimited budgets and political support. The current political climate is one that demands a focus on results and accountability. There are also too many interconnected differences within the organization that have been accelerated and amplified by the advance of technology systems, and a lack of understanding of what the “Faster, Better, Cheaper” approach to project management really means to NASA at each level of the organization and across the organization.

In taking a cursory examination of FBC, the concepts of faster, better, and cheaper may not be mutually exclusive. Does better mean better science? Does it mean more missions successfully achieved within a prescribed time? Does it mean less cost when compared with similar missions? Does it mean happier employees and less burnout and stress? Does it mean more value for the taxpayer in terms of a better life? The concept of better may carry a multifaceted interpretation that can in some cases define faster and cheaper. It also may be true that the concept of better may be

meaningless outside of the context of faster and cheaper. Within the broader boundaries of organizational improvement, the concept of better possesses many meanings depending on the philosophical and theoretical approach employed. Is it any surprise that NASA was struggling with the meaning of better in terms of its FBC management approach?

Change is occurring more rapidly than the ability of NASA to effectively deal with it. Policies and procedures cannot be developed quickly enough in this era of accelerating technology and increasing information flow. Adding to this, NASA is facing a problem that all government organizations are facing: government reform activities usually emphasize flexibility for government employees to do their jobs, and responsiveness and accountability in terms of serving the American public. This affects both the technical bureaucratic organization and the cultural aspects of governmental organizations, since they are organized as traditional rule-bound bureaucracies that carry out the majority of functions internally. Despite this, it is telling that even in the face of the recent FBC failures, the Mars Independent Assessment Team stated that “Faster, Better, Cheaper, properly applied, is an effective concept for guiding program implementation that should continue” (NASA Mars Program Report, 2000). FBC is here to stay, regardless of what it might be called in the future. If this is so, what will this new environment look like, and what are the workforce development requirements that will allow NASA to succeed?

Purpose of the Study

The purpose of this Grounded Theory Case Study is to examine and understand what it means to be “Faster, Better, Cheaper” within the context of the NASA organization and culture, and how this is supported by their workforce. NASA cannot return to the Apollo years and the business processes of the past even if it wanted to. Modern public administration demands that the organization adapts to current and future political, economic, technical, business, and social realities. NASA chose and highlighted the FBC approach as one of the major ways that they did business. The FBC approach was the way that NASA approached the mandate of government reform, thereby making FBC a high profile policy that deserves study in terms of efficiency, effectiveness, and impact. The FBC approach was claimed as consistent with Osborne and Gaebler’s treatise, *Reinventing Government* (1992), advocating the banishment of bureaucracy in order to achieve a better and more responsive government. Despite the high profile of government reform activities and the embrace of the concepts, theories, and methodologies by the public and private sectors, scholars have noted that it is striking how little critical discussion has been achieved in the literature on the adoption of these new government reinvention principles (Moe, 1994).

Significance

NASA is undergoing significant change as part of the overall government reform movement. It has changed from the immense bureaucracy that placed men on the moon to a new organization that was required to do many of its missions “Faster, Better, Cheaper”. In the continuing current environment of downsizing and budgetary cutbacks conducted within the context of government reform and new public management, NASA could be eliminated or severely curtailed unless it can prove its value. Compounding this impetus for change is the fact that NASA operates everyday in a dangerous and unpredictable environment: things can go wrong in an instant, resulting in high-profile expensive failures and possible loss of life. It has undergone a painful transition to adapt the new budget realities, and has radically reinvented the way that it conducts business. However, the FBC approach generated several notable and expensive failures. The failure board investigations raised several troubling issues with FBC, one of which was particularly damning: there were several meanings of FBC that existed between the various Centers and across the four Enterprises of Aerospace Technologies, Human Exploration and Development of Space, Earth Science and Space Science, and potentially several paths to achieve mission success. These reports also criticized the development of project managers, and in many cases specified a different type of skill mix than what was needed by NASA in the past.

This study helps to advance the discussion of the effects of NPM and government reform. There is a reflexive embrace of these concepts and theories across the government and private sectors, but little critical discussion as to whether these approaches are effective or ethical within the context of a democracy. This study also clarifies the new expectations concerning performance and capability that personnel must address to succeed in NASA. The more the Agency understands what FBC was and how it continues to impact the organization, the better chance it has of continuing successfully through the gauntlet of government reform and achieving real value for its customers (the American public) and its stakeholders (the Executive and Congressional branches of government, academia, private industry, other government agencies, and international partners). Additionally, the lessons learned by NASA in trying to achieve FBC may be relevant to the broader context of other government research agencies operating under the philosophy of government reform.

Research Questions

The following questions guided this study, and served as the basis for the development of categories using the iterative research and analysis cycle of Grounded Theory methodology:

1. What does FBC mean for Public Professionals in the NASA organizational environment?

2. What are the interrelationships between the concepts of “faster”, “better”, and “cheaper”?
3. How does the technical and cultural structure of NASA influence the implementation of “Faster, Better, Cheaper”?
4. What are the required workforce capabilities to perform “Faster, Better, Cheaper” in NASA?

In terms of organizational development and organizational improvement methodologies, this study clarifies the concepts that should be considered for government organizations implementing these reform activities. The research questions will reveal data in other salient categories that will potentially require further scholarly investigation in the areas of leadership, change, philosophical frameworks of reform, strategic management and planning, and workforce development.

Organization of the Paper

The current literature for this research study is covered in Chapter II, Literature Review. This review uses the literature review to stimulate thinking about properties or dimensions that can be applied to the collected data under the Grounded Theory approach. The review fosters conceptualization of theory development from the collected data, and enhances the iterative process of collection and analysis. This literature review intentionally concentrates on a broad-based review of recent work on organizational reform and relates this work to a proposed theory development process that integrates often-contradictory concepts of organizational change to the management of scientific organizations in the Federal structure. The literature review covers organizational development and improvement processes in general, moves to the conceptual framework of government reform activities, and closes with a focus on the impact of this framework on government agencies, in particular NASA.

Chapter III, Methodology, covers the Grounded Theory methodology and how it will inform this particular dissertation. Topics covered include sites and subjects, researcher considerations under Grounded Theory, interpretive paradigm, research strategy, and procedures for data collection and data analysis. Chapter IV, Analysis, covers the analysis of the interview data and relevant documents using the Grounded Theory approach. Chapter V, Discussion, Conclusions, and Recommendations, contains the substantive-level theory that emerges from the data analysis, interpretations and discussion of conclusions drawn from the research, and provides a roadmap for future research.

The historical context of NASA is outlined in Appendix A, covering the evolution of NASA from its roots in the National Advisory Committee on Aeronautics

(NACA) up through its present configuration under the banner of “Faster, Better, Cheaper” (FBC) championed by Dan Goldin, the former NASA Administrator that shaped development and implementation of FBC policy. Appendices B and C contain an example coded interview and the codebook used for development of the data categories. Appendix D contains Summary Tables that consolidate the Grounded Theory data analysis logic developed in Chapters IV and V of this study.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This literature review will cover several approaches that have been used in pursuit of organizational improvement through organizational development, making a better organization. The review will then consider the revolution occurring in public administration, and the impact that these organizational improvement activities is having on government organizations. It will examine the recent literature emphasizing the conceptual and theoretical basis for this new movement of government reform, or the new public management (NPM), including a look at the role of leadership as part of the management aspect of people, processes, and technologies. Included in this will be a look at implementation of government reform and public administration conceptual and theoretical frameworks, and several case studies.

Conceptual and Theoretical Framework

Organizational development can be viewed as an improvement strategy that applies behavioral science principles and practices to increase individual and organizational effectiveness, a process of planned change that attempts to make organizations better able to attain their short and long-term objectives (French, Bell, & Zawacki, 2000). The management of this social-technology system involves several dimensions of activities, including the manipulation and deployment of information, the timing and synchronization of work, the technical structure that supports the implementation of business processes, the defined functions that the technical structures perform, the resources required for the technology, and the behavior of the individuals and teams that operate the business processes. In this sense, the social-technology system is the mechanism through which the organization meets the needs of its members, customers, and stakeholders. This system is grounded in attributes that are considered critical for achieving the organizational mission, such as business, cost, human resources, quality, and engineering.

NASA is not alone in its efforts to try to do things “Faster, Better, Cheaper”. The private sector has embraced several methodologies over the years to achieve organizational development and organizational improvement towards their desired results in the face of increasing change. Government reform is now a major effort that cuts across national boundaries, where issues of efficiency, representation, participation and accountability are becoming central to the role of the state (United Nations Research Institute for Social Development, 2000). Regardless of the type of organization involved, organizational development and improvement theories and methodologies often focus on the elements of people and processes, and the management of these elements in an organizational system guided by purpose, the reason of the organization for being.

Bennis (1966), in an article that contributed to the modern day foundation of organizational development and change, discussed the effects and pace of change on society, and how these changes would tremendously affect organizations. He felt that, in order to survive, organizations needed to be more receptive and adaptive to new trends and influences, and that management techniques and methodologies needed to evolve in order to effectively work with transformed values, environment, goals, structure, and motivations. Bennis and Slater (1968) made several predictions that have come true in the Information Age: they predicted an American society that consisted of temporary systems, nonpermanent relationships, turbulence, uprootedness, unconnectedness, mobility, and tremendous social change. They also predicted that democracy, an institution that increases the power and availability of individuals uncommitted to the status quo, was inevitable and was fueled by the accelerating rate of technological change.

Bennis and Slater go on to predict that bureaucracy was doomed due to its inability to address issues of integration of organizational and personal goals, distribution of power and authority, collaboration, adaptation, definition of identity in complex environments, and revitalization during accelerating change. In the world of work, temporary systems will carry the day, led by people who can integrate, collaborate, create synergy, create supraorganizational goals and commitments, and engage in an iterative action-research model of data-generation, feedback, and action planning.

Leigh and Gifford (1999) report in a study using data from the 1993 National Longitudinal Survey of Youth that workplace transformation is a commonplace occurrence, with 40% of private sector workers reporting that a change occurred in the workplace that required them to learn new job skills, and 23% reporting that they experienced a workplace change categorized as organizational transformation. Greengard (1998) covers the amazing transition of the world economy from the Industrial Age to the Information Age over the past 20 years, and covers a litany of predictions from several worldwide experts: telecommuting and flexible workspace design will accelerate; use of time as a measure of productivity will decrease; multicultural work teams will increasingly apply technology to work with each other virtually and will routinely “follow the sun” in work patterns that moves projects 24 hours a day around the world; business rules will increasingly emphasize innovation, knowledge, and computer literacy; organizational structures will link people by what they know versus job titles or ranks; tracking training and career development will become increasingly important, and virtual environments will deliver the training; and the workforce will become more dynamic through part-time workers, consultants, specialists, and contractors. Kemske (1998) adds that the transition to collaborative cultures will continue to accelerate, and that traditional bureaucratic hierarchies are on the way out.

These changes have had a profound impact on the private sector. Competitive advantage has emerged as the key element on whether an organization will survive and prosper, and low cost and high quality have emerged as standards to judge the level of advantage that an organization possesses. In order to achieve competitive advantage, strategic management processes have been implemented so that companies can create a strategy to achieve the defined vision and objectives of the organization. Using the definition that was previously given for organizational development, we can focus on the results desired by business organizations in the private sector. These desired results can be viewed through the concept of competitive advantage.

Porter (1985) specifies that competitive advantage grows from an activity-based view of an organization. It is at this level that value and costs are created for customers. Porter advocates the identification and definition of value chains, enabling managers to isolate value and cost drivers within activities, determine how activities interrelate internally and externally, and how the organization can leverage technologies to achieve improved output through the value chains. Organizational improvement efforts through organizational development in the private sector are often targeted to the twin results of efficiency and effectiveness in achieving competitive advantage in the short and long-term. As radical change has enveloped the private sector, organizations have been forced to adapt to new ideas and innovations. These concepts as applied to the private sector in achieving competitive advantage are now reverberating throughout the public sector, and these organizations are being forced to confront these changes as well.

Congress and the Executive branch have mandated that strategic management activities will occur in Federal agencies, and that these efforts will be evaluated and graded annually. Thomson and Strickland (1999) define strategic management as the development and management of a company's strategy for positioning the company in its chosen market arena, competing successfully, pleasing customers, and achieving good business performance. They outline five tasks for management in the area of strategic management: forming a strategic vision of the future business makeup and where the organization is headed; setting objectives in terms of specific performance outcomes; crafting a strategy to achieve the desired outcomes; implementing and executing the chosen strategy efficiently and effectively; and evaluating performance and initiating corrective adjustments in vision, long-term direction, objectives, strategy, or implementation in light of experience, changing conditions, new ideas, and new opportunities. In this light, the complimentary relationship of strategic management to achieving competitive advantage is clear. The strategy refers to the ideas, plans, and support that organizations use to compete successfully with their rivals, or in other words, gain competitive advantage so that an organization generates successful performance over an extended period of time (Pitts & Lei, 2000). Competitive advantage grows from effective strategic planning activities.

Government organizations around the world are radically transforming the way they accomplish their mission because of several pressures. Bangura (UNRISD, 2000) specifies four major global pressures that are driving public sector reform efforts. The first is financial globalization, which has driven the spread of global markets of goods and services and created the need for ease of transfer of funds across countries in order to provide the monetary impetus for growth. The second is fiscal deficits, driven by Western policy makers associating high inflation rates, slow or negative growth, imbalances in external accounts, and low domestic investments with the marked deterioration of government finances. The need to control these budget deficits in order to get economies out of inflation and recession and to promote the private sector came to the forefront. The third is structural adjustment, driven by multilateral institutions such as the World Bank and the International Monetary Fund (IMF). The World Bank emphasized civil service restructuring, pay and employment reform, privatization, decentralization and marketization of public services, while the IMF pushed for aggregate fiscal balances, transparent budgetary practices, expenditure controls and tax administration. The fourth is democracy, which is linked with better representative and more accountable forms of government and dissatisfaction with the cost and quality of public service.

Science and computer technologies are driving the creation of a world with new rules, where some organizations born in the modern industrial era are ill equipped to cope. Concepts such as customer service and performance measurement have moved to the forefront, concepts that have been imported from the competitive marketplace. In terms of human resources, adult learning has become a critical issue in workforce development where organizations may not be able to survive unless they can tie their strategic planning activities to workforce development. The translation of public administrative policy across a government organization is a particularly vexing problem, since most present-day American government institutions were designed in the industrial era and were never meant to address the issues that are facing private sector corporations in a modern information society.

For NASA, these issues have proven to be particularly important as they struggle to move from the successful legacy of the past to assume a new leadership role as a scientific research organization for the future. As with other government agencies, NASA has embraced the new realities of public administration in modern government, and developed the management paradigm of "Faster, Better, Cheaper" to comply with the competing demands of greater performance under constricted resource availability and demands for more accountability. The following sections will look at the major organizational improvement approaches that have been used to achieve better organizational results through strategic planning processes in order to gain competitive advantage.

Fundamental Interventions

Argyris (1970) defined organizational intervention as an entry into an ongoing system of relationships in an organization, to come between or among persons, groups, or objects for the purpose of helping them. These can be diagnostic or problem solving in nature, and encompass a variety of methodologies and tools. The dimensions of these interventions can assume a variety of configurations. Blake and Mouton (1964) classify interventions in terms of causes and mechanisms: discrepancy interventions for contradictions in actions or attitudes; theory interventions for explaining present behavior and assumptions underlying the behavior; procedural interventions critiquing a process and whether the best methods are being used; relationship interventions focusing on interpersonal issues; experimentation interventions testing two different action plans in terms of consequences; dilemma interventions that examine choices in responding to imposed or emergent situations; perspective interventions that emphasize looking at historical background, present context, and future objectives prior to decision-making; organization structure interventions that examine possible structural causes of organizational ineffectiveness and inefficiency; and cultural interventions that study the traditions, precedents, and practices of an organization. Blake and Mouton (1964) specify that the application of organizational interventions, the size of the client group, the level of the client group in the organization, and the relationship across the organization must also be taken into consideration in order to manage the scope of the intervention.

Quality Approaches

The quality arena possesses several approaches that have been implemented by organizations over the last several decades. These include Six Sigma, Total Quality Management, the Malcolm Baldrige Quality Award criteria, and ISO 9000. Six Sigma (Harry & Schroeder, 2000) was developed by Motorola in the 1970s as a general system that measured quality, produced quantifiable results, and established a world-class quality goal. It strives to eliminate defects and their causes from an organization's processes, focusing on outputs that are defined by the organization's customers. Sigma is the Greek letter used to designate a standard variation from a normal bell-shaped curve, where the higher the sigma, the fewer the number of defects. One Sigma equals 690,000 defects per million opportunities, with organizations functioning at the Six Sigma level producing 3.4 defects per million. A geometric improvement occurs at each level. Two Sigma displays a two-fold improvement over One Sigma, but Six Sigma requires a 75-fold improvement over Five Sigma.

Motorola won the first Malcolm Baldrige National Quality Award in 1988 due to Six Sigma. In quantifiable terms, Motorola realized \$2.2 billion in savings when it advanced from Four Sigma to Five-Point-Five Sigma in the early 1990s. A Six Sigma initiative begins with a detailed survey of critical customer requirements by senior

management. The quality leaders then identify activities that are negatively affecting critical requirements, and management establishes a cross-functional team to carry out a four-phase methodology of measuring key processes that influence customer requirements, analyzing the defect data through statistical tools and uncovering root causes, improving through quantification of the impact of identified variable and implementing change to keep performance within acceptable ranges, and controlling through statistical process control tools. Production and availability of automated information is critical for the success of this approach.

Total Quality Management (TQM) is an American approach to management that is based on the writings of Deming (1993). Total quality management is a management approach for an organization, focused on quality, based on the participation of all of its members, and aiming at long-term success through customer satisfaction and benefits to all members of the organization and to society. Deming believed that management has the responsibility of constantly improving the quality of products and services, and a result decreasing costs, capturing markets, providing jobs, and increasing dividends. For Deming, the goal of management is to achieve a stable system through the removal of special causes of trouble that are detected by statistical clues in the processes of the organization. In TQM, Deming specified 14 points that applied to quality in organizations: creating a constancy of purpose for product and service improvement; adopting a new philosophy of quality; ceasing dependence on mass inspection; ending the practice of awarding business on price alone; constantly improving the system of product and service; instituting training; instituting leadership; driving out fear; breaking down barriers between staff areas; eliminating slogans, exhortations, and workforce targets; eliminating numerical quotas; removing barriers to pride of workmanship; instituting a vigorous program of education and retraining; and taking action to accomplish the transformation.

Chatterji and Davidson (2001) observed that, despite losing momentum and stagnating, TQM efforts have helped R&D organizations to focus on the customer, and changed the mindset of R&D managers to accept the benefits of continuous improvement, from eliminating administrative inefficiencies to strengthening cross-functional and cross-organizational linkages and teamwork. Walton (1986) emphasizes the importance of statistics in the implementation of TQM in an organization, on basing management decisions on accurate and timely data derived from tools such as cause-and-effect diagrams, flow charts, Pareto charts, run charts, histograms, control charts, and scatter diagrams. These seven quality control tools provide techniques for a structured approach to business problem analysis and solution that is a prerequisite for improvement. Seven management tools were developed for problem solving when there is little or no data to make decisions. These include the affinity diagram, the relationship diagram, the tree diagram, the matrix chart, the matrix data analysis chart, the arrow diagram, and the process decision program chart (Cartin, 1995).

The Malcolm Baldrige Quality Award program is managed by the National Quality Program of the National Institute of Standards and Technology (NIST), a part of the U.S. Department of Commerce. The Award is named for Malcolm Baldrige, the Secretary of Commerce from 1981 until his death in 1987. NIST publishes the "Criteria for Performance Excellence" annually, updating the criteria to reflect learning from the previous year's award winners. The American Society for Quality (ASQ) administers the award program under contract to NIST. The Baldrige criteria are designed as a descriptive or diagnostic framework, not a prescriptive model, to achieve excellence in product and service quality. There are several core areas that are evaluated using the criteria: Leadership; Strategic Planning; Customer and Market Focus; Information and Analysis; Human Resource Focus; Process Management; and Business Results. The criteria reflect many of the common themes that run through the majority of quality-oriented management systems.

ISO 9000 (Kantner, 2000) is a business rules system published by the International Organization for Standardization that defines universally recognized business practices ensuring quality and customer satisfaction. This system is applicable to both the provision of products and services, and can apply to all businesses and industries, including government organizations. The requirements in the system fall into four basic types: output requirements covering products and services; quality system requirements covering implementation and verifiability; requirements covering the effectiveness metrics of various aspects of the business system; and requirements that support continuous improvement of the business system. Organizations that proceed through the ISO 9000 process are aiming towards registration, which refers to the successful completion of a quality audit by an independent outside registration body.

Kantner (2000) specifies the following benefits in achieving ISO 9000 registration for an organization: improved customer focus and processes; improved continuous improvement; process consistency; strengthened customer and supplier relationships; increased customer confidence; improved management decision-making; institutionalized training; reduced dependence on individuals; and added value to all business processes. The ISO 9000 registration process consists of four major phases: preparation, documentation, training, and audit. Once the registration has been achieved, there is a recertification that occurs either annually or semi-annually. Kantner cautions that, as with any managerial improvement methodology, the organization must pursue it for the right reasons. Some organizations may feel that they are coerced into implementing ISO 9000 and achieve only superficial change in the way they do business, and that ISO 9000 is sometimes implemented in parallel with other major change efforts in an organization, resulting in added confusion and lowered morale.

Chu and Wang (2001) surveyed public sector services in Taiwan and found that there are five critical factors affecting ISO 9000 implementation in the public sector. The

factors are top management capability and involvement, policy and management support, level of ISO awareness, level of cooperation among divisions, and degree of resistance from employees. The reasons for adoption of ISO were consistent with Government Reinvention drivers such as enhancement of service quality, improved administrative efficiency, and organizational structure reform. The researchers cite the need for empirical research and caution that ISO 9000 is a mechanism that requires careful management, and that, echoing Kantner's concerns, transfers of these practices from the private sector to the public sector need to be made for the right reasons, not because of policy pressure.

Statistical Quality Control (SQC) was refined by Edward Deming and Joseph Juran over the years during World War II and beyond. The process identifies the quality and productivity attributes of a product or service system and applies statistical techniques in order to see if variations from the process are due to random chance or systematic error that can be eliminated or mitigated. It plays a major role in the management system of TQM, but specifically concentrates on the identification and analysis of data.

Process and System Approaches

A work or business process is made up of discrete steps, tasks, or activities with a beginning and an end. At the input stage, resources are introduced into the process towards the goal of producing either a tangible product or an intangible service at the output stage. Process mapping (Galloway, 1994) is a method for visually depicting the steps that make up a task or process where the process map is used to understand the process and identify problem areas.

Business process reengineering, or BPR (Hammer & Champy, 1993), focuses on cost reduction by improving organizations through the elimination of low value functions in business processes, resulting in the creation of new and less costly processes to take their place. BPR has also been closely identified with the use of information technology in order to achieve development and implementation of these new processes. BPR has gained a bad reputation because it was perceived as an excuse to lay off employees as cost reductions were achieved through process redesign, resulting fear that jobs were in jeopardy when BPR initiatives were implemented.

Moosbrucker and Loftin (1998) studied cases that suggest that there is a tremendous need for information technology, organizational development, and business-process reengineering to understand each other in terms of language and history, organizational paradigms and tools, organizational structure inhibitors to collaboration, and divergent values before any BPR initiative can be successful. Nader and Merten (1998) have specified three judgments related to the failure of BPR to achieve its intended outcomes: the simplistic presentation of BPR in popular journals

and media despite a lack of theoretical maturity; the rapid growth in the number of companies interested in BPR outgrowing the availability of experienced and knowledgeable people; and the people leading BPR efforts adapting their core competencies without appreciating the value of other disciplines.

Japan has taken Deming's original concepts on quality management and has consciously applied new technology for high customer value (high quality and low cost). This process is called an integrated product and process development (IPPD) technology that includes simultaneous design and manufacturing of a product, similar to the concepts that underpin concurrent engineering and systems management principles. Technological innovation has been a cornerstone for Japanese success in obtaining competitive advantage, and can be seen today in the application of advanced information and robotic technologies in many manufacturing processes.

Cost Approaches

Management accounting processes have been an important consideration in the transition from the old industrial environment to today's information intensive and globally competitive business environment. Modern manufacturing technologies have produced high-quality, innovative new products and services at a lower cost and with greater customer satisfaction. This type of environment demands a management accounting process that is responsive to the requirements of the management decision-making process.

Johnson and Kaplan (1987) claim that the management accounting practices being used by many modern organizations are obsolete and are ill-suited for the modern competitive environment, in particular the lack of ability of management accounting systems in providing accurate information for decision-making, its traditional focus on internal organizational operations to the exclusion of the external competitive environment, and that financial accounting product costs are being used for management accounting purposes (since external financial accounting requirements to third parties have largely superseded internal organizational accounting requirements in importance). Bhimani and Bromwich (1992) reviewed these arguments for management accounting reforms, but caution that the process of reform needs to be an evolutionary one that incorporates effective new tools for costing output, pricing products and services, appraising new investments, reporting non-financial attributes, and managing financial resource allocations within companies.

Activity-Based Costing (ABC) and Activity-Based Management (ABM) are currently being implemented in both the private and public sectors. ABC is the collection of financial and performance information on the important activities of an organization. ABC attaches costs to products and services that reflect the demand and consumption of resources from the organization's overhead by that particular activity.

Innes and Mitchell (1992) stress that a good ABC system avoids simplistic cost categorization and forces a realization that all costs can be viewed as variable with respect to a wide array of potential cost drivers. The authors go on to say that managers develop a better appreciation of the total demands that individual products and services place on organizational resources. For ABM, Brimson (1992) explains that it is a management approach that focuses on total quality, continuous improvement, cycle-time reduction, and non-value added elimination. Brimson clarifies that ABM employs the procedure of ABC for collecting costs and applies this information at the enterprise level to determine whether the activities support strategic objectives, what the performance improvement potential is for each activity, and how the activities support operational and strategic decisions. Another closely related management paradigm is Strategic Management Accounting, which adds the dimension of focusing on consumer values relative to competitors in terms of costs incurred in maintaining competitive advantage (Bromwich, 1992).

Planning Programming Budgeting Systems PPBS works at the strategic level and then drills down to costs. Pendlebury (1992) describes the process as a very rational approach to resource allocation where the overall organizational objectives are determined, programs are identified that will best achieve these objectives, and the costs and benefits of each program are evaluated so that budget allocations can be made based on these identified cost/benefit relationships.

Zero-Based Budgeting (ZBB) examines the gap that exists from the existing budget base of an organization where the budget line item must be justified as if it were starting from scratch, thus incorporating priorities and preferences in terms of today's requirements versus obsolete requirements (Pendlebury, 1992). Decision packages are developed containing well-defined and measurable objectives and impacts for each organizational element and the different levels of activity and associated costs, thereby establishing a threshold below which it would be impossible to continue the program, and the different levels above the minimum threshold at which different levels of service can be sustained (Pendlebury, 1992). From this analysis, priorities are established and funded.

Many public organizations face the issue of "make or buy", and if the answer is "buy", a decision must be made on how this is accomplished. This is an important issue, since the majority of work in the government is contracted out, and this trend is accelerating under the banner of government reform. The cost ramifications of contracting out and outsourcing are viewed as more favorable than producing goods and services internally. Shetterly (2000) studied the contractual relationship between government and for-profit or nonprofit firms, and its influence on contractor performance, where the key concern is how to structure the principal-agent relationship so that completion of the contract is likely and the interests of the principal are protected. In his study, Shetterly used responses to the 1992 International City/County

Management Association (ICMA) Survey of Alternative Delivery Approaches that reported on contracting for refuse collection, and discovered that penalties for nonperformance have a statistically significant ($p < .05$) influence on contractor performance, where penalty provisions are strongly associated with an increase in unit cost. He concludes that rewards and sanctions must be carefully understood and analyzed for the potential impact of provisions included in service contracts, and that new trends in allowing public organizations to engage in public/private competitions may require careful consideration in establishing a level playing field in terms of solicitations, assessing penalties, and transaction complexity and its associated costs (Shetterly, 2000).

Philosophic Basis for Government Reform

Where does this discussion leave the Federal government as an institutional element of society? Even in modern times, many elements of the government are structured as a place for employees who care more about long-term security than short-term achievement (Light, 2000), built around the merit system created by Congress a century ago, but now increasingly characterized by a flexible, multi-sectored public service model incorporating government, nonprofit agencies, and private firms. Competing for talent with the private sector becomes increasingly important for a modern government organization, and this directly affects the definition of capabilities that are needed for government professionals to be successful. For NASA, this is particularly important when personnel are expected to transition to performance in an FBC environment. In today's volatile environment, the government is expected to prove return on taxpayer investment, to earn faith in government performance from the public, to reasonably customize products and services for an increasingly demanding population, and to do it now rather than later.

There are several competing orientations in the literature that repeatedly surface concerning the development of a government that is better and more responsive. One concept is streamlining the current bureaucratic government institutions through such activities as the former National Performance Review, which emphasized a strategic planning and implementation process that reengineered and reinvented the existing government infrastructure. A second concept moves toward one extreme of the continuum, eliminating the bureaucratic model and replacing it with other alternatives such as competitive market-based solutions from non-governmental organizations. A third concept moves toward the other extreme of the continuum, allowing government bureaucrats to become innovative and creative in how products and services are delivered and rewarding them when they improve effectiveness and efficiency, but also holding them accountable for outcomes that serve the public good.

All approaches involve significant reform and restructuring, and may involve the danger that the spirit of public service may be lost in the process. In viewing this

shift in the institutions of government, Light (1995) laments the loss of what he terms the “six old chestnuts of public service”: it is apolitical; it consists of hierarchy and rules that create predictability, universality, and probity; it offers permanence and stability; it has an institutionalized civil service; it regulates internally through acquiescence and responsiveness to policy directives; and it promotes the greatest possible equality of outcomes.

Entrepreneurial Government

Osborne and Gaebler (1992) published a book that had enormous impact on certain leaders of government called *Reinventing Government*. The key ideas of this approach are influenced by the same ideas that are driving worldwide government reform efforts (UNRISD, 2000), the new institutional economics and principal-agent theory. New institutional economics focuses on transaction costs, uncertainties, and contract enforcement, while principal-agent theory focuses on society as the principal and public servants as the agents, and how the interests between the two are not necessarily the same. In this conceptual framework, the public sector is viewed as bloated and underperforming because state officials pursue their own narrow self-interests rather than public interests, and that it is difficult to obtain accountability due to the monopoly characteristics of public services and the huge costs incurred in writing and monitoring complete contracts. Government reform advocates address these issues by creating transparent processes that eliminate the monopolistic nature of government organizations, and focuses on results that are tied to the customer rather than the agent.

In the 1990s, Presidential and Vice-Presidential candidates Bill Clinton and Al Gore seized upon the concepts of entrepreneurial government and created the National Performance Review (NPR) upon their election as President and Vice-President. NPR implemented Osborne and Gaebler’s blueprint that government organizations can supercede the inherent inefficiencies caused by industrial-era bureaucracy and can deliver better public administrative services while drastically reducing the waste of valuable resources, a construct termed entrepreneurial government (representing the use of resources, such as tax dollars, in new ways in order to maximize productivity and efficiency).

This approach is most consistent with the elimination and replacing of bureaucracy with market-based mechanisms as previously discussed. Osborne and Gaebler popularized the notion, parts of which were articulated earlier by such writers as Peter Drucker in *The Age of Discontinuity* (1969) and Alvin Toffler in *Future Shock* (1970), that the industrial era bureaucracies, as articulated by Max Weber as a response to countering the exercise of arbitrary power by authoritarian regimes and to make possible the undertaking of large complex tasks, were no longer applicable to the task of operating in a knowledge-based economy and information society. Other researchers such as Morgan (1997) address this issue through the lenses of metaphor, specifying one

approach that views organizations as machines, originating from Max Weber's works on bureaucracy (Aron, 1970) and Frederick Taylor's tenets of scientific management (1911/1998), emphasizing structural patterns of hierarchical authority and functional specialization. On the other side of this argument, Jaques (1990) claims that managerial hierarchy has never been adequately explained nor adequately used, and that the levels of an effectively structured bureaucracy deploys people on tasks at complementary levels, ensures that capability exists at those levels, ensures that value is added to the work accomplished below that particular level, and where the stratification of management strikes everyone as necessary and welcome. In Jaques' view, new organizational structures are not the answer: managerial hierarchies that understand their own nature and purpose are.

Osborne and Gaebler (1992) emphasize that American government was reformed by Progressives such as Theodore Roosevelt, Woodrow Wilson, and Louis Brandeis, who successfully creating civil service systems and independent public authorities, split up government management functions, and professionalized the administration of public services. However, the successful elimination of patronage and the elevation of public interests had a price, where government became impossible to manage because it ignored results: it was slow, inefficient, impersonal, and delivered one-size-fits-all products and services (Osborne and Gaebler, 1992).

With the advent of a modern knowledge economy and an information society, government organizations are expected to produce results that are responsive to the needs of their customers, regardless of whether they are public or private. Osborne and Gaebler (1992) specify ten tenets of successful entrepreneurial government: the promotion of competition between service providers, the empowerment of citizens through inclusion in the process, the measurement of performance outcomes, the focus on goals and organization missions instead of rules and regulations, the redefinition of clients as customers who are offered choices, a proactive preventative stance towards problems, a focus on earning money versus spending money, the decentralization of authority, the embrace of market mechanisms, and the emphasis on catalyzing all sectors (public, private, voluntary) in solving community problems. Osborne and Plastrick (1997) further refined these tenets of entrepreneurial government into five strategic areas of core, consequences, customer, control, and culture. Alignment of these areas of strategy is seen as critical for a government agency to develop a cohesive strategic plan that can be implemented and is measurable. These researchers also outline a set of meta-tools that are used in order to successfully accomplish a strategic alignment, such as performance budgeting, competitive bidding, vouchers, and reimbursement programs.

Bangura (UNRISD, 2000) specifies that reform advocates question the state's nationalistic, hierarchical, redistributive and interventionist character, which they believe is partly responsible for poor service delivery and poor economic performance

in developed and undeveloped countries alike. The researcher goes on to say that reform advocates are seeking to transform the state into a market-friendly, lean, managerial, decentralized and customer-oriented institution. The American reform movement certainly fits into this vision and conceptual framework.

Criticism of the Entrepreneurial Approach

There is some concern about government reform activities; besides the fact that seldom are such top-down change initiatives such as NPR implemented successfully. From the previous discussion, it seems that this new public management (NPM) movement (Aucoin, 1996) advocates efficiency as the overriding consideration of government institutions. The sponsors of government reform endorse a shift away from the bureaucratic-scientific management model of highly specialized tasks, extensive written rules, and hierarchical reporting to an organizational structure that promotes greater autonomy of frontline workers delivering high-quality service, self-management, and innovation (Thompson, 2000). If a person takes a tour of any government agency today, it is evident that the reform movement advocates not only adopting the best practices and methods of business, but adopting business values as well. People hear it in the language used in the hallways and the meeting rooms: strategic alignment, competencies, return-on-investment, performance-based budgeting, outputs and outcomes, value, customer service.

Several scholars argue that efficiency should not be the overriding concern, but that the democratic polity needs preference, since public bureaucracy is embedded in a particular political socioeconomic system, and that the desired result is an inclusive democratic polity (Kelly, 1998). Kelly goes on to define an inclusive democratic polity as one that provides all of its adult mentally competent citizens with full rights, duties, and responsibilities and a sense of belonging as an equal partner entitled to the and burdens society offers. With this interpretation as the foundation of the principle-agent relationship between government and contractors, the government manager clearly articulates the policy, sets performance standards, and chooses in a competitive environment an agent who will faithfully act in the government's behalf to deliver goods and services so that the outcome is attained (Kelly, 1998). However, in the real world, politics enters these situations, changing the dynamics at every turn. Kelly argues that this goes beyond a simple definition of customer satisfaction at the citizen level, but extends to considerations of general delivery standards, fairness, and equality in terms of the goods and services. To have the government simply act more like a business might not ensure that these standards and protections will be met.

Beckett (2000) notes that the phrase "government should run like a business" is a powerful metaphor that evokes many definitions and interpretations, resulting in the many competing versions of government reform that are being implemented today, and that there is a lack of clarity in defining what a business is, differentiating between the

various forms of business, and defining the criteria of good business practice. The researcher cites broad generalizations that hold for the most common business types: business is expected to self-interested and self-supporting; business is expected to take chances and bear the risks and rewards; business is expected to keep secrets; and business rights are based on property, ownership, and control (Beckett, 2000).

DeLeon and Denhardt (2000) provide a thoughtful analysis that the practice of government reform must be viewed in light of its impact on democratic governance, especially in the most basic premise of the reform movement: that the accumulation of the narrowly defined self-interests of many individuals can adequately approximate the public interest, in terms of the interests of individuals as they privately apprehend them, unmediated by public discourse. The researchers go on to analyze government reform as a political theory that employs three key elements in its construct: the market model, the emphasis on customers rather than citizens, and the emphasis on entrepreneurial attitude. Through this analysis of government reform as political theory, DeLeon and Denhardt reach a troubling conclusion that this new public management (NPM) may actually denigrate the role of collaborative action, produce an impoverished vision of the public interest, may tend to exclude some persons from the public arena, and ultimately reduce trust among citizens and between them and the government. Clearly, the costs of government reform and its methodologies have not been recognized nor clearly articulated.

Simon (1946) outlined several equally plausible but opposite proverbs of administration that have applicability in today's government reform efforts. These contradictory proverbs are:

- Public agencies are unique because of their special missions and decision-making environments, or: Public agencies are similar to all other organizations, particularly to businesses.
- The really significant professionals are high-level public agency personnel and their staffs, or: All public employees are or must strive to become professionals.
- Professionals can best serve the public by aligning themselves with general political institutions, or: Professionals can best perform their jobs by sticking to the facts and avoiding political concerns and values.
- Professionals must be empowered to take on increasing initiatives so as to interact more freely with other professionals and managers within and between agencies, or: Managerial controls over professionals must be progressively refined so as to pinpoint their responsibilities, thereby

achieving greater agency efficiency and effectiveness through rapid response to direction.

Terry (1998) discusses four approaches in understanding public administration research and practice: quantitative and analytic management, political management, liberation management, and market-driven management. The quantitative and analytic approach emphasizes the systematic analysis of public policy data and information so that better decisions can result. Political management assumes a legitimate right to exercise political power in the policy-making process, and gives public managers the responsibility of goal-setting and political management in addition to traditional public administration duties. Liberation Management was popularized by Tom Peters (1992) as a new management paradigm in order to cope with increasing levels of organizational change, and gained additional weight with Light (1995) in his discussion of the four tides of reform: scientific management reforms, war on waste reforms, watchful eye reforms, and liberation management. Market-driven management, as discussed earlier, is driven by competition and the perceived superiority of private sector business practices. Terry categorizes both Liberation management and Market-based management under a new form called neomanagerialism, which has inherited many of the values and assumptions of public-choice theory, agency theory, and transaction-cost economics, beginning with the basic assumption that human beings are rational economic actors driven by competitive self-interest. If this is true, the idea of cultivating entrepreneurs may not serve democracy well because of the accountability problem and personal agendas that interfere with fairness, justice, representation, or participation, but may serve well the idea that efficiency, economy, and effectiveness may be achieved by assuming an entrepreneurial leadership role in public service (Terry, 1998).

McCubbins (1999) addresses the thorny issue of separation of powers as defined in the Constitution and the growth of delegation of legislative authority to executive branch organizations. The researcher points out those critics of this delegation of Congressional authority argue that non-elected federal officials should possess the least possible room for discretion or interpretation in carrying out the laws of the land, since wide latitude in interpreting the law allows them to in effect make the law. On the other hand, he also notes that delegation of authority and redelegation are facts of modern government, and that efficiencies are gained only through this specialization and division of labor across specialists, thus making oversight the critical issue, not delegation. McCubbins also raises the point that special interests may exert undue influence in this type of system, benefiting from collusion in making policy with the executive agencies that are funded and nurtured by Congress. The author specifies two conditions that are necessary for delegation to fail, turning into abdication: where principals and agents possess conflicting interests in the outcome of delegation, and the principals lack an effective check on agent actions. He further specifies that delegation succeeds where one of two conditions are satisfied: where principals, through

experience or knowledge gained from others, distinguish beneficial and detrimental agency actions, or where agents possess an incentive to take account of the principal's welfare in making their decisions. McCubbins argues that reinvention of the Jeffersonian nondelegation doctrine or dismantling the federal bureaucracy are not the answers to government improvement.

Brandi (1998) believes that both competition and community are required for efficiencies in delivering public services. He bases his beliefs on four assumptions: that organizational behavior is a function of the aggregated actions of individuals within it; that each of these individuals ordinarily pursues their own self-interests; that individual interests are commonly divergent from each other and those of the organization; and that organizational failure results from aggregated actions of individuals harming others because they are not constrained from doing so. Given a typical government bureaucratic system, Brandi argues that failure is inevitable in a situation where money is received regardless of customer satisfaction. Government reform as formerly embodied in Gore's Government Reinvention effort, according to Brandi, occurs through better policy-making and better institutional design, where individuals acting in their own interest will tend to accomplish a greater good, or at the very least do no harm. The author believes that competition harnesses these self-interests, and encourages innovation, overcoming government bureaucratic inefficiencies. Through the leveraging of mediating communities, Brandi feels that policy-makers can achieve greater results and more efficient use of resources, and possibly better-designed policies from the beginning in terms of accountability, equity, resources, organization, management, and leadership.

At the level of the individual employee, motivation for public service can be a critical component in the competition for talent for the government. Buchanan (1975) studied the difference between public and private sector employees using job involvement as a proxy measurement of Public Service Motivation (PSM), and found that public sector employees reported lower levels of job involvement. Building on this research, Rainey (1982) hypothesized that public sector employees would score higher on job involvement if they were asked more directly about public service, specifically about their desire to engage in meaningful public service. His results showed that public sector employees scored much higher than private sector employees. However, he went on to say that PSM was a broad, multifaceted conceptual framework that could be articulated in many different ways (Rainey, 1982). Other studies (Wittmer, 1991) discovered that employees in hybrid, nonprofit, and public sector organizations valued community service more than private sector employees, who valued pay and job security as most important.

Perry (1996) created a measurement scale using confirmatory factor analysis that moved PSM beyond the use of proxy variables and sectoral comparisons prevalent in earlier research, addressing four factors of PSM: public policymaking, public interest,

compassion, and self-sacrifice. One of the criticisms of his approach, however, is that it does not capture differences in individual conceptions of PSM (Brewer et. al., 2000). These researchers looked at 69 public service employees and public administration students through Q-methodology, where the subjects sorted statements about PSM according to strength of agreement or disagreement. Based on the Q-sort (a worldview about public service), the researchers conceptualized four different orientations towards PSM: Samaritans who are strongly motivated to help other people; Communitarians who are motivated by civic duty and public service; Patriots who are motivated by loyalty to duty over personal consequences; and Humanitarians who are motivated by social justice and public service. The research revealed PSM to be a multifaceted concept, possessing several areas of overlap between the concepts. Within the context of government reform activities, Moon (2000) cautions that public managers do not appear to be effectively motivated by monetary factors, so pay-for-performance reforms need to be advanced cautiously.

Naff and Crum (1999) examined the relationship between PSM and performance, retention, and support for Gore's Government Reinvention through the analysis of nearly 9,710 federal employees to the Merit Systems Protection Board's 1996 Merit Principles Survey. They calculated a total PSM score for each respondent by summing the response to the six items from Perry's scale. Through their analysis, they found that Perry's PSM scale has a positive relationship with favorable attitudes towards government, level of pay, and performance. The researchers recommend that a multivariate analysis be done to determine whether PSM has an independent impact over and above those caused by factors such as age, gender, race, education, grade level, and tenure.

There are issues beyond the philosophic difference between government and private sector organizations in terms of mission. Adler (1999) cautions that, regardless of public or private sector mission, simply eliminating bureaucracy may do more harm than good in that there will always be a need for some hierarchical structure, some formalized procedures, and some staff expertise in order to avoid chaos and to ensure that employees are not continually reinventing the wheel. Adler stresses that the conventional view of bureaucracy works well in an organization where the main tasks are routine and the goals are efficiency, but that this falls apart in organizations that have a combination of simultaneous requirements for innovation or continuous improvement and for efficiency, timeliness, and conformance quality. He bridges this gap by addressing the difference between the traditional focus on technical structures of bureaucracy and the needed focus on social structure. This dichotomy results in a four-cell typology with technical structure in terms of bureaucracy either low or high and social structure either enabling or coercive. Adler uses the typology to provide perspective for managers who are deciding whether to eliminate bureaucracy. Organizations can apply enabling social structure in either low or high bureaucracy

depending on the particular task, and depending on whether the strategy demands control or facilitation.

Light (1995) reminds us that the “thickening” of American government bureaucracy has gone on for over fifty years, continuing unabated under every Republican and Democratic president and Congress since Herbert Hoover, and that the structure of government bureaucracy inevitably creates new positions for people to oversee any reforms initiated by each succeeding government. Light says that these new positions do not go away, and actually end up initiating new organizational costs in terms of information distortion, administrative inertia, disunity of command, a growing gap between responsibility and authority, barriers to innovation, obstacles to employee involvement, and tensions between strategies to improve entry-level recruitment and efforts to improve senior-level retention.

Peters (1996) proposes four macromodels of government that moves beyond the bureaucracy that is currently in place: market government, participative government, flexible government, and deregulated government. The market government emphasizes the approach of Osborne and Gaebler, and stresses that a more efficient and effective government results from a decentralized and market-driven model, eliminating the monopoly aspects of government bureaucracy, and making policy through internal markets and incentives. The participative government focuses on empowerment of government employees that produce the goods and services and the citizens who receive government goods and services, differing from the competitive model primarily in its emphasis on refocusing control at a different level rather than creating competition among service providers, eliminating the bureaucratic hierarchy and achieving policy through negotiation and consulting. The deregulated government focuses on removing constraints on government performance, allowing it to become entrepreneurial and compete with other government and private sector organizations in providing goods and services, producing policy through entrepreneurial mechanisms. Flexible government focuses on allowing institutions to move quickly through partnerships and temporary organizational structures, leveraging part-time and temporary employees, and existing as virtual and networked organizations, producing policy through experimentation.

Leadership in Public Administration

Concepts and constructs of leadership are inextricably linked to organizational development and change. For example, Katz and Kahn (1978), in another foundational work for organizational development and change, provided a theoretical viewpoint that an open-system view was most effective in addressing issues of moral and motivation, productivity and effectiveness, power and control, leadership, and change in large-scale organizations.

In the Federal government, leadership issues are constantly addressed in the development and implementation of government reform activities. Researchers address leadership at every level of government organizations, from the top-level elected officials and political appointees through career bureaucrats down to the street-level implementers of public policy. However, leadership as a conceptual and theoretical construct has been a source of frustration for decades in terms of research.

Most of the leadership research has focused on determinants of leadership effectiveness in terms of traits, abilities, behaviors, sources of power, and context that determine how well a leader influences followers and accomplishes group objectives; other research has covered why some people emerge as leaders and the determinants of how a leader acts. Yukl (1998) defines leadership as influence processes that impact the interpretation of events, the choice of objectives and strategies, the organization of work activities, the motivation of people to achieve the objectives, the maintenance of cooperative relationships, the development of skills and confidence by members, and the enlistment of support and cooperation from outside the group or organization.

The Trait Approach emphasizes the personal attributes of leaders in terms of personality, temperament, needs, motives, and values. It is the “Great Man” approach to leadership where some people are endowed with certain traits not possessed by other people that would make them more likely to seek and attain leadership positions and to be effective in these positions. Stogdill (1948) conducted reviews of trait studies and found that leaders did differ from non-leaders with respect to certain traits, but that the results varied considerable from situation to situation. Thus the studies failed to support the premise that a person must possess a particular set of traits to be a successful leader.

The Behavior Approach began in the 1950s when researchers became discouraged with the trait approach. They began to pay attention to what managers actually do on the job, focusing on job content, roles, function, and responsibilities and began to look at behavior of effective and ineffective leaders. Mintzberg (1973) indicated that managerial behavior is hectic and unrelenting, the content of work is varied and fragmented, that many activities are reactive rather than proactive, that managers devote little time to reflective planning, that oral communications predominate, that political activities predominate, and that boundary-spanning activities eat up a majority of the time. Other research also began to address the situational aspect of behavior within the organization. The Ohio State (Fleishman, 1953) and Michigan (Katz, Maccoby & Morse, 1950) Leadership Studies occurred at approximately the same time and found initiating and consideration behaviors, or task-oriented and relationship oriented behaviors that were deemed important.

The Power-Influence Approach attempted to understand leadership by examining influence processes between leaders and followers, where effectiveness is

measured in terms of the amount and type of power possessed by leaders and followers, and how power is exercised. Power types and sources by French & Raven (1959) discovered reward, coercive, legitimate, expert, and referent power. Most subsequent research focuses on the effectiveness of different types of power as proposed by French & Raven.

The Situational Approach emphasizes the importance of contextual factors like the nature of the work, the external environment, and follower characteristics. The Least Preferred Co-worker (LPC) Contingency Model of Fred Fiedler (1967) addresses the moderating influence of three situational variables on the relationship between a leader trait (LPC) and subordinate performance; leaders with high LPC (people-oriented) are effective in moderately favorable situations, while low LPC (task-oriented) are effective in either very favorable or very unfavorable situations. The favorability of the situation is rated using weighted scores based on leader-member relations, position power, and task structure, yielding eight levels of favorability (octants).

The Participative Leadership approach is concerned with power sharing and the empowerment of followers; participative leadership involves efforts by the manager to encourage and facilitate participation by others in making decisions that would otherwise be made by the manager alone. Theories of participative leadership include the Vroom and Yetton Normative Decision Model (1973) that allows managers to identify the appropriate decision procedures in different situations. It examines the effects of five different decision procedures (two autocratic, two consultative, one group) on two intervening variable (decision quality and decision acceptance) according to seven situational variable/decision rules, such as information availability, likelihood of autocratic decision acceptance, and leader-follower objectives compatibility.

Charismatic and Transformational Leadership approaches attempt to explain why some leaders can inspire exceptional effort and personal sacrifice to accomplish group objectives or mission. Transformational leadership refers to the process of building commitment to the organization's objectives and empowering followers to accomplish these objectives. Bass (1985) said transformational leaders make followers more aware of the importance of task outcomes, motivate higher-order needs, and induce followers to transcend self-interest for the organization. He felt that this was achieved through use of charisma, and views charisma as a part of transformational behavior, but transformational goes beyond it in terms of systematic change of an organization through coaching, teaching, mentoring. In his view, charismatics are rare, while transformational leaders are not rare.

The Organizational Culture approach is best represented by Schein (1992), who defined culture as the basic assumptions/beliefs shared by members of an organization. There are three layers of culture consisting of visible artifacts (changed by decree),

invisible values that are harder to change and must be made explicit, and unconscious assumptions that are still harder to change and must be made explicit. Leaders change and shape culture through primary mechanisms like rewards and selection of leaders like them, and through secondary mechanisms like the design of organization structure and story telling. Schein also addresses the stages of growth of an organization; founding and early growth where a leader has a profound effect; midlife, where culture becomes more unconscious and less uniform; and mature and declining organizations, where drastic changes may need to occur to revitalize the organization.

The Organizational Systems approach emphasizes both leader attributes and the situational determinations of the organization acting as a holistic system. Katz and Kahn (1978) emphasized an open-systems approach that focused on human relations research in organizations. Their theoretical model addressed the impact of the wider context of the organization and moved away from the individual and interpersonal levels of leadership focus. In another theoretical view, Jacobs and Jaques (1990) created a General Theory of Bureaucracy in terms of leadership in organizations, and how it relates to organizational complexity. Jacobs and Jaques suggest that large organizations possess 7 distinguishable levels that are divided into 3 broad bands, with each band more conceptually complex than the one below it, characterized by greater ambiguity, uncertainty, and complexity as one climbs up the organization from direct through middle to executive leadership.

Given this discussion on leadership theory, the question remains: does research into leadership help us understand public administration issues and the capability requirements that accompany them? Leadership research in the public administration area tends to address the power and influence dynamics within these political organizations. Loverd (1997) uses several examples of individual leaders in politics and government to illuminate how leaders gain power, and how that power can be used for constructive policy purposes. Politics within this context is defined as the craft of identifying important social challenges and building coalitions to meet those challenges, while government is the social mechanism through which the citizenry can achieve purposes which cannot be accomplished alone or through profit-seeking businesses and voluntary cooperation (Doig, 1997).

Cook (1998) specifies that public institutions are both instrumental to and constitutive of the political regime. In public organizations, the formative influence of individuals is indirect, coming through the influence they exert on the work of organizations and institutions. Cook clarifies that what government agencies do in a formative sense comes from the collective processes of the organization rather than individual initiative of any particular sort. This researcher goes on to advocate that the political nature of government organizations is central to any institutional design efforts, and that the nature of leadership at this level requires a political grounding to the education of leaders that encompasses what should be done as well as how to get it

done, and to recognize where tensions and conflicts rise between the two and how to address them. For leaders, this is an argument for politics rather than economics to be at the core of theory development.

The special case of entrepreneurial leadership demands that this type of leader abandon self-interested behavior in favor of the public interest, which seems to have little standing as seen in the previous discussion of public choice, agency, and transaction-cost economics theories that underpin the Market and Liberation management approaches. This is very different from the leadership approaches discussed to this point, and enters into the context of public organizations and their responsibility for the public good.

Behn (1998) specifies that public managers have an obligation for leadership in order to achieve mandated goals. In this researcher's view, public managers must exercise leadership in order to help correct for failures in governance relating to organizational, analytical, executive, legislative, political, civic, and judicial failures. Organizational failures are prevented and fixed through leadership behavior from the top down to the street-level through planning and budgeting, aligning people, and motivating and inspiring (Kotter, 1990). Analytic failure occurs in any program implementation and requires adaptation, another activity that is guided by leadership. Executive failure results from ambiguous or contradictory directives of elected officials who may not be fully informed of all the nuances inherent in a policy decision, therefore placing faith in the public manager exercising leadership. Legislative failure results from ambiguous, contradictory, or unrealistic directives of legislatures, where public managers must exercise leadership in establishing programmatic clarity. Political failure results from the inability of the executive or the legislative branches to guide the implementation of policy in a public organization, thus ceding this to organizational stakeholders and interest groups: again, public manager leadership fills this void. Civic failure occurs from a disinterested and disengaged electorate, which again can be assisted through leadership and education by public managers. Finally, judicial failure occurring through the infiltration of litigation throughout the policy-making apparatus of government organizations can be mitigated through the exercise of public management leadership.

In a similar vein, Balk & Calista (2001) have developed a framework for government professionals that emphasizes the need to increase the effectiveness of public professionals as the government contracts out and privatizes many of its routine functions so that Federal agencies can concentrate on their core missions. The researchers conclude that this effectiveness depends on a readiness and acknowledgement for government professionals to become proactive, requiring a synthesis of analyzing facts and values. The researchers outline their Scope of Action (SOA) model that defines three planes of action consisting of policy, operations, and evaluation. In attempting to become more innovative in policy, anticipatory in

foreseeing operations errors, and conducting more useful evaluations, Balk and Calista cite two major obstacles that interfere with taking full advantage of public professional expertise and positional knowledge. The first is that key stakeholders are suspicious of potential bureaucratic growth and the disorder that may result from proactive government professionals, and that prejudices such as government workers being less capable than private sector workers are politically valuable. The second is that educational and agency socialization focuses government employee capabilities towards directives of agency management, which confines innovation to narrow agency goals and processes, isolates professionals into specialized competencies, and avoids the paradoxes of governance. Balk and Calista argue that without proactive outlets and motivation to advance the nobility of democratic institutions, professionals in public administration lose their individual and social potential.

Leadership at Street-Level

Leadership takes on a very different form at the street-level, where public policy is actually implemented. Lipsky (1980) describes the process where lower-ranking employees of service agencies apply discretion in determining how public policy is actually implemented, and calls them “street-level bureaucrats” because of their direct interaction at the point of service delivery and their ability to apply discretion, many times on a case-by-case level. This ability and expectation by the public for street-level bureaucrats to exercise discretion and judgment amounts to leadership behavior, but the values to which this behavior is executed is the key. Lipsky considers these public servants policy-makers rather than implementers of policy, since their actions in aggregate define the agency policies being implemented.

Lipsky defines eleven factors upon which the quality of street-level bureaucracy (defined by client satisfaction with service, fairness of service decision, openness of service decision, efficiency of service, and the bureaucrat’s job) is dependent: the level of employee discretion; resources available for resistance; budgetary resources; agency goals; personal goals; measurement criterion; relationship of the public servant to the client; the current political climate; the client demand for services; the political power of the clients; and the estimated probability that clients will benefit from the services delivered. Lipsky’s conclusions hit directly at the government reform movement; for he feels that the most important source of inefficiency is the structure of the street-level bureaucrat’s work.

Lipsky seems prophetic in his message as to what must occur in order for public agencies to improve. The reforms he advocates could be taken word-for-word out of any government reform handbook. Lipsky feels that agencies must know what they want workers to do; they must know how to measure performance; they must be able to compare workers to each other; they should have incentives and sanctions to discipline workers; client autonomy must be increased; street-level bureaucrats must be made

more accountable to clients; clients must organize and obtain control over service provision; job-discretion leading to discriminatory treatment must be eliminated; current budgetary resources must be maintained; street-level bureaucrats must be provided assistance in problem-solving; street-level bureaucrats must be provided adequate salaries; peer support mechanisms must be developed and encouraged; management must be committed to this new orientation; and there has to be societal support for social and economic justice. Lipsky concludes with a prescient observation, that a coalition between public concerns for cost and effectiveness, a respect for client involvement, and an awareness of the needs of the workplace will determine the fate of innovation.

The reinvention laboratories launched by the former National Performance Review appear to recognize the importance of these lower level managers in achieving change at the grass-roots level. In the context of the reinvention laboratories, these street-level bureaucrats are allowed a central role in devising alternative means of processing work (Thompson, 2000). Strategic change achieved in this generative approach (Hart, 1992) is characterized by responsibility for strategy formulation shared by managers at all levels, informal rather than formal means serving to gain compliance, and formulation and implementation occurring in an iterative rather than sequential manner.

Coble and Crothers (1998) cover four case studies in public administration at the front lines and argue that a leadership model at street-level is the best way to comprehend policy performance, since administrators at this level possess discretion and exercise considerable judgment in carrying out directives. The researchers suggest that front-line public servants must be empowered in order to reconcile organizational and individual goals and norms, thus allowing for enhanced esteem and competence. This translates to the discretion that Lipsky (1980) discusses in his theory, and aligns with Balk and Calista's theoretical construct (2001).

Balk and Calista (2001) report on street-level bureaucrats in the U.S. Economic Development Agency that satisfied their particular organizational level responsibilities through transformation of larger scopes of activity to isolated smaller ones, taking broadly-defined policy statements and adjusting them to manageable boundaries in terms of policy, operations, and evaluation, and recreating within limits the original intentions of federal policymakers. This innovation and redefinition of policies at the point of implementation is exactly what will need to occur in any successful change effort. This involves a shift in power, however, that is very troubling to many federal managers and bureaucrats.

Riccucci (1998) investigates the opposite end of the spectrum, senior government career executives who make administrative policy. She develops an inventory of factors (following in the footsteps of the Trait theorists) that influence executive effectiveness.

The identified factors would be at home in any Trait or Situational leadership theory, and includes political skills, managerial skills, leadership skills, situational factors, government experience, technical expertise, strategy, and personality attributes. The political skills are evident and primary throughout the case studies, and illuminate how these public servants developed and maintained support for their policies through turf battles, loss of allies, competing agendas, loss of momentum, and changing priorities. In comparing the work environment between the two levels, it becomes readily apparent just how important political skills are in implementing public policy.

Considine and Lewis (1999) applied four images of the role of bureaucracy and bureaucrats in the United States in order to model governance as a strategy of ordinary bureaucratic work: the Traditional or Procedural bureaucracy, Corporate Management, Market bureaucracy, and Network bureaucracy. The Procedural bureaucracy is the most familiar to us, in that it consists of a system of rules and procedures, a career structure, and a defined hierarchy. The Corporate Management model focuses on strategy and policy targets of government executive managers. The Market model incorporates private ownership, competition, and market incentives into government. The Network model emphasizes collaborative mechanisms between government managers, stakeholders, and target populations, promoting interdependence as an overall force. Considine and Lewis wanted to explain work process change patterns in terms of local-level choice. They used factor analysis on 40 scale items in a questionnaire to look for the latent dimensions of governance patterns, and worked towards the hypotheses of whether the latent orientations existed and could be observed in the reports that ground-level official gave of their work, whether the orientations could distinguished from each other, and whether these officials exhibited one or other characteristic orientations. They identified that there were only three distinct images from the factor analysis, with the Market and Corporate merged into a single orientation, the Procedural orientation, and the Network orientation, with the three subscales achieving an alpha score of 0.50 or greater, suggesting reasonable internal reliability. The researchers also found significant variation in the orientations of frontline bureaucrats towards bureaucracy, adopting one of the three strategies concerning the organization of their work.

Sarbaugh-Thompson (1998) conducted a comparative case study of three county social service managers that initiated a statewide program supported by \$4.24 million, despite upper-level agency resistance. She suggests a conceptual framework called bottom-up entrepreneurship that adds to the literature of public policy implementation, suggesting that lower-level implementers act in an entrepreneurial fashion to gain buy-in, funding, and support for their innovative public policy programs that are developed without impetus from the top of the agency. Thus, momentum for the change occurs from the lower levels of the organization. Experimentation clearly emerges as a key element, since it allows small successes to build incrementally, and the costs in time and budget were minimal at the beginning. Another key was that the initial action is

developed in order to meet the street-level bureaucrat's own needs and wishes, and then gains acceptance as it meets the needs of the agency. Additionally, the voluntary nature of the initiatives circumvented resistance and suspicion. Finally, the interactive shared experiences of the community of practitioners changed the expectations of more and more people as the program gained acceptance. Then the inevitable top-level reaction arrived: control of the program was centralized, procedures were standardized and formalized, and compatibility and consistency were stressed, with the street-level bureaucrats tolerating this in exchange for program expansion and increased funding (Sarbaugh-Thompson, 1998). From this comparative case study, Sarbaugh-Thompson develops a four cell classification of processes in a bottom-up entrepreneurial approach: actions without lower or upper-level acceptance (isolated actions not formulated into a program); gaining lower-level acceptance first (bottom-up entrepreneurship); gaining upper-level acceptance first (traditional bureaucratic policy formulation processes); and programs with both lower and upper-level acceptance (the goal of any program development process).

In another study focusing on building employee commitment and involvement, researchers used the Organizational Climate Inventory developed by Wallach (1983) that measures the three dimensions of bureaucracy, innovation, and support. They studied 269 employees in an information technology company whose activities included facility management, technical service, and project management. Shadur, Kienzle and Rodwell (1999) employed three hierarchical linear regressions to discover relationships between supportive organizational climates and commitment, where these climates and commitment produced significant overall regressions ($p < .001$) for employee involvement in communications (0.43), participation (0.34), and teamwork (0.23), suggesting that street-level leaders can analyze organizational climate and employee affective attitudes to assess the success of participative approaches.

Implementing Government Reform

Light (1995) identifies several problems that have occurred in the implementation of government reform efforts, in particular that reform concepts often contradict and nullify each other, that reforms suffer "ebb and flow" problems that erode support or impede implementation of earlier reforms, and that the government has not been inclined to perform systematic experimentation with reforms. Light categorizes reform efforts into four types: scientific management efforts focused on efficiency; war on waste reforms focused on spending accountability; watchful eye reforms focused on Congressional control and accountability efforts over the Executive branch; and liberation management reform focused on quality, reengineering, reinvention, and empowerment. As a prime example, Light cites the National Performance Review, which applies downsizing, reengineering, and continuous improvement, each of which differ in goals, methods, focus, and action strategies. Light

goes on to say that each different Congress and Administration holds conflicting preferences, and that this adds to the confusion at the implementation level.

Bangura (United Nations Research Institute for Social Development, 2000) says that policy goals and reforms in public sector restructuring covers several methodologies that focus on four main objectives: fiscal stability, managerial efficiency, capacity building, and public accountability. Fiscal stability reforms include expenditure reduction, privatization, and tax reform. Managerial efficiency reforms include decentralized government, executive agencies, quasi-markets, corporate boards of directors, performance contracts, and outsourcing. Capacity building reforms include HRD, policy analysis and monitoring, management of recurring costs, management of public investment, and pay reform. Public accountability reforms include citizen's charters, ombudsmen, service delivery surveys, plural parliaments, press freedom, independent judiciaries, mass-based political parties, and civic action. Bangura stresses the importance of seeing the links between the goals and the reforms as an integrated whole rather than discreet elements that demand different reform methodologies for each goal.

In terms of Gore's Government Reinvention effort of the 1990s, Durst and Newell (1999) analyzed the effect of these activities on select government agencies, despite the problem that there is a lack of clear distinctions between reinvention, reorganization, and organizational development, improvement and change, as well as a difference in how each organization approached this drive towards increased efficiency and effectiveness. The research design incorporated a survey given to 153 public executives addressing what kinds of organizations had pursued reinvention activities, who or what prompted the reinvention activities, what actions had been taken under the mantle of reinvention, and had the reinvention activities been successful. Results from 80 respondents indicate that actions undertaken under reinvention were diverse and numerous, with the most frequent being the introduction of new information technologies and processes. Top administrators were named as the fundamental catalysts, with political pressure and fiscal stress named as the next most frequently cited prompts for reinvention. The majority of respondents believe that reinvention activities have resulted in better customer service, cost management, internal changes, and enhanced employee performance. In terms of practical advice for government agencies, the researchers indicate that reinvention activities may be inevitable under the pressure for change; that there must be a careful balance between gathering data from multiple stakeholders and controlling the number of implementation players; that strategic planning, changes in technologies and processes, and empowerment tactics elicit more support and are easier to implement; and that chief executive support is crucial.

Thompson (2000) addresses the new reinvention laboratories that grew out of the NPR effort in 1993. The focus was to create several laboratories for reinventing

government within the departments and agencies of the government in order to guide and initiate strategic change in the organizations as a whole. Thompson categorizes the use of reinvention laboratories as a generative approach to strategy-making and strategic change. The generative model allows responsibility for strategy formulation to be shared by managers at all levels, as opposed to a command mode that focuses strategy development at the top and uses formal mechanisms to disseminate strategy to the organization. The generative process follows a three step process: the Initiation step, allowing mid-level and lower-level managers to participate in the formulation of strategy; the Implementation step, allowing these managers to possess autonomy in carrying out the innovations with minimal organizational interference; and the Institutionalization step, allowing for replication of successful efforts. The interview data that he collected suggests support for a generative model in the government, but that the scope of the changes tended to be modest changes rather than anything that qualifies as a significant strategic change.

Risk management is another area of implementation concern. Bax (2000) illustrates that the modernization and rationalization of Western society created an increase of instrumental rationality and a relative growth of complexity, which man constantly tries to reduce, leading to the need for bureaucratization, since man is seen as basically irrational in terms of behavior, and that bureaucratization, based on rational thought, technology, and empirical science, delivers control through rules and procedures. The rules and procedures, of course, add to the complexity and can actually lead to less control. The researcher conducted a case study of a chemical process company, where his research indicated that general business strategy may set the boundaries for risk management, and that risk management cannot be restricted to the supply-side of the human resources equation, but should extend to the demand side of the design and structuring of work processes (Bax, 2000). This may have implications in research and development government organizations where the strategies must align correctly before effective risk management can be put into place, and that risk management is a business consideration in process design, not just in competency development of individual workers.

Several tools have been developed in order to implement government reinvention concepts rapidly within and across organizations. Large Group Interaction Methods (LGIMs) have been used by several organizations in the public sector to speed up the process of change within bureaucracies (Bryson & Anderson, 2000). The researchers describe several of these methods, including Real Time Strategic Change, Search Conferences, Future Searches, Strategic Options Development and Analysis, Strategic Choice, Technology of Participation, and Open Space Technology. Typically, these methods involve large numbers of people in solving organizational problems, and are increasingly assisted by information technology tools. The researchers list the impetus for these methods as the increasing pressure for responsiveness and accountability in government, a growing awareness that the world is comprised of

interconnected systems that must be viewed holistically, that the methodologies have matured over a period of 30 years, an increased supply of skilled facilitators internal and external, the methods are intense and involving, and the general move towards democratization in organizational and political realms (Bryson & Anderson, 2000). The authors emphasize the ability of LGIMs to foster large-scale participation of key stakeholders across organizational boundaries, a strength particularly appealing to government reinvention advocates, since these methods can involve citizens in the planning and implementation process. An important point that they make is that in the majority of these methods, the theoretical basis is not very well articulated, therefore it is never clear why certain approaches work best in particular circumstance and not in others.

One tool that has gained in popularity with government reform proponents is the idea of creating lockbox government, where key activities and whole agencies are being excluded from normal budget processes and given the protection of long-term funding guarantees (Roberts, 2000). The intent of lockboxing counteracts the effects of a diminished public service infrastructure due to budget retrenchment and downsizing. Critics of this approach maintain that it could weaken legislative oversight and limits the democratic mandate that legislatures possess in allocating taxpayer monies, while proponents claim that this is the only way to ensure that critical federal functions receive the attention they deserve for the long-term. Since there have been conflicting reports on the success of the Reinventing Government effort and there seems to be no end in sight for the budget turmoil, Roberts is seeing a shift by policy-makers to innovative techniques that place policy firewalls in place to fence off funding for critical initiatives. Examples of these proposals include funding for the Food and Drug Administration in the Prescription Drug User Fee Act of 1992 and the Violent Crime Reduction Trust Fund of 1994. Roberts concludes that lockboxing needs to be carefully administered, for as in any methodology, it is appropriate in some cases while not in others.

Case Studies

Daly (Daly, 1999) shows how Arlington, Texas implemented customized its bureaucracy to the needs of a neighborhood with a community partner teaming approach. The qualitative benefits of identifying common goals, increasing communications, and sharing resources were undeniably better, but the quantitative benefits were mixed in terms of police calls for service (calls on domestic disturbance and loud noise decline, while calls concerning suspicious persons increased). Code enforcement calls were 5-7 times less than a sister neighborhood. The results showed that a community partnership team works best when clear goals and concrete results can be achieved. Daly suggests that customizing services and approaches may result in the most effective use of taxpayer monies in that both the government and residents are actively involved in problem solving, resulting in long-term solutions.

Osborne (2000) reported that the Social Security Administration had successfully met the standard that 95% of all callers to the agency would be served within five minutes. The rate of calls into the agency was 60 million per year, and it kept rising every year. During the busiest times of the year, 50% of the callers got busy signals. Despite political and budget turmoil, the agency hit the goal in 1996 and has remained at that standard ever since. The lessons learned were: involve customers in the creation of standards; make the standards specific and measurable; publicize the standards and results; make the service standards consequential through rewards and penalties; keep pressure on from outside the organization to create meaningful standards and to continually meet them; involve employees in creating and meeting standards; and create a holistic standard that covers customer satisfaction.

Kettl (2000) reports that the Internal Revenue Service (IRS) and the Department of Energy (DOE) possess similar problems that led to their inability to implement a coherent government reinvention approach, thus causing embarrassing crises in agencies where government reinvention had penetrated the least, while the Federal Emergency Management Agency (FEMA) and the General Services Administration (GSA) succeeded by embracing government reinvention and moving forward. The IRS and DOE had dysfunctional bureaucratic structures, were slow in launching reforms, needed a crisis that brought demands for revolutionary change, and both realized that it is difficult to catch up once other agencies have passed them by. For the IRS, the crisis took the form of Congressional hearings on the organization mistreating citizens, resulting in a new quasi-public governance board running the agency. DOE ran into trouble through charges by Congress of sloppy handling of the country's nuclear secrets, resulting in supposed leaks to the Chinese government, resulting in a new office overseeing DOE security. In contrast, the Federal Emergency Management Agency (FEMA) had weathered its worst crisis with Hurricane Andrew in 1992, suffering Congressional and public charges of incompetence in delivering aid. James Witt changed the course of the agency from reactive to proactive in terms of disaster relief, and coordinated closer ties with the communities and citizens, resulting in measurably improved services to the public. At the GSA, David Barrani changed a reputation of a bloated and stuffy bureaucracy to one committed to delivering "thrilling" customer service (Kettl, 2000). A background lesson in all of these case studies is the important role that a dynamic leader plays in transforming an organization.

Pendlebury (1992) discusses the implementation of the Planning Programming Budgeting Systems (PPBS) and Zero-Based Budgeting (ZBB), two cost-related reform strategies. By the mid-1970s, the researcher explains that PPBS had failed in the federal government due to the lack of ability in collecting relevant data for identified outputs, and the disregard of the importance that politics and negotiation play in the decision-making process of the government. As for ZBB, Pendlebury reports on the implementation of the process in Georgia, where an overwhelming 11,000 decision packages were produced by the process.

Crane (1998) assumes that Americans are convinced that social programs do not work, despite the fact that many do have a substantial and positive impact on the people served. He applies the five standards of cost-effectiveness, resolving an intractable social problem, long-term effects, substantial benefits, and large benefits per dollar of cost. In his book, he highlights specific government social programs that demonstrate success according to these rigorous standards, and argues that the best programs should be replicated on a large-scale, and that rigorous evaluations with experimental designs are critical for building on success rather than continuing to invent new programs. The programs studied were the Success for All reading curriculum, the Reading One-to-One reading program, Chicago's Child-Parent Center intervention program, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the drug prevention programs Project Alert and Oregon's Treatment Foster Care.

Schellenberg and Miller (1998) looked at a high technology firm to study the effects of turbulence on bureaucratic structure. They found that the effects were paradoxical in that turbulence enhances the appeal of bureaucracy while simultaneously making it difficult for the company to operate according to bureaucratic principles. Bureaucracies promise increased efficiency, regulation of power, reduced conflict, order, and ethical and fair treatment of employees. Based on interview data across the hierarchical levels of the organization, bureaucratization efforts failed in delivering on this promise due to the turbulent and competitive high technology environment. The company had originally depended on a functional/matrix organizational structure with control maintained via professional norms, shared values, and interpersonal ties. Acquisition by a parent firm and continuing growth forced the company to implement more bureaucratic structure, with a new CEO adding divisions, rules, and layers of hierarchy. Due to the bureaucratic extremes, the new CEO was fired and the company retreated from the promise of stable predictability of bureaucratization. The researchers conclude that parent and venture capital firms should assist high technology in acquiring expertise enabling them to independently deal with organizational issues. The lessons of this case study would be worth the attention of Congress and the President in working with Federal Agencies.

Thomson (2000) in his study of the National reinvention laboratories sponsored by the National Performance Review concludes that Hart's generative model of strategy development and implementation (1992) is generally applicable for the Federal government, despite shortcomings related to the rather modest changes in existing practices. Thomson studied specific case studies that were implemented at the local level and were still in place after three years, with many achieving key original objectives. However, of the six cases addressed in this article, only changes at the Veterans Benefits Administration and the Public Building Service of the General Services Administration qualified as having achieved broad strategic change at the local level. Out of 35 other labs in the sample, 7 qualified as achieving strategic change at the

local level. Thompson speculates that if Vice President Gore and the NPR had intervened to promote more widespread replication and institutionalization of innovations developed at the labs, broader changes could have occurred. Thomson goes on to specify that several considerations work in favor of Hart's generative approach over a top-down command approach to strategic change: the practical inability of the President or the Vice President to direct change of this type within the Executive branch; the heterogeneity of the Federal bureaucracy that demands a tailoring of strategy to individual circumstances; and the necessity to gain compliance by virtue of participation in a system that does not make it feasible for top management to direct the behaviors of lower-level managers.

Managing Science and Technology Organizations

Scientific knowledge and its application through technology have become critical elements in the face of globalization of the world economies. Innovation and knowledge expansion are serving as the foundation for prosperity around the world, and is recognized, in some cases explicitly and in other implicitly, as a critical function of any government that is fortunate enough to possess the infrastructure and resources necessary to continually create, accumulate, disseminate, and apply knowledge. As a result, there is a strong argument for redefining and transitioning NASA's role from mission operations to becoming a catalyst, facilitator, and investor for promising science and technology knowledge in pursuit of National interests. If this is the direction that is desired for NASA, what are the factors that characterize well-managed scientific research organizations?

Neufeld, Simeoni, and Taylor (2001) identified ten attributes that characterize high-performance scientific research organizations. The researchers studied eight public and private sector research organizations and found that the ten attributes are organized under the four key performance perspectives of People, Leadership, Research Management, and Organizational Performance. These attributes are defined as follows:

- Management knows what research and other talent it needs to accomplish the mission, and recruits, develops, and retains the right mix of people.
- Employees are passionate about their own work, have confidence in management, and are proud of their organization.
- The current and anticipated needs of dependent constituencies drive the organization and its research program.
- Employees and dependent constituencies share management's vision, values, and goals.

- The portfolio of programs represents the right research at the right time and at the right investment.
- Research projects embody excellent science, involve the right people, are on track and within budget.
- Research projects leverage external resources.
- Organizational knowledge is systematically captured and turned into needed work tools.
- The organization is widely known and respected.
- The organization meets the needs of dependent constituencies.

Boseman and Wittmer (2001) studied data from questionnaires sent to industrial organizations that interacted with federal laboratories from 1996 to 2001, totaling 229 project interactions and covering 27 federal government laboratories. The researchers found that:

- Increased technical range in terms of basic and applied research through development capability was associated with increased product development and net economic benefit.
- Few companies are technically passive in their partnerships with Federal labs, even though this role can result in improvements.
- Jointly performed technical roles were generally less effective than single-performer roles or technically passive roles.
- Companies are most effective in product development when performing applied research, product development, and product testing.
- Product marketing and improvement are associated with Federal lab roles of precommercial research and testing.
- Companies performing the role of precommercial applied research and Federal labs performing the role of basic research results in the greatest economic benefits.

Germeraad (2001) emphasizes that R&D fails not just because of poor development, but also by targeting the wrong opportunities. This researcher emphasizes that portfolio selection is important, and “third generation” portfolio

management emphasizes the rating of technology positions in specific areas as dominant, strong, or weak, and the projects are categorized as incremental, next-generation, or breakthrough technologies. Germeraad emphasizes that as visualization and management tools improve, the research and development cycle becomes shorter.

Lambright (1998) researched the issue of leadership in government research and development agencies during times of cutback management and downsizing. Through his interviews of public professionals in NASA, the Department of Energy (DOE), and other government professionals, Lambright discerned that there were three strategies that leaders could employ in a budget-driven environment: resistance, mitigation, and a mix of resistance and mitigation. Lambright describes a sequential pattern of resistance, mitigation, and a mixed approach as applied to the NASA Mission to Planet Earth (MTPE) program, the DOE Supercollider program, and the NASA Space Station program, each achieving different results. The Supercollider was killed, the MTPE survived and achieved modest stability at a much lower level of funding, and the Space Station was nearly killed, but survived with an agreed-upon yearly congressional allocation despite cutbacks and downsizing. Lambright argues that in government science agencies, leadership priorities, timing, and alliances are key factors in explaining why Big Science programs succeed or fail.

Kochanski & Ledford (2001) surveyed scientific and technical workers in the private sector and found that there are five major types of rewards that appeal to science and technology workers in particular, with work content being most important to the majority (75%), affiliation a close second (73%), and the others roughly equal in importance (62% to 65%). The reward categories are:

- Work content, in terms of variety, challenge, autonomy, meaningfulness, feedback.
- Affiliation, in terms of organization commitment, organization support, work environment, organization citizenship.
- Career, in terms of advancement, personal growth, training, employment security, title.
- Indirect financial, in terms of benefits, non-cash recognition, perquisites.
- Direct financial, in terms of base salary, incentives, ownership, cash recognition, premium pay, pay process.

Interpretations of the Literature

The literature on government reform demonstrates that there is an ongoing process of experimentation in the Federal sector, as well as worldwide. The studies that are available on public sector reform are somewhat fragmented and ill defined. However, embracement of government reform and experimentation through application of private sector methodologies is occurring despite the lack of theoretical frameworks. Many of the cost, quality, and systems methodologies possess a mixed record of success in the private sector. Additionally, there is a concern among many public management researchers and practitioners that the nature of government service is not being well served by the competing nature of several elements of the reform effort. Included in this concern are the often-competing requirements and agendas that exist between the various stakeholders in the reform process, to include taxpayers, the private sector, Congress, the Executive branch, and the bureaucratic infrastructures that exist within the various federal agencies.

Leadership emerges as a critical issue because it goes to the heart of the controversy pertaining to the latitude of action that is granted and taken by public employees to develop and implement public policy as defined by the Legislative and Executive branches of government. Leadership possesses an additional dimension of public service orientation that impacts on the theoretical interpretations of this construct as applied to government organizations. The derivations of influence and power in public organizations differ from private sector organizations, leading to different concepts of the exercise of leadership tied to political necessity. Related to this is the issue of how proactive public professionals can be, and how much risk can they assume in government organizations.

Methodologies that apply in a competitive environment that are designed to achieve competitive advantage are being applied to an environment that may not, and possibly should not, prioritize competition as the primary function of its organizations. Information is being made available within government organizations and across the Federal government. Technologies are impacting team and communications processes for planning and decision-making. However, government organizations are often not optimally structured to better serve a modern information society, but efforts to reform this structure may need to address the preservation of the nature of public service.

The case studies illuminate the mixed nature of results that flow from various implementations of Gore's Government Reinvention activities. Several efforts show promising results in terms of improved customer service and streamlined business processes that take advantage of technology. Other efforts indicate the difficulties encountered in any system that must address several stakeholders and customers that define product and service delivery in very different terms.

This study proceeds with the knowledge that many of these issues will be encountered within the organizational and cultural context of NASA. This literature review informs the interviews, observations, and document analyses in how NASA is being impacted by government reform activities, as well as how NASA is tailoring government reform tenets for its own purposes in achieving organizational objectives, and how public professionals are developed to be effective in this type of environment.